International Transport Forum

Liberalisation of Air Transport

Liberalisation of Air Transport

Research Report
2019

The International Transport Forum

The International Transport Forum is an intergovernmental organisation with 59 member countries. It acts as a think tank for transport policy and organises the Annual Summit of transport ministers. ITF is the only global body that covers all transport modes. The ITF is politically autonomous and administratively integrated with the OECD.

The ITF works for transport policies that improve peoples' lives. Our mission is to foster a deeper understanding of the role of transport in economic growth, environmental sustainability and social inclusion and to raise the public profile of transport policy.

The ITF organises global dialogue for better transport. We act as a platform for discussion and pre-negotiation of policy issues across all transport modes. We analyse trends, share knowledge and promote exchange among transport decision-makers and civil society. The ITF's Annual Summit is the world's largest gathering of transport ministers and the leading global platform for dialogue on transport policy.

The Members of the Forum are: Albania, Armenia, Argentina, Australia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Canada, Chile, China (People's Republic of), Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, India, Ireland, Israel, Italy, Japan, Kazakhstan, Korea, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Mexico, Republic of Moldova, Montenegro, Morocco, the Netherlands, New Zealand, North Macedonia, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Arab Emirates, the United Kingdom and the United States.

International Transport Forum
2 rue André Pascal
F-75775 Paris Cedex 16
contact@itf-oecd.org
www.itf-oecd.org

ITF Research Reports

ITF Research Reports are in-depth studies of transport policy issues of concern to ITF member countries. They present the findings of dedicated ITF working groups, which bring together international experts over a period of usually one to two years, and are vetted by the ITF Transport Research Committee. Any findings, interpretations and conclusions expressed herein are those of the authors and do not necessarily reflect the views of the International Transport Forum or the OECD. Neither the OECD, ITF nor the authors guarantee the accuracy of any data or other information contained in this publication and accept no responsibility whatsoever for any consequence of their use. This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Cite this work as: ITF (2019), *Liberalisation of Air Transport*, ITF Research Reports, OECD Publishing, Paris.

Acknowledgements

The International Transport Forum (ITF) would like to acknowledge the contributions to this document of the Working Group on the Liberalisation of Air Transport, composed of a cross-section of representatives from ITF member countries, international organisations, industry and researchers as well as experts who were not part of the working group but provided much valued input. Our special thanks go to the authors: chapters one and two were written by Alain Lumbroso, Antigoni Lykotrafiti and Wouter de Wit of the International Transport Forum; chapter three was written by Mike Tretheway and Robert Andriulaitis; chapter four by Guillaume Burghouwt, Pablo Mendes de Leon, and Jaap de Wit; chapter five by Alan Khee-Jin Tan and chapter six by Xiaowen Fu and Tae Hoon Oum who gratefully acknowledge the excellent and substantial support from Dr. Zheng Lei and Ms. Ruowei Chen in writing this chapter.

Country Representatives:

Andreas H. KAVALARIS, Denmark

Brian HEDBERG, United States of America

Didier LEDUR, Belgium

Federal Ministry of Transport and Digital Infrastructure of Germany

Gun Young LEE, South Korea

Jagoda EGELAND, United Kingdom

Keith JONES, Canada

Lasse FRIDSTRØM, Norway

Maarten DE LANGE, Netherlands

Mark BOSLY, United Kingdom

Matti TUPAMAKI, Finland

Megan WALKLET-TIGHE, United States of America

Nabil LAKHEL, Morocco

Niels REMMER, Denmark

Peter IRVINE, United States of America

Philippe AYOUN, France

Signe Marie FINDERUP NIELSEN, Denmark

Sonya VAN DE GEER, New Zealand

Stephen BORTHWICK, Australia

Todd HOMAN, United States of America

Virginie BOUTUEIL, France

Yuichiro KAWASHIMA, Japan

International organisations, industry and research:

Antonia Giulia CARZANIGA, World Trade Organisation

Brian PEARCE, International Air Transport Association

Carole ARNAUD-BATTANDIER, International Federation of Air Line Pilots' Association

Helen MARANO, World Travel and Tourism Council

Jaap DE WIT, University of Amsterdam

James WILTSHIRE, International Air Transport Association

Mike TRETHEWAY, InterVISTAS

Olivia RUGGLES-BRISE, World Travel and Tourism Council

Rob ANDRIULAITIS, InterVISTAS

Tae OUM, University of British Columbia

Toru HASEGAWA, International Civil Aviation Organisation (Chair of the Working Group)

Table of contents

Executive summary 11

What we did 11
What we found 11
What we recommend 12

Chapter 1 Policy insights and recommendations 13

Introduction 13
Regulation and deregulation of commercial aviation 14
Air traffic rights 15
Economic consequences of liberalisation 17
Connectivity 19
The environment 21
The emergence of aviation blocks 21
Market access 23
Ownership and control 24
The business environment 27
Fair competition 28
Outlook for liberalisation 31
Conclusions and recommendations 32

Notes 35

References 36

Chapter 2 Research report 37

Purpose 37
Outline 39
Freedoms of the air 39
Defining open skies 40
Instruments for regulation and liberalisation 41
Alliances and joint ventures: Industry's response to competition and ownership and control policies 73
Economics impacts of liberalisation 94
Country case studies 140
Challenges and issues 185
The way forward 209

Notes 214

References 222

Chapter 3 What do we mean by a level playing field in international aviation? 240

Introduction 240
Historical context 241

Factors affecting the level playing field that should not be considered an issue 243
Geography 243
Airline size 244
Factors of production 244
Sixth freedom traffic 245
Airport slots 246
Legitimate concerns raised by level playing field 247
Subsidies 248
Liberalisation and the level playing field 250
Alliances, antitrust immunity and the level playing field 250
A final implication of having a level playing field 251
Conclusions 252
Future areas for consideration 252

References 253

Chapter 4 EU air transport liberalisation: process, impacts and future considerations 254

Introduction 254
The creation of the internal market 255
The impact of liberalisation on the European market 258
The emergence of low-cost carriers in Europe 267
Development of full service network carriers in the liberalised market 276
Airport competition and airport capacity as a competition barrier 283
EU external aviation policy: process and impacts 285
Merger control 288
Conclusions and future perspectives 289

Notes 293

References 294

Annex 4.A 296

Annex 4.B 298

Annex 4.C 299

Annex 4.D Comparison between bilateral and plurilateral arrangements governing the operation of international air services 301

Annex 4.E The air cargo fuel charge cases 303

Chapter 5 Assessing the prospects for an EU-ASEAN air transport agreement 304

Introduction 304
Envisioning the EU - ASEAN open skies market 304
Conclusion 314

References 315

Annex 5.A Network maps of leading sixth freedom carriers in the Middle East and Asia 316

Chapter 6 Dominant carrier performance and international liberalisation: The case of North East Asia 320

Introduction 320
Domestic market development and status of major airlines 322
Implications of liberalisation to dominant airlines 331
Liberalisation by facilitating low-cost carrier services 337
Summary, conclusion, and further thought 342

Notes 345

References 346

Figures

Figure 2.1 Airline partnership options and their level of integration 109

Figure 2.2 The S-curve effect 113

Figure 2.3 Minimum economic mass (product of GDP at origin and destination) necessary for the opening of a direct connection, as a function of distance 114

Figure 2.4. Regional breakdown of revenue passenger kilometres 116

Figure 2.5 Share of low-cost carriers in intraregional (excluding domestic) capacity in 2010 117

Figure 2.6 Schematic representation of the network organisation of a two-country hub-and-spoke model 119

Figure 2.7 Returns and cost of capital for the listed airline industry 121

Figure 2.8 Net profit margin for fiscal year 2014 (2014f) versus Herfindahl-Hirschman Index of market concentration based on market share by seat capacity ... 123

Figure 2.9 STRI for commercial establishment in air transport by policy area 124

Figure 2.10 Schema of network design with and without co-terminalisation 136

Figure 2.11 Degree of aviation friendly policies of selected carriers in their home country 191

Figure 4.1 Number of routes and number of flights within EU15+2, 1990-2013 260

Figure 4.2. Number of routes and number of flights within EU15+2, 1990-2013 260

Figure 4.3. Year-on-year growth of number of intra-EU15+2 scheduled flights and number of scheduled routes (airport-pairs) compared to previous year, 1990-2013 261

Figure 4.4. Share of different carrier types in the total number of intra-EU15+2 flights 262

Figure 4.5. Number of scheduled and effectives carriers with services within EU15+2 and number of effective carriers, 1990-2013 264

Figure 4.6. Weighted number of effective carriers at the route level for intra-EU15+2 flights, 1990-2013 265

Figure 4.7. Number of routes and number of carriers operating at the route level (intra-EU15+2), 1990-2013 266

Figure 4.8. Categorisation of intra-EU15+2 services by freedom of the air for selected European carriers 267

Figure 4.9. Categorisation of intra-EU15+2 services by freedom of the air for selected European carriers 268

Figure 4.10. Unit cost differentials for selected European FSCs and LCCs in 2012 269

Figure 4.11. Annual growth of the number of low-cost carrier intra-EU15+2 flights 1990-2013, compared to previous year 270

Figure 4.12a Number and share of low-cost flights in total number of intra-EU15+2 flights 271

4.12b. Number and share of low-cost flights in a selection of originating countries, 1990-2013 271

Figure 4.13. Total number of low-cost routes (intra-EU15+2) and share of route by number of operators, 1990-2013 272

Figure 4.14. Number of low-cost carriers and number of effective low-cost carriers (1/hhi) operating flights within EU15+2, 1990-2013 272

Figure 4.15. Percentage of routes shared by low-cost carriers and (former) flag full-service carriers 274

Figure 4.16. Total Europe (incl. domestic) passenger yield, US¢/RPK 275

Figure 4.17. The rise and consolidation of European hubs (EU15+2), 1990-2010 277

Figure 4.18. Feeder value of major EU hubs in 2004 and 2014 278

Figure 4.19. Number of routes (airport-pairs) operated by (former) flag full-service carriers and share of type of routes by number of carriers, 1990-2013 279

Figure 4.20. Total number of scheduled intra-EU15+2 operations per week of the ten largest leisure carriers 282

Figure 4.21. Selected mergers, take-overs and bankruptcies of legacy carriers 283

Figure 4.22. Airport congestion according to Eurocontrol's scenario C 284

Figure 4.B.1 Low-cost airlines and years of operation as applied in this chapter 298

Figure 5.A.1. Emirates 316

Figure 5.A.1. Qatar airways 317

Figure 5.A.3. Turkish airlines 317

Figure 5.A.4. Korean Air 318

Figure 5.A.5. Thai Airways 318
Figure 5.A.6. Singapore airlines 319

Tables

Table 2.1 Freedoms of the air 40
Table 2.2 Number of EU member states having ASAs with Canada with their levels if restriction 69
Table 2.3 Literature overview on the impact of alliances on air fares, traffic and consumer surplus 103
Table 2.4 Revenue passenger kilometres and direct connections (between model regions) in 2030 and 2050 115
Table 2.5. Examples of granted subsidies 200
Table 2.6. Qualitative assessment of the impacts of subsidies 205
Table 4.C.1. Low-cost carriers in different studies 299
Table 4.D.1 Comparison of the degree of liberalisation of selected air policy regimes 301
Table 5.1. Status of EU designation agreements with ASEAN member states 305
Table 5.2. Direct operations by EU and ASEAN carriers between the two regions 306
Table 5.3. One-stop operations by sixth freedom carriers between the EU and ASEAN 307
Table 5.4. Middle Eastern and Turkish carriers' capacity into ASEAN, by weekly seats 308
Table 5.5. Points offered for ASEAN-China Agreement's Draft Protocol 2 on Fifth Freedom Rights 311
Table 6.1. Airport slot control and coordination of Chinese airports 325
Table 6.2. Market share of the top-ten Chinese airports 327
Table 6.3. Average aircraft size on routes between different sized airports 328
Table 6.4. Weekly average flight frequency on routes between different-sized airports 328
Table 6.5. Benchmark major airlines' performance in NEA 329
Table 6.6. Gross Total Factor Productivity (TFP) Index of major airlines: Normalised at American Airlines 2005=1 330
Table 6.7. NEA Airline service to North American destinations 332
Table 6.8. NEA Airline service to European destinations 333

Table 6.9. NEA airline services to destinations in Asia and Oceania (International markets only) 334
Table 6.10. Hub airport performance benchmarking..... 335
Table 6.11. NEA low-cost carrier profile 338
Table 6.12. NEA LCC service overview as of July 2014 339
Table 6.13. LCC entry to NEA countries as of the first week of July 2014 340

Executive summary

What we did

Air transportation is one of the most economically regulated industries in the world. Over the last four decades, it has benefitted from significant liberalisation in many markets, which has made it more competitive. Although the benefits of these measures for consumers, whether passengers or shippers, and for airlines are widely acknowledged, several issues related to fair competition, labour standards and the environmental impact of this ever-growing industry need to be addressed as the liberalisation process continues to unfold. To discuss these issues and formulate policy recommendations, the International Transport Forum (ITF) established a working group consisting of member country representatives and aviation experts representing the airline industry, international organisations and researchers. A two-day working group meeting in Paris (8-9 February 2015), a member country survey, four commissioned papers and many written contributions have provided the input for this report, written by the ITF Secretariat and reviewed by experts from the working group.

What we found

In most markets liberalisation of economic regulation initially led to the entry of multiple new airlines, followed by a period of consolidation during which many airlines went bankrupt, some low-cost carriers (LCCs) grew rapidly and most incumbent airlines engaged in mergers and acquisitions. As foreign ownership and control restrictions in national legislations generally prevent mergers between international carriers, airline alliances were formed along with some strategic joint ventures.

To prevent anticompetitive effects, some competition authorities, such as the United States, only grant antitrust immunity to airline alliances in markets where an open skies agreement is in place. This has provided an incentive for other governments to liberalise markets. The open skies agreement between the United States and the Netherlands (1992), facilitating a strong alliance between Northwest Airlines and KLM, laid the blueprint. This has gradually resulted in less restrictive bilateral and multilateral air service agreements (ASAs) and the proliferation of open skies agreements. This has resulted in:

- new airline groups such as Air Asia, LATAM, IAG, Air France-KLM and the Lufthansa Group that have been able to exploit a more liberal interpretation of airline ownership and control
- new network carriers that have been able to exploit both their geographical location and the national goals of their government to develop large aviation hubs, such as Emirates, Qatar Airways, Singapore Airlines and Copa Airlines
- business models that have innovated to reduce costs by maximising use of capital assets and with new labour conditions, which in some cases such as Ryanair or Norwegian Long Haul may be problematic from a social acceptance perspective.

Although these developments have largely benefitted the consumer, they have also raised concerns with regard to fair competition and social acceptability. The impact on the labour market , the combination of market liberalisation and the growing presence of the LCC model, especially within the European Union (EU), has led to the emergence of a new and atypical organisation of labour. These labour models have

raised significant concerns over their legality, desirability and sustainability. There is now a need to define what constitutes a level playing field.

What we recommend

Provide a clear basis for Air Service Agreement negotiations

The challenge for further liberalisation is to unlock consumer gains through fair competition. This requires legal frameworks that open markets for competition but provide safeguards against unfair competition. To facilitate future negotiations on less restrictive ASAs, consensus needs to be reached on defining legitimate conditions to be included in ASAs.

Agree on a global framework for subsidies to level the playing field for competition

Legitimate areas of concern include discriminatory carrier-specific subsidies. A global framework, under the auspices of the International Civil Aviation Organisation (ICAO) on which forms of subsidy are acceptable and which are not, should be established to provide clarity on the issue and rules by which all can abide. In the short-term, carriers should be urged to provide more transparency on the operating subsidies they receive.

Accept that a range of factors are not relevant to ensuring a level playing field

Comparative advantages such as geographical position, differences in the cost of factors of production, technological advantage, sixth freedom traffic opportunities and low rates of general taxation on business do not run counter to the principle of equality of opportunity and thus should not be used as arguments against liberalisation. The same holds true for airline size and airport slot allocation procedures as long as they are the same for all carriers. Competition issues that might arise from these factors should be dealt with by competition authorities.

Liberalise ownership and control clauses in air service agreements

Ownership and control restrictions have curtailed the ability of airlines to access capital and complete mergers and acquisitions that could provide for a less fragmented and more efficient air transport industry. A liberal interpretation of airline control requirements has allowed the formation of multinational airline groups in some regions of the world. A shift of emphasis from restrictions on ownership to regulation of control worldwide would enable carriers to lower capital costs and fully utilise the economies of scale, density and scope that come from a merger.

Extend liberalisation to the entire aviation supply chain

While much of the focus of liberalisation is placed on traffic rights between countries and airline ownership, it is important to examine how to bring market liberalisation to all key stakeholders in the aviation industry, including airports, air navigation services providers and ground services providers. The benefits of open competition in these sectors could augment the existing benefits to consumers from aviation liberalisation and provide air carriers with a more competitive marketplace in which to operate.

Chapter 1
Policy insights and recommendations

This chapter discusses the case for aviation liberalisation and proposes policy actions to help aviation deliver increased social welfare.

Introduction

The economic regulation of air services predates the first commercial flight by a year and reflects a realisation by governments that some economic regulation was necessary to provide a framework for this otherwise highly competitive industry. Over the decades, thinking on the economic regulation required has evolved. Initially highly regulated, the industry has seen evolutionary and sometimes transformative change as governments have progressively removed themselves from the role of supply manager.

Today, we see two main tracks for aviation liberalisation. First, with regard to international traffic rights, most major economies and leading emerging countries have liberalised their own domestic markets and markets shared with many of their key trading partners to a large degree. Bilateral air service agreements (ASAs) granting full rights on third, fourth and fifth freedoms[1], open code-sharing opportunities and liberal cargo and charter regimes (generally known as open skies agreements[2] or OSAs) are often the desired goal, with individual states taking into account what each believe to be the right balance between the needs of travellers, shippers, airlines and airports. Liberalisation has led to important gains in consumer welfare. In major emerging economies and the international markets in which they participate, liberalisation has begun but is far from complete and there remains a large potential for unlocking consumer benefits. On the other track, concerning airline ownership and control, national ownership requirements have been relaxed to facilitate access to foreign capital in some markets, with control exercised through standard local business regulations, whilst in other markets legislatures have ruled out reform. While this paper focuses on air carriers, it should be noted that air transport liberalisation also entails liberalisation of airports, air navigation services and all stakeholders involved in the aviation value chain.

The regulatory challenge for aviation is that it is a globally connected industry, subject to an integrated, international regulatory framework for safety and interoperability, but also subject to a significantly more heterogeneous series of economic regulatory frameworks reflecting national priorities and bilateral agreements between individual states. For example, while the operational regulations for flying are highly uniform across the globe, sales and marketing for international flights is subject to a patchwork of different regulations that can suppress market entry. Similarly, local economic regimes that provide opportunities for bankruptcy, state ownership or subsidy can reduce exit of incumbent airlines and restrictions on foreign ownership of nationally registered airlines limits access to international capital markets. All this limits innovation, investment and expansion in aviation markets. The object of liberalisation is to remove these limits to benefit users and increase consumer welfare.

The challenge for further deregulation is to unlock consumer gains through fair competition. This requires legal frameworks that open markets for competition but provide safeguards against unfair competition. Competition authorities effectively monitor market concentration and predatory pricing, but the issue of subsidies, or state aid, remains problematic in aviation. There are no broadly accepted definitions as to what constitutes acceptable or non-acceptable state aid in the air services industry. So long as international aviation is not integrated into trade regulated by the World Trade Organisation (WTO) this will require agreements either on a bilateral basis, or, ideally, a global framework, probably under the auspices of the International Civil Aviation Organization (ICAO) on what forms of subsidy are acceptable and which are not. This framework would require transparent and audited financial reporting that meets international standards for carriers. It would also require an enforcement mechanism to address violations, either on a route basis or network basis, depending on the nature of the subsidies, and that would not translate into limiting market access, the most damaging outcome for tourism and trade.

Regulation and deregulation of commercial aviation

Much of the economic regulatory framework in which aviation operates today has its origins in the US government intervention to promote the development of airmail service in a nascent industry in the 1920s and the need to ensure reliable access to sovereign airspace for air passenger services at the close of the Second World War. While providing a structure for development of international air services, the regulation developed on this basis restricted competition, thus distorting markets, limiting efficiency, foregoing growth and curtailing consumer welfare. But it imposed a strict order under which some airlines were able to grow.

The United States began deregulating its inter-state market in 1978 after a significant gap emerged between prices on similar US intra-state and inter-state routes. High prices meant little incentive for efficiency; planes were flying half empty. The result of deregulation has been improved efficiency through reorganisation and innovation through new entry, with new business models. This led to a marked and sustained fall in prices, with great differentiation of prices and services offered and rapid growth in passengers and freight carried, which was accompanied by rapid growth in overall employment in the sector. In the last decade, following the post-9/11 bankruptcy of the six large US network carriers, the US industry experienced a degree of unprecedented consolidation which has led to the emergence of three major carriers, American Airlines, Delta Airlines and United Airlines, each anchoring one global alliance as well as establishing new, less labour-friendly, collective agreements. With fewer competitors, a healthy economy, strict and disciplined yield management, labour peace and now significantly lower oil prices, these carriers have been able to limit excess capacity on the domestic market and return to profitability.

Deregulation spread internationally with the United States pursuing open skies agreements with its trading partners and has accelerated in the last two decades, notably with the establishment of the first fully free international market in the European Union (EU) in 1997, which was predicated upon full regulatory convergence. This replaced restrictions on the ownership of airlines (nationality clauses) with the right to register a European airline anywhere in the EU and for a European registered airline to fly any route in the EU. This led to rapid expansion of intra-EU point-to-point carriers, numerous route entries and exits and significant cost pressures on legacy network carriers that ultimately led to significant consolidation articulated around the three large carrier groups: IAG, Lufthansa and Air France-KLM. A decade later, acting on behalf of its member states, the European Commission (EC) concluded EU-US (2007 and expanded in 2010) and EU-Canada ASAs (2009) that have liberalised the North Atlantic

market. Both of these agreements are clearly open skies according to the previous definition but compared to the EU Single Market, they include some restrictions, including cabotage, seventh freedom passenger flights and ownership and control requirements.

Deregulation is in preparation in a number of markets, notably operation of the Association of Southeast Asian Nations (ASEAN) Single Aviation Market planned for 2015 and negotiations towards comprehensive air service agreements have been completed between the EU and countries including Brazil, currently awaiting ratification, Georgia (2010), Moldova (2012) and Israel (2013). In 2013, at the 38th session of ICAO's General Assembly, the ICAO Council was tasked to develop and adopt a long-term vision for international air transport liberalisation, including examination of an international agreement by which states could liberalise market access. Regarding cargo in particular, the ICAO Council has been mandated to develop a specific international agreement to facilitate further liberalisation of air cargo services.

The way in which China decides to develop international air service agreements will be particularly significant as Northeast Asia is the market with the largest potential for growth in the coming decades. The rate of this growth will be determined to a large extent by the pace of liberalisation and the success in finding enough skilled labour to sustain it while ensuring the highest levels of safety. China's gradual approach consists of granting traffic rights commensurate to estimated market size rather than full outright liberalisation. It has also adopted an airline designation policy that has enabled its three main carriers, Air China, China Eastern and China Southern, to establish three fortress hubs in Beijing, Shanghai and Guangzhou respectively and from where they operate most of their medium- and long-haul international flights.

The momentum that liberalisation has gained reflects the geopolitical changes and market developments that have occurred since the Chicago Convention was agreed to. Technological progress, with new planes able to fly longer distances more efficiently, has been important and innovation in airline business models has transformed some markets. Regional economic integration is becoming increasingly important. At the same time, the creation of single markets, most notably, the single European market has been predicated on the concept of ensuring a level playing field for competition – a concept still in the process of being defined in relation to aviation. Regulatory convergence in relation to competition is one of the pillars of the EU external aviation policy and the concept has successfully been transposed by the EU and its member states in all comprehensive air transport agreements negotiated so far. However, regulatory convergence on a global level remains in its infancy. Convergence measures developed unilaterally within the EU to ensure a level playing field have led to some distortion when non-EU carriers, who are not subject to them, compete against EU carriers that are subject to them. Even within the EU, differences in social and labour laws have enabled carriers, especially those operating point-to-point, to leverage these differences to tilt the playing field in their favour.

Air traffic rights

The first agreement on air transport was signed in 1913 between France and Germany and codified a framework which constitutes the foundation of modern air transport agreements. The agreement was an exchange of traffic rights, mutual recognition of licensing documents for aircraft and flight crews and the affirmation that countries had sovereignty over their air space.

In 1944 the Chicago Convention laid out the cornerstone of aviation law and established ICAO, the main international body governing international civil aviation. The Convention did not stipulate any particular form of international service structure but rather reaffirmed national sovereignty over airspace and an institutional framework within which nations could essentially exchange traffic rights, commonly referred

to as 'freedoms of the air'. Market access rights are usually granted in exchange for similar rights and may be limited by a state as a way to restore a perceived balance in the exchange of rights.

The initial underlying aim of these exchanges of traffic rights was to gain reciprocal access to each other's market and enable carriers from each country to obtain an equivalent share of traffic. However, the Convention's preamble clearly states equality of opportunity as one of its guiding principles, rather than equality of outcome. A particularity of international aviation not found in many other industries is the Chicago Convention's Article 6, which explicitly forbids all international scheduled services except with the special permission of the state that the flight overflies or has as its destination. These special permissions referred to in Article 6 became traffic rights traded by states, possessing the characteristic of national property or national benefits that can be traded amongst nations as opposed to private property, which is how demand for goods and services is perceived in most other industries. In that sense, aviation is treated as special even though there is no economic rationale as to why this should be. The high-risk nature of aviation certainly requires a very robust safety oversight regime, but the existence of such a regime does not require altering the fundamental economics of this service industry. Other strategic industries, such as mining, oil extraction, telecommunications, banking and insurance have all experienced similar restrictions in the past; however those have gradually receded in recent decades. The combination of national property rights, the imperative of ensuring high standards of safety and security, the wider economic benefits that flow from aviation and the need for connectivity between nations has led national governments to treat aviation in a very different way than most other service industries. Some governments even consider it as part of their national infrastructure, accepting the industry to be operated unprofitably in exchange for the wider economic benefits it provides.

Following agreement of the Chicago Convention, international aviation was governed by relatively unrestricted air service agreements, adopting the model of the US-UK air services agreement known as Bermuda I (1946). Gradually, air service agreements became more restrictive, culminating in the Bermuda II Agreement (1976). Under this agreement, the United Kingdom secured restrictions on trans-Atlantic traffic to protect its airlines from increasing competition from US airlines expected to emerge from the reform of the US domestic market. These types of agreements would set out the capacity, frequency and routes that designated carriers from each country were allowed to serve, in effect giving governments the responsibility of setting the parameters of commercial aviation capacity.

Deregulation of the US air freight market (1977) followed by the US passenger market (1978) also sowed the seed for liberalisation internationally over the longer term. It transformed the US airline network, moving from a railway-inspired point-to-point pattern of services to the hub and spoke model widely found in contemporary commercial aviation. Liberalisation of aviation markets began to spread internationally with an open skies agreement between the United States and the Netherlands (1992), facilitating a strong alliance between Northwest Airlines and KLM which laid the eventual blueprint to global airline alliances. This was followed by the Canada-US open skies agreement (1995[3]/2006), the European Single Air Transport Market (1997), the Trans-Tasman Single Aviation Market (2002), the EU-US open skies agreement (2007 and amended in June 2010), and the ASEAN-China open skies agreement (2010). These agreements and others have resulted in large parts of the commercial aviation market being able to operate with little or no traffic restrictions.

The exchange of traffic rights, based on an expected balance of benefits and costs, created a mosaic of ASAs, over 3 000, by some counts[4] which has led to international aviation being subject to a very complex economic regulatory framework. Despite this heavy regulatory environment, commercial aviation has been very successful in bridging large geographic distances separating people from each

other and goods from the marketplace. Today's global aviation network carries annually over 3.3 billion passengers and 50 million tonnes of freight worth over USD 18 billion.

ASAs can incorporate many features covering aviation safety, security, incident investigation, immigration, control of travel documents and exemptions from national fiscal, labour and airport handling laws in order to make international aviation viable. The WTO Secretariat (WTO, 2006) identified seven features of ASAs as relevant indicators of openness for scheduled air passenger services. These are the 'freedoms of the air' or granting of rights, capacity restrictions, fare restrictions, withholding clauses[5] designation, compulsory exchange of statistics and restrictions related to co-operative arrangements, such as code sharing agreements.

Economic consequences of liberalisation

The results of deregulation have been closely studied for over a quarter of a century, providing a rich body of economic literature on the topic. Overall, liberalisation, especially when combined with the entry of low-cost carriers (LCCs), has driven down air fares, which has increased demand, improved connectivity and supported the growth of trade, tourism and the broader economy. Highlights from selected key studies are outlined in this section.

Deregulation in the United States led to sharp fare decreases and significantly better indirect connectivity as passengers from one secondary market could for the first time travel to another market through a well-timed, co-ordinated connection. Initially, this meant a rash of new entries would test the market, force incumbent carriers to react and then exit the market, leading to a series of airline start-ups and closing. As the deregulated market gained in maturity, the churn of new entrants and exits diminished significantly, at least until the financial crisis of 2008 that prompted more consolidations and failures. Morrison and Winston (1990) were among the first to study the effects of the deregulation of the United States' market on fares and concluded that fares were about 30% lower than they would have been if fare-regulation was still in place. Several studies confirmed their findings and emphasised the importance of the LCCs that were able to develop with the ending of controls on entry to the market in achieving this decrease in average fares (Borenstein, 2014). Meanwhile, for air freight, US domestic deregulation enabled the air express market to thrive by allowing it to organise a hub and spoke network and enabling it to charge a premium for speed at a level dictated by market conditions rather than simply charge by distance as was the case prior to deregulation. In the air express segment, it also led to industry consolidation articulated around the two large integrators, FedEx and UPS.

A similar story holds for Europe in which the creation of the Single Air Transport Market enabled LCCs, such as EasyJet and Ryanair, to develop very rapidly, dramatically increasing connectivity and lowering air fares. It also enabled EU carriers from one country to freely operate in another, a feature that proved far more desirable for LCCs than full service carriers. Using a 24-year period of analysis (1990-2013) Burghouwt et al. (2014) provide an overview of the long-term supply developments in the liberalised EU air transport market with respect to airline output, market structure, yields, business models and the position of the (former) flag carriers. They find that EU air transport liberalisation has facilitated significant growth in the number of routes and frequencies and offered more competition at the route level, lower fares and substantial connectivity growth as a result of the adoption of point-to-point networks. Between 1992 and 2002, the number of intra-EU flights per week nearly doubled, from about 60 000 to over 100 000. In the subsequent decade, the number of flights remained stable, while the number of intra-EU routes grew steadily, going from about 4 000 in 1992 to about 9 000 today, the number of frequencies per route has gradually declined. While connectivity and capacity experienced

large increases over the last quarter century, fares and yields experienced a dramatic decline, being more than halved in real terms since 1992. Meanwhile, save for a few notable exceptions, direct state subsidies to carriers were abolished while secondary airports used public funding to finance significant expansion and entice LCCs into establishing a base.

Gönenç and Nicoletti (2001) were among the first to examine the effects of bilateral air service agreements on air fares. They analysed agreements for a sample of OECD countries, including the United States, Australia, European and developed Asian countries and collected fare data for predominantly intercontinental flights. It was concluded that both at the national and route level there "is clear evidence that fares tend to decline as the regulatory and market environment becomes friendlier to competition". In addition, they concluded that fares react to changes in the level of regulation independent from market structure, which they explain by suggesting that potential entry as much as actual competition disciplines prices. They also concluded that economy fares tend to be higher for non-stop routes that are dominated by an airline alliance and they find that airport congestion and dominance tend to raise fares for business passengers. Thus, competition through indirect connectivity has a greater influence on lowering air fares than competition on direct connectivity.

Doove et al. (2001) extended the work of Gönenç et al. (2001) to cover 35 countries. They found a positive and significant relationship between the restrictiveness of air service agreements and air fares, with larger effects for developing countries than for developed countries. A differentiated effect of air service liberalisation for developed and developing countries is also found by Micco et al. (2006). Focusing on OSAs with the United States, they investigated the impact of these agreements on air fares and on the share of US imports arriving by air. They found that for developed and upper-middle income countries, signing OSAs reduces air fares on average by 9% and increases the share of imports arriving by air by 7% three years after the OSA is signed. In contrast, they do not find significant effects of OSAs for low-income countries. Here we might be observing the fact that air fares in low-income countries remain high relative to individual income, even in the wake of a reduction brought on by OSAs. In those cases, it is likely that these countries would need a combination of OSAs and the entry of LCCs to see a marked traffic increase.

Piermartini and Rousova (2008) use a gravity model to explain bilateral passenger traffic and estimate the impact of liberalising air service agreements on air passenger flows for a sample of 184 countries. In order to assess the effective degree of liberalisation of the bilateral air service agreements, the Air Liberalisation Index, constructed by the WTO (2006), was used. The study found robust evidence of a direct and significant relationship between the volume of traffic and the degree of liberalisation of the market. An increase in the degree of liberalisation from the 25^{th} percentile to the 75^{th} percentile increases traffic volumes between countries linked by a direct air service by approximately 30%. The study finds that the most traffic-enhancing provisions of air service agreements are the removal of restrictions on the determination of prices and capacity, granting of cabotage rights and the possibility for airlines other than the flag carrier of the foreign country to operate a service.

Liberalisation does not always have such dramatic impacts. In the case of the US-EU open skies, the fact that the markets were already relatively open between most large EU countries (Netherlands, Germany, Italy, France) and the United States meant that there was little pent-up demand that a new agreement could release. Thus liberalisation has shown positive or neutral effects on passengers and carriers, depending on how restrictive the regime it replaced actually was and how much pent-up demand was not being met.

Liberalisation has had the largest impact on traffic and consumer welfare by enabling the creation or significant growth of LCCs. However, the growth of those carriers has also led to labour cost-cutting

measures, such as atypical employment, lower salaries and lower pensions, which offset some of the consumer welfare gains. Removing restrictions on entry to the market can generate significant levels of new demand, changing travel patterns and transforming the market. A number of studies conclude that in most markets competition through entry of a full-service carrier does not yield such transformative results as entry of the first low-cost carrier.

Connectivity

Liberalisation of air transport has altered how aviation markets are connected. With an increased reliance on the hub and spoke network at an airline alliance level, secondary markets have become increasingly dependent on their linkages to the major hubs for indirect global connections. While some secondary locations have lost direct services, connectivity has increased both in the overall market, with many more convenient indirect routes provided, and usually for these secondary locations too. Meanwhile, a number of airports around the world have established or tried to establish themselves as global hubs with the aim of vying to attract transferring passengers and freight from one part of the world to the other, while generating little traffic themselves. This is the case of Abu Dhabi, Amsterdam, Doha, Istanbul, Panama and Singapore to name only a few examples. This has significantly changed the way people and goods travel across the world, shifting travel patterns away from some of the more traditional EU and North American hubs and providing consumers and shippers with new routing options.

These changing travel patterns have been particularly felt in Europe where flights through Turkey and the Gulf hubs have become viable alternatives to direct flights from the major European hubs in connecting Europe with Asia or Eastern Africa. ACI-Europe (2014) shows that direct connectivity between EU and Asia-Pacific is at an all-time high, but its growth rate has been lagging, thus reducing the market share of major EU hubs despite growing traffic. Thus, for example when looking at onward connectivity from Europe, in the last decade connectivity grew by 28% for EU hubs, compared to 307% for non-EU European hubs and 53% for non-European hubs. This has in turn pushed down the combined market share of Heathrow, Charles de Gaulle and Frankfurt from 33% to 29% since 2004 as those airports have faced both increased competition from emerging mega-hubs and the global financial crisis that affected EU hubs more significantly than non-EU hubs. Overall, direct connectivity from EU airports declined by 7% between 2007 and 2014, while non-EU European airports saw their direct connectivity grow 34%. On the lucrative Europe to Asia routes, where EU hubs have some geographic and economic disadvantage, the top four EU hubs combine for nearly 40% of connections, compared to 7% for Istanbul and 5% for Dubai.

The increase in the importance of hub connections has raised issues over a fall in direct connectivity, met with greater concern in some countries than in others. From a societal welfare perspective, passengers and freight may often be better off with indirect connectivity if it is accompanied by lower fares. Conversely, they have shown a willingness to pay more for direct routings, demonstrating that direct connectivity commands a premium value. When given a choice, we also see a significant portion choosing to travel via a third airport, taking advantage of better fares, better schedules or better services. All other things being equal, passengers obviously prefer direct connections and some are even willing to pay a premium for it. However, a significant issue that is challenging policy makers is that a number of secondary airports and small countries have seen an erosion of their point-to-point long-haul direct connectivity. This forces passengers to choose between indirect connectivity via a neighbouring hub or via a more distant one, but removes the option for direct connectivity, thus reducing the welfare of passengers who valued them. This situation is often not the result of a restricted market but rather of

how airlines construct their long-haul networks around hubs that consolidate traffic from secondary points.

Connectivity for the passenger depends on generalised costs – the combination of ticket price and time costs. Time costs include time spent in travel, time spent in transfer – including a penalty for the foregone comfort and convenience of direct flights[6] – and scheduling costs, which fall as frequencies increase. The higher frequencies and lower ticket price options provided for by connecting services generally more than offset the inconvenience of transfers, especially for leisure travellers and travellers visiting friends and families. However, business travellers with a significantly higher value of time, likely have a different perspective, placing more value of total travel time and preferring, when possible, direct connectivity. The challenge for network carriers is that their business model is predicated based on a healthy mix of both. The revealed preferences of travellers and shippers can yield outcomes different from national policy goals when these focus on direct connections or the provision of international services by a national carrier. Direct connectivity is not in competition with indirect connectivity, but rather each compliment the other; both are necessary to achieve an optimal social welfare outcome and a competitive marketplace offering a wide variety of choices to meet the needs of travellers and shippers.

Accessibility of regions served by secondary, non-hub airports, to international markets is an issue of concern in a globalising economy, especially to local industry. The quality of connectivity will depend on the frequency of services to hubs that offer direct onward connections to a large range of relevant destinations. Competition from new entrants or consolidation by incumbent carriers that reduces the frequency of services to secondary airports by incumbent hub network carriers can weaken connectivity to the region, particularly for business travellers, at the same time as increasing the range of connections offered and introducing lower fares on some routes. On the other hand, secondary airports and smaller countries will seek to maintain and grow the all-important long-haul point-to-point services they may provide, even if operated by a foreign carrier. This forces them to carefully balance connectivity with global hubs and all the indirect connectivity it can produce with the point-to-point direct service so that passengers and shippers can have more choice on the market. In so doing, countries may find themselves conducting a strategic arbitrage between the interests of one foreign carrier with point-to-point service and a foreign carrier seeking to link the secondary market to its main hub and global network. The overall effect on the regional economy may not be easily modelled.

Decisions on liberalisation can be influenced both by perceptions that direct connectivity is better than indirect connectivity and by the potential consequences for regional economic development of changes in network configurations that result from new entrance. Perceptions concerning connectivity can argue for as well as against liberalisation. Competition from airlines whose business model is based on connecting services through a hub located in a small origin/destination market has tended to result in the introduction of new long-distance services for secondary airports to their hubs and onward connections to some cities not formerly served by one-stop transfers. The new direct connections that often follow open skies agreements are of particular political interest in the constituencies served. The long-term challenge from a connectivity perspective is that the far away hub is only appropriate for travel towards certain parts of the world, whereas hubs located in closer proximity to secondary airports tend to offer appropriate connectivity to all parts of the world. Thus a strategic concern for secondary airports is that an over-reliance on far away hubs may lead to reduced service to its local hub and thus negatively affect overall connectivity and ultimately social welfare. This could occur despite improvements in connectivity to selected parts of the world and the prestige of gaining long-haul, wide-body service to far away hubs.

The environment

Aviation liberalisation between states with a strong safety oversight regime is mainly an economic and aero-political issue but it does have ramifications for the environment. On the short-haul markets, liberalisation combined with the advent of LCCs has led to significant traffic increase and, in some cases, a switch away from an environmentally friendlier mode as lower prices have stimulated demand and enabled air transport to gain greater market shares. On the medium and long-haul markets, liberalisation has offered travellers and shippers more routing options to get from origin to destination, but of course none is shorter, and thus more fuel efficient, than the direct routing which would have already been in place pre-liberalisation. Aviation has managed to partially mitigate the environmental effects of its growth, through improved, more energy-efficient technology and operational efficiencies, as well as flying larger and fuller aircrafts. But growth rates in traffic and emissions have not been fully decoupled. Thus, if a more liberalised aviation market translates into traffic growth it also translates into emissions growth. And if a more liberalised aviation market translates into more options for users, it also means longer routings than point-to-point flights, thus higher emissions for the same origin and destination.

Some states believe that expanding the liberalisation framework to include environmental issues creates an opportunity for arriving at a consensus on the best way to address aviation's environmental footprint but may in the process delay the advancement of liberalisation. On the other hand, some states are concerned that unilateral or bilateral limitations on liberalisation could negatively influence the competitive environment or create an unlevel playing field. In addition, ICAO has been charged by its member states with drawing up a global aviation emissions agreement in time for the Organisation's 39th Assembly in latter half of 2016. This should catalyse the development of a global emission trading scheme or other market-based measure for international aviation. Some states believe that considering the potential economic consequences a patchwork of regional environmental measures could have on the industry and making internalisation of aviation's climate impacts part of the consensus on air transport liberalisation is an important opportunity for the sector. Finally, there may be some value in combining, under an environmental lens, the wider economic benefits of aviation with the concept of connectivity explained previously, to see how the economic benefits per emission unit compare across modes of transportation.

The emergence of aviation blocks

Liberalisation of domestic air transport markets has led to the emergence of regional aviation blocks, which we can define here as a group of states seeking to act as a single unit in either a particular instance or in all aviation-related matters. In some regions, most notably in the EU, domestic air transport liberalisation has been part of a broader objective for the creation of an EU Single Market. It was spurred on by rulings by the European Court of Justice and the adoption of three packages of measures by the EU (1987, 1990, and 1992), culminating in the freedom to provide cabotage services (1997). The creation of a single air transport market entailed the transition from a system of national ownership and control to a system of EU ownership and control. The establishment of an internal air transport market governed by uniform rules led to the concept of a Community carrier, as defined originally by Regulation (EEC) 2407/92 and then Regulation (EC) 1008/2008, that is to say an airline which is majority owned and effectively controlled by any EU Member State and/or its nationals and which enjoys the EU right of establishment. The establishment of Community carriers was predicated upon regulatory convergence towards higher regional standards in terms of safety. It brought about extensive market access opportunities for European airlines, which can now serve any route within the EU. LCCs, particularly

Ryanair, EasyJet, Norwegian Air Shuttle, Vueling and Wizz Air make extensive use of seventh and ninth freedoms within the EU, establishing bases in other EU countries. Meanwhile, European network carriers chose to continue to focus on their home countries, for economic rather than regulatory reasons, but conducted a series of mergers and acquisitions leading to the formation of IAG, the Lufthansa Group and Air France-KLM.

The establishment of an internal air transport market resulted in the European Commission playing a more active role in the area of negotiation of air transport agreements. The 2007 US-EU Air Transport Agreement is the first agreement negotiated between the European Commission on behalf of the EU Member States and a non-EU member, in this case, the United States. Regional integration, on a scale far more modest than in the EU, but gradually leading to single markets, can be seen emerging in other parts of the world. In Southeast Asia, the ten member states of the Association of Southeast Asian Nations (ASEAN) have set the target of gradually establishing an ASEAN single aviation market by 2015, enabling a more liberalised aviation market but still not comparable to what exists in the EU, especially with respect to regulatory convergence, ownership and control and cabotage. Meanwhile, ASEAN has successfully negotiated its first ASA, with China, and has set-up an aviation working group with the EU as a first step to strengthen co-operation between both regions, which may provide an opportunity to establish a single EU-ASEAN ASA.

Latin American States have established regional initiatives designed to open up air transportation in secondary markets. The 1996 Mercosur Sub regional Agreement on Air Transport Services (which involves Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay) provides a liberalised regime for new routes alongside services on existing routes that continue to be regulated by earlier bilateral agreements. The members of the Andean Community (ANCOM), including Bolivia, Colombia, Ecuador and Peru, have established the Andean Sub regional Air Transport Integration System (the Andean Pact). This is relatively liberal as it allows airlines to enter the Andean market if they have their principal place of business in one of the member states and there are no ownership and control requirements. However, all existing ASAs between these countries remain intact and have not been replaced by a regional framework. The systems co-exist in parallel with the multinational agreement complementing the bilateral ASAs. The member states and associate members of the Association of Caribbean States (ACS) have also concluded an Air Transport Agreement (whose provisions are similar to those drawn up under bilateral ASAs) with the objective of promoting a “Community of Interest” and introducing a moderately liberal market regime among the member states.

In Africa, the 1999 Yamoussoukro Decision provided for gradual liberalisation of intra-Africa air transport services without, however, establishing a single aviation market or regulatory convergence. The Decision derives from the 1991 Abuja Treaty, which established the African Economic Community. Although the Yamoussoukro Decision prevails over any multilateral or bilateral agreements, to the extent those are incompatible with it; it has not been operationalised thus far. As a Monitoring Body has been established to supervise, follow-up and implement the decision, charged with its periodic review, the mechanism for its re-invigoration is in place.

These initiatives suggest a trend towards regional integration that might culminate in regulatory convergence and the establishment of single aviation markets. These regional blocks might then behave as unitary states, applying rules, such as those on ownership and control, labour laws and safety regulations at a regional rather than national level, negotiating ASAs as a single entity and achieving a level of regulatory convergence on a par with that seen in the EU.

Market access

Concerns to ensure that national businesses benefit from liberalisation, or that specific companies are sheltered from competition, sometimes complicate or delay negotiation of open skies agreements and restrictions on access to passenger and freight markets remain even in highly liberalised markets. Fifth freedom code share and fifth freedom beyond rights are often limited and seventh freedom rights and cabotage rights, either as part of an international service or as a stand-alone operation, are rarely provided. In non-open skies ASAs, third and fourth freedoms are generally capped despite the benefits that lifting restrictions on these basic traffic rights have been shown to bring in terms of social welfare. Traffic rights are exchanged on the basis of reciprocity, particularly for fifth freedoms and beyond with reciprocity here implying the trading of rights of equivalent value rather than simply exchanging the same rights. During negotiations, reciprocity is often key to granting traffic rights as states strive to attain what they consider to be a level playing field. In those cases, regulators support air services development by ensuring that traffic rights ceilings remain above the level of demand markets can bare, gradually increasing rights in existing agreements while containing what they would likely perceive as a drawback to an open skies agreement. The air freight market is generally more liberal than the passenger market, with seventh freedom rights for air freight becoming increasingly common. This has only helped global express carriers, such as FedEx, DHL and UPS, to establish hubs outside of their home markets and operate truly global networks.

ICAO has set up two working groups to look at issues related to liberalisation: the first is focused on market access while the second is focused on fair competition. It is also looking at three possible templates regarding the economic regulation of international air transport: an international agreement to liberalise air carrier ownership and control, an international agreement by which states could liberalise market access, and an international agreement to liberalise air cargo services. These templates are still being developed and they have yet to reach the required consensus to move forward.

Some countries continue to feel the need to protect their own airlines by limiting the opportunities to compete, often based on the perception that their home carriers are ill-suited to compete with large foreign carriers. In some cases, transitional restrictions on entry at specific airports have been imposed for a few years to allow incumbent airlines to prepare for competition when open skies agreements have been implemented. In other markets, governments have aimed to liberalise market access only to the degree that available capacity remains ahead of demand. While this may not distort the market as much as a restrictive agreement would, it does have the effect that the government must constantly monitor demand and adjust capacity in consequence, thus absorbing the risk of misreading the actual demand in the market. It also assumes governments can properly estimate the present and future degree of unmet or unobserved demand and maintain capacity ahead of it; in all likelihood, they may be successful at doing this on some, but not all, occasions.

Demand can also be influenced by market capacity. By limiting capacity, governments may also be limiting demand and only realise the extent of hidden demand when markets are liberalised. All these situations may affect innovation in new business models or the entry of LCCs and can create winners and losers if not managed properly. New business models are currently being analysed by the EU, especially with regards to social standards, subsidies, labour practices and rule shopping in aviation. Finally, there are more restrictive ASAs if one country is not confident its air carriers will obtain desirable slots in the other country if the latter's main airport is facing a slot shortage and there is no offer to include guaranteed slots at the congested airport into the ASA.

The policy and business environment can also act as a barrier to liberalisation or to market entry. This can take many forms. For example, public policies can limit the use of certain airports, either by imposing curfews, limiting runway capacity or having infrastructure operating at or near capacity levels. These measures may be in place for very legitimate reasons, but one of their drawbacks is that they constrain airport access and could prevent all the benefits of liberalisation and possibly some externalities from taking place. As for the business environment, this is a reflection of the global nature of the air transport industry, which faces different business cultures and processes in every country it operates in. This can understandably create challenges for air carriers exposed to a business environment in one country very different from what they are used to in their home country. Here, governments can play a positive role in facilitating the establishment of their carriers in a foreign country and leveraging the existing bilateral relationship between national governments to ensure the carrier is fairly treated, enjoys equality of opportunity and that it is able to access the market in the way intended by the ASA.

Different approaches to market access are the result of diverging national policy priorities. Some countries, such as New Zealand, Finland or Chile have articulated policy goals that prioritise improving connectivity with the rest of the world, particularly in light of the challenges posed by their geographical position, and see more liberal ASAs as important to stimulating that improvement. The United States pursues open skies-type agreements as part of a broader, liberalised foreign policy articulated around market-based resource allocation and improved service delivery; they have established open skies agreements with 116 partners. This policy has recently been called into question by US carriers and airline unions with respect to Norwegian Airlines International and the open skies agreements with Gulf countries over concerns about fair conditions for competition (see below). The EU is also a liberalised block, as it is fully open within its 28 countries and an increasing number of neighbouring countries. It has recently signed more than 10 open sky agreements with more remote countries. Many other countries have taken a more defensive stance, limiting market access, for example, when they are concerned that liberalisation might lead to more indirect connectivity or threaten existing direct connectivity and incumbent carriers (see final paragraph on connectivity above).

Ownership and control

Restrictions on the nationality of the individuals that own and control airlines are one of the main barriers to liberalisation. These restrictions may seem anachronistic in such a globalised industry and in the world of increasingly free-moving capital. Walulik (2016) refers to this as a "relic of the outgoing mercantilist aviation regime". Foreign investment in national airlines is limited in most countries and even forbidden in some. When allowed, it is usually capped as low as 0% (Chile, domestic carriers in Australia and New Zealand) or between 25% (Canada, Mexico, US) and 49% (EU, Australian international carriers, New Zealand international carriers, Brazil, Israel, Morocco, Russia, Ukraine). Walulik (2016) found ownership and control requirements in 121 different countries to be very varied and nuanced; of those countries, 81 had a 49% threshold of foreign investment in international carriers and 79 had the same threshold for domestic carriers. These restrictions are reflected in bilateral ASAs in the form of ownership and control clauses (O&C clauses). These clauses provide that majority ownership and effective control of an airline be vested in the country of airline designation, usually the country of airline establishment. A typical O&C clause reads: "each contracting State reserves the right to withhold or revoke a certificate or permit to an air transport enterprise of another State in any case where it is not satisfied that substantial ownership and effective control are vested in nationals of a contracting State…".

Ownership and control restrictions can prevent airlines merging because of the risk that traffic rights will be removed as ownership has passed to nationals not covered by the relevant ASAs. It should be noted that no traffic rights have been lost as the result of the recent large mergers in Europe, the United States, the Caribbean or Latin America as existing traffic rights from the incumbent entity were inherited by the new one. However this outcome is not automatic and requires carriers and regulatory authorities to work together to achieve this desirable outcome. A key consideration in these situations is determining whether the new ownership structure will enable foreign owners to circumvent limitations in ASAs between the country to which the new owner belongs to and third countries, the so-called free-rider phenomenon. Regulators will look favourably on situations where changes in ownership nationality do not lead to changes in market structure. Regulators have given themselves tools, such as US Department of Transport (USDOT or DOT) waivers in the United States or the granting of rights extra-bilaterally[7] to have the flexibility to allow changes in ownership and control nationality of foreign carriers when it is not inimical to their own national interests.

Nationality restrictions were established for a number of reasons, including:

- National security: ensuring that national air carriers are not owned by a national from a foreign, potentially enemy power.
- National defence: traditionally, the civil aviation fleet provided a pool from which national governments could augment their military forces in times of war. This was greatly facilitated if the airline was owned and controlled by nationals of that state. While less of an issue today as military support is increasingly provided under contract, in some countries, particularly in Latin America, the United States and Africa, some links still exist between civil aviation and military aviation.
- Reservation of air traffic rights for national stakeholders: traffic rights in ASAs are traded by countries on behalf of their designated carriers. Nationality restrictions provide a definition as to what constitutes a carrier from one country.
- Fostering a domestic industry: by imposing nationality restrictions, each country was encouraged to develop their own national carriers. This in turn created a very fragmented industry driving carriers to work together, through pooling, code-sharing, alliances and joint ventures.
- Safety considerations: there is a concern that the safety performance of an air carrier could be negatively affected if it were owned and controlled by nationals of a country with a weak aviation safety culture. This argument is negated by the fact that regulatory control of an airline in practice is not a function of ownership but rather location of establishment. However, in the EU, a Community carrier can be based in one member state, and thus subject to its civil aviation authority regulatory oversight regime, while operating most if not all of its flights from other member states, hence the need for close safety convergence within the EU, currently pursued by the European Aviation Safety Agency and its members.

The consequence of ownership and control restrictions has been to curtail the ability of airlines to access capital and complete mergers and acquisitions that could provide for a more efficient air transport industry, particularly in smaller, non-EU countries with limited capital markets. This translates into higher capital costs for air carriers and an inability to fully utilise the economies of scale and density that could come from a merger. These restrictions on shareholder nationality would be considered harmful to most other industries that currently enjoy broad access to global capital markets.

Ownership and control thresholds treat all foreign capital equally even if the purpose could be radically different. In addition, within the EU, a strategic investment by an EU carrier in another EU carrier is examined under a competition lens, although that is not the case when a non-EU carrier invests in an EU carrier. It is worth questioning whether purely financial investments by foreign, non-airline investors should be treated on the same footing as strategic investments by a foreign airline, as they can yield significantly different outcomes. In the case of the former, the foreign investor is likely seeking to maximise their returns as would any domestic investor, whereas in the case of the latter, the foreign airline is likely seeking to integrate the carrier being purchased into its existing network and reinforce it.

In the face of these restrictions, airlines have responded by finding new and innovative ways to collaborate and extract as many of the benefits of a merger as possible. In some cases, this entails an air carrier taking an equity stake in another within the limits permitted by law (i.e. Lufthansa group, IAG, Air France-KLM, Etihad's equity partners, Air Asia group). In other cases, airlines seek the benefits of a merger without changes in equity. This started with airline alliances, such as the Northwest-KLM alliance in the 1990s, which saw the carriers co-brand their aircraft and offer co-ordinated services. Meanwhile, in both Europe and Southeast Asia, route-specific airline pooling agreements were established. They enabled carriers to share revenues and even profits on certain routes. These arrangements laid the groundwork for the formation of three large multi-airline alliances by the turn of the century and now, metal-neutral Joint Ventures (or metal-neutral JVs) forming smaller, more closely integrated, market-specific alliances within each broader alliance. Metal-neutrality is the term for comprehensive economic benefit sharing agreements where each airline partner becomes indifferent to which carrier actually carries the passenger.

Metal-neutral joint ventures offer most of the benefits of a merger, including the elimination of double marginalisation, co-ordination of schedules, capacity, shared frequent flyer programmes and air fares, sharing of revenues and costs and joint marketing. However, these joint ventures are market specific, such as over the North Atlantic, the North Pacific or between Europe and Asia and thus each one covers only a small part of an airline's activities, but taken together, they extensively cover the core long-haul network of these carriers. They require antitrust immunity and close scrutiny by competition authorities and are usually only approved in the context of liberalising bilateral ASAs (OECD/ITF, 2014). They have proved to be successful but have raised questions as to the relevance of ownership and control restrictions in a world where increasingly the most strategic trunk routes are effectively operated by multinational joint ventures.

For EU carriers, horizontality is another way to mitigate the impact of barriers related to ownership and control. Present in recent ASAs involving an EU country, it allows rights secured by one EU member to be used by an air carrier from another EU member. For example, the traffic rights of French carriers in the France-Singapore ASA can be used by any EU carrier, subject to a free-rider clause. Thus in theory, we could see British Airways fly between Paris and Singapore. Similarly, we might see Air France fly between Frankfurt and New York. In practice these routes, which may be profitable, do not fit in the network carriers' strategies of building hubs and are therefore not offered for economic reasons rather than regulatory ones.

In ASEAN countries, a more liberal interpretation of airline control has allowed for the Air Asia group to develop nine subsidiaries across the region, majority-owned by nationals from the country in which they are based but heavily influenced by the mother company. However, since interpretations can change over time, having clear and common rules, which require a lengthier process to be changed, would be a more desirable outcome.

For international services, USDOT, for example, must find that an air carrier is fit, willing, and able to provide the foreign air transportation, has been designated by the government of its country to provide the foreign air transportation under an agreement with the US, or that the foreign air transportation to be provided under the permit will be in the public interest, as per 49 U.S.C. 41302. There are a number of factors USDOT considers when reaching this public interest determination, including the ownership and control of the carrier. The Department has a policy of requiring a foreign air carrier to be substantially owned and effectively controlled by citizens of its claimed homeland. The reason for this standard is to prevent the economic benefits of a service from flowing to citizens of a third country with which the United States may have less than satisfactory aviation relations. In recognition of the growing importance of trans-border investment, however, USDOT will waive the ownership and control standard if, upon examination of an air carrier's non-homeland ownership, USDOT concludes that there is nothing in the ownership structure that would be inimical to US aviation policy or interests. While this right of waiver is a common provision in ASAs, being able to do so administratively permits USDOT to make determinations quickly and allow a carrier from one country to use that country's traffic rights to the United States even if the United States believes that carrier is owned and controlled by nationals from another country. Such flexibility is also present in other jurisdictions and is consistent with Article 1 of IATA's non-legally binding Agenda for Freedom, endorsed by 13 governments including the United States, the EU and New Zealand, where states agree to waive their right to refuse to grant operating authorisations to an airline from another country on the basis that it is not owned and controlled by nationals of that country.

Latin American countries generally follow liberal policies towards ownership and control. Chile, for instance, has abolished caps on foreign investment in its air carriers. It has also joined Latin American countries, including Argentina and Brazil, in allowing cross-border mergers of international carriers, subject to the constraints of competition law. This resulted in the establishment of the LATAM group, the largest airline holding in Latin America, bringing together Chile's LAN with Brazil's TAM, while respecting Brazil's restriction of 20% foreign ownership in its carriers. It is interesting to note in this respect that the 2006 EU-Chile ASA allows nationals of several Latin American countries (in particular, the countries which are members of the Latin American Civil Aviation Commission) to own or control Chilean airlines without jeopardising their market access to EU member states.

The business environment

A rather opaque but very real barrier to benefiting from air liberalisation is differences in business environment. Cultural differences that affect the way business is conducted are easily overcome but in some cases complex and inefficient bureaucracy or systemic corruption become an obstacle to conducting business in a safe and legally predictable way. Air carriers sometimes seek the assistance of their national governments in using conditions to ASAs to drive improvement of business practice to comply with national and foreign laws.

The juxtaposition of diametrically opposed business models, such as fully privatised air carriers and vertically integrated, state-owned carriers, operating at either fully privatised user-pay airports or publicly operated and subsidised airports has created a need to develop a competition framework that could support the co-existence of all existing business models within a fair and competitive environment. In that regard, the EU-Gulf Cooperation Council Aviation Dialogue, initiated by the European Commission could serve, if successful, as a basis of discussion for a more global approach.

There are a number of other endogenous and exogenous barriers to market entry. Arguably, the most important exogenous barrier is airport congestion, while endogenous barriers include strategies by dominant carriers to deter competitors from entering the market. Strategies related to network competition and those related to loyalty programmes can be distinguished, although both types of barriers are interrelated and generally reinforce each other.

Loyalty programmes including frequent flyer programmes (FFPs), corporate discount schemes (CDSs), and travel agent commission overrides (TACOs) can also be used to direct customers to particular airlines, thus making it more challenging for new entrants to establish a strong foothold in an existing market. FFPs exploit the so-called principal-agent problem. A frequent business traveller (the agent) that has tickets paid for by his or her employer (the principal) benefits from the FFP by accumulating credit points by flying with a specific carrier and has an incentive to choose this airline even if it costs the employer more than fares offered by competing airlines. CDSs and TACOs can function in a similar way to incentivise travel agents and companies. They all intend to lock in beneficiaries because the discounts offered reduce their willingness to switch to other airlines. The larger the airlines or alliances between them are, the greater the benefits for customers of these programmes. Borenstein (2014) claims that this provides important incentives for airlines to engage in airline alliances. He concludes that increasing the number of alliances among otherwise competing, or potentially competing, airlines, is likely to result in anticompetitive effects.

Several studies (OECD/ITF, 2009; and Zhang, 1996) suggest that airlines may form hub-and-spoke networks and alliances as a strategic response to competitors not simply to save costs. In these cases, air carriers build up their hubs as a global connection platform through which most of their flights are routed. The hub then becomes a fortress dominated by the hub carrier with other airports in the country reduced to the role of feeder stations. The line between strategic motivation and network optimisation is, however, not easily identifiable. Meanwhile, reducing secondary airports to a feeder role introduces opportunities for other carriers to penetrate the market and try to divert connecting traffic from the national hub to their own hub in a different country, when geographical conditions are favourable to it, which can have negative effects on the national hub and the national carrier's network.

Passenger rights is an area where there is very little regulatory convergence, save for the Warsaw (1929) and Montreal (1999) Conventions which deal mainly with loss of life or luggage. Passenger rights today have far broader scope, including tarmac delays, denied boarding, flight cancellations, etc. The proliferation of code shares, alliances and joint ventures operating in a patchwork of jurisdictions with strong, weak or non-existent passenger rights legislation has made it very difficult for passengers to understand exactly what their rights are. Until regulatory convergence can be achieved in this field and a global standard adopted, increased liberalisation underscores the need for transparent application of passenger rights.

Fair competition

Inequality between airlines can arise as the result of many factors, including inequality of environment. Favourable geography for example, a lower-cost business environment, more aviation-friendly public policies, more cost-efficient airports or state aid and subsidies can all lead to inequality between carriers. Views as to which of these factors are relevant to establishing a level playing for competition in economic terms differ between jurisdictions. This contrasts greatly with other global service industries where mechanisms under the framework of the General Agreement on Trade of Services provide for adjudication and countermeasures over issues of perceived or real unfair trade practices and has no

rules on which subsidies are acceptable or not in services trade. In aviation, most ASAs have a formal dispute resolution mechanism with non-binding judgement but very few specifically refer to which subsidies are acceptable or not, only that they should not negatively affect the fair and equal opportunity of carriers to compete.

Favourable geography is the most clear-cut of the factors that should not be viewed as distorting competition. Geography can result in markets being unevenly distributed, i.e. carriers from small countries at the crossroads of aviation are able to access a far larger market base than foreign carriers operating services into this crossroad. This is a factor in the success of airlines operating out of bases in the Netherlands, Panama, Qatar, the United Arab Emirates or Singapore, and in the past favoured locations including Canada, Iceland and Ireland when aircraft range was more limited.

The degree of competitiveness and liberalisation of other stakeholders within the aviation value chain can have a significant impact on carriers' ability to compete. For example, the performance of the hub airport of a hub-and-spoke carrier will directly influence the competitiveness of the carrier, as will the performance of the air navigation system. As both airports and air navigation service providers are not liberalised and their performance and cost vary significantly between countries, air carriers face a situation where they compete in a liberalised environment but depend on the support of other aviation value chain stakeholders who generally enjoy a significant degree of shielding from direct competition.

Capacity constraints at hub airports can be a significant constraint on the impact of liberalising an air service agreement. If congestion at peak hours prevents new entry there will be little or no competition to exert pressure on prices. Congested airports have three options for dealing with excess demand: allow congestion to accumulate, as in many US airports; auction slots, the ideal way to assign slots to the highest value users, but not used anywhere yet for the primary allocation of slots, only secondary trading of small numbers of slots in a few airports; or allocate slots, preferably following fair, clear and transparent guidelines. As with any rationing system, it is not possible to satisfy all of the customers, all of the time. Slot allocation methods attempt to prioritise who should have access to the limited number of slots available.

Many airports follow the IATA World Scheduling Guidelines (WSGs). These follow a number of key principles, including grandfathering rights, so that carriers that historically were assigned slots are free to keep those slots. The airlines argue that this guideline is important for facilitating long-term market development and a better plan for aircraft investment and crew training. It would be difficult and perhaps uneconomic to develop airline services if airline slots were to change every six months with the new IATA scheduling season[8]. The principle is especially important for investing in connecting flight banks at hubs and for developing market awareness of non-stop service availability. Related to grandfather rights is the principle that an airline wishing to reschedule an existing slot will have a higher priority in allocating a slot at the new time than an entrant airline.

Grandfather rights make entry difficult for new carriers into airports with slot allocation. A number of governments and the European Commission have imposed regulations to provide for access to slots by new entrants. The principle of grandfather rights is accepted, but half of the remaining available slots are reserved for new entrants. IATA has adopted this externally imposed policy. The allocation of half of any available airport slots to new entrants and half to existing operators balances two key objectives. Enabling new entrance seeks to ensure that markets are subjected to competitive forces. Allocating some slots to incumbents recognises that due to higher interconnection possibilities and airline economies of traffic density, higher allocative economic efficiency might be achieved by incumbent airlines.

In the last two decades, the combination of a more liberalised environment, the emergence of LCCs and new technologies have enabled carriers to derive significant efficiency gains which has translated into lower prices and more travel options for consumers. Air carriers have increasingly turned to outsourcing in-house activities and embraced self-service solutions for passenger services (on-line purchasing, on-line check-in). Outsourcing has resulted in legal but less advantageous working conditions marked by lower union penetration, lower wages and reduced benefits while self-service options offered to passengers has reduced the need for frontline personnel.

More problematic though is that some carriers have adopted employment practices with questionable social acceptance in what appears to be a race to the bottom for labour standards, which can be detrimental to worker's rights, aviation safety, liability and competition. It can also force their competition to emulate to the extent possible these practices, further pursuing this race to the bottom in terms of labour standards. This can take a number of forms, including self-employment, fixed-term work, zero-hour contracts, pay-to-fly schemes and regulatory shopping leading to social dumping (Jorens et al., 2015). This last issue is a relatively new but growing concern in aviation and arises when carriers hire crew from lower wage countries to operate their flights in higher wage countries. Trade union opposition would prevent most airlines operating this way. The issue has arisen under the US-EU ASA with a non-unionised carrier, Norwegian Air International, that was established in Ireland to take advantage of traffic rights available only to EU-licensed airlines but which a number of US and European unions and airlines allege is intended to sidestep the application of Norwegian labour and tax laws by using less expensive crews based in Bangkok on some flights between Europe and the US. USDOT is reviewing Norwegian Air International's application to provide services in response to the concerns raised by several US Airlines, labour groups and members of Congress.

State support for aviation has been prevalent from the industry's early days to today in both developing and developed countries. This reflects the recognition of the wider economic benefits aviation brings to national economies. Direct and indirect subsidies to a home carrier can be problematic as can cross subsidies when the entire aviation value chain is publicly owned and integrated. ICAO's Air Transport Regulatory Panel had indicated in its 10th meeting held in 2002 that state support can distort international markets but can also play a role in transitioning to full liberalisation in response to market forces failure. The panel pointed out that states should refrain from taking actions that could result in hampering liberalisation of air transport. However, some states have argued that a level playing field is necessary in order to pursue greater liberalisation and that the perceived absence of fair competition can justify a protectionist policy to mitigate the impact of a distorted marketplace.

Transparency in airline funding and finance is essential to ensuring a level playing field for all carriers. Publishing audited annual accounts to International Financial Reporting Standards (or the equivalent) is the industry standard for transparency. Reporting on the use of state aid as start-up capital versus covering long-term operating costs is also important. Under free trade agreements, subsidies for operation are usually limited and accompanied by stringent conditions. In aviation, this can take the form of being forced to exit some markets and refraining from opening new ones, to minimise the distortion to competition.

Whilst a commonly held definition of what constitutes a level playing field in international aviation has yet to be agreed internationally, the aim should be equality of opportunity, as set out in the Preamble to the Chicago Convention, rather than equality of outcome, an approach which tends to impose static results, preventing market entry and preserving inefficiencies. Some inequalities are clearly the result of natural advantage and, as with other goods and services, are important sources of benefits provided by trade. These clearly include geographic advantage. Many differences in general business regulation can

probably also be put in this same category, also including differences in the ownership model of the various stakeholders involved in the aviation value chain and differences in the desired societal systems of different states. One can easily see how a fully integrated, publicly financed model could behave differently from a mixed public-private ownership with a focus on the user-pay model and little or no public funding. However, liberalisation needs to be accompanied by an ICAO-endorsed framework that defines what forms of subsidies and the degree of harm they create are acceptable, that establishes how to report the presence of subsidies throughout the aviation value chain and that provides safeguards against anti-competitive practices through conflict-resolving instruments.

The issue of how to ensure fair competition in an environment of liberalisation was discussed in 2003 at the ICAO Fifth Worldwide Air Transport Conference, which culminated in a model clause on "Safeguards against anti-competitive practices". The model clause was later incorporated in ICAO's Policy and Guidance Material on the Economic Regulation of International Air Transport[9] and was analysed by ICAO in its Manual on the Regulation of International Air Transport. ICAO has recommended that states recognise that subsidies that discriminate between carriers can distort trade and competition. It also recommended that measures be taken to avoid distorting competition. Furthermore, states should also consider the ICAO Template Air Services Agreements, which includes an article on fair competition and competition laws. The ICAO Secretariat has produced an overview of competition policies and practices applicable to air transport across a number of states and regions, concluding that "common elements could form the basis for the development of a set of core principles on fair competition in international air transport" (ICAO, 2012). Finally, it would be noteworthy to examine fair competition rules that are in place at the WTO and govern most other industries to see which ones may be transferable to aviation. Such commonly held principles would provide a practical basis for safeguarding fair competition. If adopted, it would help the industry make significant progress towards regulatory convergence and would remove an important argument against liberalisation.

Outlook for liberalisation

Looking forward, the state of the industry in the next decade should be one of increased integration and liberalisation, despite the challenges to liberalisation discussed previously. The airline industry is dynamic and innovative so making predictions for its future evolution is perilous. Therefore, what follows are some plausible future evolutionary milestones for this industry.

Airport and airspace congestion may limit fully taking advantage of a liberalised ASA if capacity is insufficient to meet demand. This issue affects markets globally, but possibly more so in North America and Europe, where, generally speaking, building new runways or new airports can be a longer process than in other parts of the world. Therefore, it will be important to accelerate consolidation of air traffic management and devise more efficient ways to make use of the existing infrastructure and invest in new infrastructure so that the full social welfare gains permitted by a liberal regime can continue to materialise.

Africa should experience a decade of strong growth with some carriers, such as Ethiopian Airlines and Kenya Airways joining South African Airways in providing Africa with global connectivity. We will likely see the emergence of a strong group of airlines operating under a common brand, similar to the LATAM or Air Asia groups, and centred on a financially robust carrier. The first signs of this have appeared with the acquisition of 49% of Air Malawi by Ethiopian Airlines. Growth in LCCs could help make flying more affordable and stimulate growth.

Gulf and Turkish carriers are poised to continue to grow their market share of Europe to either Asia or Africa and Asia to Africa traffic, taking advantage of their geographic location in proximity to the world's economic centre of gravity, aviation-friendly public policies, massive infrastructure airport investments and a growing fleet of modern aircraft. They are likely to benefit from a slowly increasing number of more liberal ASAs. The trend could be reversed in the short-term as accusations of subsidised competition and potential impacts on network efficiencies are investigated. This illustrates the need for co-operation in developing agreed frameworks for fair competition including high standards of transparency in annual accounts and enforcement mechanisms that do not prevent the progress of market liberalisation. Gulf carriers are likely to be increasingly active in seeking partnerships or even buying stakes in other carriers in order to both feed Gulf country hubs and also to access those carrier's secondary markets to expand the reach of the Gulf carrier's network.

ASEAN countries need to continue their integration towards a single market if agreements with external partners are not to cause difficulties with competition between ASEAN airlines within the region. We can expect more ASAs where ASEAN will negotiate in accordance with the principle of "Community of interest". However, it is not clear that ASEAN will achieve the same degree of integration and openness as the EU in the next decade.

In Northeast Asia, China will eventually open up its domestic market and allow LCCs to operate at its major airports, thus removing the protections it put in place for its three large carriers. When this will happen is difficult to predict. ASAs will probably be further liberalised only when the major national carriers are judged ready to compete. Japan, will continue to liberalise both air services and the management of its international airports. Liberalisation in Northeast Asia will be accompanied by strong growth in LCCs and significantly higher passenger traffic volumes, placing additional pressures on existing infrastructure.

Integration between air carriers will continue as airlines seek the benefits of mergers despite ownership and control restrictions. These commercial developments may affect impetus for further liberalisation. Large, multinational carrier blocks, either in the form of subsidiaries, joint ventures or alliances may persuade policy makers to not only consider the national interest but also the interests of the aviation block to which its national carrier belongs.

Air freight will continue to be on the leading edge of liberalisation, particularly with respect to seventh freedom rights[10] This increased level of liberalisation is due to the needs of globally integrated air express business and because the one-way nature of air freight forces airline planners to find creative routings to make a flight profitable. Meanwhile, as more than half of air cargo is carried in the belly of passenger aircraft, and this proportion is growing, it will be dependent on traffic rights obtained for passenger flights on an increasing share of its non-express business. Thus, we can observe divergent interests between freighter operators and passenger aircraft operators, with the latter likely favouring equal treatment for passengers and freight.

Conclusions and recommendations

Liberalisation of ASAs has an established track record of producing societal benefits, particularly to users of the transport system and stakeholders that benefit from the wider economic benefits it provides. The effects of liberalising markets where governments tightly control the supply of air services can be transformational, stimulating for example the emergence of LCCs. Incremental liberalisation is likely to have less visible effects where markets already enjoy a large degree of freedom, as economically efficient patterns of supply and airline organisation will already have been established, but enhanced

opportunities for competition will always exert pressure on prices. Liberalisation has opened up air travel to the whole of society and greatly facilitated tourism and trade.

The momentum that liberalisation has gained reflects the geopolitical changes and market developments that have occurred since the signing of the Chicago Convention. Today's international aviation marketplace is more connected than ever, with major global airlines aligned in one of three network alliances and metal-neutral joint ventures appearing on most trunk routes. Liberalisation has shown itself to be highly beneficial to consumers and shippers. In the United States it enabled a transition from a point-to-point domestic network to a far more efficient hub-and-spoke model, fully integrated into the international network while allowing LCCs, such as Southwest, to operate flights between states with the United States. In the EU, the creation of a single air transport market supported by common rules for the operation of air services has seen the emergence of LCCs, sharply falling air fares and significantly improved connectivity for secondary airports. In ASEAN countries, a liberal interpretation of airline control has enabled the growth of low-cost airline groups, bringing lower airfares to the region.

Liberalisation has the potential to deliver large consumer welfare gains in the aviation markets of Northeast Asia, Africa and Russia, three of the areas of the world with the largest potential for growth in air travel if their markets are liberalised. However, particularly in the case of Africa, consideration should be given to advance liberalisation in a gradual way when there is a real risk that global carriers from developed countries may overtake the much smaller African carrier. This can take the form of a transitory period during which some African carriers enjoy more liberalised rights than their non-African counterparts in order to give them a head start in building a sustainable market.

Liberalisation should not only be seen under the prism of air traffic rights. Ownership and control of air carriers remains quite restricted compared to other global industries, including transport, although some areas, such as the domestic Australian or New Zealand markets or the EU, are far less restrictive than others. This has made it more challenging for some airlines to access capital, particularly in small capital markets outside the EU. It has forced them to find creative ways to derive the benefits that mergers between air carriers could produce.

One of the most effective means used by air carriers is metal-neutral joint ventures, which have removed the concept of majority national ownership. This should encourage national legislators to further explore bilaterally or multilaterally removing restrictions on ownership and control and allowing foreign ownership and control of national airlines, first for domestic services and eventually for international services where allowed by ASAs, as the EU has successfully done. Such a policy would be consistent with IATA's Agenda for Freedom. It would also provide a framework around ownership and control in the airline industry that is in-line with that which exists in other modes and the economy at large. Finally, because the airline would remain under the same state regulatory control, no matter the nationality of its ownership, the amount of foreign capital invested in a carrier should have no incidence on safety, security or environmental performance but could add a manageable level of complexity for regulators.

Lifting ownership and control restrictions would likely result in an increase in foreign direct investment in airlines with a strong business case, as they establish operations in new markets and consolidate through merger and acquisition. This increase in investment would lead to a more efficient use of capital, debt reduction and a more rational use of resources providing financial benefits to airlines and their balance sheets. In addition, a capital-intensive industry such as the airline industry would greatly benefit from being able to access the lowest cost capital, independent of its nationality, as most other sectors of the economy already do.

The success of air carriers from countries with a small home market but a significant geographical advantage regularly prompts review of fair conditions for competition and the net benefits of

liberalisation from a national perspective. A common definition of what constitutes a level playing field in international aviation has yet to be agreed internationally. The objective should be equality of opportunity, as set out in the Preamble to the Chicago Convention. Aiming instead for equality of outcome tends to impose static results that prevent market entry and preserve inefficiencies.

Some inequalities, including geography, are clearly the result of natural advantage and, as with other traded services, are important sources of the benefits provided by trade. Many differences in general business regulation can probably also be put in this category. However, other inequalities can be the result of a level of support with public finance that extends beyond domestic regional development policy measures or short-term protection of airlines from economic collapse. There is no simple principle for demarcation but there is a clear need to establish an ICAO-endorsed framework that defines what forms of subsidies are acceptable, establishes how to report the presence of subsidies throughout the aviation value chain and provides safeguards against anti-competitive practices.

Even with such safeguards the impact of new entry on national carriers and the local labour force means that liberalisation will sometimes by constrained and phased-in only gradually. On the other hand the benefits of competition from new entry may represent a clear overall benefit to the economy, at least in the short-term, in spite of impacts on incumbent airlines. There are two underlying issues. First, whether competition will continue to be enhanced over the long-term, i.e. are the operations of the new entrants financially sustainability? And second, how to find the right balance in labour standards that allow for some differences in regulatory regime while preventing an unreasonable erosion of labour standards through a race to the bottom. Regulatory convergence is the strongest guarantee of a level playing field but the consumer benefits of competition will drive liberalisation ahead of convergence.

Notes

1 See Annex for definition of these terms.

2 The United States Department of Transportation (USDOT) has defined an open skies agreement to include several additional elements. See, Order DOT-OST-1992-8-13.

3 The 1995 agreement did not meet the USDOT definition of open skies but was generally deemed to be one by Canada. The 2006 agreement is considered by both to be an open skies agreement.

4 The WTO Air Services Agreement Projector contains over 2 200 ASAs as of 2011, representing about 70% of all ASAs that existed at the time, suggesting the actual number of ASAs in existence today to be around 3 000.

5 Restrictions related to foreign ownership, community of interest and foreign control.

6 Time spent waiting is often assigned a higher cost than time spent moving in economic appraisal. This includes time spent waiting and queueing in origin and destination airports.

7 Rights granted unilaterally and temporarily beyond what was negotiated in an air services agreement when deemed in the national interest to do so.

8 Slot co-ordination is based on the IATA summer and winter seasons.

9 Doc 9587 and 9626 2nd edition respectively.

10 Operating flights between two countries, neither one of which is the country where the carrier is based (i.e. US-based FedEx flying from France to China).

References

Abdennebil, N. (2014) *Liberalization and air transport connectivity index*. Paper presented at the ITF session of the Air Transport Reasearch Society 18th annual world conference, Bordeaux, France.

Borenstein, S. (2014), "Three Legacy Airlines and Southwest. Now What?" *Milken Institute Review*, Second Quarter. Milken Institute, Santa Monica.

Burghouwt, G., P. Mendes De Leon and J. De Wit (2015), "EU Air Transport Liberalisation Process, Impacts and Future Considerations", *International Transport Forum Discussion Papers*, No. 2015/04, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/5jrw13t57flq-en

Doove, S., O. Gabbitas, D. Nguyen-Hong and J. Owen (2001), "Price Effects of Regulation: Telecommunications, Air Passenger Transport and Electricity Supply". Productivity Commission Staff Research Paper.

Gönenç, R. and N. Giuseppe (2001), "Regulation, market structure and performance in air passenger transportation", *OECD Economic Studies*, Vol. 2001/1. DOI: http://dx.doi.org/10.1787/eco_studies-v2001-art6-en

ICAO (2012), "Fair Competition in International Air Transport (ATF/6-WP4)". Worldwide Air Transport Conference Sixth Meeting. Working Paper 4. 12 April 2012. International Civil Aviation Organisation,]

Jorens, Y., D. Gillis,, L. Valcke, J. De Coninck (2015), "A typical forms of employment in the aviation sector". European Social Dialogue, European Commission.

Micco, A. and T. Serebrisky (2006), "Competition regimes and air transport costs: The effects of open skies agreements". *Journal of International Economics*, Vol. 70/2006, pp. 25–51.

Morrison, S., C.M. Winston (1995), *The evolution of the airline industry*. Brookings Institution Press.

OECD/ITF (2009), "Competitive Interaction between Airports, Airlines and High-Speed Rail", *OECD/ITF Joint Transport Research Centre Discussion Papers*, No. 2009/07, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/223853273815

OECD/ITF (2014), "Air Service Agreement Liberalisation and Airline Alliances", *International Transport Forum Policy Papers*, No. 4, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/5jlwvzf1vg41-en

Piermartini, R. and L. Rousova (2008), "Liberalization of Air Transport Services and Passenger Traffic". Staff Working Paper ERSD-2008-06, World Trade Organisation.

Waluilik, J. (2016), "At the core of airline foreign investment restrictions: A study of 121 countries". *Transport Policy,* Vol 49 pp. 234-251. Elsevier, Amsterdam.

WTO (2006), Note by the Secretariat, document S/C/W/270/Add.1 Second Review of the Air Transport Annex: Developments in the Air Transport Sector (Part Two) Quantitative Air Services Agreements Review (QUASAR), Vols. I and II.

Zhang, A. (1996), "An analysis of fortress hubs in airline networks", *Journal of Transport Economics and Policy*, Vol. 30/3, pp. 293-307.

Chapter 2
Research report

This chapter presents different historical milestones of commercial aviation through the lens of economic regulation and deregulation. It also discusses how airlines have adapted to these policies, how aviation liberalisation has been beneficial for travellers and shippers and discusses how a more liberalised environment can have positive impacts on demand. It also presents case studies of selected ITF countries and their respective policies. The conclusion spells out challenges facing further liberalisation.

Purpose

The future global aviation market, operating at high efficiency and providing benefits to the widest public, might be expected to be organised as follows: a number of large, multinational airline companies, each operating hubs on more than one continent, complemented by airlines focused on origin-destination services, some providing full service carriage, some following low-cost models catering for business and long-haul passengers as well as the traditional short-haul leisure market. Some of today's alliance partners could be expected to merge where national ownership regulations evolve to open investment in airlines to international capital. Thus, transatlantic carriers would emerge operating hubs in Europe and North America. Asian, Gulf and Latin American carriers could equally be expected to become multinationals, operating hubs on several continents.

In a regulatory environment that promotes equality of opportunity, minimises barriers to entry to all markets and relies on competition law to protect consumer interests, the benefits to passengers and the economy will be maximised. This will be reflected in large increases in the number of people travelling for business, leisure and education and able to afford to travel to visit family and friends. A highly liberalised market (with or without internalisation of the cost of greenhouse gas emissions) would potentially see an annual growth rate of traffic of 5.5% per annum between 2010 and 2030 compared to 2.8% assuming air service agreements (ASAs) remain as today.

Potential routes to achieve such a highly liberalised regulatory environment in most parts of the world are the subject of this report. It examines the key components of ASAs and competition policy in the international airline market and examines evidence for the impact of regulatory change in practice on airline behaviour and outcomes for passengers and the economy as a whole.

The economic regulation of air services predates the first commercial flight by a year and reflects a realisation by governments that some economic regulation was necessary to provide a framework for this otherwise highly competitive industry. Over the decades, economic thinking on the regulation required has evolved. At first highly regulated, the industry witnessed sometimes evolutionary and sometimes transformative change as governments have progressively removed themselves from the role of supply manager.

Today, we see two main tracks for aviation liberalisation. First, with regard to international traffic rights, most major economies have liberalised their own markets and markets shared with many of their key trading partners to a large degree. Bilateral ASAs without restrictions on third, fourth and fifth freedoms (see the Freedoms of the Air Section for more details), open code-sharing opportunities and liberal cargo and charter regimes (generally known as open skies agreements), are usually the objective except when individual states believe that the negative consequences to some of their constituents, usually airlines, outweigh the benefits of a liberalised market. Liberalisation has led to important gains in consumer welfare. In major emerging economies and the international markets in which they participate, liberalisation has begun but is far from complete and there remains a large potential to unlock consumer benefits either through further liberalisation of traffic rights or removal of other distortions such as excessive rates of taxation.

On the other track, concerning airline ownership and control, national ownership requirements have been relaxed to facilitate access to foreign capital in some markets, with control exercised through standard local business regulations, whilst in other markets legislatures have ruled out reform.

The regulatory challenge for aviation is that it is a globally connected industry, living at the nexus of an integrated, international regulatory framework for safety and technical interoperability but a significantly more heterogeneous series of economic regulatory frameworks reflecting national priorities and bilateral agreements between individual states. In such a context, one could argue that selling tickets for international flights can be more of a regulatory challenge than actually flying the aircraft, which is highly uniform across the globe. Under a patchwork of different regulations market entry can be suppressed. This is compounded by bankruptcy regimes to reduce exit of incumbent airlines and restrictions on foreign ownership of nationally registered airlines that limit access to international capital markets. All this tends to inhibit innovation, investment and expansion in aviation markets. The object of liberalisation is to remove these restrictions to benefit passengers and shippers and increase social welfare.

Ultimately, the goal of liberalisation is to unlock consumer gains, be it for passengers or shippers, through competition that is fair and durable over the long-term. However, liberalisation of markets should also be done to benefit stakeholders on the supply side of the equation, including air carriers, airports, air navigation service providers, the labour employed by them and the communities in which they operate.

This report examines the key components of ASAs and competition policy in the international and domestic airline market. It examines evidence for the impact of regulatory change on airline behaviour in practice and outcomes for passengers and the economy as whole. It presents some key contemporary policy issues and the challenges for further liberalisation. Finally, it looks at how liberalisation of air transportation could evolve over the short to medium-term.

Liberalisation requires legal frameworks that open markets for competition but also must provide safeguards to ensure markets remain competitive and relatively fair for all stakeholders involved. There are no broadly accepted definitions as to what constitutes acceptable or non-acceptable subsidies. So long as international aviation is not integrated into trade regulated by the World Trade Organization (WTO) this will require agreements either on a bilateral basis, or, ideally, a global framework, possibly under the auspices of the International Civil Aviation Organization (ICAO) on what forms of subsidies are acceptable and which are not. However, establishing such a framework presents some challenges. Such challenges include how to ensure that violations are sanctioned by measures that are effective but do not result in decreased liberalisation, how to establish carve-outs for developing countries that do not create an unlevel playing field and how to ensure that states abide by the market economy investor

principle. This framework would require transparent and audited financial reporting that meets international standards by any carrier receiving subsidies and operating international flights. It would also require an enforcement mechanism to address violations, either on a route basis or network basis, depending on the nature of the subsidies, and that would not translate in limiting market access, which is the most damageable outcome for tourism and trade.

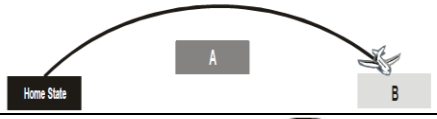
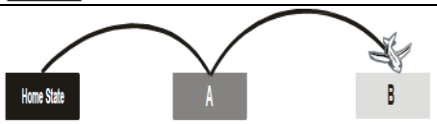
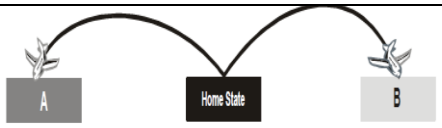
Outline

The chapter is organised into eight sections. The first section presents basic concepts related to international air transportation. The second walks the reader through a brief history of significant historical highlights in the regulation and then deregulation of air transport. This is then followed by sections pertaining to industrial organisation, such as alliances and joint ventures, followed by a discussion on the economic consequences of liberalisation. The fifth section presents short case studies of the state of economic regulation in aviation for over 15 jurisdictions. The chapter ends with three sections discussing firstly the current issues and challenges related to aviation liberalisation, followed by a prospective analysis of the future state of aviation liberalisation and finally some policy recommendations.

Freedoms of the air

Throughout this document, we will be referring to various types of scheduled airline operations as freedoms of the air. Below is a definition and illustration from ICAO of these various freedoms. They represent rights granted by one country to airlines based in another country. Of those, generally only the first five are recognised by international treaties. The term “home state” in the illustrations below refers to the nationality of the carrier. Rights are progressively liberal and usually carriers who have one right are presumed to also have all less liberal rights (i.e. a carrier granted a fifth freedom right in a given country usually also enjoys the first four freedoms as well).

Table 2.1 Freedoms of the air

Freedom	Name	Description	Illustration
1st	Overfly	The right of a carrier from one State to fly across another State without landing	
2nd	Technical stop	The right of a carrier from one State to land in another State without picking-up or dropping off traffic	
3rd	Drop-off traffic	The right of a carrier to carry traffic from its home State to another State.	
4th	Pick-up Traffic	The right of a carrier to carry traffic to its home State from another State.	
5th	Traffic to/from 3rd State	The right of a carrier from one State to operate a flight to or from two other States and pick-up or drop –off traffic between those last two states. 5th freedom applies to both through and beyond traffic and can be operated directly or, more commonly, through code share.	
6th	Traffic via Home State	The right of a carrier to carry traffic between two foreign Staes via its home State.	
7th	Flight between foreign points	The right of a carrier from one State to carry traffic between two other States on a flight that has no point in the carrier's home State.	
8th	Consecutive cabotage	The right of a carrier from one State to carry traffic between two points in another State on a flight between both States	
9th	Cabotage	The right of a carrier from one State to carry traffic between two points in another State on a flight taking place entirely in that State	

Source: ICAO, adapted by the International Transport Forum. The two airplanes indicate where passengers are picked up and dropped off.

Defining open skies

Throughout this document, the term "open skies" will be used to convey a situation of relatively high liberalisation. The expression is based on Order 92-8-13 issued on 5 August 1992 by the then Assistant Secretary of Transportation of the United States, Jeffrey Shane, establishing an official definition of "open skies", which would contain, amongst others, the following elements:

- no limitation on flights or capacity between both contracting states (third and fourth freedoms)

- no limitations on flights or capacity between both contracting states and a third one (fifth freedom)
- multiple designations of airlines
- double disapproval pricing
- promotion of liberalisation in the field of charter flights, cargo and computer reservation systems
- performance of own support functions at airports located in the territory of the other party.

The open skies definition did not include seventh, eighth and ninth freedoms or national ownership as requirements for an open skies status, but did contain a lengthy discussion about the topic. Thus, an open skies regime should be considered highly liberalised but may not be completely liberalised.

It should be noted that the ICAO finds that there is no uniform definition to what actually constitutes an open skies agreement. Rather, it is generally used to refer to the type of agreement where routing, capacity and pricing are not determined by the regulator but rather by market forces (ICAO, 2012). The inclusion of fifth freedom traffic in the US definition is not accepted by all countries, who sometimes view traffic rights under an open skies agreement as unlimited third and fourth freedoms only.

This document will also refer to a "fully open sky" or "single market". In this case, we are going beyond the US definition to a situation prevalent within the intra-EU air transport market, where regulatory convergence has led 28 sovereign states to behave as one within that market. More specifically, full open skies would be a situation where a carrier owned and controlled by nationals from one country would enjoy the exact same rights and privileges in another country with a carrier owned and operated by nationals of the second country.

Finally, this document refers repeatedly to "national carriers". This term simply conveys that the carrier is registered in the country in question and is not meant to conjure the concept of the old "flag carriers"; rather, it is used in opposition to "foreign carriers".

Instruments for regulation and liberalisation

This section presents a chronology of key selected milestones in the regulation and deregulation of air transportation, from the birth of international aviation to today.

The world before the Chicago Convention (1913-1944)

The earliest air services agreement can be traced back to a diplomatic note between France and Germany in 1913 that provided a legal framework for airship services between both countries. The agreement had two parts to it, one covering military aircraft and personnel and the other covering civilian ones. In the civilian part, it allows airships from one country to fly over and land in the other, provided both pilot and aircraft are properly certified by their home government. While quite primitive compared to today's standards, it did introduce a few key notions still found in modern ASAs, such as the sovereignty of states over their own airspace, the granting by a country to nationals and aircraft of another country of the right to overfly its airspace and land in its territory and the mutual recognition of safety certification for both aircraft and navigation. Assignment of sovereignty over airspace provided states with the basis for the right to deny entry and regulate foreign flights in their airspace, a basic tenant of international aviation law that holds true to this day.

In its early days, creating a regulatory framework for civil aviation was motivated to a great extent by the realisation of its military potential, as experienced in World War I. The Paris Convention of 1919 constituted the first codification of public international air law and confirms some notions already defined in the Franco-German agreement of 1913. Hence, Article 1 thereof provided that each state enjoys "complete and exclusive sovereignty over the airspace above its territory". The legitimisation and encouragement of national regulation of air transport matters, a corollary of the principle of national sovereignty, set the regulatory course the aviation industry would follow in the years to come.

This 43-article agreement codified technical, operational and organisational aspects of civil aviation. It created the International Commission for Air Navigation (ICAN) and placed it under the League of Nations. ICAN turned out to be the predecessor to ICAO. The treaty also contained provisions regarding airworthiness, pilot license, rules of the air, the right of flight across foreign territory, and a prohibition of the transportation of arms, explosives and photographic equipment by aircraft (Cook, 2010). Thus, the mind-set was very much focused on safety and national security concerns[1] rather than economic considerations. The Treaty provided that France, Italy, the United States and Japan each have two representatives and that each of those countries have a number of votes of at least a fifth of the total[2] (League of Nations, 1922).

In the years following the war, large numbers of military aircraft were available for conversion to civilian use, opening up new prospects for expeditious transport and communication. Advances in technology rendered possible the first intercontinental operations, leading to the creation of air carriers on both sides of the Atlantic. Following the Paris Convention, the Ibero-American Convention Relating to Aerial Navigation (Madrid Convention of 1926) and the Pan American Convention on Commercial Aviation (Havana Convention of 1928) both set out to codify ASAs.

The Madrid Convention, signed by 21 states but ratified by only five, was very similar to the Paris Convention, however it treated all states on an equal basis. This was meant to alleviate concerns by Spain and Russia, who had both refused to ratify the Paris Convention because it did not treat all states equally. The Havana Convention reconfirmed the exclusive sovereignty of each state over its own airspace. It enabled US-based carriers to freely operate services within the Americas. It was signed by 21 states and ratified by 11.

Haanappel (1980) explains that prior to World War II, international air services were often performed without bilateral agreements. Some services were the result of government concessions to foreign airlines in hopes of attracting international air services to their country. This was the case with Pan American Airways as it built its South American network.

The 1920s witnessed the development of new long-haul, multi-stop routes, connecting Marseille with Saigon (now Ho Chi Minh City), Amsterdam with Batavia (now Jakarta) and the United Kingdom with Australia and New Zealand (Hooper et al., 2011). All flights included multiple stops in and around the Persian Gulf, following long-established trade routes that still hold today. This was the start of what would become a global network centred on fifth freedom rights made necessary because of the relatively shorter range of aircraft flying back then and a business model that favoured multiple stops.

In 1929, Canada and the United States signed their first ASA, which provided for a level of economic freedom in that market that would not be seen again until 1995. The 1929 agreement gave carriers licensed in one country the right to fly to the other country, with no specification of route, frequency or capacity. It also provided for mutual recognition of the certification of air worthiness for aircraft. Agreements between both countries became more restrictive in 1938, when each country's government had to approve routes operated by the other country's carriers and again in 1939, 1940 and 1943 when these rights now had to be exchanged on the basis of reciprocity. International aviation had now evolved

beyond safety and national security concerns; governments were realising the economic importance of international aviation and wanted to make sure their carriers obtained a "fair share" of the market.

Chicago Convention (1944)

World War II resulted in commercial aircraft being diverted to military uses. By the end of the war the European civil aviation fleet had been largely destroyed while the US fleet had grown to 20 000 aircraft accounting for 72% of the global fleet. Against this backdrop, the need for a comprehensive regulatory framework for post-war international civil aviation led to the International Civil Aviation Conference, held in Chicago from 1 November to 7 December 7 1944.

Despite the need for a multilateral exchange of traffic rights, which would facilitate commercial air transport operations, the strong national security and defence considerations prevailing during the war dictated a prudent approach towards the development of international civil aviation. The Chicago Convention, agreed to at the conclusion of the conference, did not depart in this respect from the principle of exclusive national sovereignty, embedded in the Paris Convention. In a similar fashion, it proclaimed that "every state has complete and exclusive sovereignty over the airspace above its territory". Thus, whilst Article 5 of the convention allows for a limited multilateral exchange of traffic rights for non-scheduled international flights, as far as scheduled flights are concerned no similar provision is made. In addition, whilst the freedom to provide cabotage[3] services is not prohibited, the right to refuse such a service is vested with the contracting states. Most states chose to forbid cabotage in order to support and protect their national airline industry and a market which they consider to be exclusively their own.

Article 1 of the convention, in conjunction with Article 6, in essence prevented any multilateral exchange of traffic rights on the basis of universally accepted terms and conditions. Article 6 specifically forbade all international scheduled flights, except those explicitly permitted by a contracting state. Article 6 reads "[n]o scheduled international air service may be operated over or into the territory of a contracting State, except with the special permission or authorisation of that state, and in accordance with the terms of such permission or authorisation". It places commercial aviation in the odd position of being forbidden except where specifically allowed, as opposed to most industries where conducting business is allowed except in specific circumstances.

Instead, these Articles paved the way for bilateral solutions on the basis of government-to-government negotiations, setting the framework for the myriad of ASAs in existence today. The reason for the failure of the Conference to adopt multilateral regulation is related to the balance of power between the two leading aviation forces of that time, i.e. the United States and the United Kingdom. The United States, enjoying an unrivalled superiority in aircraft capacity and technological expertise, was interested in safeguarding access to foreign states through the privilege of friendly passage. It, therefore, advocated a system of commercial freedom of airlines. The United Kingdom, on the other hand, whose aviation industry had been severely damaged during the war, yet which was still a colonial power controlling strategic points around the globe, fearful of unrestrained competition from the United States, was anxious to preserve its historical prerogatives, whilst rebuilding its economy and aviation industry. It, therefore, aimed at a protectionist system along the lines of an International Regulatory Air Authority.

The policy disagreement between the United States and the United Kingdom resulted in the Chicago Convention regulating only technical and operational aspects of civil aviation in a multilateral framework rather than economic and commercial aspects, the latter being left to sovereign states to decide on the basis of bilateral negotiations. The freedoms of the sky defined up until that moment related to: the right of a nation's airlines to fly over the territory of another country in order to reach a third (first freedom);

the right of a nation's airlines to make technical stops for fuel and maintenance, but not to load or unload passengers or cargo, in another nation while in transit to a third nation (second freedom); the right to carry commercial traffic (i.e. cargo and passengers) from the operator's state of origin to a third nation (third freedom); the right to carry commercial traffic from a third nation to the operator's state of origin (fourth freedom); and, the right to carry commercial traffic between two foreign nations as an extension of a service originating in or destined for the operator's home state (fifth freedom or "beyond right").

The first two technical freedoms were exchanged multilaterally by means of the International Air Services Transit Agreement, which also came out of the Chicago Conference and which has been ratified by over 100 States. The International Air Transport Agreement, also produced at the conference, provided for a multilateral exchange of international air services of all five freedoms of the air. However, its ratification by a mere eleven states[4], not including the United States, despite the latter's campaign for liberalism and openness, did little to change the resulting compromise promoted at the conference, that of bilateral regulation of international air transport matters.

Although the very limited multilateral exchange of overflight rights and rights to technical stops left very little room for the formation of a uniform system of air transport rules applied without discrimination to all industry participants, the growth dynamic of civil aviation, already evident during the war years, necessitated the creation of a global forum for civil aviation. This role was reserved for ICAO, established by Article 43 of the Chicago Convention, whose aims and objectives would be to develop the principles and techniques of international air navigation and to foster the planning and development of international air transport. The carefully crafted wording of the relevant convention provision delineating ICAO's objectives is a reflection of the will of the signatories not to delegate any regulatory power in the economic field. This resulted in ICAO being established mainly as a technical standard setting body; although current developments in the field of economic regulation might result in a more active role for ICAO in this area.

The Bermuda Treaties (1946/1976)

Bermuda I

At the conclusion of the Chicago Conference, the United States engaged in bilateral negotiations with a number of countries in an effort to safeguard critical traffic rights for its carriers. These early bilateral ASAs were modelled on the Form of Standard Agreement for Provisional Air Routes, a model bilateral agreement produced at the Chicago Conference. Nevertheless, the negotiations with the United Kingdom held in Bermuda from 15 January to 11 February 1946, culminated in a different bilateral agreement than the ones the United States had concluded up until that point.

Bermuda I provided a framework that would serve as a basis for the drafting of thousands of ASAs around the world. It comprised of three documents dealing with air traffic rights, civilian use of military bases leased by the United Kingdom to the United States and the establishment of a dispute-settling process. The air traffic rights component cemented a concept still in place today that airline traffic between two states "belongs" to those states rather than the market.

A product of compromise between prevailing American liberalism and British protectionism, the first document, which is the most salient for this report, dealt with the issues typically addressed by an ASA, namely market entry (designation of airlines and routes) and traffic rights, capacity and frequency of service and rate-setting in a moderately restrictive way. Thus, whilst the designation of carriers was left with individual governments, the routes to be operated were negotiated and agreed to bilaterally. The

determination of capacity and frequency levels fell in the first instance to the airlines and had to respect traffic demand subject to ex-post review by individual governments. Whilst the setting of fares was delegated to the International Air Transport Association (IATA), the latter's authority was subject to the double approval requirement, meaning that while IATA could propose a fare, both national governments had to agree to it before it could be made available in the marketplace. The rationale for this was to avoid a price war resulting from "unfair and uneconomic rates". If the governments could not agree, the fare dispute would be referred to ICAO[5] for further analysis and advice (Flight, 1946).

Perhaps the most salient feature of the agreement was that for the first time in a bilateral ASA the parties reserved the right not to allow the exercise of traffic rights by a carrier in cases where they were not "satisfied that substantial ownership and effective control of such carriers are vested in nationals of either contracting State".

The genesis of the ownership and control requirement is found in the Transit Agreement and the Transport Agreement, which both provide that "each contracting State reserves the right to withhold or revoke a certificate or permit to an air transport enterprise of another State in any case where it is not satisfied that substantial ownership and effective control are vested in nationals of a contracting State…". It should be noted that these agreements are multilateral in nature, which means in practice that the term "contracting state" refers to a multitude of states, in fact to all parties to the agreement. In contrast, the reference to "either contracting state" in Bermuda I was aimed at the United States and the United Kingdom exclusively. What is common in both cases, nevertheless, is the discretion of the parties to block the designation of an airline ("each contracting state reserves the right…") rather than any kind of obligation to do so.

The tight rules on designation of routes and airlines, designed to safeguard equality of operating opportunity for the air carriers in contracting nations, prompted national governments to become involved in air transportation activities through the de facto establishment of national flag carriers. Apart from the United States, where private airlines had appeared right from the outset, in the rest of the world and especially in Europe, the tight regulation of the sector nurtured the creation of state-owned national airlines, perceived as symbols of national pride and prestige. Enjoying virtual dominance in their homelands, national champions did not hesitate to operate international networks, even in the absence of sufficient volumes of passengers to render these services profitable.

Bermuda II

In 1976, the United Kingdom renounced Bermuda I and negotiated its more restrictive successor, Bermuda II, signed on July 23rd 1977 and effective the following year. The new agreement restricted US carriers' fifth freedom rights, providing only for exchanges of third, fourth and fifth freedom rights. It further aimed at restricting capacity, restricting competition at Heathrow Airport in particular, by allowing access to a maximum of two carriers from both the United Kingdom and the United States and this only for air services destined for specific US airports (Mendes de Leon, 2002). It focused on third and fourth freedom traffic as the primary objective of international air services and promoted the role of government in pricing decisions.

Whilst under Bermuda I the United States was entitled to designate both US and UK airlines and the United Kingdom was entitled to designate both UK and US airlines. The amended nationality clause under Bermuda II turned the system unilateral by requiring that substantial ownership and effective control of the airline shall be vested "in the contracting party designating the airline or in its nationals".

Box 2.1. Is aviation special?

From a contemporary market economy perspective, aviation markets are heavily over-regulated in many jurisdictions and few, if any, other industries have faced such a complex economic regulatory regime in the last half-century. In 1944 the Chicago Convention laid out the cornerstone of aviation law and established the International Civil Aviation Organization (ICAO), the main international body governing international civil aviation. The Convention did not stipulate any particular form of international service structure but rather re-affirmed national sovereignty over airspace and an institutional framework within which nations could essentially exchange traffic rights, commonly referred to as 'freedoms of the air'.

Market access rights are usually granted in exchange for similar rights and may be limited by a state as a way to restore a perceived balance in the exchange of rights. The initial underlying aim of these exchanges of traffic rights was to gain reciprocal access to each other's market and enable carriers from each country to obtain an equivalent share of traffic; however, the convention's preamble clearly states equality of opportunity as one of its guiding principles, rather than equality of outcome.

A particularity of international aviation not found in many other industries is the Chicago Convention's Article 6, which explicitly forbids all international scheduled services except with the special permission of the state where the flight overflies or flies to. These special permissions referred to in Article 6 became traffic rights traded by states, with the character of national property or national benefits that can be traded amongst nations as opposed to a private property, which is how demand for goods and services is perceived in most other industries. In that sense, aviation is treated as special even though there is no economic rationale as to why this should be.

The high-risk nature of aviation certainly requires a very robust safety oversight regime. Considerations of national security and defence, as well as global aeropolitics, stand in sharp contrast with other industries. Security costs are very high for the aviation sector as air transport has been used as a potential instrument for terrorist attacks and hijacking. In addition, in aviation a crash is much more publicly visible and consequential. This is not a reason not to liberalise. Concerning safety and deregulation, a number of studies have shown no negative effect on safety. In some countries, including the United States, the opposite is true as people increasingly fly rather than rely on road transport, which is relatively more unsafe, for intermediate distances. Taken together, safety and security arguments are often sufficient for a national government to justify some level of economic regulation. Yet, in some instances this may be misused to impose barriers in the aviation sector, such as restricting the market access of airlines from certain countries.

Airline economics do not present any significant features that make that industry stand-out within the science of economics. It is a capital-intensive industry that sells a limited quantity of a perishable product, aircraft capacity, using price personalisation schemes. None of these features would be sufficient to justify economic intervention by states. The most salient economic feature of aviation is that it is a network industry. Important characteristics of such an industry are economies of density, scale and scope. Network industries are generally considered as enablers of broader national economic growth development rather than just a goal in itself, which can partly explain the large government involvement. Clear examples are Singapore and Dubai, where governments have largely invested to exploit their strategic locations in transport networks.

However, this kind of policy is not at all new, nor special to aviation. In the past, railway companies, or more recently telecom companies, have largely increased countries productivity and resulted in wider economic benefits. While increasing competition on physical tracks, such as in railway networks, has

proved difficult this is a much smaller issue in aviation, where airport congestion poses the largest barriers. In addition, while most passenger railway services rely on subsidies, most airline services could be profitably provided for by private companies. The fact that the involvement of the government in the aviation sector is still very large cannot just be explained by the ambition to link the local economy to the rest of the world and secure connectivity. Many observers have linked national pride to aviation, claiming that the global reach and large visibility of the aviation sector is exploited by many governments as a way to show the world its economic and technological strength.

The same applies to some extent to other strategic industries, such as mining, oil extraction, banking and insurance. Because of their strategic value most of these industries have been regulated for a long time even though economic theory does not imply that strategically important industries need regulating and protecting. On the contrary, it predicts that protectionism will reduce long-term performance. During the last decades gradual liberalisation has therefore occurred worldwide with the aim of increasing both efficiency and competition. Although this has clearly benefitted the majority of the consumers, it has also put less efficient companies out of business, of which some were considered national symbols. This caused political pressure in some countries to increase regulation again.

Overall, the combination of national security inherently linked with aviation, the imperative of ensuring high standards of safety and security, the wider economic benefits that flow from aviation and the need for connectivity between nations has led national governments to treat aviation in a very different way than most other service industries, with some governments even considering it as part of their national infrastructure, accepting the industry to be operated unprofitably in exchange for the wider economic benefits it provides

US domestic deregulation (1978)

The United States Congress first regulated the airline industry in 1938 by forming the Civil Aeronautics Board (CAB) on the theory that strict regulation was necessary to protect airlines from "excessive competition". The CAB's chief tool of regulation was to sponsor price-fixing. The CAB also tightly restricted rates, routes and entry into the market[6]. With regard to new entry in particular, the CAB's power to grant certificates of "public convenience or necessity" utilised a test that placed the burden on applicants for certification to show new entry was in the public interest and would not harm an incumbent airline. Since a new entrant had no proven track record to distinguish its merits, it suffered a significant disadvantage in pressing its case (Hardaway, 1985).

Domestic passenger deregulation

Proponents of the CAB felt that the policies were justified to allow the airlines to reap oligopoly profits (Levine, 1987). Yet, as observed, the profits the airlines earned were attributable to technological advances, such as the development of the jet engine, rather than economic policies. But even the exponential rise in aircraft efficiency resulting from the advent of jet aircraft and improved technology did not appreciably serve to recapitalise the industry. Potential profits were matched by rising costs, particularly labour costs (Hardaway, 1985). Despite its growth, the North Atlantic market was afflicted by what has been described as "profitless growth syndrome" (Staniland, 1999). In 1976, when ocean liners were left with only 5% of the passengers they had carried twenty years earlier, a book was published drawing parallels between liner shipping and the capacity and pricing problems of the North Atlantic air

transport market subtitled *Saving an Endangered System* and describing the market as in a "sick condition" with losses "chronic and widespread" (Friedman, 1976).

Shielded from competitive pressures and operating within an established and predictable regulated environment, the airlines had no incentive to resist cost inflation. The CAB's policies allowed the airlines to simply use cost increases as the basis for requesting fare increases. Under CAB regulation, investment and operating decisions were highly constrained, with airlines competing mainly on service features. As a result, prices and frequency were high but load factors were low. Indeed, in the early 1970s load factors were only about 50% (Smith and Cox, 2008). There was little cause for the airlines to fear competition from new, efficient, cost-cutting airlines since any cost savings could not be reflected in lower, CAB-set fares. All fares were price-fixed by the CAB across the board (Hardaway, 2007). The CAB continued to regulate the industry until 1976, at which point an incoming chair, appointed because of his liberal economic standpoint, proposed to Congress that the aviation industry be deregulated in order to combat poor profitability of US airlines[7].

The unprofitability of US airlines induced Congress to pass the Airline Deregulation Act of 1978. The act phased out federal regulation of rates, routes and services for domestic airlines, opening up the industry to market forces. It forced a reorganisation of the US domestic network, abandoning a railway-based, linear, point-to-point model for a gravitational hub-and-spoke model. While hub airports experienced rapid growth in traffic, spoke airports enjoyed new-found connectivity via those hubs. Air fares were dramatically reduced, especially at spoke airports where competition was fiercer.

The Airline Deregulation Act eased entry restrictions and allowed carriers to choose their own routes and set their own fares. It further set a number of public interest goals including:

1. placing maximum reliance on competitive market forces and on actual and potential competition
2. preventing predatory or anticompetitive practices in the airline industry
3. preventing unreasonable industry concentration, excessive market domination, monopoly powers and other conditions that would allow an airline unreasonably to increase fares, reduce service, or exclude competition
4. encouraging market entry by new and existing carriers[8].

During the period 1978-1983, fares in real terms declined sharply, despite fuel cost increases. The market share of new entrants more than tripled between 1978 and 1983, while that of the major carriers decreased proportionately. By 1984, airline productivity had increased markedly, the number of passenger miles almost doubled and in the first two years of deregulation the number of employees in the industry increased by over 30 000 (Hardaway, 1985).

The greatest beneficiaries of deregulation were the consumers. During the seventeen years prior to deregulation, the CAB's policy of subsidising service to small communities and requiring airlines to take losses on such routes had induced airlines to eliminate over 173 routes servicing small communities. Between 1970 and 1975, airlines cut small community flights by over 25%. By 1983, however, there were more city-pair markets receiving non-stop service than in 1978 (Hardaway, 1985). Graham et al. (1982) concluded that on balance, every class of city benefitted from the better-integrated service network, either through increased flights or more direct service to major cities, and the beneficiaries include the smaller communities, which were considered vulnerable to service losses from deregulation.

Despite sweeping reform, regulatory restrictions on foreign investment in US airlines remained unchanged. As a result, the consolidation and rationalisation effect of deregulation in the form of

unprecedented mergers and acquisitions was restricted in the US domestic market. Foreign ownership restrictions haven't stopped mergers of US carriers but only limited them to US owners. Therefore, the status quo as regards the regulation of international civil aviation stayed initially intact.

However, US deregulation did have a long-term impact on international civil aviation. Pan American Airways and Trans World Airlines, which for decades had been the United States' main international flagship airlines, were unsuccessful in building a domestic feeder network to their international operations. Pan Am folded in 1991 and TWA first declared bankruptcy in 1992 and was then subsequently bought and folded into American Airlines in 2001. The failure of these two US flagship carriers stems mainly from an inability to contain costs and to align a domestic feeder system to their global network in a deregulated environment. Gradually, domestic US carriers started funnelling international traffic through their hubs, which set both former flagship carriers on a course leading to their ultimate demise.

In the last decade, the US industry experienced a degree of unprecedented consolidation that has led to the emergence of three mega-carriers providing global services, American Airlines, Delta Airlines and United Airlines, each anchoring one global alliance. With fewer competitors and a healthy economy, these carriers have been able to exercise capacity discipline in the domestic market and return to profitability.

Domestic air freight deregulation

Prior to the 1978 deregulation, air freight carriers operating aircraft with a maximum certified take-off weight of over 3 400 kg were confined to a route regime devised in the late 1940s and early 1950s, which did not evolve with the westward and southern shift of the US economic centre of gravity. Furthermore, air freight rates were based on size and distance, not the quality of service, meaning there was no possibility to discriminate prices according to speed (i.e. charge more for overnight service than 1-day service). Rate regulation was slow to adjust to market changes. As a case in point, the Domestic Air Freight Rate Investigation, launched in 1970 was not yet complete when air freight rates were finally deregulated in 1977. The difficult operating conditions resulted in no new all-cargo airlines being certified in the United States between 1956 and 1977 (Bailey, 2008).

Meanwhile, carriers operating smaller aircraft, such as Federal Express (FedEx), were never subject to regulation. The 3 400 kg weight limit meant they were bound, however, to operate only smaller and therefore less efficient aircraft[9].

Air freight took advantage of the fact that air passenger deregulation was attracting its fair share of debate to liberalise more swiftly. John Robson, Chair of the Civil Aeronautics Board, proposed to Congress in 1976 to separate the regulation of passenger and air freight services and fully deregulate the latter.

Air freight services were seen as somewhat less sensitive than passenger services. Havel (2009) attributes this to less prevalent safety concerns for freight services as well as the fact that air freight services, at that time, were perceived as having less overall economic significance. This was, of course, long before FedEx and UPS morphed into the global integrators that they have become today. An additional factor that may explain this was that politicians felt more familiar with the air passenger side of the industry, for which they were both legislator and customer. Also, as belly freight is carried in spare storage capacity on passenger aircraft and is rarely the driver of demand, it may have been perceived as less risky to deregulate air freight while maintaining regulation of passenger operations as belly freight would still remain indirectly regulated in terms of routing and frequency.

Full domestic deregulation for all freight services (except cabotage, which remains prohibited in the United States) was phased in between November 1977 and late 1979 (Zhang et al., 2002). Full passenger deregulation took until January 1983. From the onset, regulations concerning freight aircraft size, routing and fares were all abolished. The stock market reacted very positively to the liberalisation of domestic air freight, as FedEx's share price rose from USD 9.16 to USD 34.74 between October and December 1977. That company experienced a 38% growth in shipments in 1978, compared to 15% a year earlier (Bailey, 2008). The unmitigated and immediate success of air cargo deregulation in the United States helped dispel fears with respect to passenger deregulation and eased the passing of the amendments to the *Federal Aviation Act* which enabled full airline deregulation.

The advent of Just in Time manufacturing in the United States in the mid to late 70s combined with deregulation helped the express air freight market soar. In a span of only 20 years, the amount of revenue tonne-kilometre in the United States more than tripled, going from 6.7 million to 21.5 million between 1977 and 1996. Meanwhile, Larson (1998) shows that air freight rates experienced steep declines, with yield[10] in real terms falling from USD 0.86 in 1977 to USD 0.66 in 1996[11]. Finally, the compatibility of business practices required for Just in Time with the service delivery model of express integrated air freight helped that sector gain a substantial share of the domestic US freight transport market. Whereas it was stable around 18% by value for most of the 1970s, it quickly grew in the 1980s to reach 37% by 1996. By 2010, 83.1% of US domestic air freight revenues were generated by FedEx and UPS (ACMG 2011), which represented over 60% of total domestic revenue tonne-kilometres flown[12].

US-Netherlands open skies (1992)

Until 1957, Dutch carriers operated to and from the United States on the basis of permits issued by the Civil Aeronautics Board (CAB). On 3 April 1957, the Netherlands and the United States concluded their first ASA, modelled on the Bermuda I Agreement.

US-designated carriers enjoyed unlimited market access opportunities. Carriers designated by the Dutch government were allowed to operate (in both directions) from Amsterdam to New York or Houston and from the Netherlands Antilles to New York or Miami. Intermediate and beyond points were limited and specified for Dutch carriers.

In 1969, the routes Chicago-Amsterdam and San Juan-Netherlands Antilles were added to the agreed route schedule. US aviation policy makers balanced the estimated earnings of US carriers with the benefits to be derived from the agreement by the Dutch air carriers. However, the Dutch newspaper Aldermen Handelsblad complained that the United States, while proclaiming freedom of the air, did not apply this principle to the Netherlands, because the United States refused traffic rights to the US West Coast (Mendes de Leon, 2002).

In 1978, a Memorandum of Consultations amended the Agreement of 1957. The Protocol of 1978 was concluded one year after the conclusion of the Bermuda II Agreement between the United States and the United Kingdom. The United States was looking for an "ally" to shape a more competitive international air policy, reversing the restrictive policy underlying the Bermuda II Agreement. This goal was in part achieved. The Dutch were prepared to go further than the offer made by the United States and the protocol formed an open-ended compromise, which was designed to be further liberalised in the years to follow.

In 1990, the US Department of Transport (USDOT or DOT) conceded to the wishes of secondary US airports, under the Cities programme, by allowing foreign airlines to start operating routes not listed in

the ASAs and for which US carriers did not show any interest in operating. Pursuant to this programme, in 1990 KLM obtained extra-bilateral rights on a temporary basis to Baltimore, Minneapolis and Detroit.

This programme was an immediate success and showed that routes could be given away unilaterally to liberal trading partners and still being economically beneficial for society (Shane, 2006). It thus formed an impetus for the conclusion of the open skies arrangements agreed in 1992. On 31 March 1992, Transportation Secretary Andrew Card announced that the United States would explore open skies aviation agreements with all European countries willing to allow free access to their markets. Heretofore, it had offered such agreements to only a few of its largest aviation partners. The Dutch seized this opportunity and in the first week of April 1992, the Dutch Minister of Transport, Mrs Maij-Weggen, indicated that the Netherlands was interested in talking about the liberal policy.

A significant benefit of open skies agreements, in addition to the freedom to operate they provide, is that they enable carriers from foreign countries which have an alliance with a US carrier to seek antitrust immunity by the United States for such an alliance. Thus, only five days after the agreement was signed, Northwest Airlines and KLM sought antitrust immunity, which was granted by DOT in January 1993[13].

The 1992 agreement became the cornerstone of the US's international air policy and has been replicated to a large degree in its 115 other open skies agreements. It also eventually created the impetus for the EU-US Open Skies Agreement. Thus the historical significance of this agreement cannot be overstated. It provided a clear departure to existing policy and helped position the United States as a global leader in traffic rights liberalisation.

The US-Netherlands Open Skies Agreement of 1992

The US-Netherlands Open Skies agreement was not a new agreement but rather an evolution of the agreement already in place. The 1992 Memorandum of Consultation (MOC) was an expression of what both countries intended to allow pending entry into force of the agreement in October 1992. It called for each country's airlines access to 'a point or points' in the other country, and beyond, without any limitation. As compared with the Protocol of 1978, the position of US carriers remained unchanged. Dutch carriers received unlimited route and traffic rights. Nationality requirements remained unchanged. The MOC of 1992 provides for multiple designations and that neither country shall unilaterally limit the volume of traffic, frequency or regularity of service, or the aircraft type and size[14]. It continued the practice established a year earlier in the 1991 MOC of a free, pricing regime. It removed restrictions on changing of aircraft from one size to another using a same flight number, commonly referred to as change of gauge and enabled carriers from one country to perform the following support functions in the other country:

- establish offices for the promotion and sale of air transport
- bring in and maintain managerial, sales, technical, operational and other specialist staff required for the provision of air services
- self ground-handling
- sell air transportation through its agents in the other party's territory
- convert and remit to its country local revenues
- carriers enjoy non-discriminatory distribution facilities and intermodal rights.

Discussion of air freight issues did not play a crucial role. The previous arrangements foresaw a liberal regime for cargo operations. The United States refused a Dutch proposal designed to include seventh freedom rights for such operations, because it wished to keep this option for "bigger fish".

Benefits of the 1992 Open Skies Agreement

At first glance, the agreement may seem a bit one-sided, as Dutch carriers gained unlimited access to a far greater number of airports in the United States than US carriers did in the Netherlands (effectively only Amsterdam Schiphol). From a US perspective, as Sundberg (2000) illustrates, the MOC of 1992 was in large part geared to challenging other European partners to follow suit and eventually open up the US-European market. The US administration succeeded, albeit not as swiftly as it had hoped. On the commercial side, US carriers did not gain more than fifth freedom price leadership and a few extra commercial opportunities. KLM and other Dutch carriers received unlimited access into and from the United States, without intra-US rights.

The grant of potential price leadership on intra-European Community routes (i.e. fifth freedom services operated by Northwest Airlines) to non-Community carriers may have been in conflict with EC regulations. At the same time, the practical value of price leadership for Northwest Airlines was not relevant as Northwest did not operate on intra-Community routes because its code-sharing agreement with KLM provided a more efficient alternative for such operations.

The Northwest-KLM alliance resulting from this open skies agreement placed pressure on other European carriers to follow suit, namely Lufthansa which partnered with United Airlines and British Airways and tried unsuccessfully to purchase a stake in USAir, before eventually forming an alliance with American Airlines. Perhaps the most important commercial benefit drawn from the open skies policy is related to the combination of the conclusion of an open skies agreement with the grant of antitrust immunity to carriers of the two parties exploited to good effect by Northwest and KLM. Granting of antitrust immunity has therefore become something of a policy tool as well as a legal test; more precisely competition authorities take the broader context for competition into account in making decisions on antitrust aspects of mergers and alliances.

Marché commun du Sud Air Services Agreement (1996)

The Asuncion Treaty of 26 March 1991 established a free-trade area between Argentina, Brazil, Paraguay and Uruguay[15] MERCOSUR expanded with the accession of Chile in June 1996 and Bolivia in December 1996. The accession of Bolivia coincided with the conclusion of the MERCOSUR ASA among these six countries on 17 December 1996, at one of the group's periodic presidential meetings, held in Fortaleza, Brazil. The MERCOSUR ASA is open for adherence by all other South American countries. It is rather unique as it is meant to complement existing ASAs between MERCOSUR members rather than replace them as would eventually be the case in the European Union[16]. Just like the Andean Pact before, the agreement liberalises traffic between countries while keeping existing ASAs intact (OECD, 2011).

The agreement was conceived as a tool to improve the efficiency of air transport. At the time of signature, the region had many densely populated urban areas, located not very far from one another, yet isolated from each other. Travel between cities separated by distances that could be covered by no more than an hour's direct flight required half a day, with multi-leg, connecting flights and long delays. This was especially so in border areas, where airports were mainly used for domestic flights, requiring a connection through the national capital or metropolis (Maciel, 1997).

The agreement's objective was to make it possible for new regional air services to be created on routes other than those already operated within the framework of the bilateral ASAs between the members of MERCOSUR. Once fully in place the agreement was expected to result in some 70 airports across the membership of MERCOSUR being connected with scheduled and non-scheduled flights between medium and large-sized towns[17]. To achieve the objective the parties opted for preserving their bilateral ASAs, which were not superseded by the MERCOSUR ASA. Rather, this agreement put in place a parallel regime, aimed at enhancing connectivity by excluding overlapping routes and encouraging the operation of new ones.

MERCOSUR members multilaterally exchanged the first two freedoms of the air. The third and fourth freedom rights were granted for scheduled air transport services carried out solely within the MERCOSUR region. The fifth and sixth freedom rights were subject to the authorisation granted by the states of origin and destination. These traffic rights were limited in geographical scope to the MERCOSUR region. The seventh freedom rights and cabotage rights were not included in the ASA, meaning airlines could only operate flights from, to or through their home country. Linked to the preservation of ASAs is also the provision that sections of MERCOSUR's regional routes cannot overlap sections of routes already included in bilateral ASAs.

With regard to volume of traffic, capacity represented by frequencies and aircraft size must be in line with traffic potential. Multiple designations were permitted. Fares were subject to regulations of the state where those services were initiated. Finally, the issue of airline ownership nationality was left to the parties' domestic laws.

Among the most liberalising aspects of the MERCOSUR ASA is the establishment of the national treatment principle, that is to say, the provision that no signatory state will grant a more favourable treatment to its airlines than that granted to airlines of the other signatory states. The agreement further encourages regulatory convergence by calling on the signatories to simplify and standardise their laws and regulations pertaining to:

- authorisations to carry out air transport services (routes, rates and schedules)
- facilitation of international air transport (migration, customs and sanitary control)
- airworthiness, operations and licences of personnel
- a review mechanism was put in place, with a view to gradually eliminating existing restrictions.

European Union Single Aviation Market (1997)

Arguably, the deregulation of the US air transport market caught Europe unprepared in the sense that, since the entering into force of the Treaty Establishing the European Economic Community (EC Treaty) in 1957, no competition regulation had ever been adopted concerning air transport. As a result, not only was there no single European air transport market at that time, it was not even clear whether the competition provisions of the EC Treaty were applicable in the field of air transport. If the application of the EC Treaty rules to air transport is traced to its origin, it should first be underlined that a common policy in the sphere of transport (Common Transport Policy) was envisaged at the signing of the EC Treaty as one of the means by which the objectives of the community, as set out in Article 2, would be achieved. Illustrative of the "special aspects" ascribed to transport, the treaty included a separate title regulating transport services. In practice, this meant, as explicitly stated in Article 61(1) of the EC Treaty, that transport was excluded from the treaty provisions on the freedom to provide services, however Article 84(2) did grant the European Council the discretion to decide "whether, to what extent and by

what procedure appropriate provisions might be adopted for … air transport.'' Thus, the regulation of the sector was contingent upon positive action by the council. This special settlement created some controversy over whether air transport was merely excluded from the Common Transport Policy in the absence of any council action or from the EC Treaty as a whole.

In 1979 the Commission adopted a cautious memorandum listing future priorities for the development of the European air transport market in response to a ruling by the European Court of Justice that the former had a duty to apply the treaty to air transport. This was followed by a proposal, in 1981, for an implementing regulation under Article 83 on third country air transport, which was met, nevertheless, with opposition from the Council of Ministers[18].

The situation began to evolve rapidly in 1983 when the European Parliament brought an action before the court against the council for failure to act in the field of transport pursuant to Article 175[19]. A year later, the Tribunal de Police de Paris sought a preliminary ruling from the court on whether certain provisions of the French civil aviation code were compatible with the competition rules of the EC Treaty[20]. Some days later the Commission published a second, more thorough civil aviation memorandum, together with a set of proposals, which paved the way for the liberalisation of the air transport market[21].

In a landmark 1985 ruling, the *Nouvelles Frontières* case, the court concluded that the council failed to act with regard to the freedom to provide services in the field of international transport and the laying down of conditions under which non-resident carriers could operate transport services in a member state. Soon after the court's judgment, the Commission presented its White Paper on Completing the Single European Market, setting out a programme of legislative measures whose main objective for air transport would be the establishment of a single European aviation market with respect to entry, tariff, and capacity control by 1992.

In addition to responding to rulings from the court, the Commission was also responding to member states adopting increasingly more liberal aviation policies (Button, 1996). In the United Kingdom, the national regulatory agency was becoming more liberal in its acceptance of fares and in issuing licences. The United Kingdom had fully privatised its national carrier, British Airways, in 1987, while Germany and the Netherlands were gradually privatising their own national carriers. Meanwhile, leading member states, such as France, Germany, Ireland, Spain, the Netherlands and the United Kingdom were seeking to liberalise their existing ASAs with other EU members, which risked fragmenting the intra-EU market into more or less liberalised areas. Finally, the US policy goal of achieving open skies with EU members[22] also encouraged the Commission to move forward with a single aviation market.

A decisive moment for the history of European integration, with an immediate impact on aviation, was the enactment in 1987 of the Single European Act (SEA). The liberalisation of the air transport market took the form of three packages of regulatory measures, adopted by the council in 1987, 1990 and 1992 and covering respectively market access, air fares, and licensing of air carriers. The packages opened up to competition all international routes within the EU in 1992 and all domestic EU routes in 1997, when full cabotage rights were extended to all EU carriers. This made the EU and its extended partners within the European Common Aviation Area the only countries to fully achieve all nine freedoms of the air, at least amongst themselves. In line with the goal of a single European market, the third, fully-liberalised regulatory package provided uniform standards for intra-EC market access to EC carriers through article 3(1) of EC Regulation 2408/92. In contrast to the United States, where the policy chosen was that of complete deregulation occurring with the adoption of a single piece of legislation (the Airline Deregulation Act), in Europe the model advanced was that of controlled liberalisation, occurring gradually over a period of almost ten years.

The establishment of a single European air transport market in the 1990s resulted in a large area, where EU Member State airlines enjoy freedom of establishment and all nine freedoms, while remaining under the regulatory authority of their respective countries. In effect, it transformed the entire EU into a single, "domestic-like" market. It transitioned European aviation policy from being articulated around national interest to being articulated around community interest, a concept defined by Resolution A24-12 of the 24th ICAO General Assembly, held in Montreal in 1983. In so doing, it broke the traditional links that existed between ownership, traffic rights and national regulatory control (ICAO, 2002). This concept of community interest was originally developed to ease the problem faced by certain developing countries arising from the strict application by other states of the traditional airline ownership and control criterion[23]. The EU internal deregulation thus differed significantly from the US Airline Deregulation Act as the former addressed simultaneously both domestic and international aviation within the boundaries of the EU whereas the latter was limited to domestic aviation only.

A common licensing regime created the concept of a "Union carrier", namely a carrier majority owned and effectively controlled by any EU member state and/or its nationals. The transition from national ownership and control (O&C) to Union O&C facilitated intra-EU consolidation, but also rendered obsolete the traditional nationality clauses in EU member state ASAs with third countries. In order to safeguard traffic rights negotiated bilaterally between EU member states, negotiations were conducted for the replacement of the traditional designation clauses with updated, non-discriminatory, EU clauses. Despite initial fears about third-party countries refusing to accept EU member states designating any Union airline, as opposed to airlines owned and controlled by them, by 2012 nearly 1 000 bilateral ASAs, representing 75% of all extra-EU passenger traffic, had been amended in line with the principle of EU designation[24].

EU regional integration questioned the traditional concept of "national interest", reflected in the nationality rule, juxtaposing a new standard of assessment, namely the "Union interest". Although EU designation multilateralised the nationality rule, it also defragmented and harmonised national interests and laws. This process paved the way for the EU to negotiate an ASA *en bloc* with the United States which would replace the member states' individual ASAs with the United States.

After the creation of the European internal market in 1993 and following the "open skies" judgements of the European Court of Justice on 5 November 2002, existing bilateral ASAs between EU Member States and non-EU Partners had to be amended to include EU designation clauses permitting designation of any EU air carrier established in a member state (freedom of establishment) or else they would remain vulnerable to legal challenge.

The most efficient way for restoring legal certainty to existing bilateral ASAs is through the so-called "horizontal agreements" between the EU and third countries concerned that would resolve all outstanding legal issues under a single and simple standard agreement. Hence, the European Commission is entrusted by the European Council to negotiate such agreements on the basis of horizontal mandates from the council.

Horizontal agreements replace therefore the existing bilateral agreements that enable designation of all 'European' airlines instead of just the ones from that particular European country. EU designation actually allows all European carriers to be designated to fly a particular intercontinental route from any European airport. For example, Lufthansa could be designated to fly from Paris to Singapore, even though it is not a French airline.

Yet, actual traffic capacity remained governed by the relevant bilateral agreements. If these have finite entitlements (such as the France-Singapore agreement), the EU carriers will have to share that limited capacity between themselves following EU Regulation 847/2004. Several countries have accepted the

horizontal agreement, including the United States. The latter created the joint market between the United States and the EU in which all restrictions on route frequencies and capacities that were binding in the bilateral agreements have been removed.

The EU Single Aviation Market generated the deepest and most transformative realignment of the aviation market since US deregulation. It enabled the emergence of European low-cost carriers (LCCs), which initially based their business models on Southwest Airlines. These LCCs would transform the European marketplace by operating a point-to-point, intra-EU network, with high aircraft utilisation rates, very low air fares and extensive use of ancillary fees. The LCCs crowded out legacy network carriers, whose intra-EU network is now mainly geared towards feeding their respective hubs. The EU aviation marketplace today can now be described as two parallel markets, made up of an intra-EU component, heavily dominated by LCCs, and an extra-EU component dominated by large EU carrier groups like Lufthansa Group, Air France-KLM and International Airlines Group. These are supported by their respective Star Alliance, SkyTeam and OneWorld alliance European partners competing against non-EU carriers.

LCCs rapidly established bases across the EU, particularly in secondary markets, relief airports and converted air force bases, where they rapidly became the dominant carrier. LCCs make extensive use of the seventh and ninth freedoms allowed under the EU Single Aviation Market. In fact, today about half of the intra-EU flights operated by LCCs make use of one of those two freedoms. A few legacy carriers did attempt to establish bases in other EU countries, such as Lufthansa in Italy, but these ventures did not prove financially viable and soon closed down.

Using a 24-year period of analysis (1990-2013) Burghouwt et al. (2015)[25] provide an overview of the long-term supply developments in the liberalised EU air transport market with respect to airline output, market structure, yields, business models and the position of the (former) flag carriers. They find that EU air transport liberalisation has facilitated significant growth in the number of routes and frequencies offered more competition at the route level, lower fares and substantial connectivity growth as a result of the adoption of hub-and-spoke systems. Between 1992 and 2002, the number of intra-EU flights per week nearly doubled, from about 60 000 to over 100 000. In the subsequent decade, the number of flights remained stable, however there was a sharp increase in intra-EU connectivity, as the number of routes has been steadily growing in the past 20 years, going from about 4 000 in 1992 to about 9 000 today. Since 2001, the number of frequencies per route has been gradually diminishing. While connectivity and capacity experienced sharp increases, yields experienced a dramatic decline, being more than halved in real terms since 1992. Meanwhile, Gaspari (2012) notes that intra-EU routes increased by 220% between 1992 and 2009 while the number of intra-EU routes with two or more competitors grew from 93 to 479 during that period.

They conclude that the full-service carriers mainly used the freedoms of the liberalised market to increase third and fourth freedom operations between their country of origin and other EU countries. The few exceptions, such as Lufthansa, which operated a mini-hub at Milan Malpensa for some time, have not proved to be very successful. They therefore conclude that setting up a foreign hub within the internal European market is still a costly and risky undertaking. Furthermore, on-going bilateral regulations of extra-EU air services had contributed to full service carriers articulating their networks around their national home bases, for economic rather than regulatory reasons. These results contrast sharply with the operations of LCCs. They found that over 45% of low-cost carrier operations in 2013 were fifth to ninth freedom operations.

European LCCs experienced very strong growth in the last fifteen years as liberalisation, combined with very aggressive cost-cutting and effective marketing, stimulated demand for air travel across Europe. For

example, Ryanair (72 bases) saw its annual traffic grow from about 7 million passengers at the start of the century to over 82 million today, while EasyJet (24 bases) grew from 6 million passengers to 65 million passengers. Air Berlin[26] (six bases) grew from 10 million passengers to 31 million passengers and Norwegian Air System (15 bases) grew from 300 000 passengers to over 21 million. Meanwhile legacy carriers have entered this market by launching their own stand-alone LCCs, such as Vueling/Iberia Express (IAG) and Transavia/Hop! (Air France). Burghouwt et al. (2014) show that the share of intra-EU flights operated by LCCs was marginal until the turn of the century but today operate about a fifth of all flights in the market.

The EU Single Aviation Market has thus been a resounding success in that it stimulated demand in the intra-EU market, significantly improved the connectivity of European cities, particularly secondary markets and led to sharp declines in air fares while establishing profitable LCCs. It has also facilitated the merge and integration of major European network carriers from different countries by allowing nationals from one EU country to own an air carrier in another EU country.

Multilateral Agreement on the Liberalization of International Air Transportation (2001)

On 1 May 2001, five countries, Brunei Darussalam, Chile, New Zealand, Singapore and the United States, signed a Multilateral Agreement on the Liberalisation of International Air Transportation (MALIAT)[27]. The agreement is open to accession by any other state that is a party to the multilateral aviation security agreements listed in Article 7(1) of MALIAT[28]. It constitutes a "supra-regional" agreement (as opposed to an "inter-regional" agreement) and has been presented by the parties as the first multilateral "open skies" agreement (Mendes de Leon, 2002).

The key features of the agreement are:

- open route schedule
- open traffic rights, including seventh freedom cargo services
- open capacity
- airline investment provisions which include effective control and principal place of business, but protect against flags of convenience carriers
- multiple airline designation
- third-country code-sharing
- a minimal tariff filing regime.

With regard to traffic rights in particular, the agreement provides for multilateral exchange of the first six freedoms for passenger traffic and seventh freedom for all-cargo traffic. Moreover, an optional protocol was also negotiated on 21 May 2001, providing for the exchange of seventh freedom passenger and cabotage rights. The Protocol has been signed by Brunei Darussalam, New Zealand, Singapore and the Cook Islands; however, no carrier has yet taken advantage of these cabotage provisions.

With regard to nationality ownership restrictions, the agreement attempted to relax some terms but it had little material impact as the Parties' laws and regulations concerning the ownership and control of airlines that they designate remained unaffected by the agreement. Thus, MALIAT accomplished the creation of pooled open skies within the region (Havel et al., 2014) and, like the US-Netherlands Open Skies, creates a precedent that could encourage others to follow.

Trans-Tasman Single Aviation Market (2002)

Since 1983, when the Australia-New Zealand Closer Economic Relations Trade Agreement came into effect, both countries' economies have experienced a high degree of integration. However, aviation was purposely excluded from the agreement and continued to be dealt with on a bilateral basis. The decade that followed saw important changes in both domestic markets. In Australia, the domestic market for aviation was deregulated in 1990 and Qantas fully privatised by 1995. Meanwhile, across the Tasman Sea in New Zealand, domestic aviation was deregulated in 1983 and Air New Zealand was partially privatised in 1989.

A 1992 Memorandum of Understanding (MOU) between the countries granted unlimited third and fourth freedom rights for all carriers of either country, created a double disapproval tariff regime and granted greater sixth freedom rights by 1994.

The result of this agreement was a sharp rise in Trans-Tasman traffic. Three carriers entered the market, Kiwi, Freedom Air and Ansett, all targeting leisure traffic. The Trans-Tasman market saw its growth rate jump from about 4% a year between 1993 and 1995 to 22% in 1996. In six years, between 1995 and 2001, annual traffic doubled, rising from 1.8 million passengers to 3.6 million passengers (ICAO, 2007).

The open skies agreement between Australia and New Zealand was successfully negotiated and signed and provisionally brought into effect in 2000 before being ratified in 2002. It is innovative in that it establishes a two-tier nationality regime for airlines. The agreement distinguishes between "designated" airlines and "Single Aviation Market (SAM)" airlines. Designated airlines are meant to conduct international air transport in accordance with the criteria set-out in the ASA between Australia or New Zealand and the appropriate third country, whereas SAM airlines are meant to operate within the established Australia-NZ Single Aviation Market. A SAM airline may also be a "designated" airline if the nationality of ownership and control meet the appropriate ASA requirements.

Designated airlines do not have to be majority owned by the designating party and/or its nationals unless required under the appropriate ASA. It suffices that they are incorporated and have their principle place of business in the territory of the designating party. In addition, they have to be effectively controlled by the designating party. By contrast, SAM airlines shall be majority owned and effectively controlled by nationals of either or both parties. This distinction has to be seen in the light of the traffic rights granted to designated airlines and SAM airlines. Designated airlines, conducting international air transport, enjoy unlimited fifth freedom passenger rights and unlimited seventh freedom all-cargo rights. SAM airlines, operating trans-Tasman or domestic Australian or New Zealand routes, are subject to no restrictions (including ninth freedom rights).

The two-tier nationality regime established by the agreement prevents the loss of traffic rights negotiated bilaterally with third countries, whilst creating an Australia-New Zealand single aviation market. The provision that a SAM airline may also be a designated airline entails that third countries are willing to accept the designation of SAM airlines to operate between the SAM country and the third country are free to do so (i.e. Air New Zealand could theoretically fly from Sydney to Seoul, using rights granted to Australia under the Australia-Korea ASA and subject to approval by Korea).

Article 13 of the agreement, entitled "Right of Establishment and Inward Investment", reads:

"[E]ach Party shall allow the airlines of the other Party to establish and operate an airline for the purpose of operating domestic air transport wholly within the territory of the other Party with aircraft registered in the territory of the other Party, subject to the application of national laws and regulations of the other Party".

This provision should not be confused with the freedom to provide cabotage, as contemplated in Article 7 of the Chicago Convention. Its objective is to confer a "right of establishment" on each party's investors to allow them to participate in the other party's domestic aviation sector by taking majority ownership and control of domestic carriers, but also setting up new airlines or subsidiaries of their home airlines. The right of establishment is subject to application of national laws and regulations. This entails that the foreign-owned entity must operate as a domestically regulated carrier employing "localised" workers and abiding by local labour, tax, immigration, registration, safety, security and other laws.

As far as cabotage, within the meaning of Article 7 of the Chicago Convention is concerned, in effect the establishment of SAM airlines, coupled with their right to operate between points in Australia or New Zealand, amounts to SAM airlines already enjoying such freedom.

This new and ultimate round of liberalisation was met once again by swift market response that resulted in a 50% increase in capacity (ICAO, 2007). Australia's Virgin Blue established a New Zealand carrier, Pacific Blue[29], to fly Trans-Tasman routes and domestic New Zealand routes. Emirates Airlines began flying Trans-Tasman fifth freedom flights. Today, it flies four times a day in each direction with A-380 and B-777 wide body aircraft. Finally, the two incumbents carriers on the route, Qantas and Air New Zealand, responded to this newly liberalised market through innovative service delivery models. Qantas established its low-cost carrier division JetStar, while Air New Zealand launched the Tasman Express business plan, which included its own dedicated fare plan.

Traffic has now stabilised at a significantly higher level than before liberalisation and the Trans-Tasman market possesses all the features of complete liberalisation.

European Union–United States open skies (2007)

Soon after the 1992 MOC between the Netherlands and the United States, the European Commission issued a communication urging member states to refrain from entering into new air transport arrangements with the United States[30]. The Commission's efforts to safeguard a mandate from the European Council to initiate negotiations with third countries on behalf of the community and its member states date back to 1979, when its first civil aviation memorandum was adopted[31]. The 1984 memorandum reiterated the need for a common approach towards international air transport[32], something that was strongly supported a decade later by the *Comité des Sages*, a committee of experts set up by the Commission to analyse the situation of EC civil aviation and make recommendations for future policy initiatives[33]. In view of the completion of the air liberalisation process in Europe, the committee underlined that bilateral ASAs "ignore the new realities" and should be replaced by a multilateral regime directed by the EU-and in particular by the European Commission, rather than the member states.

Meanwhile, despite the Commission's repeated requests to the contrary, six member states - Denmark, Sweden, Finland, Belgium, Luxembourg, and Austria - signed open skies agreements with the United States in May 1995, followed by Germany (1996), Italy (1998) and France (2001). In view of the council's unwillingness to empower the Commission to negotiate *en bloc* with the United States and given the growing success of the US open skies policy, the commission initiated infringement proceedings against the aforementioned member states and the United Kingdom, which, while not entering into an open skies agreement, proceeded with an amendment of its Bermuda II agreement with the United States. It was only after the latter action that the council agreed, in mid-1996, to give the Commission a limited mandate to initiate preliminary talks on a multilateral ASA.

The council's concessions - a product of last minute compromises – provided the Commission with a limited mandate, covering only the so-called "soft-rights" (i.e. computer reservations systems, slot allocation, maintenance, ownership and control, code-sharing, leasing, competition issues, environmental issues, dispute resolution, and transitional measures) and was considered insufficient by the United States as a basis for negotiations. The latter made clear that a partial agreement was unacceptable and that as long as the hard issues of market access, capacity, airline designation and pricing had not been included in the agenda, no further progress could be made. In the face of the council's consistent refusal to consent to a comprehensive mandate and given the initiation of open skies negotiations between the United States and four more member states (the Netherlands, France, Italy, and Portugal), the Commission reactivated its infringement proceedings under former Article 226 of the EC Treaty. In 2001, following the member states' refusal to comply with the commission's reasoned opinion, the latter took its legal action to the next level, referring its cases to the European Court[34].

The European Court of Justice handed down its individual judgments for all eight cases in November 2002[35]. The court was called on by the Commission to decide whether:

- The community had exclusive competence to negotiate and conclude open skies agreements with the United States and, if so, to what extent.
- The nationality clauses typically included in bilateral ASAs violate the freedom of establishment enshrined in Article 43.

The starting point of the Commission's rationale against the open skies agreements was their potential to undermine the outcome of the liberalisation process (i.e. the establishment of a single European air transport market). In the Commission's perception, the creation of such a common market implied the conferral on the community of the power to conclude ASAs with third countries on behalf of the member states. Such exclusive external power was indispensable for the interests of the community and the individual member states to be properly safeguarded. The limited negotiating leverage of the individual member states resulted in disequilibrium of beyond traffic rights in favour of the US carriers, who could operate through service to any point in the EU. The prohibition of cabotage services in the United States reduced the options of European airlines to exercise beyond rights. In addition, nationality clauses in an air services agreement between the United States and an EU member ran counter to EU Regulation 2407/92 on licensing of air carriers, which marked the transition from nationally owned and controlled airlines to community owned and controlled airlines. According to the commission, the net result of this discrimination on the basis of nationality was the distortion of competition between Community carriers. It could also prevent the consolidation of the industry through mergers and acquisitions, which could jeopardise traffic rights exchanged bilaterally with third countries on the basis of the nationality principle.

The court ruled that member states retained the competence to conclude ASAs with third countries. Nevertheless, the court identified three areas, intra-EU fares, computer reservation systems and slot allocation, where the common rules adopted had deprived the member states of their right to assume obligations towards third countries, conferring, as a consequence, exclusive competence on the community. The court also upheld the commission's view as to the illegality of ownership clauses and that, as a result, the freedom of establishment could not be exercised properly.

In June 2003, the council granted the commission the long-sought comprehensive mandate to negotiate with the United States and other third countries, thus correcting legal issues highlighted by the court[36]. Along the lines of the commission's package of proposals communicated in February 2003, the mandate authorised the commission:

- "to open negotiations with the United States" for the establishment of an "Open Aviation Area"
- "to open negotiations with third countries [for] the replacement of certain provisions in existing bilateral agreements with a community agreement"
- to prepare "a proposal for a Regulation of the European Parliament and of the Council on the negotiation and implementation of ASAs between member States and third countries".

The alignment of the many hundreds of existing bilateral ASAs with EU standards constituted a real challenge to the extent it required not only the joint action of the commission and the member states, but also the willingness of the third countries involved to co-operate. In this regard, it was deemed necessary that the member states could negotiate not only in their own areas of competence, but also on issues subject to the horizontal mandate granted to the commission. To eliminate the risk of inconsistencies, the commission prepared a standard designation article to replace the old ownership and control clauses, to which the member states had to adhere[37].

First stage EU-US Comprehensive Agreement

Soon after the European Council's mandate was accorded, representatives of the two biggest aviation markets in the world announced their agreement to begin comprehensive negotiations "with the goal of maximising benefits for consumers, airlines, and communities on both sides of the Atlantic (EC, 2003). After three rounds of negotiations at the beginning of 2007, and in total eleven rounds of negotiations lasting four years, the two sides reached the Comprehensive Agreement, initialled on 2 March 2007, and finally signed on 30 April 2007 in Washington D.C. at the EU-US Transatlantic Summit (EC, 2008).

The first-stage agreement, which became effective on 30 March 2008 following a period of provisional application, superseded the existing agreement, putting an end to the fragmentation of the regulatory framework (EC, 2010). All EU Member States, irrespective of whether or not they had in the past signed a bilateral air services agreement with the United States, were now bound by common rules, along the lines of the recognition by the United States of all European airlines as "Community air carriers". In practice, this paved the way for consolidation of the European air transport market through mergers and acquisitions, as it pre-empts the danger of traffic rights being lost as a result of changes in an airline's ownership and control regime following a merger.

In terms of market access, in addition to unlimited third, fourth and fifth freedom rights, provided for already by the preliminary 2005 agreement, limited seventh freedom passenger rights and unlimited seventh freedom all-cargo rights were for the first time introduced. In line with the parties' desire to promote an international aviation system based on competition in the marketplace with minimum government interference, no restrictions were introduced on the frequency and capacity of the services offered. Moreover, with the exception that US carriers were not allowed to price-lead on intra-EU routes, free pricing was established. Market access was combined with a spectrum of commercial opportunities for airlines to enter, *inter alia*, into blocked-space or code-sharing agreements, franchising or branding arrangements, as well as wet-leasing arrangements. Additionally, community carriers were granted the right to participate in the US "Fly America" programme, provided that the transportation of passengers and cargo at stake is financed by a US government civilian department, as opposed to a military department. Lastly, guarantees have been granted that applications for antitrust immunity with regard to airline agreements and co-operative arrangements will be given fair and expeditious consideration. This means that, in practice, community airlines qualify for antitrust immunity under the agreement.

Moreover, the United States unilaterally assumed the obligation not to oppose the designation of airlines of Liechtenstein, Switzerland or the European Common Aviation Area (ECAA). Apart from its practical value, the provision in question indirectly, but effectively, broadens the agreement's scope of application. This is in line with the parties' expressed will to extend the agreement to include third countries.

The 2007 US-EU Air Transport Agreement is the first inter-regional agreement of its kind. With respect to the nationality rule in particular, it crystallised *de facto* US policy to refrain from enforcing the nationality rule against open skies partner states if their airlines become owned and controlled by nationals from third states with which the United States has also concluded open skies agreements. Thus, the agreement enables the United States and the EU to acquire third country airlines or establish foreign subsidiaries in third countries without compromising their traffic rights to either the United States or the EU, "provided that the third country in question has established a record of cooperation in air services relations" with both the United States and the EU.

The agreement also provides for extensive regulatory co-operation over a range of areas, i.e. security, safety, competition and government subsidies and environment. The realisation that the viability of a final agreement is dependent upon a degree of regulatory convergence necessitated not only the adoption of these provisions, but also the establishment of a joint committee, a body consisting of representatives of the parties, entrusted with the task of reviewing the application of the agreement and resolving, where necessary, questions relating to its interpretation and application. In the event that a dispute is not settled by the joint committee, it may be referred to arbitration, unless competition issues are concerned, in which case the authorities in charge are the EU Commission and the USDOT.

Second-stage EU-US Comprehensive Agreement

Following the successful conclusion of the first stage agreement, negotiations continued on a second stage agreement signed by all parties on 24 June 2010. The second stage agreement is arguably not far-reaching in terms of contributing to the establishment of an open aviation area. In terms of market access very little changed. With regard to designation, in addition to Liechtenstein, Switzerland and any member of the ECAA, the United States agreed not to oppose the designation of airlines from any country in Africa upon fulfilment of certain conditions specified in the agreement. Domestic cabotage remained a "national" privilege, whilst traffic rights were not further liberalised. In the area of US government procured transportation a slight improvement did occur. EU airlines were granted the right to offer services between the United States and non-EU countries, as opposed to services solely between the United States and EU countries, which was the case before.

On the complex issue of ownership and control, the EU undertook to allow majority ownership and effective control of their airlines by the United States or its nationals on the basis of reciprocity, upon confirmation by the joint committee that the laws and regulations of the United States permit majority ownership and effective control of its airlines by the member states or their nationals. To the extent that no new concrete obligations were assumed, the issue was effectively left intact.

In addition, a new, expanded provision on the environment was adopted, accompanied by a Joint Statement on Environmental Co-operation and some eight paragraphs in the Memorandum of Consultations dedicated to the environment[38]. The new provisions provide for regulatory co-operation in a range of environmental issues, often within the framework of ICAO or the United Nations.

The parties also expanded co-operation on aviation security issues. This reflects that the need to facilitate air transport in the most economical way, without compromising aviation security, may only be

satisfied through a high-level of co-operation through mutual reliance on the other party's security measures, as well as swift and co-ordinated responses to new threats.

An innovation of the 2010 Agreement is a provision entitled "Social Dimension" in response to potential negative implications of the agreement on the labour market. This provision enhances the role of the joint committee by entrusting it with the task of monitoring the social effects of the agreement and developing appropriate responses to legitimate concerns.

The conclusion of the second stage agreement and its entry into force leads inexorably to the question of whether a final agreement is going to be reached, and, if so, when. Arguably, a crucial difference between the first and the second stage agreement is that whilst in the 2007 agreement the parties agreed on a timeframe within which certain issues had to be resolved, in the 2010 agreement no such provision was included and, consequently, no suspension clause applies anymore[39]. Although it might be considered that this is justified in view of the delicacy of the issues that have to be settled in the final stage of the negotiations, the possibility remains that the parties procrastinate and settle, eventually, for the 2010 acquis (Lykotrafiti, 2015).

Impacts of open skies on the EU-US market

One of the most visible consequences of the agreement is that it enabled US carriers to shift their London flights from Gatwick to Heathrow, which was generally seen as more favourable, despite heavy congestion, high charges and limited slots. A few carriers also started up niche services, such as L'Avion (now OpenSkies, a full service carrier), La Compagnie (all Business class) or Norwegian Air International (low-cost). While permitted by the agreement, EU network carriers have yet to operate flights to the United States from a country other than their home country, demonstrating that, for network carriers, the economic benefits of developing a hub outweigh those of operating flights to the United States from a third country. A second consequence of the agreement is that it enabled five EU states, Cyprus, Estonia, Latvia, Lithuania and Slovenia, to have an ASA with the United States, something they did not previously have.

One area where the open skies agreement (OSA) did not impact EU-US aviation relations, despite hopes that it would, was the question of foreign ownership of air carriers. This had been a primary goal for the EU (European Parliament, 2013) whereas the United States was looking more at replicating the existing open skies ASA model, but on a multilateral rather than bilateral basis. Thus, some EU stakeholders are of the belief that the US-EU OSA did not add much to the existing OSA the United States had with a number of EU States.

In terms of market repercussions, it is very difficult to properly measure the impact of this agreement as its timing coincided with the global financial crisis and economic downturn of 2008. Faced with dropping demand, air carriers consolidated capacity, despite the fact that the open skies agreement allowed for unlimited capacity. In addition, with open skies agreements already in place between the United States and the Netherlands, France, Germany and Italy, there was limited pent-up demand on the North Atlantic market. Fares did not experience any significant decline as LCCs are almost non-existent on the Trans-Atlantic market due to the fact that areas of cost savings, such as increased aircraft utilisation and lower landing fees, are relatively less important in the cost structure of long-haul flights than they are for short haul flights. The impacts of the agreement on air services will be felt more in the long-term, with airlines having more flexibility to match capacity and fares to demand and new carriers being able to enter the market. It also removes a regulatory hurdle for low-cost transatlantic operators although the economic challenges of operating low-cost long-haul flights remain.

A less visible but more transformative impact was that international aviation policy had now clearly shifted from a national concern to a community concern. While hundreds of bilateral ASAs remain in place between EU and most non-EU countries, this agreement set in place a framework to consolidate a country-to-country agreement into a community-to-country agreement.

Before the enactment of this agreement in 2008, Pels (2008) conducted a theoretical prospective analysis to assess the potential outcomes. He concluded that the effects of the EU-US OSA may resemble the effects of the earlier deregulation of the respective US and EU markets. That is, when density effects are important, airlines are likely to rearrange their networks in a process of hub-and-spoke network formation and consolidation. Consequently, the airlines using hub-and-spoke networks will stick to their fortress hubs and enter alliance agreements to connect to the hubs of alliance partners rather than to compete with them.

This prediction turned out to be right in the longer term, even though some airlines initially tried to exploit the new market by opening new intercontinental routes that they could previously not serve due to bilateral restrictions. In 2008, OpenSkies, a British Airways subsidiary announced plans to start flying directly to the United States from London, Paris Orly, Amsterdam Schiphol, Frankfurt, Madrid, Brussels and Dublin. However, only the first three routes were actually opened, while the route from Amsterdam was terminated again in August 2009 due to weak customer demand. Similarly, Air France served the London-New York route for some time, but also terminated services claiming tough competition as the most important reason. In addition, the fact that the momentum of the financial crisis coincided with the opening of the Atlantic market also worsened the prospects of potential new market entries.

LCCs expected to enter the transatlantic market by engaging in cherry picking. That is, entering markets whenever they see profits and can quickly exit them again if they prove unprofitable. So far, one European LCC, Norwegian Air Shuttle (NAS), has indeed entered the market, being the first LCC to do so since the failure of LCCs such as Laker Airways and People Express in the 1970s and 1980s. Norwegian has taken advantage of the new traffic rights by operating from several points in Europe to several North American cities. As a result, it does not only increase competition in the very largest markets, such as London-New York, but it has also opened new routes previously not served directly by any airline, such as Stockholm-Oakland and Oslo-Orlando. It should be noted that Norwegian has faced a lot of opposition from both sides of the ocean, from incumbent airlines, governments and labour unions, because of its strategies in relation to tax efficiency and labour costs. This will be dealt with later in the report, but it emphasises that besides ASAs, many more barriers to entry remain and should be dealt with before all benefits of liberalisation can truly materialise.

Canada–United States open skies (1995 and 2006)

Canada and the United States share the largest bilateral international air market in the world. In 2013, 24.6 million airline passengers flew between Canada and the United States (TC, 2014). Those two countries have a long history of bilateral ASAs going back to 1929 (Elwakil et al., 2013). Over the years, there has been an ebb and flow of liberalisation of air services between the two countries. While the 1929 agreement could be considered an open skies agreement by today's terminology and provided similar traffic rights to the 2006 agreement, subsequent agreements in 1938, 1939, 1940 and 1943 became more restrictive (Haanappel, 1980). The tide started turning in 1949 when fifth freedom rights were awarded and new routes were added in 1959 and again in 1966.

In 1974, the Preclearence Treaty formalised a process already in place in Toronto, Canada, whereby US-bound passengers would clear US customs in Canada. Today, US preclearance is available at eight Canadian airports[40]. While the treaty does allow Canadian customs preclearance at US airports, Canada

has never made use of this provision, probably because there are few, if any, US airports where such an operation would be both financially sustainable and operationally feasible. This derives from the fact that the US market is significantly more diffuse than the Canadian one. This is caused by population distribution patterns, geography and the important number of US leisure destinations that are attractive to Canadian tourists. Thus, most cross-border travellers fly from a few Canadian markets to a large number of US markets. For example, three-quarters of cross-border traffic is generated in eight Canadian airports but about 25 US airports, thus limiting efficiencies of scale for Canadian customs preclearance.

The Preclearence Treaty changed the dynamics of the Canada-US market as it necessitated a review of the 1966 route structure. This led to the 1974 route agreement that granted US carriers 23 new routes and added frequencies on five additional routes, while granting Canadian carriers 14 new routes and additional frequencies on three existing routes (Kaduck, 1997). A separate Non-Scheduled Services Agreement also came into force that year to cover charter services.

Four years later, US deregulation generated a rapid and complete transformation of the US domestic network as mentioned previously in the section on US domestic deregulation and, naturally, as US carriers moved to a hub-and-spoke network, they wanted to align their Canadian routes to their growing hubs. Having liberalised domestic fares in the United States that country's government was now keen on liberalising air fares on the US-Canada market, something Canada was hesitant to do.

For nearly 20 years, the United States and Canada attempted unsuccessfully to amend the agreement, despite being able to negotiate the far more complex Free Trade Agreement of 1987. Finally, two negotiators, Stephen Kaplan for the United States and Geoffrey Elliot for Canada, produced a paper, the Framework for Resumption of Canada-US Transborder Air Negotiations, which set the table for the successful 1995 agreement. This was deemed a "de facto" open skies agreement in the transborder US-Canada market by the standards of time; however, as the definition of that term evolved, calling the 1995 agreement an open skies agreement has fallen out of favour (Tretheway, 2005).

That agreement removed routing and fare restrictions in the market. Carriers were now free to set routes, frequencies and fares, thus fully liberalising third and fourth freedoms and allowing fifth freedom code-sharing. In-transit preclearance was introduced, meaning travellers between the United States and a third country could transit through Canada without passing through Canadian custom inspection in either direction and, if available, benefiting from US customs preclearance on the US-bound leg of their journey. Finally, Reagan Washington National airport was now eligible to receive US customs precleared flights from Canada[41].

The 1995 agreement was a true watershed event in the aviation relationship between both countries and, in some ways, was the most liberal agreement between the countries since 1929 as air carriers were now completely free again to operate on any cross-border route of their choice.

Within three days of the agreement coming into force, US carriers announced 17 new city-pair routes, including five that had no previous direct service (Dubey, 1999). Within the first ten months, Air Canada, aided by a new and rapidly growing fleet of Canadair Regional Jets (CRJ-200) opened 31 new routes and developed a "hub-busting strategy", offering passengers the option of forgoing the connection at large US hubs proposed by US carriers and flying directly to secondary markets[42].

Meanwhile, in 1996, the second largest Canadian air carrier, Canadian Airlines International, obtained antitrust immunity under US law to develop a strategic alliance with American Airlines and code-share extensively with that airline. It also leveraged its Vancouver hub's extensive trans-Pacific market to connect it with American Airlines' domestic network, enabling American Airlines to extend its Asian network beyond Japan, which it was already serving. While Canadian International and American may

have extended their code share arrangement beyond the United States and Canadian borders, their antitrust immunity to coordinate pricing and capacity decisions was limited to the transborder market in keeping with scope of the 1995 ASA. Subsequently, United Air Lines and Air Canada obtained the same authority, with the same requirement to limit their antitrust-immunised activities to the transborder market.

By August of 1997, 79 new routes were established, 50 by US carriers and 29 by Canadian carriers, while 28 additional Canadian charter routes were converted to scheduled routes[43]. Of those first 79 routes, 20 were shortly discontinued, indicating a certain degree of trial and error by air carriers in responding to this new, open, market structure. The agreement significantly improved the connectivity between Canadian airports and major US hubs and between overseas destinations and secondary US points through a Canadian gateway, giving passengers on both sides of the border significantly more travel options, whether travelling within North America or around the world.

The improvements to the agreement and subsequent launch of new routes addressed pent-up demand and resulted in a significant jump in traffic. Between 1994 and 1997, the number of air passengers grew by 26.6%, going from 6 million in 1994 to 7.6 million in 1997. To provide some perspective, total traffic growth during the last decade on this market was just slightly higher than what was experienced during those first three years of open skies. Traffic continued to rise on this market and was up 41%after five years (Jeanniot, 2005).

The 2006 agreement introduced new rights to the 1995 agreement. For example, it allowed seventh freedom flights for freighter flights and eliminated the restrictions on co-terminalisation for air courier services, meaning carriers from one country could operate a multi-stop flight in the other as long as it did not carry any local traffic between the two points in the same country (see section on co-terminalisation and air cargo for more details). It also removed all own-metal fifth freedom restrictions, including routing, pricing and gauge change, for US and Canadian carriers, which until then had been limited to three routes: Canada-Hawaii-Australasia, Canada-San Juan (Puerto Rico)-points beyond and US-Gander (Canada)-Europe. It allowed carriers, under antitrust immunity, to jointly set pricing and capacity decisions in a full range of markets, including markets “beyond” the United States and Canada, something that was prohibited in previous agreements. Finally, it allowed carriers from one country complete price freedom for sixth freedom travel between the other country and a third country[44].

The 2006 agreement, negotiated the previous year, was Canada’s first open skies agreement in the contemporary sense of the word and became the corner stone upon which its international air policy, Blue Sky, was built. In fact, the policy states that as its primary objective, Canada will seek to negotiate reciprocal open skies agreements similar to the one negotiated with the United States, when it is deemed to be in Canada’s best interest (TC, 2006).

While the 2006 agreement is very important in its own right, the changes it introduced were more technical in nature and addressed niche issues, with results far more modest than the 1995 agreement. Most of the progress for liberalisation came on fifth, sixth and seventh freedoms, as the first four, which are significantly more important in the Canada-US market, were already fully liberalised in 1995.

This is not to say that the 2006 agreement did not have some clear impact on the market. For example, co-terminalisation was used by FedEx to extend its Memphis-Montreal (Mirabel) flight to Ottawa. Joint setting of pricing and capacity enabled Air Canada and United Airlines to deepen their collaboration within Star Alliance and the Atlantic Plus-Plus joint venture (Tretheway, 2005). Similarly, price matching offers the travelling public more options and air carriers more opportunities to compete and grow their hubs, but the impact of this factor is extremely difficult to measure. As for seventh freedom rights,

currently only one carrier has taken advantage of this; Cargojet, a Canadian freighter operator offers flights between Newark Liberty and Bermuda.

Canadian and US carriers extensively use fifth freedom rights in their code-sharing and joint venture arrangements. However, operationally, the expanded right to operate fifth freedom rights services did not provide any material benefit. They are not currently operated by carriers from either country[45] as they usually prefer to fly directly from their hubs to overseas destinations without making a stop in the other country. This may point to the fact that at least between Canada and the US, fifth freedom flights have fallen out of favour with airlines and their clients and also reflects technology change, with jets now able to fly long trans-Atlantic routes without the need to refuel. That being said, the fact that they are allowed to operate fifth freedom flights means that it is now the market and not the regulator, which decides whether or not they should take place, a far more desirable outcome.

The Canada-US experience shows how a restrictive ASA that is out of touch with market realities can dampen demand and create unrealised demand, thus lowering consumer and producer surplus. The 1995 agreement shows that the effects of liberalisation can be immediate, even in a very mature market between two neighbouring developed economies. The 2006 agreement shows that even in a liberalised environment, further opening of markets can produce some positive results and address niche issues.

While the Canada-US market enjoys full liberalisation in many aspects, it is not completely liberalised yet. The restrictions that still exist in the agreement concern cabotage, which has been forbidden since the first agreement, passenger flights operated on a seventh freedom basis and foreign ownership exceeding 25%[46]. When comparing the world's two largest trading blocs, NAFTA and the EU, one notices that many features present in the EU, such as cabotage by EU carriers, equal treatment of all EU capital (free movement of capital) or the ability to serve the trading bloc from another country (i.e. the EU-US ASA) do not exist within the NAFTA countries. The Canada-US market is actually further along in liberalisation than either the Canada-Mexico or US-Mexico ones, although in the latter case, the very liberal agreement initialled between the United States and Mexico on 21 November 2014 represents a significant leap forward towards a liberalised market. Nonetheless, the intra-NAFTA market remains significantly restrictive compared to the situation which prevails in the EU, reflecting the fact that NAFTA is not a single market. This could be a reflection of a broader philosophical difference between the two trading blocs: while the EU defines itself as an integrated community of interest with economic and political integration and common institutions, NAFTA is a free trade agreement between three countries with no political integration.

Canada–European Union open skies (2009)

Canada and the European Union signed an open skies agreement in December 2009 after initialising it in London on November 30, 2008 (Gaspari, 2012). It superseded or replaced a mosaic of 18 ASAs, including an existing open skies agreement with the United Kingdom. The agreement, Canada's first multilateral agreement, permits unlimited flights between EU member countries and Canada and was a first step toward a comprehensive trade and economic agreement between both parties, signed in 2014.

The agreement resulted in much closer cooperation between Star Alliance partners Lufthansa and Air Canada. It also facilitated the establishment of code share agreements between Canadian low-cost carrier WestJet and Air France, KLM and British Airways, helping position WestJet as a feeder carrier to both the Skyteam and OneWorld networks. One of the most immediate results of this agreement was the conversion of a number of charter flights into scheduled flights. This change enabled charter carriers, particularly Air Transat which dominated the Canada-EU charter market, to offer significantly more

options to passengers, such as one-way flights, more flexible open jaw routings and more services using unrestricted fourth freedom rights.

The agreement also includes a regime of fifth freedom rights, which is a function of the foreign-ownership limits imposed by both parties currently at 49% in the EU and 25% in Canada[47]. The agreement sets out fifth freedoms in a very prescriptive fashion, specifying the rights of carriers from Canada and from each EU country. It is the only area in the agreement where a homogeneous treatment is not given to EU countries, reflecting the fact that the economic value of these rights varies from country to country. Interestingly, three of the ASAs that the Canada-EU agreement replaces actually had more liberal fifth freedom traffic rights. The agreement does allow fully liberalising fifth freedom traffic rights for Canadian carriers if and when Canada raises its airline foreign ownership limit from the current 25% to 49%.

Like the EU-US open skies agreement, the EU-Canada open skies agreement provides for a tiered structure of liberalisation, culminating in the right to own and control 100% of the airlines of the other party and provide for cabotage. What is innovative in this agreement is that liberalisation of traffic rights has been tied to progressive relaxation of ownership restrictions and an intermediate stage, whereby the national laws of each party permit nationals of the other party to establish an airline in its territory for domestic and international air services. This means, for instance, that once EU airlines obtain the right to establish wholly-owned subsidiaries in Canada, they will be entitled to the provision of cabotage services and, what is more, they will become eligible for designation under the ASAs Canada has entered into. The same applies by analogy to Canadian airlines[48]. This stage on the way to full liberalisation marks a transition from the current system of regulatory and economic control, whereby airlines are established in their country of registration and are owned and controlled by these countries and/or their nationals, to a future system of sole regulatory control, whereby airlines will be subject to the rules of the country of establishment, whilst owned and controlled by the other party and/or its nationals. The tying of market access to investment freedoms has not been subject to a specific time frame. As a result, no progress has been achieved since the coming into force of the agreement, foreign investment being capped at 49% in the EU and 25% in Canada[49]. At present, there are no indications that either party is ready to move forward on the ownership question beyond the current levels.

Just as was the case with the EU-US open skies agreement, the results of the Canada-EU open skies agreement are difficult to measure since the timing coincides with the economic crisis. In the first year of the agreement, 2010, traffic increased by 5.2% to a record 8.8 million enplaned/deplaned passengers. In 2011, traffic increased by 5.5%, but has flattened out since. The first full four years of the open skies agreement shows a growth in traffic of 9.4%, compared to 27% for the last four years before open skies.

Prior to the agreement, Canada already had an open skies agreement with the United Kingdom, Ireland and Iceland and extensive charter services to both France and Germany. The open skies agreement led to a significant transformation of charter flights to scheduled flights, a phenomenon also observed with the 1995 Canada-US open skies agreement. Almost 95% of charter traffic was converted to scheduled traffic, which is positive for airlines and passengers as scheduled traffic operates under fewer restrictions. For example, charter carriers are usually only allowed to carry passengers originating in the carrier's home country.

Although at a pan-European level, the agreement did not generate significantly strong quantitative growth, this was not the case at an individual country level. Belgium, Germany and Spain all experienced strong increases in capacity to and from Canada, while France experienced strong growth in the first two years, followed by declines to pre-open sky levels. Surprisingly, capacity to the United Kingdom has declined since the agreement was signed and is now at levels similar to 2005.

Overall, the liberalisation of traffic between Canada and the European Union has been positive. It has enabled a number of new routes to be established and facilitated co-operation between Star Alliance members Air Canada and Lufthansa as well as their respective subsidiaries. More importantly, it enables markets, rather than regulators, to determine the appropriate level of service and permits airlines to react more swiftly to changes in demand patterns. Thus it achieved a significantly more liberalised marketplace, particularly in the smaller EU markets that had restrictive, if any, ASAs with Canada. However, this was an already mature market with limited pent-up demand, liberalised in a time of financial uncertainty. In that context, it is not surprising that the impact on traffic was relatively modest and, on the contrary, it shows that the market did not require economic regulation in order to achieve a sustainable outcome.

The table below shows alterations to the qualitative dynamic of traffic rights as the result of the Canada-EU open skies agreement. European Parliament (2013) points out that the current degree of liberalisation in the Canada-EU open skies agreement is less than that contained in the three existing open skies agreements Canada had with the UK, Iceland and Ireland. Furthermore, the Canada-EU agreement lacks some rights contained in ten other ASAs with EU member states. In any future comprehensive ASA between the EU as a whole and individual states or group of states, the EU will have to determine if it is preferable to pursue an agreement putting all member states on the same footing, even if that means some loss of liberalisation for some of its members, or create carve-outs to maintain a more liberalised regime but only for certain member countries.

Table 2.2 Number of EU member states having ASAs with Canada with their levels if restriction

	Pre-2009			Post- 2009
Traffic Rights	Restrictive	Moderate	Open	Open
3rd/4th freedom (frequency)	11	4	3	28
3rd/4th freedom (capacity)	11	2	5	28
5th freedom	15	0	3	3 (pax)/ 28 (cargo)
7th freedom (cargo)	16	0	2	2
Pricing	5	0	13	28

Source: Adapted from European Parliament (2013).

The Association of Southeast Asian Nations (2010/2015)

The Association of Southeast Asian Nations (ASEAN) comprises ten countries with a combined population of 600 million inhabitants and a combined GDP of USD 2.4 trillion, slightly less than that of Italy. Its regional integration is set on the pillars of security, social integration and economic integration. It set the objective of establishing an ASEAN economic community by 2015, which comprises, amongst other things, a single aviation market to support its goal of free movement of people, goods, investment, capital and labour. It also addressed one of its twelve priority sectors, namely tourism.

The idea of an ASEAN aviation single market has been around for two decades but gained new momentum with the recent establishment of an ASEAN economic community. The 10th ASEAN Air Transport Ministers' Meeting, held in Cambodia in 2004, witnessed the adoption of the 2005-2015 Action Plan for ASEAN Air Transport Integration and Liberalisation.

In order to advance towards the Action Plan's goal of a single ASEAN aviation marketplace, ASEAN members adopted two agreements: the 2008 Multilateral Agreement on Air Services (MAAS) and the 2010 Multilateral Agreement on the Full Liberalisation of Passenger Air Services (MAFLPAS), each composed of a number of implementing protocols. The agreements and their implementing protocols allow for progressive liberalisation in an effort to increase their acceptance by the ASEAN States.

ASEAN States, not unlike their EU counterparts, took a phased-in approach to liberalisation with important milestones coming into effect over time in order to give the market time to adapt to a new liberalised environment and for regulatory convergence within member countries.

The 2008 MAAS agreement gradually introduces market liberalisation up to the fifth freedom through a series of six protocols. The protocols divide intra-ASEAN routes into three groups of growing importance: intra sub-region, inter sub-regions and between national capitals. In each case, a first protocol liberalises third and fourth freedoms, while a second one liberalises fifth freedoms. This segregation reflects the fact that most national primary markets in the regions are concentrated national capitals.

The agreement has been slow to implement and the initial deadline for ratifying all six protocols by 31 December 2010 was missed. Eight of the ten ASEAN countries have ratified the agreement. Indonesia, the largest ASEAN member, has yet to ratify the protocols. However, Indonesia has expressed concern that its high fuel prices and tariffs on aircraft and aircraft parts may put it at a disadvantage compared to other ASEAN countries. Indonesia also faces a situation of high congestion and challenges in expanding capacity at Jakarta's Soekarno-Hatta International Airport, the nation's busiest airport by far. Meanwhile, the Philippines have ratified the first four protocols but have yet to liberalise access to Manila's Ninoy Aquino International Airport, citing high congestion suffered at that airport (Hanaoka et al., 2014).

While ASEAN governments attempt to liberalise air services, local LCCs have been aggressively developing their business plans. Malaysian carrier Air Asia, for example, established six foreign joint-venture affiliates within ASEAN countries, majority owned and controlled by local nationals to comply with ownership and control legislation in the various ASEAN nations. Meanwhile, Singapore's Tiger Airways established locally owned and controlled subsidiaries in Indonesia and the Philippines. In Indonesia, Lion Air established joint ventures in Malaysia (Malindo Air) and Thailand (Thai Lion Air) while Australia's JetStar, itself a subsidiary of Qantas, established Jetstar Asia Airways in Singapore and Jetstar Pacific Airlines in Viet Nam[50]. Low-cost Southeast Asian carriers have thus been at the forefront of liberalisation in the region, finding innovative ways to mitigate existing restrictions in air services. In some cases though, it has been critical of local governments, who often are both the regulator and the owner of the local full service carrier, especially on the question of interpreting effective control which is often a question of interpretation by the regulator.

Hanaoka et al. (2014) have described this corporate structure model as "branchising" and can be useful in obtaining regulatory permission to operate a common brand under multiple joint ventures. However the strategy is not always successful. For example Air Asia had to abandon its planned joint venture with VietJet Air as Vietnamese authorities would not approve the name VietJet Air Asia in 2011 since they do not allow Vietnamese carriers to adopt names and logos of foreign airlines after having made an exception once for Jetstar in 2007. Air Asia also struggled in establishing Air Asia Japan because of strategic divergences with its Japanese partners, All Nippon Airways (ANA), which led Air Asia to pull out of the joint venture and ANA to rebrand the carrier as Vanilla Air. Since then, Air Asia has attempted to relaunch the Air Asia Japan with new partners and expects to start operations in 2016.

Tan (2010) examined these foreign affiliates and found that they respect the letter of the law in terms of local ownership, with each entity being majority owned by nationals from the country where the airline is based. He explains that these agreements introduce the concept of an ASEAN community carrier,

which could be majority owned by interests from various ASEAN member countries. He also finds that both the CEO and a majority of board members are local nationals, thus meeting national airline control requirements. However, he is less clear on effective control since aviation management expertise, brand management and marketing are all vested with the parent carrier.

Hanaoka et al. (2014) point out that foreign ownership limits continue to exist with the ASEAN community and vary between 40% in the Philippines and 49% in Indonesia, Malaysia, Thailand and Viet Nam, although in the case of the latter, no single foreign investor may own more than 30% of a Vietnamese carrier. Only Singapore allows for 100% foreign ownership, but in ASAs, the other country may not recognise an airline with less than 50% Singapore ownership as being entitled to Singapore's traffic rights under that ASA. In fact, Singapore Airlines limits its foreign ownership to under 50% to make sure it can take advantage of any traffic rights granted to Singapore by a third country through an ASA.

The ASEAN agreement is actually quite liberal when it comes to the matter of ownership and control as it distinguishes between regulatory control and economic control. Airlines based in one ASEAN country must be under full regulatory control of that country on matters such as safety, security or the environment. But economic control must be in majority vested with nationals from ASEAN, a concept which resembles the Community carrier present in the EU. However, unlike in the EU, the wording of the agreement says that states may accept the designation of such a carrier rather than must accept, which creates a risk for airlines with minority local ownership that their application to be designated could be turned down, as was the case with Air Asia Pacific.

One of the clearest impacts of liberalisation can be observed on the Kuala Lumpur-Singapore route. For 34 years the route had been a shared duopoly between Singapore Airlines and Malaysia Airlines. Once the route was liberalised, first in February 2008 to allow limited new services by LCCs and then in December 2008 to fully align with MAAS, Air Asia, JetStar and Tiger air joined the two incumbent carriers. The results were immediate. Traffic on the route jumped from 1.7 million passengers in 2007, a level it had sustained for most of the decade, to 2.5 million passengers in 2009 and 2.7 million passengers in 2010. Within three years, flights between both cities had grown by 27% while tourism to Malaysia from Singapore rose 24%. This surge in demand was in response to the average ticket price dropping from USD 180 to USD 30 (Hanaoka et al., 2014). The previous example is an empirical reminder that traffic stimulation best occurs when a market is both liberalised and subject to competition between full service carriers and LCCs.

In 2010, ASEAN concluded its first ASA as a trading block. The agreement, which was signed with China, is a milestone in that for the first time there is the recognition of the concept of an ASEAN carrier. The agreement, which provides for unlimited third and fourth freedoms between both parties, cannot be called an open skies agreement in the contemporary sense of the word, but it does represent a significant improvement in a part of the world that is still not liberalised. The agreement is silent on the issue of airline competition, reflecting the absence of an ASEAN-wide competition framework and the lack of a uniform regulatory system for the entire ASEAN block (Tan, 2010).

As we have seen, the ASEAN agreement is silent beyond fifth freedoms and thus no seventh freedoms were granted for ASEAN carriers from one country to operate stand-alone flights from another ASEAN country to China. Tan (2014) argues that this creates an uneven playing field for ASEAN carriers as Chinese carriers could, in theory connect any point in China to any point within ASEAN countries, something no ASEAN carrier can do. While Chinese carriers do tend to focus on their own respective hubs, negating somewhat this argument, they also operate point-to-point services from secondary cities to ASEAN countries.

Considering the economic potential of the region, the continued emergence of a middle class and the success LCCs have had in penetrating and reshaping this market, one can expect that a future fully liberalised ASEAN single aviation market, combined with adequate infrastructure and sensible aviation policies, could lead to very strong traffic growth in the region and a multiplication of liberal ASAs between ASEAN countries and other states or trading blocs.

The Association of Southeast Asian Nations–European Union air services agreement

In 2014, ASEAN officials and their EU counterparts began discussing the possibility of crafting an open skies type of ASA between the two blocs. This would be in line with previous EU open skies agreements, much as with the United States or Canada but would be a first for ASEAN in negotiating as a bloc with another bloc. The impetus for such an agreement came both from the fact that traffic between both regions doubled in the last 15 years and that this traffic is increasingly being routed through the Gulf countries or Turkey, although the latter's ASEAN network is far less developed (Tan, 2014).

The EU and ASEAN vary greatly in their level of integration. While the EU has truly formed a single aviation market in every practical sense, ASEAN countries continue to operate their own aviation markets with some regional integration. For example, EU carriers enjoy all nine freedoms of the air when operating within the EU, whereas ASEAN carriers are limited to unlimited third, fourth and fifth freedom rights within the ASEAN region. The right of establishment also differs significantly. EU nationals can establish an EU carrier in any EU country, while in ASEAN, the designation of "Community carrier" is subject to the acceptance of the member state receiving the application of a designated airline (Lykotrafiti, 2015).

A key value for the EU is the concept of horizontal agreements, where rights granted to one EU country can be exploited by any EU carrier. Tan (2014) points out that only Indonesia, Malaysia, Singapore and Viet Nam allow for horizontality for all EU ASAs, while Brunei, Cambodia, the Philippines and Thailand have agreed to EU designation in a more limited way, i.e. through amendments of bilateral agreements with individual EU states, and Laos and Myanmar do not allow it.

The challenge in negotiating such an agreement will be on the issue of fifth freedoms and beyond, as unlimited third and fourth freedoms seem to be pretty much a given within the current context. However, the great distances between both markets and relatively low point-to-point demand except in certain key markets could limit the impact of a fully open EU-ASEAN market. Aside from the largest markets, cities on both sides would have to be served via a hub. This lack of direct connectivity will make it challenging for EU and ASEAN carriers to wrestle some traffic away from sixth freedom carriers. Hence, "unlimited traffic rights alone will not help the EU and ASEAN carriers fill up their flights, particularly on the thinner routes" (Tan, 2014).

Tan (2014) also raises the issue of the lack of a single ASEAN sky as another challenge, pointing to the fact that EU carriers enjoy seventh freedom rights anywhere in the EU while the converse does not apply to ASEAN countries. However, this may be a non-issue since EU network carriers have shown little or no interest in availing themselves of such rights. However, it does open up the possibility that a low-cost, leisure EU carrier could cherry-pick the most profitable ASEAN-EU routes, something an ASEAN carrier would be unable to do.

In light of this, EU and ASEAN airlines would benefit from an ASA that allows them to co-operate more closely and compete more effectively against Gulf carriers. This includes the possibility of operating joint ventures, unrestricted fifth freedom rights and liberalising ownership requirements. The three Gulf carriers now offer 52 flights a day from Southeast Asia with connections to Europe via Gulf hubs

compared to only 28 in 2010. In comparison, the number of direct flights between Southeast Asia and Europe only increased from 57 a day in 2010 to 61 in 2015 (CAPA, 2015a).

Pursuing increased co-operation between ASEAN and EU carriers could lead to better services and lower fares for passengers and shippers and help this market grow. It can also help EU and ASEAN carriers better compete on this market against carriers based outside of those two trading blocks. To that effect, the European Commission will be seeking the authority to negotiate an ASA with ASEAN in the context of an aviation package, which will include an "Aviation Strategy" communication identifying challenges and measures for improving the competitiveness of EU aviation. This inclusion was proposed by the European Commission to the European Parliament in December 2015 and aligns with the Kuala Lumpur declaration creating the ASEAN Community single market effective 31 December 2015.

Alliances and joint ventures: Industry's response to competition and ownership and control policies

Competition policy and aviation liberalisation

The financial gains of airline consolidation can carry the risk of social welfare losses as a result of a less competitive marketplace. In the United States, for example, domestic deregulation was followed by reductions in air fares, which pushed uncompetitive operators out of the marketplace and brought on several waves of industry consolidations, first into six large full-service network legacy carriers and now just three, plus Southwest Airlines, which is currently the largest domestic operator. Concentration of air carriers invites scrutiny by competition authorities to assess if market power results and ensure the remaining airlines do not abuse any potential monopolistic powers. Thus, throughout the merger process, the US government closely monitored how the reduction in competition affected social welfare. In parallel LCCs, such as Southwest Airlines, Jet Blue and Spirit Airlines have emerged as a viable and profitable alternative to full service carriers.

In 2001, USDOT evaluated how successful competition law enforcement had been in the wake of domestic US deregulation. In its report, "Enforcement Policy Regarding Unfair Exclusionary Conduct in the Air Transportation Industry", DOT critically examined economic theories related to contestable markets brought forward by the Chicago School. These theories postulated that the mere threat of competition was enough to force a monopolist to keep prices at a competitive level to thwart future entry. This was thought to be inherently true in the airline industry where capital, namely aircraft, are mobile by definition and thus an airline could easily re-allocate an aircraft from a route with competitive price to one with a monopolistic (higher) price.

However, this theory ignored how airline networks were actually constructed. Since deregulation, the US domestic network has been constructed as spokes around key hubs. Competition takes place at spokes, where network carriers try to attract traffic to travel through their respective hubs, but the hubs themselves remained monopolistic. Network carriers had no interest in offering a flight from a competitor's hub to a spoke airport; the opportunity cost would be too high, they would compete from a position of weakness, traffic would only be point-to-point and such an action would surely invite the other carrier to retaliate.

LCCs would try to penetrate these markets but the home carrier would retaliate by flooding the market with discounted capacity and multiple new frequencies, forcing the new entry out of the market. Incumbents also monopolised gates and held onto existing slots on unprofitable routes to ensure neither could be used by a new entrant. With most major markets being a hub[51], small LCCs struggled to

establish themselves against these large network carriers and would often fail. The report points to 130 US carriers that were established after deregulation and had folded by the turn of the century.

During the first two decades of deregulation, numerous law suits were brought against the network carriers by new entrants claiming to be victims of predatory pricing. However, US courts set a high standard of proof for predatory behaviour, repeatedly finding that incumbent airlines had the right to defend their market with aggressive tactics, such as undercutting prices. In 1986, the US Supreme Court stated in the Matsushita Electric Industrial Co. v. Zenith Radio Corp case that "predatory pricing is rarely tried and even more rarely successful" (USDOJ, 2008). This sentiment is understandable. Identifiable standards do exist in statute to identify predatory pricing but are very difficult to prove.

In the years following the DOT report, thinking began to evolve on this issue. While airlines could still engage in very aggressive practices to prevent entry by new players, the courts and the government closely monitored the recovery phase of price predation. Thus incumbents were still free to sell below cost to block the entry of new players, but would have to maintain these lower prices once the threat of new competition dissipated. The EU has adopted similar competition policies focused on price recovery to mitigate the monopolistic effects of predatory pricing while still enabling consumers to benefit from lower prices.

National competition authorities and policies thus have an important role to play in ensuring that sufficient competition exists within the marketplace. In their analysis of the marketplace, they endeavour to ensure that consumers enjoy low fares while the system remains economically sustainable.

The global marketplace has also experienced a significant wave of consolidations. While national ownership and control restrictions have acted to prevent mergers and acquisitions, airline alliances have enabled airlines to organise global networks and better manage capacity. The emergence of metal-neutral joint ventures (where aircraft are deployed without regard to ownership) introduces a new dimension. In effect, these create an airline within the airline, or alliance within the alliance. They offer carriers many of the benefits of consolidation while avoiding the legal ramifications of changing the equity structure.

Relaxation of the nationality restrictions would facilitate airline access to foreign capital markets. It would also be expected to lead to industry rationalisation and consolidation through mergers and acquisitions. This scenario of consolidations through mergers and acquisitions has already materialised in both the US market, following the adoption of the Airline Deregulation Act (1978), and in the EU market, following the adoption of the three air liberalisation packages (1987, 1990, 1992) and the creation of a single air transport market (1997). This was not accompanied by relaxed nationality restrictions in the US, while in the EU nationality restrictions were exchanged for community restrictions. Industry consolidation and rationalisation is meant to dispense with excess capacity and enhance efficiency. The net result is a more concentrated market, with fewer airlines and fewer hubs.

This effect raises two types of concerns for governments. First, more concentration might allow airlines to exploit market power, both at the airport and route level, as discussed in the previous paragraphs. Secondly, governments may have concerns over the future of their national airlines and hub airports.

The fear that foreign takeover of ownership and control might result in changes in the airlines' strategies and have negative economic effects nationally at least partly explains why some governments refrain from relaxing ownership and control conditions.

In a fully liberalised environment, airlines can more easily join forces and then seek opportunities to streamline their costs by consolidating their hubs. Airline network reorganisation may have severe implications for the hubs within these networks. Airlines operating hub-and-spoke networks may go

bankrupt, close down duplicating hubs or specialise in certain markets. In all cases the implications for the affected airports and their respective regions can be substantial.

This is because hub airports provide employment and, most importantly, connectivity. Several definitions for the latter exist. ICAO defines it as "the movement of passengers, mail and cargo involving the minimum of transit points, making the trip as short as possible, with optimal user satisfaction, at the minimum price possible" (Abdennebi, 2014). For a more detailed assessment of connectivity and its measures see Airport Council International - Europe(ACI- Europe, 2014), which distinguishes direct, indirect, total and hub connectivity, as well as the closely related onward connectivity. Important is that hub operations allow regions to benefit from a larger number of directly served destinations than comparable regions without a hub operation, at higher frequency and with more opportunities for same-day return and more long-haul connections.

Having a broad portfolio of direct routes resulting from hubbing activities delivers economic benefits, in particular for the business community. The direct benefits of reduced generalised travel costs for consumers "ripple" through the rest of the economy, for example in the form of agglomeration effects, an improved business climate, regional employment and inbound tourism. Controlling for the reverse causality between employment and traffic, according to Brueckner (2003) a 10% increase in passenger enplanements in a US metropolitan area leads to a 1% growth in employment in service-related industries. Bèl and Fageda (2008) find that a 10% increase in intercontinental direct routes results in a 4% growth in international headquarters in European metropolitan areas. According to a study on the economic impact of US hubs, the presence of a hub operation in a region increases high-technology employment by over 12 000 (Button et al., 1999). Using a Granger causality test, they find that hubs create employment rather than airlines selecting cities as hubs simply because they are important economic centres.

As the markets of the United States and Europe have matured, the number of international hubs has decreased. According to Redondi et al. (2012), 37 worldwide airports have been dehubbed over the period 1997-2009. These airports did not recover their original traffic within five years and moreover the dehubbing process seems to be irreversible as all their examples show that once a network carrier stopped operating hub activities at an airport, it would not be replaced by another network carrier, but by LCCs at best (Redondi et al., 2012). This leaves the airports with expensive infrastructure suited for transferring passengers while hosting mainly LCCs operating solely point-to-point flights and demanding low airport charges or network carriers connecting the airport to their own hubs.

A number of examples of this situation have surfaced over the years. In the United States, airline mergers and acquisitions have led to the dehubbing of St. Louis (American), Pittsburgh (US Airways), Cincinnati (Delta), Memphis (Delta) and Cleveland (United) to name but a few. In Europe, dehubbing of national airports mainly took place in the wake of the national carrier's bankruptcy (Sabena, Malèv, etc.). However, the three dominant airline groups have elected to operate multi-hub systems, despite the loss of connectivity that this entails. This is a reflection of a number of factors, including being able to protect a given country market, addressing labour issues and air traffic rights in markets where an EU-wide ASA is not in place.

Antitrust considerations

When deregulation and the ensuing liberalisation began in the USA in the mid to late 1970s, the focus was on domestic services operated by domestic carriers alone. As the concept matured and expanded beyond national borders, starting with the US-Netherlands Open Skies agreement of 1992, alliances of airlines with different nationalities became a prominent feature of international aviation as a response to

the restrictions on the flow of airline traffic in the web of inconsistent bilateral agreements, as well as restrictions on the flow of capital in the ownership and control provisions of the bilateral agreements and national laws. The rules governing ownership under ASAs, even when routes and volumes are fully unrestricted, remain subject to strict limitations. Alliances between airlines involve co-ordinating services and prices and therefore are subject to scrutiny by the national competition authorities of each airline's home country. Approval or clearance of an alliance can involve several authorities, each applying different rules. Individual states grant antitrust immunity or clearance, conditional or not, to airline alliances based upon their own national competition laws, except within the European Union where antitrust immunity review may occur at the EU level is granted in line with EU law.

The 11th Meeting of ICAO's Air Transport Regulation Panel (ATRP/11) concluded that ICAO should consider measures to foster co-operation between competition authorities towards regulatory convergence. The panel recommended that ICAO explore the possibility of developing a set of core principles for fair competition in international air transport. It also suggested that ICAO should consider, in preparation for ATConf/6, collecting information regarding competition policies and practices developed or applied by other organisations and that ICAO should explore the possibility of developing a set of core principles on fair competition in international air transport.

Meanwhile, national competition regulators have been working together to provide rulings that are consistent with each other and do not create a distortion that would favour one member of an alliance over another. The US-Aruba ASA of 18 September 1997 is accompanied by a memorandum stating: "Lack of regulatory convergence adds an added layer of complexity, but in practice competition rulings have avoided creating significant market distortions."

Institutional arrangements for competition regulation differ between jurisdictions. In some jurisdictions, aviation is subject to the decisions of the general competition authority; in others the Ministry of Transport has been assigned authority to confer antitrust immunity. In many cases, the substantive standards and procedural rules being applied differ. This can result in differences in the way issues of competition are viewed but in general all competition authorities seek outcomes that improve efficiency overall and will consider a similar range of factors in making decisions on mergers and alliances.

In the United States, the Department of Transport (USDOT or DOT) has sole jurisdiction over granting antitrust immunity for airline alliances, although the US Department of Justice does provide some input. USDOT pursues a two-step analysis, taking into account impacts on both city-pairs and the airline's network. In the first instance, it determines whether the alliance merits approval by evaluating if:

1. it is not adverse to the public interest or,
2. in the event it substantially reduces or eliminates competition,

- it is necessary to meet a serious transportation need or to secure important public benefits and,
- the benefits thereof cannot be secured by reasonably available alternative means having materially less anti-competitive effects.

Thereafter, if the agreement is approved, the authority examines whether immunity from antitrust laws should be granted. This is granted when:

1. the parties would not otherwise proceed with the agreement
2. the grant of ATI is necessary to benefit the public interest.

In the European Union, as of 1 May 2004, following the advent of Regulation 1/2003[52] and Regulation 411/2004[53] it is the alliance parties' own responsibility to safeguard compliance with Article 101 of the

Treaty on the Functioning of the European Union (TFEU). Article 101 TFEU prohibits agreements, decisions or practices which may prevent restrict or distort trade between member states, such as setting fares or capacity, unless the Commission issues an exemption, which is the EU equivalent of antitrust review.

The Directorate General for Competition (DG COMP) is entrusted with the enforcement of EU competition law and general transport policy lies with the Directorate General for Mobility and Transport (DG MOVE). This division of competences entails that DG COMP, when reviewing airline co-operation agreements, is only entitled to apply the legal tests provided for by Article 101 and 102 of the TFEU, i.e. the potential of consumer welfare being harmed.

In Japan, antitrust immunity is granted by the Ministry of Land, Infrastructure, Transport and Tourism, while in South Korea it is granted jointly by the Ministry of Land, Infrastructure and Transport and the Korean Fair Trade Commission. In Canada it is granted by the Competition Bureau, an independent law enforcement agency. In Australia, authorisation is granted by the Australian Competition and Consumer Commission.

Awarding of antitrust immunity is usually done in response to a request from national carriers or alliances containing a national carrier and determinations usually consider whether or not an open skies agreement is in place with the state to which the foreign partner airline belongs. Antitrust immunities are usually granted in the context of decisions to liberalised ASAs (OECD, 2014). In that respect, Singapore's case is somewhat different as it has granted immunity to alliances that do not include Singaporean carriers and its decisions do not take into account the existence of an open skies agreement. The latter part has permitted Singapore Airlines to operate with antitrust immunity with fellow Star Alliance members based in countries that do not have an open skies agreement with Singapore.

Competition authorities will have concerns about market concentration in traffic between two hubs of a same alliance. To alleviate potential harm to consumers in that market, regulatory authorities have sometimes resorted to carve-outs, where carriers are free to co-operate fully except on hub-to-hub routes. For example, the antitrust immunity granted to Lufthansa and United to co-operate on flights across the North Atlantic specifically excludes the Frankfurt to Chicago or Washington markets. These carve-outs enable benefits to be realised from the liberalisation provided for by the US-EU open skies agreement and from the co-ordination provided by the Star Alliance, while mitigating potential negative impacts. However, carve-outs have a significantly negative impact on joint ventures. USDOT considers them incompatible with joint ventures and they are usually not used or retained when a joint venture is in place. In the case of metal-neutral joint ventures, partner carriers are able to co-operate on planning, share revenues, and consolidate their flights, thereby deriving economies of density. In the first case, despite being in an alliance, each carrier will have an incentive to attract passengers to its own flights in order to obtain all the passenger revenues. In the second case, carriers are indifferent on the passenger's choice of carrier, since revenues and cost are shared, hence the metal neutrality.

In a joint venture, partners may have a strong economic incentive to consolidate flights in some markets by using larger aircraft, which normally have lower operating costs and lower fuel burn per passenger-km, thus improving the efficiency of air transportation and presenting an opportunity to lower fares and increase profitability. Thus from a broad public policy perspective, in the case of a joint venture, regulatory authorities will need to weigh the trade-offs in efficiency to be gained from greater competition and from economies of density. Brueckner and Proost (2009) provide a mathematical demonstration of this issue above. They modelled an airline profit function and show that the effect of carve-outs for non-joint ventures is clearly positive as it prevents anti-competitive behaviour. However,

in the case of joint ventures, when economies of traffic density are strong, the loss in consumer surplus from potentially lower fares outweighs the gains derived from a more competitive marketplace.

Airline ownership and control

The genesis of the ownership and control requirement must be sought in the International Air Services Transit Agreement (IASTA) and the International Air Transport Agreement[54]. These Agreements constitute ancillary accords produced by the Chicago Conference, next to the Chicago Convention. IASTA, ratified by 129 state parties, provides for the multilateral exchange of the first two technical freedoms of the air (Two Freedoms Agreement). The International Air Transport Agreement, ratified by a mere eleven states (excluding the United States), provides for the multilateral exchange of the first five freedoms of the air (Five Freedoms Agreement). Both Agreements provide that "[e]ach contracting State reserves the right to withhold or revoke a certificate or permit to an air transport enterprise of another State in any case where it is not satisfied that substantial ownership and effective control are vested in nationals of a contracting State"[55].

This clause found its way into the first bilateral ASA between the United States and United Kingdom, Bermuda I[56]. The parties to Bermuda I, for the first time in a bilateral ASA, reserved their right, under Article 6 of the agreement, not to allow the exercise of traffic rights by carriers in cases they were "not satisfied that substantial ownership and effective control of such carriers are vested in nationals of either Contracting [State]".

The multilateral nature of the Two Freedoms Agreement and the Five Freedoms Agreement implies that the term "Contracting State" refers to a multitude of states, in fact, to all parties to the agreement. In contrast, the reference to "either Contracting [State]" in Bermuda I was aimed at the United States and the United Kingdom exclusively, Bermuda I being a bilateral agreement. What is common in both cases is the discretion of the parties to block the designation of an airline, where the ownership and control criteria are not met ("[e]ach Contracting [State] reserves the right"), rather than any kind of obligation to do so.

The requirement that airlines be "substantially owned and effectively controlled by a State or its nationals" was first set out in 1944 during the Chicago Conference. It was proposed by the United States and the United Kingdom as a means to keep "enemy" states and their airlines outside the framework of Chicago (Haanappel, 1980). From a national security perspective, "allied" and "neutral" states sought to ensure that no "enemy" state would ever be able to take control over their airlines and exploit their traffic rights. From a commercial point of view, the ownership requirement was conceived as an effective way of preserving access to valuable commercial rights for the airlines of contracting states. The proposal was opposed by several smaller states because of their dependence on foreign capital for the provision of air services (Hörstke, 2003).

Determining true ownership and control can be rather complex. On the question of ownership, if the carrier is a public company, its shares are constantly trading hands in the secondary market making it impossible for regulators to accurately and constantly monitor the nationality of the shareholder. Various solutions have been put in place to counter that, such as limiting the voting rights for share classes available to foreigners (i.e. have one class of shares available only to domestic investors with 75% of the voting rights and have another class available to all with 25% of voting rights) or having investors self-declare their nationality and the carrier monitoring that it remains within the legislated limits. In Germany, airline shares must be registered with restricted transferability, instead of anonymous bearer shares.

Control is even more challenging to monitor as it holds some element of subjectivity as to what effective control actually is. There is no globally accepted empirical measure of control. This criterion looks at factors that confer the possibility of exercising a decisive influence on the airline, such as significant foreign minority shareholdings; whether there is one large foreign shareholding with the rest of the capital being divided into small shares; whether members of the board of directors have foreign citizenship, especially its president, etc. It is more ambiguous than the criterion of substantial ownership since it emphasises substance over form (qualitative criterion). The fact that it is rarely defined in law leaves room for varying interpretations on a case-by-case basis according to the aeropolitical interests in play on each occasion. As will be explained further in this section, EU Regulation 1008/2008 defines effective control in Article 2 (9) as exercising a direct influence on the use of an asset by an air carrier and on the carriers' governing bodies and management. By contrast, no definition is provided for in US statutory law.

According to ICAO, some of the main reasons for the ownership and control criteria today are that they allow a state to:

- refuse to authorise air services by air carriers owned or controlled by certain other states
- establish a link between the air carrier using international commercial rights and the state to which these rights pertain, thereby preventing a situation of potentially non-reciprocated benefits when an air carrier from one state uses another state's rights;
- implement a 'balance of benefits' policy in terms of the air carriers of the state involved
- ensure, in certain circumstances, that national air carriers do not use the rights of a foreign state to serve their own state[57].

The first three reasons stated by ICAO constitute "the external aspect" of the ownership and control issue, as opposed to the fourth reason, which constitutes "the internal aspect" of the issue. The external aspect has strong economic overtones and reflects protectionist bilateralism. The internal aspect is more "strategic" and reflects national security and defence considerations.

The first reason (refusal to authorise air services by air carriers owned or controlled by certain other states) enables states to keep airlines registered in states with which they do not maintain good aeropolitical or other relations out of their market. It is a reflection of the meaning that was ascribed to national sovereignty in the era of nation states, that is to say, before the establishment of "communities of states".

The second reason (prevention of unreciprocated benefits) aims at addressing the issue of free-riding. At the Chicago Conference states failed to agree on the multilateral exchange of traffic rights. As a result, market access in air transport is regulated bilaterally via ASA. The ownership and control clauses, by establishing a link between the air carrier and the designating state, prevent non-party states from indirectly gaining a free ride through their carriers.

The third reason (balance of benefits) has a strong protectionist colouring. States exchange mostly equivalent commercial rights in order to receive reciprocal access to the respective aviation markets. By creating a link between the air carrier and the designating state, nationality clauses enable states to identify the airlines that may operate and to specify the rights that may be exercised by those airlines. This allows states to implement a "balance of benefits" policy (Hörstke, 2003). By keeping airlines tethered to their home states and to the citizen-investors of those states, the nationality rule contributed to maintaining a degree of parity in the international marketplace; no single carrier could

hope to take advantage of cross-border capital infusions that might allow it to build the fleet capacity and resources to overpower specific international markets (Havel and Sanchez, 2014).

The fourth reason has to be seen in the light of the conditions prevailing towards the end of World War II, when the Chicago Convention was negotiated and signed. States feared at the time that enemy or ex-enemy states could gain control of a third state's airline and thereby indirectly enter their (or other) airspace even though those states' own airlines might be blocked from doing so for political and military reasons (Havel and Sanchez, 2014). Today, this remains a very serious issue in a small number of cases but, generally speaking, granting access to an airline from another country to one's own airspace does not raise national security concerns.

National ownership requirements can be waived at the discretion of the authorities granting air traffic rights. For example, the US-Colombia ASA of 10 May 2011 contains a traditional ownership and control clause[58]. LATAM Group (formed by the merger between Chilean LAN Airlines and Brazilian TAM Airlines) owns 98.9% of the shares of AIRES Colombia. The latter is 100% owned by two holdings domiciled in Panama, but provides domestic and international scheduled air services to and from Colombia. When, on 21 September 2011 AIRES Colombia filed an application before USDOT to engage in scheduled commercial return flights between Bogota and Miami, the application was approved under Order 2009-3-21 which determined that no granting of waiver was necessary given the structure of the investment. DOT raised no objection to the assertion of AIRES that "it is a flag carrier of Colombia and continues to be authorised and designated by the government of the Republic of Colombia to perform scheduled services on the routes at issue here". (Garcia-Arboleda, 2012)

A similar case concerns Aero República Colombia (Copa Airlines Colombia), whose final ownership rests in Panama. The airline was designated by the Government of Colombia to operate on the route Bogota-Miami and subsequently filed a request before USDOT in respect of this route. The airline asked for a waiver of the nationality clause, relying not only on the US-Colombia ASA, but also on the US-Panama ASA: "Aero República requests a waiver to the department's stated policy of requiring a foreign air carrier to be substantially owned and effectively controlled by citizens of its claimed homeland".

Such a policy exists to prevent the economic benefits of a service from flowing to citizens of a third country with which the United States may have less than satisfactory aviation relations. This should not be a concern in Aero República's case, however, because Panama (the non-homeland ownership state) has an open skies treaty in place and satisfactory aviation relationships with the United States. Further, the department has followed a trend of waiving its ownership and control standard when there is nothing in the ownership structure that would be adverse to US aviation policy or interests. Indeed, recognition of the importance of transborder investment has fuelled the worldwide trend to waive such ownership and control standards (Garcia-Arboleda, 2012).

This request should be seen against the background of the negotiations for the conclusion of the 2010 US-Colombia open skies agreement. According to the accompanying Memorandum of Consultations, Colombia proposed that the agreement include a principal place of business standard. This was because pursuant to the Colombian Constitution and law, foreign capital investment in airlines must be facilitated and, for such reason, the nationality of a Colombian airline is not determined by its ownership and control, but rather by its place of establishment. The United States stated that it would be a significant departure from US policy and practice not to include the ownership and control provisions in the original 1956 US-Colombia ASA, as amended. It further stated that USDOT has authority to waive the ownership and control standards with respect to foreign airlines and has an established practice of waiving such standards for airlines when all countries involved are open skies partners. The United States confirmed that the agreement of Colombia to phase-in an open skies agreement would constitute a positive

consideration for USDOT in responding to requests by Colombian airlines for a waiver of the national ownership and control provisions of the US-Colombia ASA, in particular with respect to investments from open skies partners. Such requests would receive fair and expeditious treatment[59].

The US-Aruba ASA of 18 September 1997 is accompanied by a memorandum stating: "The Aruban delegation inquired under what circumstances the US government waives its policy of requiring that foreign carriers be substantially owned and effectively controlled by citizens of their claimed homeland. The US delegation responded that the US government has granted waivers of this policy to the extent that a question may exist as to the ownership and control of a carrier where it has found that there is nothing inimical to US aviation policies or interests" (van Fenema, 1998)[60].

European Union

In EU law, the ownership and control criteria for airline designation were first defined in Regulation (EEC) No 9407/92 on licensing of air carriers. The Regulation was part of the third air liberalisation package of measures and has since been recast and consolidated in Regulation (EC) No 1008/2008[61].

Article 4 of Regulation (EEC) No 9407/92 provided that the undertaking shall be owned and continue to be owned directly or through majority ownership by member states and/or nationals of member states. Regulation (EC) No 1008/2008 provides that member states and/or nationals of member states [shall] own more than 50% of the undertaking.

The European Commission has taken the view that the majority ownership requirement is complied with, if 50% plus one share of the capital of the air carrier concerned is owned by member states and/or nationals of member states. The concept of ownership of an undertaking is based on equity capital. Holders of such capital normally have the right to participate in decisions affecting the management of the undertaking, as well as to share in the residual profits or, in the event of liquidation, in the residual assets of the undertaking. The conditions for exercising those rights may vary according to the agreement of the participating parties. The question of whether a particular type of capital qualifies as equity capital and must be taken into account under the EU concept of ownership can be answered only on a case-by-case basis. What is more, it has to be seen in the light of all relevant consequences for compliance with the effective control requirement. The Commission has emphasised that although the 50% plus one share ownership requirement entails that the remaining shares may be held by one or more investors from third countries, the scale of the third-country investment as well as the distribution of the shares within each group of shareholders need to be taken into account in assessing compliance with the effective control criterion[62].

Pursuant to Article 4(2) of Regulation (EEC) No 9704/92, European airlines shall at all times be effectively controlled by EU States or their nationals. Article 4(f) of Regulation (EC) No 1008/2008 equally provides for effective control of EU airlines, either directly or indirectly through one or more intermediate undertakings. Both regulations define effective control as follows:

> *" 'effective control' means a relationship constituted by rights, contracts or any other means which, either separately or jointly and having regard to the considerations of fact or law involved, confer the possibility of directly or indirectly exercising a decisive influence on an undertaking, in particular by:*
>
> - *the right to use all or part of the assets of an undertaking*

- *rights or contracts which confer a decisive influence on the composition, voting or decisions of the bodies of an undertaking or otherwise confer a decisive influence on the running of the business of the undertaking*"[63].

EU law requires member states and/or nationals of member states to have, either individually or acting together with other member states or nationals of member states, the ultimate decision-making power in the management of the air carrier concerned. Nationals from member states must be able, either directly or indirectly through appointments to the decisive corporate bodies of the carrier, to have the final say on such key questions as, for example, the carrier's business plan, its annual budget or any major investment or co-operation projects. Such ability must not be substantially dependent upon the support of natural or legal persons from third countries. The Commission has emphasised that each and every individual case must be assessed in the light of the objective of safeguarding the interests of the EU's air transport industry, which implies, in particular, that companies from third countries must not be allowed to take full advantage, on a unilateral basis, of the EU's liberalised internal air transport market[64].

The rationale for this provision was to reflect the restrictions imposed in most ASAs. Born out of national security considerations, these restrictions are now designed to ensure that traffic rights exchanged under such agreements be exploited for the benefit of nationals of all parties to the agreement and prevent nationals from a third country from operating flights authorised under the agreement. In effect, this prevents non-EU airlines from taking full advantage of the liberalised internal EU market and limits the choice of intra-EU travellers and shippers to EU carriers, except where explicitly allowed by an ASA[65].

The United States

The American perception of the term "substantial ownership" has fluctuated since its first expression in the Air Commerce Act of 1926 between different percentages of ownership of voting interest, ranging from 51% to 75%. The initial 51% threshold set by the 1926 Air Commerce Act was later amended by the Civil Aeronautics Act of 1938, which required an American ownership of 75% of an airline's equity. The Federal Aviation Act of 1958, which was in essence the first piece of aviation-related legislation promulgated by Congress following the Chicago Convention, maintained intact the 75% cap. Although the latter threshold is still valid, USDOT has shown a willingness to apply a flexible policy on ownership and control for US carriers and to exercise its ability to waive application of the ownership and control standards for non-US carriers, provided for by the ASA either on the basis of reciprocity or where American interests are not jeopardised by a higher percentage of foreign ownership. USDOT has also shown flexibility when the airline is owned by nationals from a country with an open skies agreement with the United States or in order to continue to operate an existing service after the ownership nationality of an air carrier has shifted.

Although determining whether an air carrier fulfils the ownership requirement might prove problematic, especially in cases of privatised, publicly traded companies. The criterion that seems to matter most in the assessment of the authorities is that of "effective control", meaning in whose hands its management lies. This is an issue to be decided on a case-by-case basis by the authorities, along the lines of certain pre-defined parameters[66]. The US control standard is set forth in the US Code (USC.), which requires that the president and two-thirds of the board of directors and other managing officers of a US air carrier be US citizens, that at least 75% of the voting stock be owned by US citizens and that the air carrier be under the actual control of US citizens. The statute thus creates two separate tests that must be met to meet US citizenship standards: voting interest and actual control.

In addition, USDOT examines several factors to determine whether or not US citizens control an air carrier, such as any contracts between the carrier and business partners, voting rights held by US and non-US citizens, and the terms of any debt instruments or bankruptcy agreements (GAO, 2013).

It should be noted, nevertheless, that despite the regulatory provisions in force, the fulfilment or not of the ownership and control conditions remains a function of the quality of the bilateral aviation relationship, as well as a determination of what is in the best interest of the United States. For instance, in 1995, DOT allowed KLM Royal Dutch Airlines to increase its total equity in its subsidiary Wings Holdings Inc. beyond the initially agreed 25% and up to 49%, although Wings had earlier merged with NWA Inc., the parent company of Northwest Airlines. Under this policy, non-US citizens of open skies partners may hold up to 49% of the total equity of a US airline, provided that they do not exercise actual control through voting stock or otherwise. In contrast to the Wings Holdings case, British Airways' attempt a year later to take over US Air failed. Despite DOT's willingness to apply a flexible policy, the reluctance of the UK authorities to liberalise its bilateral air service agreement with the United States, set as a pre-requisite for the clearance of the transaction, resulted in permission for only a modest investment and final disinvestment some years later.

A more recent case of contentious substantial ownership came in the form of the Virgin America case. In 2004, the UK-based Virgin group proposed launching an LCC in the US, of which it would own 25%, the most allowed under US law to be considered a US carrier and thus operate domestic US flights. The proposal was greeted with much opposition from incumbent carriers, particularly Continental Airlines, and the Air Line Pilots Association. It took Virgin America three years to secure the necessary approvals from USDOT to start flying, with the main issue being how much would the airline effectively be controlled by nationals from the United States. As a condition to allowing it to operate, USDOT required the carrier to change its management structure, reduce the influence of the Virgin Group on the Board of Directors and make the airline more independent in relation to its British namesake.

The Virgin America case is a clear illustration of how complex the issue of establishing effective control can be. While no one argued that the Virgin Group owned more than a quarter of the equity, in compliance with US law, the amount of control over the air carrier that this equity stake bought was a matter of heated debate.

Australia

Australia has offered foreign airlines "a right of establishment" to operate on domestic routes since 1999. Such airlines must be incorporated and licensed in accordance with Australian law and abide by local labour, tax, immigration, registration, safety and security and other laws. However, they cannot be designated to serve international destinations due to both Australia's commitments under its ASAs (O&C clauses) and domestic law which subjects the granting of an international licence to the fulfilment of typical ownership and control criteria. Despite this limitation, a number of foreign airlines have established local subsidiaries. The case of Virgin Australia stands out as it underscores the strains the nationality rule imposes on airlines. Virgin Australia (a subsidiary of the UK-based Virgin Group) was established in 2000 to operate on domestic routes. To get around the limitations imposed by Australian law and launch its international operations, the airline had to structure itself so that Australian citizens own and control its international operations. This was achieved by means of a complicated corporate structure involving a separate holding company for the airline's international operations with majority Australian ownership and an independent board of directors[67].

Chile

Chile has abolished all of its caps on foreign investment in its air carriers and, since 1979 has offered cabotage rights (in principle) on a reciprocal basis[68]. A number of Latin American countries have also relaxed their foreign ownership rules to enable Chilean-owned and controlled LAN to acquire large (even majority stakes) in their carriers[69]. The 2006 EU-Chile ASA acknowledges Chile's liberal regime by allowing a number of Latin American countries (namely, the member states of the Latin American Civil Aviation Commission) to own or control Chilean airlines without jeopardising those airlines' market access to EU member states[70].

Aviation safety

A main argument against liberalisation of ownership and control is that the relaxation of the nationality restrictions will jeopardise the industry's high safety standards. Under the current regime, the country of designation is responsible for the safety oversight of its national airlines, that is to say, the airlines which are registered in its territory and are majority owned and effectively controlled by it and/or its nationals. This link between country of designation and designated airline has ruled out phenomena of safety "arbitrage," experienced in other sectors, such as maritime transport. Under the auspices of ICAO, member states have established global minimum safety standards that all members attempt to abide by. However, a number of countries and regions have adopted more stringent safety standards than the minimums set out by consensus at ICAO. This regulatory divergence has created multi-tiered safety regimes. In fact, we have witnessed cases where airlines are certified to operate by their home country but are refused access to other countries' airspace as the latter do not judge the carrier as being safe. This is the case, for example, with the list of air carriers banned by the EU[71], and which includes, amongst others, all carriers from Afghanistan, Congo, Mozambique and Zambia. This in turn can create significant challenges for countries like South Africa whose aviation safety record is significantly better than that of its neighbours.

The argument that nationality restrictions are a *sine qua non* for the safe operation of international civil aviation is weak. The establishment of alternative criteria for airline designation and authorisation has been an issue of discussion within ICAO since the 16th Session of the Assembly (1968)[72]. The 2003 5th Worldwide Air Transport Conference (ATConf/5) adopted, by consensus, a model "designation and authorisation clause" for optional use by states in lieu of the traditional nationality clause. The model clause replaces the traditional majority ownership and effective control criteria with those of principal place of business [and permanent residence] and effective regulatory control, marking a transition from the current system of economic control to a future system of regulatory control.

Pursuant to the model clause, evidence of principal place of business is predicated upon the airline being established and incorporated in the territory of the designating party in accordance with relevant national laws and regulations, having a substantial amount of its operations and capital investment in physical facilities in the territory of the designating party, paying income tax, registering and basing its aircraft there, and employing a significant number of nationals in managerial, technical and operational positions. Evidence of effective regulatory control is predicated upon the airline holding a valid operating licence or permit issued by the licensing authority, meeting the criteria of the designating party for the operation of international air services (such as proof of financial health, ability to meet public interest requirement, obligations for assurance of service), and the designating party having and maintaining safety and security oversight programmes in compliance with ICAO standards.

Therefore, it appears that nationality restrictions do not have to be a condition for international civil aviation's high safety standards to be maintained. Instead, what is necessary is that the country of designation exercise effective regulatory control over its designated airlines. This means that an airline established and incorporated in this country may be majority owned and effectively controlled by foreign interests, but remains subject to the designating country's laws and regulations on issues pertaining to safety.

National security

Regulations of international civil aviation date back to WWI and WWII. The Paris Convention, which constitutes the first codification of international civil aviation, was signed in the aftermath of WWI (1919). The Chicago Convention, which constitutes the main primary source of public international law, was signed in 1944, when the war was still being fought. International civil aviation was thus regulated at a time when its commercial nature was overshadowed by the bombardments of the war. National security and defence considerations resulted in market access and in air transport being a function of national sovereignty.

Article 1 of the Chicago Convention provides that every state has complete and exclusive sovereignty over the airspace above its territory. Article 6 of the Chicago Convention translates the principle of national sovereignty into the context of market access, providing for the principle of economic sovereignty. Article 6 reads: "[n]o scheduled international air service may be operated over or into the territory of a contracting State, except with the special permission or other authorisation of that State, and in accordance with the terms of such permission or authorisation". These two provisions enabled states to regulate market access bilaterally by means of ASAs. To prevent third country airlines' access to traffic rights negotiated bilaterally between sovereign states, states agreed to designate only airlines majority owned and effectively controlled by them or their nationals. These so-called nationality clauses or ownership and control clauses are endemic in bilateral ASAs and stem from restrictive national laws, which disallow majority foreign ownership and effective control of national airlines.

Nationality restrictions limit the airlines' ability to raise foreign capital and compete like any other industry. To "compensate" for this handicap, states have exchanged traffic rights on the basis of reciprocal advantage. The practice of designating specific airlines to fly on specific routes with determined frequency of service and approved air fares, and all this on the basis of reciprocity, whilst deemed to be in line with the Chicago requirement for equality of opportunity, has resulted in economic protectionism. While the genesis of nationality restrictions is to be sought in the states' fear that enemy countries could obtain access to their airspace indirectly by acquiring airlines registered in other third states and then using the latter states' traffic rights to fly to the first state, today the states' attachment to nationality restrictions is linked to different reasons. These would include most notably the desire to prevent free-riding practices, national pride and prestige, employment considerations and the discharge of public service obligations.

Liberalisation of international civil aviation presupposes the relaxation of nationality restrictions. Although this outcome has already manifested itself in a number of contexts (i.e. regional integration, liberal ASAs), states remain reluctant to do away with such restrictions, facilitating the consolidation of the industry. Realising that the *raison d'être* of nationality restrictions, namely security and defence considerations, no longer applies is the first step towards a reconsideration of market access in air transport.

The economic rationale behind liberalisation has to be seen under the prism of national security. The association drawn in the preamble to the Chicago Convention between international civil aviation and

public security is perhaps what has mattered most in the states' determination of the regulation and deregulation of the industry.

For a long period of time, the discussion was centred on whether the relaxation of nationality restrictions could, in a time of war, deprive states from having access to civilian aircraft to increase the military's airlift capacity - a possibility avoided by programmes such as the US Civil Reserve Air Fleet (CRAF) programme. The last time the United States resorted to the CRAF programme in a significant way was back in the 1990s during the first Gulf War and even then, only a handful of aircraft were used. This is not to say civilian aircraft do not play a role in military theatre of operations. For example, recently NATO powers, including the United States and Canada, chartered civilian aircraft to ferry troops and freight back and forth to Afghanistan. However, these were routine commercial agreements between the military and civilian charter aircraft operators and did not depend on nationality restrictions. Furthermore, it is worth noting that there is now over-capacity in the civilian fleet, with thousands of aircraft in storage, but still operational if needed, that could be quickly reactivated should the need arise.

Industry response and initiative

The airline industry may seem to be of two minds when it comes to liberalisation. There are clear advantages to air carriers being able to create their own network, set their capacity and determine their prices without regulatory oversight. However, this is a double-edged sword for incumbent carriers, as it lowers the regulatory barriers to entry for competitors, enables the development of new service delivery models and creates an element of uncertainty and thus financial risk. Incumbent carriers may lobby their national governments in favour of selective liberalisation in markets where they consider the conditions favourable to them and lobby against in markets where they do not fly or plan to fly too directly. Once liberalised, airlines have developed innovative ways to secure their position in the market and maximise their profits. This section examines a few responses from the airline industry to a more liberal economic environment.

The Northwest-KLM Alliance

The earliest known airline alliance dates back to 1930 and was between Panair do Brazil and parent company Pan American Airways. In the United States, prior to deregulation, regional airlines[73] would ally themselves with international airlines to offer international connectivity to non-gateway airports. Around the world, airlines would operate flights in co-operation, which eventually became code-share flights, but this was route-specific rather than systemic.

The prototype for the modern global airline alliance was the 1989 Northwest Airlines (NW)-KLM Alliance. This ground-breaking partnership laid the foundation for the proliferation of open skies agreements, the establishment of network alliances and the creation of metal-neutral joint ventures, providing carriers arguably the most synergies possible short of an outright merger.

Imposition of nationality requirements

In 1989, KLM had acquired a non-voting share of 56.74% in the, then ailing, Northwest Airlines (NW) and less than 5% voting interest. KLM was entitled to nominate one out of twelve board members of NW, as well as to advise its US partner on financial matters through a special committee. Consequently, the legal requirements of US citizenship had been met, because KLM owned less than the statutory 25% of NW's voting stock and constituted less than one-third of its board of directors. However, USDOT was concerned with the many institutional links between the two airlines. It questioned whether KLM's

control of NW was more effective than it would seem on the basis of the facts and figures relating to the arrangement.

DOT worked with Wings, the holding company of NW, and KLM, in order to overcome its concerns. KLM reduced its share of NW stock and turned it into a loan. The three involved parties came to terms under DOT Order 89-9-51 of September 1989. The decision held that the foreign equity in the airline could not exceed 4% and that voting shares could not exceed 25%. DOT applied a control test, which required that the airline remain under the authority of US citizens.

Since DOT examines these transactions on a case-by-case basis, it will look at other factors in addition to the 'control' test. An important consideration is the aviation relationship between the United States and the home country of the foreign airline. The following statement confirms this: "Moreover, we reached these decisions in the context of the liberalised aviation relationship that prevails between the United States and KLM's homeland".

Antitrust considerations

The commercial co-operation between KLM and NW hinged on antitrust and competition issues. The two carriers had decided to expand their commercial relationship by engaging in joint selling and marketing, joint scheduling of flights, co-ordination of pricing, joint baggage handling, and combining logos so as to promote a single identity for the two carriers to the public. The potential antitrust aspects resulting from the joint ventures between KLM and NW were resolved in the context of the open skies agreement, when the United States and Dutch aviation authorities granted antitrust immunity to the KLM/NW co-operation (Mendes de Leon, 2002).

On 20 November 1992, on the heel of the signature of the US-Netherlands Open Skies agreement, the KLM/NW alliance filed a request with DOT for approval and antitrust immunity of their "Cooperation and Integration" agreement.

The two airlines sought authority to integrate their services so completely that they would be operating "as if they were a single carrier". The agreement has been vigorously contested by *inter alia*, its competitor airlines. Delta Airlines argued that the transaction was a de facto merger, rather than an ordinary business venture between the two carriers, and therefore could not qualify for antitrust immunity because DOT's merger immunity power had ended on 1 January 1989.

In fact, the two carriers would remain two legal entities, that is, separate and independent corporations, and would not be merged into one. However, DOT did analyse the competitive implications of allowing KLM and NW to merge their operations and identities, if not their corporate structures, but found that they were not significant competitors on most routes served by the alliance.

Under typical US antitrust/EU competition law, these practices risk anticompetitive effects in overlapping markets and may only be exempted from application of the law under predefined conditions. US antitrust law in particular subjects airline alliance agreements to a statutory "public interest" test, which is performed twice, both at the stage where a determination is made as to whether an alliance merits approval and at the stage where a determination is made as to whether the (now) approved alliance merits antitrust immunity. The "public interest" test is stricter when antitrust immunity is under consideration[74]. Therefore, an alliance may be approved, but denied antitrust immunity.

In the KLM/NW case, DOT considered the alliance agreement to be, in its intended effects, "equivalent to a merger of the two carriers". However, it found that the applicants were not significant competitors on most routes served by the alliance, since their networks were complementary. In the US/Europe market,

their combined market share was too low to raise antitrust concerns. Where direct competition would be entirely eliminated was between Northwest's hubs in Detroit and Minneapolis and KLM's Amsterdam hub. Although DOT recognised that fares might rise on those gateway markets, it considered it "impracticable" to impose remedies, as they would interfere with the applicants' intent to integrate all of their services, which, on those city-pairs, depended on the flow of connecting traffic. Thus, antitrust immunity was granted on the grounds that "the agreement overall will benefit competition" by enabling the applicants to "operate more efficiently and to provide the public with a wider variety of online services".

In KLM/Northwest, the intensity of inter-carrier co-operation and integration was indisputable. All stakeholders - the applicants, DOT and also the competitor airlines - agreed that the alliance was a quasi-merger, or even, as Delta Airlines argued, a *de facto* merger. Under the law, the granting of antitrust immunity to this type of transaction is necessary to ensure that competition will not be distorted. However, the fact that DOT found that the applicants were not significant competitors on most routes and that even on the routes where there was overlapping service there was no need for remedies, suggests that antitrust immunity was not necessary and mere approval of the alliance would suffice[75]. Thus, in January 1993, DOT granted a renewable five-year antitrust immunity to this agreement. The grant of antitrust immunity to the KLM/Northwest alliance was the first case of its kind to come before DOT. Such applications are considered on a case-by-case basis, as no general policy on the award of antitrust immunity exists.

Airline partnerships: Alliances and joint ventures

Global network alliances

Carriers join global network alliances because membership brings important benefits for carriers. It has enabled carriers to derive the connectivity benefits of providing customers access to a global network within a regulatory framework on ownership and control which would never enable such an entity to exist, even if it were economically viable. They help carriers respond to the travelling public's need to fly seamlessly from anywhere to anywhere (Pearce and Doernhoefer, 2011). For large carriers, participation in alliances enables them to extend their networks to secondary destinations that could not sustain direct service while for small- and medium-size carriers, it enables them to provide a global reach to their network which they could not otherwise afford. In effect, it enables all participants to derive the economic and operational benefits of a hub and two-tier spoke system, where the hubs are the existing global hubs of major carriers, the first-tier spoke is the major hub for the smaller carrier and the second-tier spoke is the network endpoints. It thus enables many secondary cities to be connected to virtually anywhere with two connections or less.

However, the differing degrees of co-operation within alliances give rise to different types and levels of benefits. The European Commission and USDOT have described the benefits that can be generated by means of basic alliance membership in a joint report, published in 2010 (Joint EC-USDoT, 2010).

According to the joint report, global alliances allow airlines to link their networks of routes and sell tickets on the flights of their commercial partners, thereby offering travellers access to hundreds of destinations around the world on a single virtual network. Airlines participating in an alliance aim to provide value to consumers by creating a comprehensive route network, more convenient and better co-ordinated schedules, single on-line prices, single point check-in, co-ordinated service and product standards, reciprocal frequent flyer programmes, and service upgrade potential.

Members of global alliances co-ordinate on a multilateral basis to create the largest possible worldwide joint network. The global alliance model generally applies to the entirety of member airlines' networks and offers a much wider scope for revenue synergies. While a "basic" level of co-operation is required by members of a global alliance – generally involving standard code-share agreements, co-operation on frequent flyer programmes, common alliance branding and lounge access – some alliance members seek higher levels of co-operation to enhance the benefits of the alliance.

Although alliance members co-operate on many aspects of the customer experience, they may nonetheless remain competitors, as the level of integration between and among the members of the alliance varies greatly. Thus, the trend towards joining a global alliance may not necessarily represent consolidation or reduced competition in the aviation industry. Instead, the competition analysis should distinguish between the degree of integration within the existing global alliances and the likely competitive effects.

Alliance partnership with other carriers can also significantly improve access to feeder traffic of alliance partners – particularly important for long-haul operations. While feeder traffic can also be obtained outside of the global alliances, through interlining agreements such as an IATA multilateral proration arrangement ("MPA") or a bilateral proration agreement, airlines in an alliance tend to favour their alliance partners in the financial terms of their interlining and choose them for code-sharing. With the increasing membership of alliances (and, respectively, their network coverage), it may be difficult for unaligned carriers to secure feeder traffic at some airports. This can therefore encourage them to join an alliance to benefit from more attractive conditions for feeder traffic from fellow members.

By covering more destinations and providing better connections, alliance partners are also able to better address the needs of corporate customers, certain of which may be interested in a single contract covering a large network and offering attractive schedules. Although carriers with basic alliance membership in the same alliance (that is, that are not party to a joint venture or code-sharing agreement with price co-ordination) tend to compete with each other, a joint alliance offer can nonetheless provide more flexibility to give customers what they are seeking and enhance revenues.

Breadth is important for the global network reach of an alliance. Alliances recruit new members to fill so-called "white spots" in their networks, where an alliance does not yet have coverage. Such white spots remain *inter alia* in Russia (for Star), India (for SkyTeam) and Brazil (for Star and Skyteam). On the downside, while growing in size is important for the network, a large alliance unavoidably increases the complexity of governance and risks rendering it less efficient in decision making and more difficult to integrate. Alliances, therefore, balance the trade-off between, on the one hand, an increment in global network and increased revenue synergies, and, on the other hand, the risk of inefficiencies due to increased size of the alliance.

The members of global alliances may also jointly finance expensive and long-term projects, for example, IT development projects. By pooling resources, alliance partners may find it easier to modernise their IT systems to make them more compatible with partner airlines (for example, their passenger reservation systems) and thus potentially more competitive versus non-aligned carriers that are unable to make such investments individually.

Presently there are no plans in the public domain for the creation of a fourth global alliance. Recent trends instead indicate that new or non-aligned network carriers are likely to gravitate towards one of the three existing alliances or to associate more closely with some of the alliance members. Meanwhile, another emerging trend is equity partners with minority control. This model, advanced recently by Etihad, has seen them purchase equity stakes in eight carriers, including Virgin Australia, Alitalia, Air

Berlin and Aer Lingus and align those carriers with its global network. This is done under the careful eye of regulators who ensure that ownership and control requirements are met.

Still, the possibility of new alliances should not be discounted. Industry professionals frequently discuss the potential for unaligned carriers and/or LCCs to devise new forms of co-operation that could exert competitive discipline on the network carriers that form the backbone of the existing global alliances. With regard to LCCs co-operation in intercontinental markets, there are a number of challenges.

The current LCC model, targeted primarily at cost minimisation, appears inconsistent with the complexity (and associated costs of implementation) of a global alliance. LCCs would be more likely to form an alliance if their business models evolve to include long-haul flights for which they will need improved access to feeder traffic. At the moment, however, LCCs appear more likely to continue developing simplified forms of co-operation, which are less integrated and thus less costly than the current global alliance model.

Within the context of air liberalisation, network alliances enable air carriers to expand their reach beyond what is called for in an ASA by combining traffic rights from partner carriers. Thus, a carrier could serve a given destination either directly or through the hub of one of its network partners, adding significantly more routing flexibility. Therefore, to fully leverage the advantage of an alliance membership, air carriers are best served when their home country has liberal or open skies agreements with the home countries of its network partners.

Tactical alliances

Carriers also form tactical alliances to address a specific deficiency in their networks. Tactical alliance agreements typically involve only two carriers and cover a limited number of routes, with the principal objective of providing connectivity to each carrier's respective networks. Tactical alliances often involve at least one independent carrier that is not a member of a larger strategic alliance. Examples of tactical alliances included Westjet/Air France (a code-sharing arrangement), American/Etihad (a code-sharing arrangement), Virgin Atlantic/Continental (a code-sharing arrangement), American/JetBlue (an interline and frequent flyer programme ("FFP") arrangement), and Air France/FlyBe (a code-sharing arrangement). Some of these alliances eventually collapsed for various reasons.

While tactical alliances are still rather common, many carriers providing international service increasingly prefer to join one of the three branded strategic alliances – Star Alliance, SkyTeam, or OneWorld – which are also commonly referred to as the "global alliances." Membership in a global alliance usually does not prevent the members from also forming tactical alliances with non-allied carriers and in some limited cases with members of other global alliances.

Furthermore, a number of carriers remain unaligned by choice and view independence or limited commercial co-operation as beneficial to their competitive strategies, as do all LCCs. However, they also recognise the value of tactical partnerships and take advantage of their alliance neutrality to co-operate closely with network carriers, independently of which global alliance they belong to.

One example of such co-operation is US domestic LCC JetBlue's relationship with a number of global carriers serving its JFK and Boston hubs, such as Aer Lingus (an interline), Lufthansa (a code-share), and Emirates (a code-share). This co-operation among various unaligned Star Alliance and OneWorld network carriers was facilitated by JetBlue's recent decision to invest in upgrades to its reservations system.

Another example of such co-operation is the code-share agreement signed in 2009 between Canadian LCC WestJet, and Air France/KLM (SkyTeam), and the more recent code-share agreement with

SkyTeam's Delta Airlines, OneWorld's American Airlines, Japan Airlines, QANTAS, British Airways and four other carriers. WestJet also interlines with 28 carriers, including three Star Alliance[76] members (WestJet, 2014).

Joint ventures

Joint ventures (JVs) are relatively limited in numbers, but they represent a rapidly increasing phenomenon that is growing in scope to encompass major international routes. They are an industry response to ownership limitations within an open skies environment. Such close co-operation implies significant establishment costs and can be difficult to dismantle once implemented; to date only a few carriers have established a JV within their respective global alliances. However, as JVs are now used on most flights operated by alliance members over the North Atlantic, and between Japan and the United States or Europe, their importance in the global long-haul market is considerable. They encompass about a third of global long-haul traffic and yet have little or no presence in the short- and medium-haul markets, where code shares remain the preferred arrangement.

Joint ventures differ from alliances and code shares as airlines in a JV share revenues and cost, making routes "metal-neutral". The Northwest-KLM alliance was a form of joint venture. More recently, the A++ Transatlantic joint venture between the Lufthansa Group, Air Canada and United Airlines, the J+ Europe Japan joint venture between Lufthansa and All Nippon Airways, the SkyTeam transatlantic joint venture and the OneWorld Transatlantic joint venture each has partners co-ordinating schedules and pricing, as one would expect in a code-share, but also sharing revenues and some costs from those routes, independent of whose aircraft flies the route.

These arrangements allow participating carriers to virtually create a joint airline without infringing on ownership limitations and is the closest partnership airlines can enter into with no equity stake. Joint ventures are a growing phenomenon and already account for a third of Lufthansa's capacity when measured in available seat-kilometres.

While alliances outside of a joint venture are credited with lower connecting fares due to reduced double marginalisation and to a reduction in travel time on connecting flights from improved scheduling, joint ventures benefit hub-to-hub customers with reduced costs due to exploiting various forms of economies of traffic density. Furthermore, joint ventures benefit customers who value frequency and service redundancy, being able to fly out with one joint venture partner and returning with another without incurring a price penalty.

Joint ventures are also common in Southeast Asia where a carrier from one country sets up a subsidiary in another as a form of joint venture. The JV has a majority local ownership, to respect local ownership regulations. This is the case, for example with the six foreign subsidiaries of Malaysia-based Air Asia.

The number of carriers which have implemented a JV has been smaller than the number of carriers which are engaging in enhanced co-operation, likely because of the regulatory hurdles that face such a proposal. Airlines participating in a metal-neutral JV are free to co-operate with any other airline, irrespective of whether the latter belongs to the same alliance, to another alliance or is independent. Such co-operation can be as close as consummating a virtual merger.

Box 2.2. Whose interests are countries defending in the case of joint ventures?

The heavily researched White Paper recently provided by the three major US airlines to the US government contains enormous detail on alleged subsidies to the Gulf carriers and states that lead to

unfair competition. Regardless of whether this is the case or not, it is interesting to note that the Gulf carriers' operations are largely unsuitable as substitutes for US airline services. In fact, there is even a large potential for complementarity.

Many observers have argued that the White Paper mainly aims to protect the interests of the European partner airlines. The White Paper notes: "It is no coincidence that over this same period, the Gulf carriers' share of US-Indian Subcontinent bookings more than tripled (from 12.0% to 39.8%), while US carriers and their JV partners lost nearly 800 bookings per day."

Critics say that it is really these services where the three large American airlines anticipate longer-term problems from the Gulf airlines. The bulk of these (potential) "losses" are sixth freedom traffic carried on the metal of the big three European airlines, then blended into the closed trans-Atlantic joint ventures that are operated as a single airline.

In the US, DOT's policy on alliances has evolved to reflect the changing structure of the industry. Since 2008, DOT requires a metal-neutral joint venture agreement as a prerequisite to granting antitrust immunity. By then, the global alliance networks had been pretty much defined and joint ventures appeared on the core trunk routes of the alliances. Metal-neutral JVs are expensive to implement and perhaps even more expensive to dissolve, efforts to sunset anti-trust immunity enjoyed by alliances after three years have failed and immunity granted by USDOT has an "evergreen" validity period with ongoing reporting and monitoring, whereas route "carve-outs" may be limited by time or market conditions[77]. Moreover, metal-neutral JVs must be implemented within 18 months from the granting of immunity. The European Commission, when authorising metal-neutral JVs, generally makes the parties' commitments legally binding for a period of ten years. Airlines participating in metal-neutral JVs have put in place mechanisms to solidify them, such as termination penalties. For example, the 2009 Air France/KLM/Delta integrated agreement is a long-term, auto-renewing arrangement that can only be cancelled with a three-year notice after a period of ten years[78]. Such agreements are enforceable in the courts.

According to LEK Consulting, by 2023, 45% of all global long-haul traffic will be part of a JV. The trend, observed in the last decade, towards inter-alliance competition, implies a degree of intra-alliance cohesion and network integration. However, because JVs are only subsets of alliances or a partnership between an aligned and a non-aligned carrier and that no two JVs have the exact same membership, they can raise the important competition issue of international spill over. The granting of antitrust immunity requires airlines to operate as a single carrier and, for this reason, it authorises the sharing of sensitive business information, which would otherwise be illegal. Therefore, airlines participating in parallel metal-neutral JVs are obliged not to cross-share this type of information even if the relevant JVs do not compete with each other (such as when they operate on different markets, i.e. transatlantic versus transpacific). Outside the scope of the venture, airlines remain either alliance partners, with more restrictive information sharing rights, or competitors with no right to share information. Antitrust/competition law prohibits not only actual, but also potential harm to competition, thus placing the burden on airlines to stay within the boundaries of their immunity. Thus, monitoring the legality of these relationships and the appropriateness of information sharing will be particularly challenging for competition authorities.

Aside from joint ventures within alliances, which effectively create a two-tier alliance, in the last half decade we have witnessed the formation of joint ventures outside traditional alliances, such as between Delta and Virgin Atlantic, Delta and Virgin Australia or between Emirates Airlines and Qantas. This is a transformative change to the alliance model that may have significant repercussions in years to come as

new partnerships are created on specific routes by carriers who would otherwise be competitors on others.

Maintaining a competitive marketplace

Airline alliances and joint ventures can raise concerns about the harm they can bring to a given market by transforming the relationship between carriers from competitors to partners. This transformation is often of interest to national competition authorities, who seek to maintain a competitive market. Here, we will examine one particular case, Trans-Atlantic alliances, and how they are analysed by US and EU competition authorities.

US antitrust and EU competition laws are generally inspired by similar principles and pursue similar goals, but the different scope of the authorities' review is in itself sufficient to differentiate the outcome of the competition law analysis significantly. This reality exposes the parties to an alliance agreement not only to legal uncertainty, but sometimes to conflicting legal obligations, stemming from contradictory decisions (i.e. conflicting remedies).

Both USDOT and the European Commission treat alliances as virtual mergers, as if they were a single carrier and the effects would be equivalent to a merger. This requires the approval of USDOT and the granting by them of antitrust immunity. US and European competition analysis varies considerably. Starting from the definition of the relevant market, whilst the Commission has mainly focused on city-pairs (point of origin-point of destination), DOT has also considered the airlines' network as a whole. The Commission's focus on the effects of an alliance on city-pairs has been justified on the grounds that in the passenger air transportation market widespread demand-side substitution does not exist: "if confronted with high prices due to a monopoly on a particular origin and destination pair (O&D), a passenger may find little comfort in the fact that airlines compete world-wide in the development of their respective networks" (Lykotrafiti, 2011)[79].

The Commission, therefore, maintains that consumers wishing to travel from a point of origin to a specific point of destination will consider the various possibilities to travel to the point of destination. Hence, consumers will take into account network aspects such as, for example, frequent flyer programmes, only to the extent that airlines serve the O&D pair between which they wish to travel. In other words, "if the price of travel in City Pair A increases, consumers would not generally consider substituting travel with City Pair B"[80]. By contrast, USDOT has factored into its analysis, except for the effect of the alliance at a city-pair and country-pair level, its effect at a network level, air transport being a network industry.

Moving on to antitrust immunity, exemption from competition laws and relevant conditions thereof, further differences in approaches are apparent. Generally, the Commission tends to be accommodating in clearing alliance agreements but very strict concerning the conditions to be fulfilled by the parties. USDOT, on the other hand, appears to espouse the opposite approach: while it would not hesitate to reject an alliance agreement outright, if considered anti-competitive, it tends to be more reticent to introduce detailed conditions to be fulfilled. Thus, while the Commission has cleared but attached onerous conditions to agreements between airlines with overlapping networks, USDOT sees value in complementarities and is more likely to clear without attaching conditions.

This is comprehensible in view of USDOT's focus on the airlines' network, when defining the relevant market. The Commission's analysis appears equally coherent: its consideration of overlapping routes as liable for exemption only upon conditions is consistent with its focus on city-pairs, when defining the relevant market. Nevertheless, the different rationale underpinning each analysis is clear: USDOT is

reluctant to interfere with the transaction's business rationale through the imposition of conditions, therefore considering that to be the parties' responsibility. The Commission, on the other hand, is more interventionist, imposing stringent conditions meant to ensure that competition will not be distorted.

Looking, more specifically, into remedies imposed by the authorities or commitments given by the parties, it is striking that the most common of the Commission's remedies, divestment of slots, is the least used on the other side of the Atlantic, whilst the most common of USDOT's remedies, carve-outs, is unknown in Europe. Obliging parties to release slots to competitors is the Commission's preferred way to engineer new entry.

Given that, partly due to the network carriers' business model (hub-and-spoke) and partly due to the slot allocation system in Europe (grandfathering rights), slots at hub airports are often scarce, new entry is difficult. A way to demolish that barrier, fuelling competition on problematic routes, is by requiring parties to divest slots. This has been done both by the EC, including in relatively minor cases, and by USDOT such as in the cases involving American Airlines and British Airways which concluded with the partners having to divest themselves of slots at London's Heathrow airport.

Although both slot divestments and carve-outs have been criticised for their efficiency (each one for different reasons), they are illustrative of the authorities' perception as to how far they could and should go when exercising their enforcement power.

Economics impacts of liberalisation

Rationale for liberalisation

From a contemporary market economy perspective, aviation markets have tended to be heavily over-regulated in many jurisdictions and few, if any, other industries have faced such a complex economic regulatory regime in the last half-century. The reasons for this type of regulatory regime are often explained by the alleged "specialness" of aviation. However, airline economics do not present any significant features that make that industry stand out within the science of economics. It is a capital-intensive industry that sells a limited quantity of a perishable product, aircraft capacity, using price personalisation schemes[81]. None of these features would, *a priori,* be sufficient to justify economic intervention by states. However, beyond economics, it does contain some elements, such as a heightened safety regulatory framework, connectivity, national security and defence considerations, global aeropolitics and national pride, which stand in sharp contrast with other industries. Taken together, these elements are often sufficient for a national government to justify some level of economic regulation, despite the absence of an economic justification to do so.

Until 1980, domestic inter-state flights in the USA were rationed by a system of permits issued by the federal government, specifying the airlines allowed to service city-pairs and the number of flights allowed to be operated. This limited the seats available and maintained high prices. Where routes were operated by more than one company they competed by differentiating service quality but not price. Removal of these controls resulted in large price reductions and increases in passenger numbers. Most countries today do not restrict access to their domestic market for domestic carriers, with a notable exception being China.

Today's international regulatory environment is a gradually evolving collage of different bilateral and multilateral regimes. While the system is complex, with no two bilateral regimes exactly identical, it is worth mentioning from the start that the system does work. Imperfect as it may be, it is used annually by

over 3 billion passengers and close to USD 18 billion worth of goods. Traffic rights between large trading blocks, such as within the Europe Union or North America, over the North Atlantic or the Tasman Sea, have been liberalised, while other markets, such as Japan, Mexico and the United Kingdom face significant infrastructure constraints that may limit the full impact of liberalised ASAs.

The liberalisation of the air transport market, first domestically, then internationally and finally within a community of countries, has led to a transfer of risk taking place, shifting from government, especially in the case of state-owned carriers to the air carriers themselves. Whereas governments would set frequency and fares and assume the risk of market failure, often by being both regulator and airline owner, gradually the risk has shifted to deregulated carriers who have passed on this risk to travel agents, loyalty programmes and, ultimately, their own passengers.

Some bilateral ASAs continue to identify specific carriers to operate between pairs of airports and limit the frequency and capacity of flights. Increasingly open skies agreements are being made, removing restrictions on capacity and usually allowing any route between the two countries to be operated, regardless of city or airport. A number of multilateral open skies agreements have been made between groups of like-minded countries. As discussed previously, the European Union has replaced bilateral agreements between its member countries with an open, single market, with the Union accorded the authority to conclude ASAs with other jurisdictions as a single entity. These agreements confer traffic rights to companies registered under the jurisdiction of the parties to the agreement. All jurisdictions limit foreign ownership of capital and voting rights in the companies benefiting from these rights.

Nationality restrictions under bilateral ASAs resulted in the establishment of national flag carriers. Bilateralism does not create an obligation on states to participate in the provision of air services by establishing a national flag carrier which can be designated to fly to the destinations agreed upon in bilateral ASAs. In practice, however, a country is rarely serviced only by foreign airlines.

Liberalisation of air transport has also introduced some instability in the air transport system as it has accelerated the pace at which carriers enter and exit a market, as well as the pace of launching and closing air carriers. In the first case, in particular with LCCs, we witnessed carriers taking a trial and error approach, launching a route and evaluating after a few months whether or not to keep it. As to the financial viability of air carriers, it is worth noting that when air carriers were state-owned, many were perennially loss-making, where their survival was predicted based on systemic and constant subsidisation (OECD, 2014b). Thus, in countries with a heritage of state ownership, one could argue that the decline in the financial viability of carriers was perhaps more caused by states rightly choosing to rationalise their subsidies rather than by liberalisation itself. In some cases, such as in the EU, liberalisation and the common market have forced the instauration of a subsidy control regime, which has not eliminated subsidies but has provided a common framework for them with EC oversight that takes precedence over member states. In other jurisdictions, such as the United States, increased liberalisation has not been associated with a marked reduction of public funding within the aviation supply chain.

Maximising socio-economic welfare is the broad goal pursued in economic policy making by governments in market economies. Social welfare consists of the consumer surplus and the producer surplus added together. The first is defined as the difference between the “willingness to pay” of all consumers (of airline services) and the actual price they pay, while the producer surplus can be assumed to be equal to airline profits. Markets maximise welfare when they are subject to perfect competition which prevents excessive profit and works to ensure efficient allocation of resources. Deviations from perfect competition yield economic inefficiencies. This can be countered by regulation, and intervention to promote or protect competition is essential when distortions are large. Regulation can itself distort competition, reducing welfare, particularly when it limits entry to markets. Economic regulation in air

service markets concerns two main issues: rights to serve markets and potential monopoly power and its abuse through firms setting prices significantly below marginal cost to prevent new market entry and subsequently, significantly above marginal cost to derive monopolistic profits.

The liberalisation of restrictions on traffic rights can raise issues related to monopolistic powers. However, the relative ease of potential entry and exit into a liberalised market makes it a contestable market and thus forces airlines to not charge monopoly prices, even when there is little actual competition on a route.

Beyond traffic rights, liberalisation affects other concepts, such as ownership and control. Stringent requirements on those issues have forced airlines to innovate in creating alliances and joint ventures, in effect trying to capture some of the social welfare gains of closer co-operation and integration while leaving the carrier's equity structure untouched and in-line with national airline[82] ownership and control provisions.

Box 2.3 Is granting traffic rights a give or a take for states? Or both?

A common view in ASA negotiations is that countries grant traffic rights to other countries. Negotiators on each side attempt to "give" as little as possible while "taking" as much as possible. However, since increased traffic rights translate into more connectivity for both countries with all the benefits that derive from it, it could also be argued that a more liberalised arrangement is a win for both countries. This argument is especially put forward by relatively small countries or isolated countries. Representatives of these countries claim that they do not see the negotiation process as a give and take game. Yet, it is a challenge for a negotiator if the other country is not willing to offer equal traffic rights or to offer more traffic rights at all. This still leaves the negotiator with the possibility to offer unilateral traffic rights to the other party, hoping that this will lead to an increase in services from foreign airlines which benefit both countries. However, many negotiators state that the risk of this strategy is losing the bargaining chip that could be used to obtain additional traffic rights for its national carriers in the long-term. That is, once you have granted the other country the rights that it demands, you risk that this country loses its incentive to renegotiate the ASA in the near future.

Another fear that some countries, both small and large, have is related to the sixth freedom carriers, such as from the Gulf States, Panama, the Netherlands or Singapore which have specialised in connecting two other countries via their hubs. It has raised concerns in some circles that that the growth in these so-called sixth freedom carriers could threaten some existing direct routes operated by incumbent carriers and thus decrease the quality of the connectivity. This argument has been used repeatedly to justify limiting access to these markets. In addition, some smaller countries have expressed concerns about becoming too dependent on hubs in specific regions of the world, for example on hubs in the Gulf countries for connections between Europe and Asia.

Within Europe, the United Kingdom, unlike Germany and France, opened up its markets for the largest sixth freedom carriers, including Emirates, Qatar, Etihad, Turkish Airlines and Singapore Airlines. For example, in 2007 the United Kingdom signed an open skies agreement with Singapore that removed all restrictions on passenger and all-cargo air services operated by Singapore- and UK-designated carriers. This goes well beyond conventional open skies agreements that provide unlimited third and fourth freedom access as it also accords unlimited fifth, seventh, and even eighth and ninth freedoms. This allows Singapore Airlines to station aircraft at any UK airport and actually operate these as hubs. That is, it could provide flights within the United Kingdom and feed them into flights to, for example, the

United States without having to include Singapore as part of the itinerary.

It should however be noted that United Kingdom's main airport, Heathrow, remains extremely slot-constrained and Singapore Airlines would find it hugely difficult and expensive to obtain ready slots. Even a daily flight to New York JFK would not make much commercial sense for Singapore airlines in the competition for business travellers, given that its competitors provide a much higher frequency of flights on this route.

As a result the UK government and its stakeholders, such as British carriers, had relatively little to lose in awarding the generous traffic rights to Singapore, at least in the short-term, while it obtained reciprocal rights in exchange. A similar story holds for the number of points that carriers from the United Arab Emirates (UAE) can serve within the United Kingdom. Unlike for example Germany, which has refused UAE carriers to fly into more than four German cities, no such restrictions are incorporated in the UAE - UK ASA. This has enabled carriers from both sides to increase the number of services offered. According to the UK government the agreement with the United Arabic Emirates has stimulated 120 direct connections, vastly increasing traveller choices without replacing the direct services to Asia of UK designated carriers.

Yet, it needs to be noted that British Airways relies much less on domestic feeder services to its Heathrow hub, than Lufthansa does at Frankfurt. In fact, additional Emirates flights to secondary cities in the United Kingdom, such as Manchester, mainly affect direct European competitors KLM and Schiphol, as the latter offer many more direct services to these cities than British Airways does from Heathrow.

Given Lufthansa's large flow of traffic between its main hub Frankfurt and cities like Berlin, Hamburg, Cologne or Stuttgart, it is likely that it will continue to lobby the German government not to open up this "backyard" for additional services from the UAE. A similar story probably holds true for Air France. To what extent French and German governments will follow the United Kingdom in their liberal policies is therefore likely to depend on how these governments align the interests of their national carriers and those of other stakeholders, such as passengers, shippers and the several airports.

Contestable markets

The Contestable Market Theory refers to a market served by a small number of firms that behave competitively because of the existence of potential new entrants (Baumol, 1982). The theory claims that even in the situation of monopoly or oligopoly, the incumbent firms will behave in a competitive manner when there is a lack of barriers to entry (such as government regulation or high entry costs) to prevent new entrants from penetrating the market.

Soon after the deregulation of the aviation market in the United States began in 1978, several studies (Graham and Kaplan, 1982; Morrison and Winston, 1985; Hurdle et al., 1989) showed that the perfect contestability theory does not hold for airline pricing due to the presence of barriers to entry and barriers to exit as sunk costs can act as a disincentive for carriers to exit a market. Thus markets may be far less contestable than they first appear. In addition, it was found that liberalisation led to consolidation. That is, it provided incentives for airlines to organise their networks around hubs, to take over competitors or form alliances among them. This has given rise to the question of whether these developments are anti-competitive. Several studies have shown that this is a very complex question and although the majority of these studies have concluded that liberalisation has generally led to increases in efficiency and welfare, some of them have pointed out that it could also lead to an increase in market power for some airlines.

More generally, it has been concluded that the benefits of liberalisation are geographically unevenly distributed, with spoke airports benefiting from lower prices, access to wide arrays of connection banks, while hub airports benefit from increased direct connectivity but, possibly, at higher fares. However, the most significant impact in fares comes not from the amount of competition present in a market but rather the type of competition. Thus, while the addition of a second full service carrier (FSC) to a route already served by an FSC may exert some downward pressure on air fares, the advent of a LCC will bring the most significant price declines.

Air fares

Empirical evidence has shown that market liberalisation generally exerts downward pressures on air fares as it enables new entrants to enter a market and forces incumbent carriers to innovate in order to establish price leadership. However there are cases where liberalisation of a market has led to a complete restricting of the airline industry, consolidation of activities and new-found dominance of a single carrier in a given market.

A large number of studies have examined the economic impact of air service liberalisation on air fares. Three categories can be distinguished. The first comprises studies on the effects of liberalisation of domestic markets, especially the one of the United States. The second category has focused on the effects of liberalising ASAs between two countries, while the third category is dedicated to the creation of open aviation areas, which comprises the markets of more than two countries either behaving as a single economic entity or having few if any traffic restrictions between them. In the case of the latter, bilateral agreements between sets of two countries are replaced by one single multilateral agreement that governs all traffic between a group of countries. This essentially creates one joint international open market.

This section thus proposes to examine the impacts of liberalisation on air fares under the lens of each of the three categories mentioned previously.

Hub premiums

A rich body of literature has emerged that explores the impact of market structure on average fares paid by airline passengers. This literature has provided a greater degree of understanding of how various market forces and cost conditions interact in determining airline prices, particularly at hub airports. The term hub premium has thus come to mean the fare premium paid by passengers to fly directly from a hub rather than indirectly via another hub.

Many empirical studies on determinants of air fares have focused on markets in the United States but there is a vast amount of anecdotal evidence showing this phenomenon exists in other markets. This can partly be explained by the fact that the United States has been the world's largest aviation market for years and partly because of the relatively good data availability on air fares for this market. The latter is largely due to the "Bureau of Transportation Statistics' Passenger Origin and Destination (O&D) Survey", based on a 10% sample of all airline tickets for US carriers, excluding charter air travel. The data from this survey are accessible via the Department of Transportation's Database 1A (DB1A) which contains information on total price paid, carrier, origin, destination, class of travel and routing, consisting of millions of observations, collected on a quarterly basis. It is one of the most comprehensive airline ticket datasets available and has therefore been widely used by many studies to airline pricing.

Morrison and Winston (1995) are among the first to study the effects of the deregulation of the United States' market on fares and concluded that fares were about 30% lower than they would have

been if fare regulation was still in place. Afterwards, several studies confirmed their findings and emphasised that especially LCCs could be held responsible for this decrease in average fares (Borenstein, 2014).

Outside the United States data on individual ticket purchases is difficult to obtain. Very few jurisdictions have publicly available data similar to the DB1A. As a result and because deregulation started in the United States, a large part of the early literature on air fare determinants is based on this market. In order to understand the differences between the different empirical findings, it is useful to quickly review the evolution of this literature.

Tretheway et al. (2005) provide a review of the evolution of the empirical research regarding the impact of market structure on airline fares in the United States. According to their review early studies had showed that average fares (adjusted for inflation) had decreased since the start of the deregulation, but after some time researchers began to observe that the impact of deregulation on air fares was distributed unequally among routes.

It was found that especially airport concentration led to charging premiums to passengers with an origin or destination at a hub airport and these empirical findings raised major public policy concerns. For example, in 1990 the General Accounting Office (GAO) in the United States conducted a widely cited study which was the first to quantify the so-called hub premiums. According to this report, the average revenue per passenger-mile for trips originating in 15 dominated hub airports in 1988 was compared to those in 38 airports without a single carrier dominance. The GAO defined a hub as "dominated" if 60% of all enplanements were by one carrier or if 85% were by two carriers and used air fare data from the Department of Transportation Database 1A. This simple comparative analysis concluded that yields at hub airports were 27.2% higher than at non-hub airports.

In their widely cited book, *The Evolution of the Airline Industry,* Morrison and Winston (1995) adapted the methodology used by GAO to control for a number of factors that might affect fares at hub airports and isolate the effect of airport concentration. The analysis revealed that hub premiums ranged from 4% to 10% between 1978 and 1993. Notably, they found a significantly lower hub premium of 5.2% in 1993 in contrast to the result of 33.4% estimated by GAO's methodology. The 28.2% deviation was decomposed into several aspects. Travel distance and the number of plane changes turned out to be important variables as they reduced the estimated premium by 18.6%. Meanwhile, carrier-specific characteristics accounted for a 4.6 % difference and correcting for FFPs and passenger mix each removed 2.5% off the premium (Tretheway et al., 2005).

Therefore the hub premium that was observed in the early literature can partly be attributed to higher quality service at shorter route distances, rather than to exploiting market dominance. It was also found that some carriers tended to charge higher prices not only on routes originating in the hub airports but also for the whole network compared to the average market price level, thus the characteristics of hub carriers should be regarded as a service quality premium, or brand premium, rather than the effects of dominance.

Several explanations for the differences were provided. First of all, hub airports tend to be based near major cities with generally a high proportion of business travel, which generates demand for flexible, last-minute air travel and creates a greater willingness to pay a premium for high-frequency service with flexible ticket conditions. Hubs also tend to have a greater proportion of both short-haul and non-stop trips than non-hubs. As short routes have higher costs per mile than longer routes, which can spread fixed costs, such as landing fees over more kilometres, their average fares are generally higher. In addition, since trips requiring a connection are less attractive to travellers, they are likely to have a lower fare.

Another important factor affecting fares at some major airports is congestion. Economic scarcity, rather than market power per se, may be a source of fare premiums at hub airports. Limitations on airport capacity can generate scarcity rents that accrue to all airlines using the congested airport, not only to the dominant airlines (Tretheway et al, 2005) under regulatory regimes where prices are capped. At last, frequent flier tickets had generally been excluded from previous analyses but Morrison and Winston (1995) argue that they should be included as, in their view, frequent flier travel represents, effectively, a discount on travel. For example, the 1990 GAO study filtered out zero-fare tickets used for frequent flier reward travel, possibly biasing upwards the fare premium estimate at concentrated hubs.

In conclusion, Morrison and Winston (1995) provided very useful insights into the sources of hub premiums. However, they did not apply robust econometric methods needed to fully disentangle the impact of different factors on air fares. Many aviation experts realised there was a need to distinguish airport-related and route-related drivers of pricing power. Moreover, market dominance and market concentration should be treated as two different dimensions of oligopolistic competition. Studies at this stage focus on comparing the prices of a network carrier's hub markets versus the prices of all other airlines in otherwise similar markets. The purpose is to distinguish route and airport characteristics as sources of potential pricing power by controlling for structural differences between these two types of markets.

Borenstein (1989) was one of the first authors to use a sophisticated econometric approach to estimate the effects of route and airport dominance and concentration on prices. His work is regarded as one of the most influential studies in hub premium debates. He estimated an econometric model that related the median route fare charged by each airline to a number of operational and market factors, such as route distance, unit-costs, traffic-mix, carrier identity and airport constraints, route concentration and airport concentration.

It is worth noticing that Borenstein's (1989) definition of hub premiums differs from those in the aforementioned studies. Basically, Borenstein (1989) estimated the hub premium charged by the dominant airline relative to airlines without airport dominance, while the previous studies estimated the degree to which the average fare at a concentrated hub airport differs from average fare at un-concentrated airports, which is not specific to the dominant airline.

He found that the dominance and concentration at the route level as well as at the airport level are principal determinants of price premiums of an airline, after controlling for a number of variables, such as flight frequency, distance, numbers of stops, unit-costs, carrier identity and airport constraints. He argued that frequent-flyer programmes (FFPs), travel agent commission override programmes (TACOs), and corporate discount programmes (CDPs) are the main causes of hub premiums (Chen, 2006).

Additional evidence on hub premiums was provided by Evans and Kessides (1993) who conclude, by conducting price regression analysis that airport dominance contributes more than route dominance to an airline's ability to charge higher fares. Their findings are supported by Hofer et al. (2008) who confirmed that airport market share and airport concentration contribute to the largest part of price premiums while the impacts of route market share and concentration on price are much smaller.

Finally, when analysing the issue of fare premium, one should keep in mind not just the fare level but also the fare structure. Hence, it is possible that overall fares on a given route could be relatively low but that premium fares are significantly higher, reflecting a higher degree of competition for the lower-end fares than the upper-end fares.

Quantifying the impact of concentration on fares

Lee and Luengo-Prado (2005) estimated a regression model of average route yield that controlled for distance, traffic density, traffic mix, presence of an LCC and other operational factors (the analysis did not incorporate frequent flier tickets). Their analysis was able to estimate hub premiums for individual hub airports. The premiums ranged from -5% at Miami to 31% at Newark. The overall average premium for coach fares was 12%, while the average premium for other fares was 13%.

A limitation associated with the above studies is that the different market segments of economy and premium class have not been separated. This is partly because DB1A on which most empirical studies rely is a 10% random sample of all tickets that originate in the United States and on US carriers. Therefore it is not possible to test the pricing effects of different cabin classes on airport dominance using reduced-form price equation (Chen, 2006).

Berry et al. (1996) developed a utility function based on a discrete choice model of demand to estimate the differential willingness to pay for different air travel features of leisure and business travellers. Their results are consistent with the existence of two very distinct types of passengers. One has the normal attributes of a leisure traveller, which is high price sensitivity, low willingness to pay for frequent flyer features, low willingness to pay for high frequency and low disutility from connecting flights. The other has business traveller characteristics, which are the opposite of the former.

They concluded that the dominant hub carrier's ability to charge higher fares is restricted to the tickets that appeal to relatively price-inelastic business travellers, who favour the origin-hub airline, and are willing to pay an average premium of 20%. However, these high prices do not provide a "monopoly umbrella" for other non-hub airlines (Berry et al, 1996).

Similar conclusions were obtained by Lee and Leungo-Prado (2005). They used fare data from 2000 of different cabin classes, namely, restricted coach fares and premium fares. The premium fare group in their study includes 82% unrestricted coach fare and 18% business and first-class fare. They found that some carriers extract additional hub premiums from premium fare class passengers. After controlling for passenger mix, the average hub premium at major US hubs is reduced.

LCCs are also found to play an important role in reducing hub premiums in the US domestic market. A number of studies assessed the extent to which LCCs affect the network carrier's ability to exercise their market power. These include Dresner et al. (1996), Morrison (1995), Hofer et al. (2008) and Borenstein (2014). The latter study concluded that over the years business travellers in particular had been paying especially high prices at hub airports dominated by single airlines. The concentration at those airports has dipped somewhat recently, but the hub premium has fallen much more significantly. That is, both fare inequality and the hub premium peaked in 1996 and has declined by 42% since then. In 1996, there were 10 airports among the top 50 where passengers paid an average price of 20% over the national average, whereas there was only one in 2012. He emphasised that even though price premiums at hubs have fallen, home-carrier bias has remained and even strengthened slightly over the years, particularly on business routes.

Insight from studies of the European market

Studies on air fares outside the United States generally require the use of expensive commercial data, the use of surveys to gather primary data, or the use of propriety data from government agencies or the air carriers themselves. The main disadvantage of the use of primary data, such as prices promoted by

online travel agencies, is that no information is available on how many tickets are sold for each price. As a result assumptions need to be made in order to estimate average fare levels.

After the implementation of all three liberalisation packages in Europe, Lijesen et al. (2001) were the first to examine the hub premium of European carriers. By using unrestricted economy class fare data in February 2000 obtained from the Travelocity website, they related fares to distance and route, using the Herfindahl–Hirschman Index (HHI), which measures the size of a firm in relation to its industry, thus indicating the level of competition that exists amongst firms and airline specific constants. Sample data included ten European origins, with eight of them being the inter-continental hubs for their home carriers. The results revealed that price mark-ups existed on flights to or from hub airports. The average fares of Lufthansa, Air France and Swissair were 15% higher than other airlines in the sample, everything else being equal. They therefore concluded that at least some of these premiums should be attributed to market power and that the magnitude of the premiums is comparable to those found by Berry et al. (1996).

Impact of alliances on air fares

An alliance is a commercial co-operation agreement, which, whilst not leading to legal and financial integration the way a merger does, depending on its intensity and scope, might lead to far-reaching operational integration that resembles a merger. As the level of co-operation between the members of an alliance is often high, the potential of alliance agreements to distort competition renders scrutiny under competition law indispensable.

The impact of an alliance on society depends on the form of the alliance and therefore needs to be judged on a case-by-case basis. Parallel alliances are agreements between carriers with overlapping networks that previously competed on the same routes (hub-to-hub markets). The partners integrate non-stop services on the route in a way that only one partner continues to provide the service. Complementary alliances are agreements between carriers that do not have overlap in their networks and do not compete on the same routes. Instead, they add up their existing networks including their interline market. As a result, these complementary alliances are said to eliminate double marginalisation when there is an integrated benefit sharing arrangement that gives each airline the incentive to go ahead and drop its price on one of the segments in favour of obtaining a new passenger on the full itinerary.

Double marginalisation is an economic concept that refers to the situation in which different firms in the same industry apply their own respective mark-ups to the prices of a jointly offered product. For example, two airlines that offer an interline ticket both charge mark-up prices for the respective legs of the trip that they operate which results in two deadweight losses. If the firms were integrated at least one of these deadweight losses would be eliminated. This can be done through an alliance between the two firms. Additionally, an alliance could also benefit the consumer through a better co-ordination between the two flights' legs, such as through increased connectivity and a one-time luggage check-in.

Park (1997) elaborates on the impact of parallel and complementary alliances on social welfare. His research unsurprisingly shows different effects on fares and consumer surplus for each type of alliance. The first (parallel) case leads to less competition and therefore higher fares, while the second (complementary) case leads to better connectivity for the consumers and probably higher traffic density and therefore lower fares.

Empirical studies are partly in line with Park's findings. They are quite clear on how alliance formation impacts the interline market. Studies from Armantier and Richard (2008), Bamberger et al. (2004),

Bilotkach (2007), Brueckner and Whalen (2000), Brueckner (2001), Brueckner (2003) and Pels (2015) all conclude that fares will decrease in the interline market after an alliance, while traffic will increase.

Brueckner and Whalen (1998) find a fare decrease of 25%. Brueckner (2003) refers to the case of an alliance that has been granted antitrust immunity and even finds a fare decrease of 27%. Bamberger and Carlton (2004) find that average fares fall by 5% to 7 % in the interline market due to alliance formation and that traffic will go up by 6%. In addition, Armantier and Richard (2008) conclude that code-share agreements increase the consumer surplus of connecting passengers.

The impact of alliance formation on hub-to-hub markets seems more ambiguous. Although the studies mentioned above do raise concerns on the potential anticompetitive effects for alliances in hub-to-hub markets, none of them show a clear increase in fares as a result of alliance formation.

Brueckner and Whalen (2000) and Brueckner (2001) found a 5% increase in fares in the hub-to-hub market but this result was not statistically significant. However, the research of Armantier and Richard (2008) concluded that a code-share agreement on the hub-hub-market would lead to a decrease in consumer surplus for the nonstop passengers.

In addition, Bilotkach (2007) concludes that an alliance that includes both scheduling agreements and pricing agreements decreases fares, while an alliance that only includes scheduling agreements leads to higher fares than in the case of no alliance.

At last, Zou et al. (2011) study the effects of alliance formation on the interline market on fares. They concluded that higher densities and double marginalisation will decrease fares, but that better connectivity will result in a higher willingness to pay by the consumers, leading to an increase in fares. Table 2.3 provides an overview of the different studies.

Table 2.3 Literature overview on the impact of alliances on air fares, traffic and consumer surplus

	Fares interline	Fares hub-to-hub	Traffic interline	Traffic hub-to-hub	Consumer Surplus interline	Consumer Surplus hub-to-hub	Consumer Surplus both markets
Park (1997)	↓	↑			↑	↓	↑↓1
Brueckner and Whalen (1998)	↓ 25%	↑5% 2			↑	↓	↑
Brueckner (2001)	↓	↑			↑	↓	↑
Brueckner (2003) - antitrust immunity	↓ 27%				↑	↓	↑↓1
Bamberger and Carlton (2004)	↓ 5 - 7%		↑6%				
Bilotkach (2007) - schedule agreements - schedule and pricing agreement	↑ ↓						
Armantier and Richard (2008)					↑	↓	
Brueckner and Proost (2010) - alliance - joint venture alliance			↑ ↑	↓ ↓	↑ ↑	↓ ↓	↑3 ↑3
Bilotkach and Huschelrath (2011)	↓						↑↓1
Zou, Oum & Yu (2011)	↑↓1	↑					

Impact of liberalisation measures on international air fares

Piermartini and Roussova (2008) reviewed ASAs in international markets and found that 60% of the ASAs allow multiple designations, while 40% only permit single designation, meaning that there are at most two airlines competing in the international routes involved. Gönenç et al. (2000) were among the first to examine the effects of bilateral ASAs on air fares. They analysed agreements of a sample of OECD countries, including the United States and Australia, as well as developed Asian and European countries, and collected fare data for predominantly intercontinental flights. They concluded that air transportation reforms have been implemented at different times and unevenly across countries and routes, which has resulted in a large variability of regulatory arrangements and market structures. To describe this variety of country and route-level situations and investigate their impact on efficiency in the provision of air services, they claimed that it is needed to focus on a set of regulatory and market structure indicators for which comparative cross-country or cross-route information is available. Using a variety of sources (including the replies of OECD countries to a questionnaire) they developed a total of 21 indicators at the aggregate level for 27 OECD member countries. Furthermore, they developed a total of 23 additional indicators at the micro level for a set of 102 air routes connecting 14 major international airports. Most of the underlying data for the different indicators and countries are from 1996 and 1997.

The three main areas covered by the indicators were regulation, market structure and infrastructure access. Regulatory indicators focus on entry conditions, pricing rules and government control. Market structure indicators cover market concentration at the route and country levels, the presence of challenger and third party carriers and the role of alliances. Indicators of infrastructure access conditions take into account both slot dominance and congestion. To disentangle the effects of the different indicators they tested several models using Ordinary Least Squares regression analysis.

They concluded that both at the national and route level there "is clear evidence that fares tend to decline as the regulatory and market environment becomes friendlier to competition". In addition, they concluded that fares react to changes in the level of regulation independent from the market structure, which they explain by suggesting that potential entry instead of actual competition might have a discipline role in setting prices, an interpretation based on the contestability theory that has since fallen out of favour. Furthermore, they conclude that economy fares tend to be higher for non-stop routes that are dominated by an airline alliance and they find that airport congestion and dominance tend to raise fares for business passengers in particular (Gönenç et al., 2000).

On the whole, these results confirm that air transport reforms aimed at removing entry (i.e. by eliminating bilateral designation rules) restrictions, pricing restrictions (by allowing free price-setting) and capacity restrictions (by allowing unlimited third and fourth freedom rights) will lead to fare decreases. Gönenç et al. (2000) emphasise however that "for these policies to fully bear their fruits", barriers to entry should be dealt with. That is, they conclude that constraints on airport access must be relaxed and strategic behaviour by incumbents, for example through alliances and slot dominance, must be monitored by appropriate competition policies (Gönenç et al, 2000). Lastly, they conclude that new open skies agreements between various countries or group of countries, still exclude third-party carriers. Therefore they consider these as only a step towards a true competitive environment. Large potential gains could be obtained from the simultaneous liberalisation of domestic and regional markets and international (long-haul) routes, which encourages network optimisation and cost-efficiency while reducing price-cost margins.

Doove et al. (2001) extended the work of Gönenç et al. (2000) to cover 35 countries. They found a positive and significant effect of restrictiveness on air fares, with larger effects for developing countries than for developed countries (WTO, 2008). A differentiated effect of air service liberalisation for

developed and developing countries is also found by Micco and Serebrisky (2006). Focusing on the US open skies agreements, they investigate the impact of these agreements on air fares and on the share of US imports arriving by air. They found that for developed and upper-middle income countries, signing OSAs on average reduces air fares by 9% and increases the share of imports arriving by air by 7% three years after the OSA is signed. In contrast, they do not find significant effects of OSAs for low-income countries (WTO, 2008).

At last, Piermartini and Rousova. (2008) use a gravity model to explain bilateral passenger traffic and estimate the impact of liberalising ASAs on air passenger flows for a sample of 184 countries. In order to assess the effective degree of liberalisation of the bilateral ASAs, the so-called Air Liberalisation Index, constructed by the WTO (2006), is used. Piermartini et al. (2008) find robust evidence of a direct and significant relationship between the volumes of traffic and the degree of liberalisation of the aviation market. An increase in the degree of liberalisation from the 25th percentile to the 75th percentile increases traffic volumes between countries linked by a direct air service by approximately 30%. The study finds that the most traffic-enhancing provisions of ASAs are the removal of restrictions on the determination of prices and capacity, cabotage rights and the possibility for airlines other than the flag carrier of the foreign country to operate a service.

Global connectivity

Connectivity is an intuitive concept, but one without a generally agreed definition. A key question is how to measure it in a consistent way. Different indexes have been developed by the industry to assess the correlation between connectivity and liberalisation.

Before examining the question of connectivity indices, it is worthwhile asking why an index should even be computed and what the purpose of doing so is. For example, a small market may be interested to know how it connects directly to other global markets, knowing full well that it already enjoys very good indirect connection thanks to proximity to a global hub. Similarly, a country looking at important investments in infrastructure may be more concerned with how it connects to tomorrow’s leading markets than to todays.

Pearce (2007) and IATA define connectivity as summarising the scope of access between an individual airport or country and the global air transport network. He developed a connectivity indicator based on the number of available seats to each destination served (during a given time period). The number of available seats to each destination is weighted by the size of the destination airport (determined by the number of passengers handled each year). The weighting for each destination gives an indication of the economic importance of the destination airport and the number of onward connections it can provide. All the destination weightings are then summed (and divided by a scalar factor of 1 000) to determine the connectivity indicator. A higher figure for the connectivity measure indicated a greater degree of access to the global air transport network. He finds suggestive evidence of a relationship between connectivity and important economic outcome measures such as labour productivity, and competitiveness of the travel and tourism sector.

Arvis and Shepherd (2011) from the World Bank developed the Air Connectivity Index (ACI), a measure of the degree to which countries are connected to the international air transport network. Under their definition, connectivity is a non-dimensional number between zero and one. The non-linear construction means that the concept is global. That is, a country's connectivity depends not only on its neighbours, but also on all of the interactions among the other countries in the network (just as multilateral resistance depends on trade costs across all potential trading partners). The size or potential of the node does not enter directly into their measure of connectivity, which represents “the pull and push of the

rest of the world". The measure captures important network features, such as its hub-and-spoke structure, and the dual importance of the number and strength of flight connections.

They conclude that the ACI strongly correlates with important economic measures on both the input and output sides, including the degree of policy liberalisation in air services markets, and specialisation in parts and components trade as a proxy for trade openness in high value to weight sectors. Application of the measure to 2007 data reveals that the USA (22%) was the most connected country during this year, followed by Canada (13%), and Germany (12%). A cluster of European countries made up the top ten, with scores ranging from about 10% to 12%. This positioning is consistent with their role as regional hubs and their close connections with Germany and the United Kingdom as major international gateways. Asian countries, including regional hubs, such as Hong Kong SAR (6%), China (5%), Japan (5%), Korea (5%) and Thailand (4%), fall into the middle range of connectivity scores. The same is true for the Middle Eastern hubs of the UAE (5%), Bahrain (4%), and Qatar (4%).

The bottom end of the rank table is made up of isolated countries in Oceania, such as French Polynesia and the Marshall Islands, as well as African countries including Zimbabwe, Mauritius, Madagascar and Angola. Connectivity drops off sharply from the most connected country (USA, 22%) to the second ranked country (Canada, 13%). The mean ACI score is about 4%, but the median is 3.4% which suggests that the distribution is significantly left-skewed. Both characteristics are suggestive of a power law distribution, as is the case for the number of direct air connections of each country. Intuitively, this is not surprising given that the air transport network is widely known to be composed of a relatively small number of well-connected hubs and a large number of less well-connected spokes.

The goal of the World Bank is to update the index on a regular basis to give policy makers and analysts consistent information on connectivity over time. This should enable them to track performance and examine the impacts of policies designed to improve the air transport environment and boost connectivity. In addition, this index provides scope for detailed econometric work looking at the extent to which air connectivity determines trade outcomes and the pattern of specialisation across countries

Abdennebi (2014) from ICAO built on the work of Arvis and Shepherd (2011) and came up with a different connectivity index. She defines connectivity as "the movement of passengers, mail and cargo involving the minimum of transit points, making the trip as short as possible, with optimal user satisfaction, at the minimum price possible". Based on this definition, the enhancement of connectivity involves different components aimed directly or indirectly at increasing consumer choices, while making air transport as efficient as possible and allowing the air transport product to be easily accessible and affordable. She proposes the air transport connectivity index (ATCI) which is generated from five components, each one of them is considered to be a potential indicator of a state's connectivity. These include the ASA component (number of states which signed at least one ASA with the state), the connections component (number of states connected by scheduled flights with the state), competition component (average number of air carriers on a state pair), departure component (number of scheduled departures from the State) and the capacity component (number of seats offered on scheduled flights from the State).

According to Abdennebi's (2014) methodology, the United States registered the highest connectivity index in 2013. The remaining top ten states included six EU states (UK, Germany, France, Spain, the Netherlands and Italy), and China, the United Arab Emirates and the Russian Federation. Regarding the regional connectivity index, Abdennebi (2014) concluded that all regions have recorded an increase in their regional connectivity index since 2004. The highest increase was registered by the Middle East and the lowest increase is attributed to the Latin America region. The competition component registered the lowest increase in all regions, while the fastest growing component is the number of ASAs.

Lastly, the Airport Council International (2014) and SEO Aviation Economics provided a detailed assessment of connectivity and its measures by distinguishing direct, indirect, total and hub connectivity, as well as the closely related onward connectivity. The analysis is based on the SEO's NetScan connectivity model, which measures the number and quality of direct connections, as well as indirect connections via other airports. The value of the analysis lies in the comparison between competing networks (benchmarks of competing airlines, airline alliances and airports) and between distinct years (monitoring developments over time). The NetScan model brings the most relevant connection components of every single market (frequency, travel time, connecting time) together into a single indicator called the Airport Connectivity Index. This indicator expresses the overall network performance. In other words, it represents the number of weekly frequencies (direct and indirect) weighted by their quality, between two points.

The analysis focused on Europe and assessed how the different types of connectivity have evolved over the 2004-2014 period. It concluded that the 2008-2009 crisis was a turning point in the way connectivity has developed in Europe and that while EU airports still deliver the bulk of Europe's connectivity, their connectivity gains have been modest since the crisis compared to those achieved by non-EU airports, with airports in Turkey and Russia benefitting the most. In addition, they concluded that hubs in the Middle East have grown exponentially and much faster than EU hubs in terms of hub connectivity and are acquiring a prominent position in delivering global connectivity between the different regions of the world, with positive spill over effects in terms of the direct and indirect connectivity they deliver for their own markets and communities.

All in all, it is concluded that while market forces and technology are primarily shaping connectivity, public policies and regulations also have a role to play, especially given the strong correlation between connectivity, economic growth and the wider economic benefits derived from having access to the global aviation network. There is an increasing risk of Europe being bypassed as an aviation hub and significant player in providing global connectivity, which will affect the EU economy, both in terms of its further integration (connectivity within Europe) and global outreach and competitive position (connectivity to other parts of the world). With less direct connectivity, some European countries may see a decline in connecting traffic, affecting both national airports and airlines. A further challenge in Europe is that the proximity of many hub airports, the wide availability of high speed rail and an efficient rail/air interface could encourage origin/destination passengers to bypass the local airport altogether and rather rely on the global hub located a few hours train ride away.

In the last decade, we have seen the emergence of carriers from Gulf States and Latin America with small local markets, which have specialised in connecting two other countries via their hubs, a model pioneered by carriers such as KLM and Singapore Airlines. The impact on connectivity here is uncertain. On the positive side, it has provided new connectivity opportunities for passengers, especially to less connected destinations in India or Africa for example. On the negative side it has raised concerns in some circles that the growth in these so-called sixth freedom carriers could threaten some existing direct routes operated by incumbent carriers and thus decrease the quality of the connectivity. This argument has been used repeatedly to justify limiting access of these carriers to certain markets. However, where unlimited access has been granted such as in the United Kingdom, the United States or New Zealand, there was no noticeable loss in direct connectivity.

In the case of Australia, direct connectivity to Europe has declined, but this is a result of the strategic partnership established between QANTAS and Emirates and not because of unlimited traffic rights. The partnership eliminated the direct Sydney to Frankfurt route, via Singapore, and halved the number of flights between Sydney or Melbourne and London. However, this partnership has given QANTAS

passengers one-stop connectivity to 38 European destinations and 24 African destinations. Thus, from a connectivity perspective, passengers and freight are likely better off with this increased indirect connectivity, despite the loss of one route and reduction of service in two others.

Finally, the report emphasised that the EU should truly recognise airport connectivity and its different components (direct connectivity, indirect connectivity & hub connectivity) as an essential element for its competitive position on the global stage. It indicated that significant progress needs to be made in relation to a number of policy issues which directly affect airport connectivity. In line with what Arvis and Shepherd (2011) and Abdennebi (2014) concluded, these issues mainly relate to aviation liberalisation, airport capacity, operating costs and aviation taxes as well as airport charges.

Liberalisation and consolidation

In the US domestic market prior to deregulation nearly all airlines used point-to-point networks. It takes a lot of routes to connect every airport by a point-to-point network, proving costly and inefficient. For this reason, most of the larger airlines changed their network organisation following initial deregulation of the domestic US market. Almost all of them shifted to operating hub-and-spoke networks. When airlines adopt the hub-and-spoke model, they establish one or more switching points where passengers can change planes. From the hubs, the spoke flights take passengers to their final destinations. This implies that a hub is essentially a facility to provide a switching point for flows between other interacting nodes. This requires not only spatial, but also temporal concentration to ensure transfers can take place within acceptable time spans.

In Europe and in small countries, the hub-and-spoke system appeared prior to deregulation and was a consequence of the country's economic geography. For example, in Belgium or the Netherlands, radial networks were constructed with the nation's economic centre, in both cases the national capital, being at the heart of the network. Larger countries, such as Japan, Germany or Canada had both primary and secondary hubs reflecting the fact that secondary markets were large enough and far apart enough to sustain a high-level of activity.

Full service carriers gain market share by offering a high frequency of flights to and from their hub airports. Higher frequencies make an airline more attractive to customers, since they increase the chance of departing at the desired time. Travellers placing a high value on time are willing to pay a higher price for travelling on an airline offering higher frequencies. FSCs fill the remaining seats with passengers flying either with discounted fares or indirectly via their hub (Pels, 2008). Hubs require an origin and destination (O&D) market of a minimum size and prosperity level to guarantee the relatively high yield from direct air services as compensation for the lower yield from the indirect air services provided to transfer passengers. These transfer passengers need to be collected by short-haul flights that may be unprofitable. However, they are needed to fill planes flying long-haul.

Consequently, airlines would ideally operate hub-and-spoke networks on both ends of their long-haul routes. However, besides the fact that this requires a huge network and a brand presence in foreign countries, international regulation generally does not allow airlines to operate hubs outside their home countries. That is, most air service agreements only allow airlines to fly to and from their country of designation. As a result airlines can only feed their long-haul international flights in their domestic hubs. Since most countries also do not allow foreign airlines to control or own foreign airlines, many airlines form alliances to rationalise their long-haul networks in favour of more frequencies and capacity on links between key alliance hubs in different regions of the world, while eliminating thin routes served at low frequency or with multiple stops. This enables airlines to increase the range of origin and destination points they serve around the world. This includes points that they could not have reached directly

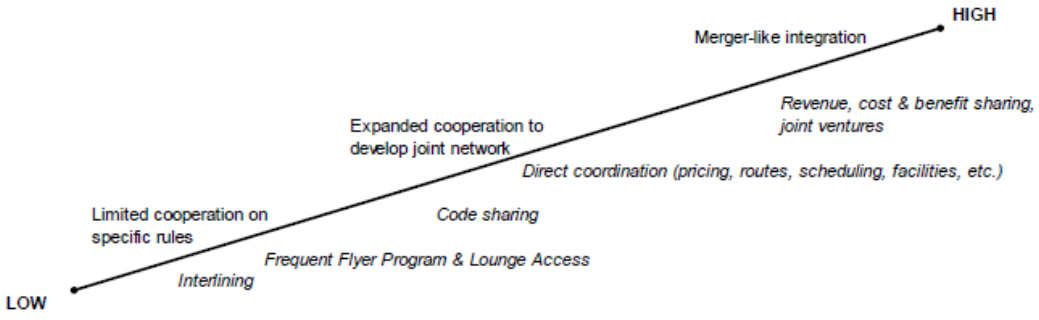
themselves due to restrictions in bilateral air service agreements or because airports are slot-constrained (Morrison et al., 1995).

Alliances can take many different forms and, to the extent regulation allows, attempt to emulate the economic and operational efficiencies of a merger or acquisition, without affecting either carrier's equity structure. Examples include joint ventures, code sharing, flight schedule co-ordination and route agreements. A joint venture alliance is an agreement between carriers to engage in comprehensive revenue and cost sharing on specific routes. Joint ventures are often described as "metal-neutral" meaning a carrier is indifferent whether it or its joint venture partner is actually operating the aircraft. By operating a flight as a joint venture rather than a code share, partner carriers eliminate the double marginalisation[83] effect, which can result in higher consumer surplus (Pearce et al. 2011).

Code-sharing means that a trip is ticketed as if it occurred on a single carrier, even though some of the route segments are operated by the code-share partner. Code-sharing agreements allow the carriers to set prices independently but offer services on city pairs that otherwise would not be served. In the case of flight schedule co-ordination carriers tune their arrival and departure structure in favour of the consumer, resulting in a decrease in transfer time and better gate connectivity for example (Pels, 2001).

Figure 2.1 shows the spectrum of airline partnership options, ranging from a low to a high collaboration intensity. It can be concluded that aviation liberalisation has led to rationalisation in the airlines sector, which is mainly reflected in the formation of hub and spoke networks, airline alliances and mergers

Figure 2.1 Airline partnership options and their level of integration



Source: ITF (2014b).

As Pels (2001) concluded, the incentives for an airline to enter an alliance or merger are similar to the incentives for a carrier to adopt a hub-and-spoke network. These strategies have partly been explained as attempts to capture economies of density, scale and scope through shared infrastructure and related cost-saving measures. Yet other benefits could occur on the demand side, as greater market power over particular routes and hubs as well as improved contract structure and bargaining power in operations are likely to increase revenues.

The empirical literature generally distinguishes three categories of drivers for consolidation: cost-related drivers, demand-related drivers and market entry barriers. The following sections provide a short overview of the literature on each of these categories.

Box 2.4 Risks of dehubbing: The case of Zurich

Zurich-Kloten Airport (ZRH) served as the hub for Swissair, former national carrier of Switzerland. Due to its central position in Europe, Swissair (and thus ZRH) profited from generating transfer passengers. However, with the deregulation and liberalisation of the air industry in the European Union (which Switzerland participated in despite not being a member) and the economic downturn during 2000 and 2001, Swissair experienced severe financial difficulties leading to the airline filing for bankruptcy in October 2001. Many of Swissair's assets were taken over by a subsidiary of Swissair, changing the name to Swiss International Air Lines. As a result of restructuring, Swiss International Air Lines cut its seat capacity at ZRH by 43% between 2000 and 2004. The airline was subsequently taken over by Lufthansa (in 2007) but continues to operate as a separate brand.

The capacity cuts by its home carrier contributed to a 25% decline in total traffic at ZRH between 2000 and 2004 (Swissair accounted for 66% of traffic before its failure). In the years following, traffic gradually recovered (by 5.4% per annum), to almost reach its pre-collapse levels by 2008. However, the restructuring had a major impact on transfer traffic at ZRH. In 2002, the year following the collapse, total origin and destination traffic (i.e. to/from Zurich) was 12% below 2000 traffic levels, but transfer traffic had declined by 32%. By 2005, O&D traffic had recovered to 2000 levels while transfer traffic had declined by 48%.

Despite the loss of traffic following Swissair's collapse, ZRH decided to continue expansion plans which had started in 2000. In September 2003, ZRH completed its new Dock E. As a consequence, ZRH had considerable excess capacity. The lack of traffic led to a closure of the existing Dock B in the same year (Kincaid et al., 2012).

Supply side drivers of consolidation: Costs

The academic literature has concluded that while international aviation does not have any unique cost features, the combination of several characteristics of its cost function can act as an impediment to the entry of new operators. Exploring these characteristics is therefore necessary to determine whether it includes features that could impede efficient entry and exit and, if so, whether they are of sufficient magnitude to justify government intervention.

Many empirical studies have shown that airline hub-and-spoke networks lower their cost. Hub-and-spoke networks require fewer routes to serve multiple airports, resulting in cost-efficiency gains. Furthermore, in the airline industry the past 15 years have seen an increasing number of international mergers and acquisitions that would have been blocked under prior regulatory regimes. These have partly been explained as attempts to capture economies of density, scale and scope.

Economies of density are the cost savings per passenger carried achieved by increasing the traffic density on a route, which allows the airline to increase aircraft size. Caves et al. (1984) were among the first to prove the existence and importance of economies of density in the airline industry in an empirical study called "Economies of density versus economies of scale: Why trunk and local service airline costs differ". They calculated traffic density by dividing the total traffic volume by the carrier's network size, which is defined as the number of origin-destination pairs served by the carrier or the number of nodes connected in its network. Increasing the density of traffic on a route also allows higher frequency of service, which makes it more attractive to travellers, especially high-yield business passengers.

The study found that, with a fixed network size, output increases more rapidly than total cost when traffic density increases. Their analysis shows that a ten percent increase in traffic density will cause a two percent decline in the marginal cost of an airline. So when traffic density rises in the network, cost per passenger-mile falls. Later on, Brueckner et al. (1992) found empirical evidence for the hypothesis

that "forces leading to higher traffic densities on the spokes of a network reduce fares in the various markets it serves". Brueckner and Spiller (1994) confirmed that traffic densities have a significant effect on reducing fares.

Empirical analyses of economies of scope and scale have proved to be more complex. The concept of economies of scale is used a lot in both the academic literature and in policy documents, but a clear definition is lacking. Scale could be expressed in terms of output of passengers, passenger kilometres or network size. However, in both cases it is very hard to distinguish economies of scale from economies of density. That is, in order to measure economies of scale expressed in network size, load factors on existing links should be considered constant when assessing the effect of adding new links. In reality it is very likely that passengers from the new markets will connect to the existing network and increase load factors here. Consequently, it becomes unclear whether potential cost savings should be attributed to economies of scale or density or both. Caves et al. (1984) showed that airlines' unit costs do not fall greatly as they expand their network. In addition, Nero (1999) concludes that advantages of hubbing become stronger with a growing network due to the externalities and spill over effects of additional spokes.

Jara-Dıaz (2003) contributed to the academic literature by introducing a technical model that shows that economies of transport network expansion should be viewed through the concept of economies of scope rather than through the concept of economies of scale. Economies of scope occur when it is less costly for one airline to provide a range of services across a fixed network than for a number of airlines to provide them separately. In terms of market entry, the existence of economies of scope implies that entry needs to be across a range of markets if the costs of the entrant are to match those of incumbents.

Furthermore economies of standardisation and economies of experience have been acknowledged in the academic literature. The first largely translates as cost savings achieved by having a homogenous fleet and offering a simplified product. These are considered important features of the traditional low-cost carrier model.

OECD (1997) concluded that one notable outcome of recent liberalisation of aviation is the ability of many incumbents to remain in the market and often strengthen their market position, referring to this as economies of experience. It was concluded that part of this effect is due to residual endowments of market power left after reforms (such as the grandfathering of airport slots) and in part to initial diversity and scope of the incumbent's operations.

It is important to gain insights into these different sources of economies of experience and scrutinise on a case-by-case basis whether there is a need to regulate them. External factors such as the development of online flight search engines as well online travel agencies have increased the transparency of the ticket market thereby reducing the incumbent's comparative advantage in marketing tickets.

Box 2.5 Differences in average prices on the internet: Evidence from the online market for air travel

Using the daily ticket price from 2002 quotes, Chen (2006) studied whether there are systematic differences in the air fares obtained through different online travel agencies and concluded that after controlling for ticket availability and heterogeneities that affect ticket prices, there is little systematic difference in the average fares. Chen's (2006) findings are in contrast to differences as large as 18% documented by Clemons et al. (2002) on data from 1997. Chen (2006) explains this difference by claiming that nowadays airlines directly compete on the online travel market, while this was less the case in 1997.

Nevertheless post-deregulation analyses (i.e. Creel & Farrell, 2001) have suggested that attempts to increase network size coupled with the evolution of the hub and spoke system have largely been driven by attempts to increase monopoly power (Peoples, 2014). Borenstein (2014) endorses this view and states the many important advantages of a larger airline network are not related to cost efficiencies but to gains in demand through customer loyalty or market power. The latter has been confirmed by several other studies such as Burghouwt (2014) and Zou et al. (2011).

Demand side drivers of consolidation: Revenue

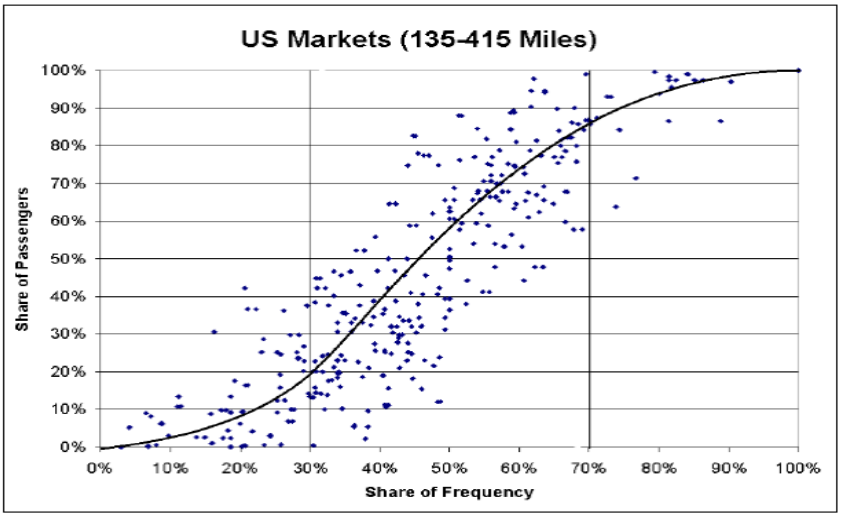
Oum et al. (2010) state that hubbing can significantly affect demand, which subsequently affects revenues and profits with its effect on passenger travel time and schedule delay time. One of the most important trade-offs an airline makes is between offering frequent service with hub connection and infrequent but direct point-to-point service. Compared to non-stop services, a hub-and-spoke network increases the average passenger's travel time due to the extra connecting time at hubs and the circuitous routing of passenger trips. On the other hand, hub-and-spoke networks reduce passengers' schedule delay time, which is the time between the desired departure and the actual departure time, by offering increased flight frequency. The overall effect on travel time is thus the difference between the time penalties (extra ascent and descent time, connection time and extra cruise time) and the reduction in schedule delay. In addition, a hub-and-spoke network allows an airline to serve many additional city-pairs when a new spoke route is added to the network (Oum and Tretheway, 1990).

The hub-and-spoke network is an efficient way to serve destinations over a large spatial distance. Airbus (2007) pointed out that one source of connecting traffic is passengers who could in fact fly directly if they wanted to. For example, in 2006, 20% of those flying between Europe and Asia selected a connecting route, even though they could have taken a direct service. There are several reasons for this. First of all, airlines often offer lower prices for connecting services. Secondly, passengers may also choose to fly via a hub to take advantage of a stay-over at an intermediate stop. Last but not least, many passengers prefer connecting services to direct service due to the wider variety of schedules offered at major hubs, either in terms of flight frequency or number of destination cities.

Some empirical studies, such as Gillen et al. (1994) and Kahn (1993) have shown that increase in frequency beyond some point brings about a more than proportional increase in market share and, indirectly, in revenue. They refer to this phenomenon as the S-curve relationship and use it to explain why airlines seek to increase the frequency of their services. Button and Drexler (2005) analysed the domestic market shares of several major airlines at several large airports in the United States between 1990 and 2003 and concluded that there is little evidence of the existence of any sustained S-shaped relationship. On the other hand, Wei and Hansen (2007) provide statistical support for the S-curve effect of airline frequency on market shares, based on a nested logit model for non-stop duopoly markets. Therefore they conclude that "airlines have no economic incentives to use aircraft larger than the least-cost aircraft, since for the same capacity provided in the market, increase of frequency can attract more passengers than increase of aircraft size". As a result, the S-curve effect triggers FSCs to increase frequencies and concentrate services at a single airport. According to the ITF (2014a) this effect is in particular present where FSCs compete and weaker when competition from LCCs is involved, as in the latter case price is a more important factor in competition than frequency. Following the S-curve phenomenon, further increases in already high frequency levels will not result in further increases in substantial market share or additional market generation. Hence, market saturation can be a reason for airlines to develop new routes or additional frequencies at other airports on a parallel route.

However, there are a number of counter-examples to the S-Curve where airlines have preferred to opt for the economics of operating a larger aircraft rather than the connectivity of operating higher frequencies. France, for example, has witnessed an increase of about 15% in capacity per flight over the last decade, enabling traffic to remain relatively constant in terms of departures despite capacity increasing by roughly a fifth. Figure 2.2 shows the S-curve for US city-pair markets, confirming that airlines with the majority of flights in a market benefit from a disproportionate market share of passengers.

Figure 2.2 The S-curve effect



Source: ITF (2014a).

Impact of air liberalisation on future demand

So far this section has laid out much evidence that liberalisation has a positive impact on passenger demand, in particular through a decrease in prices and an increase in connectivity, or at least a better match between supply and demand. Further liberalising global air markets or, on the contrary, limiting future liberalisation, will shape future travel demand.

To study the long-term impact of aviation policies on future passenger demand, the International Transport Forum has developed a new forecasting tool with 2030 and 2050 as time horizons. It combines a deep understanding of demand mechanisms with several scenarios for the future evolution of the air network, each reflecting different liberalisation environments. The model is global and assesses passenger flows between 310 regions, each region corresponding to a main centre of economic activity[84]. Passenger demand between pairs of regions results from the combination of two sub-models: a gravity-type model for the prediction of origin-destination passenger volumes and a route-choice model for the assignment of the latter onto the air transport network.

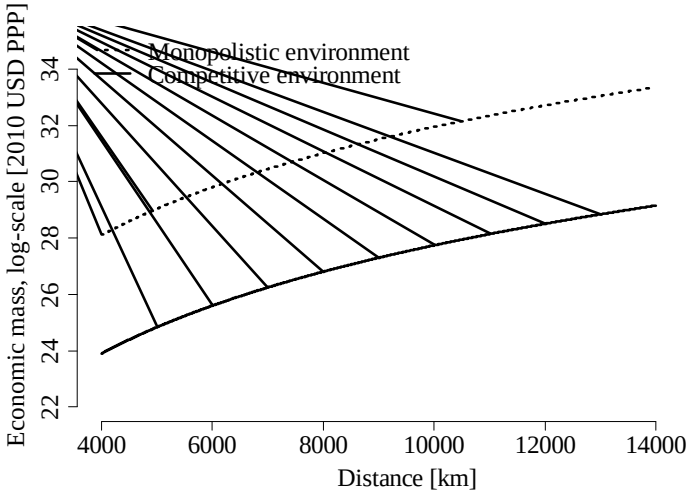
Air liberalisation and future network development

Passenger travel largely depends on the quality of the supply so forecasting future passenger demand requires a detailed knowledge of the future state of the air network, including prices. In particular, the future extent of air liberalisation is material in determining future developments. Rather than trying to

infer the liberal or protectionist measures lying ahead, the model looks at alternative scenarios based on competition[85], prices and connectivity.

The evolution of these three variables depends on the scenario (see below). In the scenario, more liberalised environments are characterised by an increase in competition and the introduction of relations from LCCs, both of which drive prices down[86], as well as easier link creations. Figure 2.3 illustrates the latter point. It shows the minimum economic mass (product of origin and destination GDPs) at which a direct link is observed in the database. It is lower in competitive environments, where airlines can go towards less profitable markets. A network evolution model captures this phenomenon so that the air network evolves according to the liberalisation framework of the scenario.

Figure 2.3 Minimum economic mass (product of GDP at origin and destination) necessary for the opening of a direct connection, as a function of distance



Description of the underlying scenarios

The three scenarios tested attempt to give a contrasting view of future international aviation in a way that is policy relevant for the study of air liberalisation. They reflect the range of outcomes for air passenger demand up to 2050 and consist of a lower bound (static network scenario, no further air traffic liberalisation), an upper bound (dynamic network scenario, complete open skies) and an intermediate scenario. Each liberalisation scenario is characterised by the outcomes in the market it is assumed to produce: competition levels, entry of LCCs for short-haul routes, and ease of new direct link creation.

In the static network scenario, we assume no evolution on the supply side from 2010 onwards. Competition and prices are constant, with no introduction of LCCs. The number of direct connections remains the same between 2010 and 2050.

In the dynamic network scenario the network is fully flexible. New links emerge whenever the model gives a probability of the presence of a link higher than 0.5. LCCs penetrate new markets following the same rule. There is an overall increase in competition. Prices go down globally, in particular in developing countries which are less liberalised.

The intermediate scenario models a future where the network responds to external growth factors. In this scenario, the number of direct links increases but a minimum number of passengers restricts the

creation of new links to relations with high potential. The threshold depends on the type of market (short-, medium- or long-haul) and observations in 2010. This limits the creation of induced demand. There is a natural increase of competition because of the new links but no exogenous decrease in the Herfindahl-Hirschman Index of market concentration, as in the dynamic network scenario. The number of relations with an LCC remains constant throughout the period.

International passenger volumes up to 2050

Air passenger volumes will continue to grow strongly in the future, albeit with significant differences between the scenarios. Table 2.4 summarises the results for international air passenger volumes up to 2050. The annual growth rate in revenue-passenger-kilometres ranges from 2.7% in the static scenario to 5.7% in the dynamic scenario. In absolute numbers, this translates into demand between 7 500 and 17 000 revenue passenger kilometres (RPKs). These results highlight that currently observed levels of growth can only continue in the coming decades if the air network is flexible enough not only to sustain the exogenous growth in passenger volumes – due to economic and demographic growth – but also to create induced demand, via the creation of new direct links. However, in the dynamic scenario, the number of direct connections grows almost as fast as demand. This suggests that reaching growth levels above 5% may require an expansion of the air network that is unsustainable.

Table 2.4 Revenue passenger kilometres and direct connections (between model regions) in 2030 and 2050

	2010-2030		2010-2050	
Scenario	**RPKs (CAGR %)**	**Direct connections**	**RPKs (CAGR, %)**	**Direct connections**
Static	172 (2.7)	100	277 (2.6)	100
Intermediate	234 (4.3)	181	466 (3.9)	245
Dynamic	302 (5.7)	289	634 (4.7)	454

Note: 2010=100 and annual growth rate of Revenue Passenger Kilometres

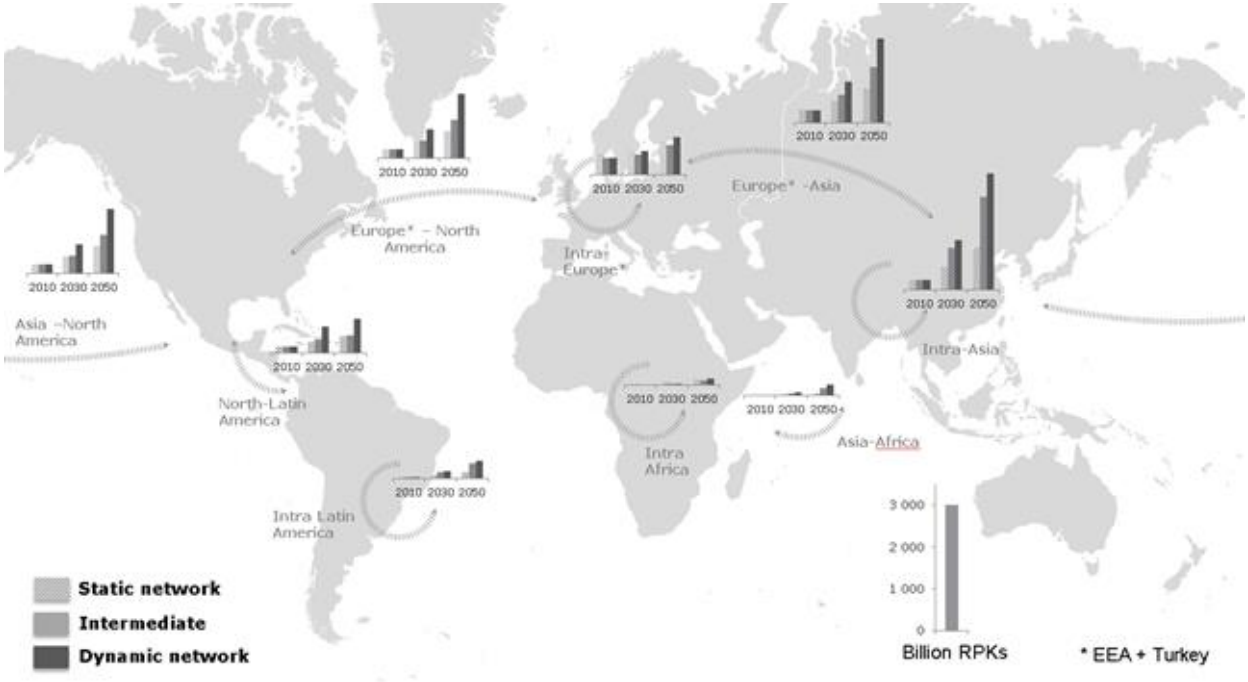
Growth in RPKs slows down after 2030 in all scenarios. There are two main underlying reasons for this slowing down. In the static scenario, slower growth after 2030 is driven by underlying GDP and population projections, which are slowing down and even saturating (for example population growth is assumed to saturate in China by 2030). In the intermediate and dynamic scenarios, the lower growth rate in demand after 2030 is mainly caused by the fact that the network reaches saturation – reducing the inductive impact of further air liberalisation.

Figure 2.4 presents our results for major regions. The largest growth in demand will take place on routes connecting developing countries, and especially Asian countries. In the dynamic scenario, demand growth for intra-Asian routes is above 8%. There is also a strong predicted increase for Latin America and Africa but from lower initial levels. On the contrary, demand for routes between developed economies witness smaller than average growth rates in all scenarios.

The difference between the static and more dynamic scenarios is largest in Asia and Latin America. The combination of a not yet mature air network with strong economic growth suggests a potential for quick and significant growth in passenger demand. The gap between the scenarios is smallest for developed regions, where the air network is closer to saturation, with fewer viable routes left to open. In Africa, the situation is more nuanced. In the dynamic scenario, the expected decline in prices drives the demand up. However, in the intermediate scenario, where competition is not exogenously increased and prices

remain almost constant, demand stays close to the value of the static scenario. Indeed, the number of new intra-African relations created is very small compared to other regions (multiplied by 1.5 by 2050, compared to a world average of 2.5) suggesting limited possibilities for network expansion. Overall, demand in Africa in 2050 remains small compared to the expected population; intercontinental demand with Africa is mostly driven by economic growth in the other parts of the world.

Figure 2.4. Regional breakdown of revenue passenger kilometres



Outlook for Asia

All developing regions will witness above world average growth rates in the coming decades. In Asia, this growth comes together with an already very high-level of demand, with around 1 000 international RPKs in 2010. This could result in as many as 8 600 billion RPKs in 2050, representing about half of the world total. The difference between the static and dynamic scenario for Asia is among the highest observed, reflecting the potential for network development. This analysis is in agreement with all other forecasts, which combine high projections for passenger demand with high aircraft sales predictions, reflecting expectations in terms of network expansion.

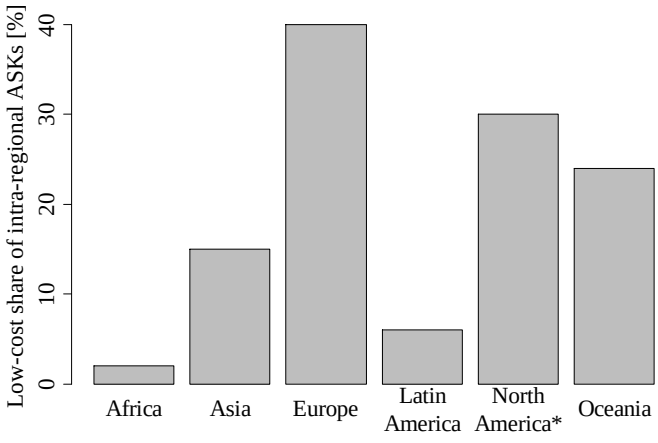
Looking more closely into the modelling results in Asia contrasts this unambiguous assessment. Indeed, the necessary supply to transport the new passengers may never materialise. In all scenarios, the new capacity required goes beyond the current ASAs for many relations, especially with India which has very restrictive agreements with many countries (see the India case study further in this chapter). For instance, the required number of frequency to serve the China to India market in the dynamic network scenario in 2030 is 11 times higher than the current limit set by the bilateral agreement. It is still twice higher in the static scenario, as the few existing routes grow and attract transferring passengers.

Another interesting point relates to the geographical distribution of the new demand. In the dynamic and intermediate scenarios, the newly created flights will use many more airports than currently observed. Passenger numbers at large airports are expected to grow at much smaller rates than in

secondary airports. These airports, many of them still largely dependent on domestic traffic in 2010, have already started to experience a boom in international traffic, with the establishment of regional flights, in particular from LCCs. For instance, the number of international flights at Chongqing airport was multiplied by five between 2010 and 2015, and passenger demand is expected to increase at a yearly rate of more than 15% in the next decades. This contrasts with the Beijing or Shanghai regions, where growth is already slowing down (less than 5% increase in international passenger numbers in the past years) and is expected to remain below the 5% limit in the future.

Low-cost intra-regional flights are an important motor of this growth in secondary airports. A comparison of the share of intra-regional seat capacity provided by LCCs around the world (Figure 2.5 below) shows this trend is likely to continue. If their expansion is not hindered by legislation, the proportion of LCCs could reach levels observed in Europe, with the development of secondary airports.

Figure 2.5 Share of low-cost carriers in intraregional (excluding domestic) capacity in 2010



Note: * Includes domestic capacity

The results show that a sustained growth in international air passenger demand relies on the network being able to expand and stimulate traffic. The existing industry forecasts, most of which predict a 5% yearly increase in demand, can only be realised if we see a continuation of the air liberalisation trends of the past and of its consequences in terms of prices and connectivity. This is particularly the case for developing regions (and especially Asia) where the air network is less mature. In all cases, growth will slow down after 2030 both as a result of the slowing down of global income and population growth and because the current pace of liberalisation cannot continue forever.

Market entry and exit barriers

The literature generally distinguishes endogenous or strategic barriers to entry and exogenous or structural barriers to entry. Starting with the first category, barriers related to network competition and those related to loyalty programmes can be distinguished. However, it is clear that both types of barrier are interrelated and generally reinforce each other.

Strategic barriers related to network competition between FSCs

Most studies have focused on barriers related to network competition and they generally conclude that airlines may form hub-and-spoke networks as a strategic response to competitors rather than to simply

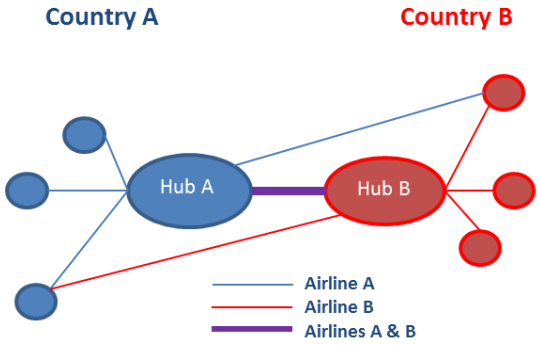
save costs. Pels (2008) argues that rather than competing, airlines using hub–spoke networks stick to their fortress hubs and enter alliance agreements to connect to the hubs of their alliance partners. The lack of competition on low-density routes may be intrinsic to the aviation sector as demand may be too low to allow more than just a few (or even one) carrier to obtain a profitable market share. This is a result of economies of density. Routes between hubs and routes with relatively high fares are likely to offer better prospects for competition. For other routes, the number of direct competitors may be low, but there may be a number of indirect alternatives available

Pels states that this kind of strategic airline behaviour is very likely to prevail if one day bilateral ASAs were replaced by one single agreement to govern all traffic between groups of countries. This essentially creates one joint international open market. His study focuses on the creation of such a joint market between the United States and the EU in which all restrictions on route frequencies, capacities that were binding in the bilateral agreements, are to be removed. This joint open market is referred to as the Transatlantic Common Aviation Area (TCAA). He concludes that the effects of the TCAA may resemble the effects of the earlier deregulation of the US and EU markets and reinforces further the hub-and-spoke concept. Thus, when density effects are important, airline consolidation will be the most dominant strategy. Pels finds that when the authorities intervene by forbidding co-operation to stimulate competition, airlines will stick mainly to their original networks rather than entering each other's markets.

Oum (1998) and Zhang (1996) state that hubbing can be used as both an offensive and a defensive strategy in airline network rivalry. Their study shows that FSCs generally compete head-to-head for both the indirect traffic between non-hub cities via trans-hub connecting services and direct traffic between two hubs or two very large destinations. However, FSC do not tend to compete for direct traffic on spoke links that connect non-hub cities to the hub of a competitor. The reason is that this competitor can channel traffic from many origins on this spoke link. So he could retaliate by increasing output in all markets using this link, thus both the direct and the indirect markets. This would enable the competitor to exploit economies of density more efficiently and thus lower average cost per passenger in all these markets. As a result, the FSC that started competing on its competitor's spoke link will not only face increased competition on this direct spoke link market, but also on all indirect markets that both FSCs compete for, which could lower profits in its original network. FSCs have therefore few incentives to invade each other's direct markets on spoke links, which leads to an equilibrium that allows FSCs to create so-called fortress hubs and obtain "local FSC monopolies" on non-hub spoke links from their own hubs without the threat of entry by competing FSCs (Zhang, 1996).

The figure below shows how carriers from two countries will compete directly on the hub-to-hub routes, and may fly between their own hub and a secondary point in the other country, but will not fly directly from a spoke in their country to a destination in the other, thus funnelling all their flights between their countries through their respective fortress hubs.

Figure 2.6 Schematic representation of the network organisation of a two-country hub-and-spoke model



At the same time, FSCs have a disincentive to exit their own spoke link markets. That is, if an FSC cancels all flights in, for instance, a short-haul market, it loses all passengers, and thus revenues, from passengers in connecting markets using the same flights. Because these connecting passengers no longer can fly on this airline, average costs will be higher on other links in the network due to density economies (Pels, 2008).

Because most LCCs rarely carry transfer passengers, they can serve markets as they see fit, without having to worry about the effects on other markets resulting from the competitors' response. Lin and Kawasaki's (2012) theoretical study therefore concluded LCCs are likely willing to compete on the spoke links and break the "local FSC monopolies".

Strategic barriers related to loyalty programmes

A second category of strategic barriers comprises frequent flyer programmes (FFPs), corporate discount schemes (CDSs), travel agent commission overrides (TACOs) and computer reservation systems (CRSs). FFPs exploit the so-called principal-agent problem[87]. A frequent business traveller represents the agent as he does not have to pay his ticket himself, but benefits from the FFP as he can accumulate credit points by flying with a specific carrier and use them to acquire gifts, free travel or upgrades. CDSs, TACOs and CRSs could in short be explained as the equivalent of FFPs for travel agents and companies. They all intend to lock-in beneficiaries because the discounts offered may reduce their willingness to switch to other airlines. The larger the airlines or the alliances between airlines are, the greater the benefits for the customers of these programmes. Borenstein (2014) claims that this provides important incentives for airlines to engage in airline alliances. He concludes that an increasing number of alliances among otherwise competing, or potentially competing, airlines, for example within domestic markets, have emerged which is likely to result in anticompetitive effects.

Fridstrøm et al. (2004) noted that FFPs have anti-competitive effects as they give rise to artificial economies of scope and switching costs. This is particularly true when a new carrier enters the market and must compete with an established carrier with a long standing FFP. Passengers who may otherwise prefer to travel with the new entrant may continue to travel with the incumbent simply to accumulate points and maintain their status level and the privileges associated with it. Competition authorities have taken note of this, particularly in Scandinavia. Hence, Sweden prohibited SAS to apply its FFP on domestic routes where competition existed. Norway went a step further and banned SAS from applying its FFP on all domestic routes; this led to four new routes being launched by rival carriers within a month and twelve within a year. The authors recommended that European competition authorities consider the anti-competitive effects of FFPs on domestic routes.

Exogenous or structural barriers to entry

Arguably the two most important exogenous market entry barriers are ASAs and airport congestion. ASAs explicitly forbid airlines to serve a specific market unless they are designated by both the countries at the market endpoints. In addition, they can prevent airlines from offering more than a specific number of weekly flights.

Likewise, airport congestion can prevent airlines from offering specific flights from these airports at least at peak times. Of course airlines can have the choice of flying to less congested airports or operating in non-peak hours, but they are drawn to congested airports and peak hours as this is where they believe they can maximise the revenues on their flights. This can create a vicious circle where more carriers want to operate at the congested airport because it is the preferred gateway to an area and thus heavily travelled. The airport becomes more congested because more airlines want to fly there, despite the fact this congestion can then turn into a source of delays and slot scarcity. In effect, this demand glut forces the airport operator to either increase capacity, something that can be very costly and risky, or manage scarce demand which could involve turning away some services at peak travel times.

To deal with this many governments have adopted congestion management measures consisting essentially in creating slots and introducing slot allocation rules. A slot is a right to land or take-off during a defined time period. As of June 2015, IATA (2015) identified 169 slot-constrained airports around the world, including 100 in Europe and 67 in Asia. In addition, in the United States, aside from a handful of airports such as those in the New York area and Reagan National in Washington, most airports operate on a first come, first served basis with no formal slot allocation system with extensive use of ground delays on departure to ensure sufficient capacity at the arriving airport. Congestion problems tend to be more acute at airports, which must manage waves of arriving and departing flights by the dominant hub carrier, creating capacity scarcity during the most desirable time periods.

Although a variety of slot allocation systems exist, including some that favour allocation of returned slots to new entrants, in many airports, slots have been allocated to incumbent carriers, granting them a privilege based on their historical presence. There is often no slot market and no such principle as free or equal access under these primary slot allocation regimes. Generally, new entrants are only able to acquire slots if an incumbent carrier decides to return its slots to the “pool”. The returned slots would then be reallocated by the pool co-ordinator to another airline.

Therefore airlines could have an incentive to keep slots just for the sake of deterring competitors from entry. Although regulators try to deter this strategy, for example by enforcing “use it or lose it requirements” courts have not ruled on slot-restriction strategies under abuse of dominance or monopolisation rules (OECD, 2014).

Some studies argue that carriers may also have some bureaucratic control over their hub airports. Not only is the home carrier the hub's best client, it is often the airport's main source of financing. Especially at congested or near-congested airports, this may give rise to control over airport operations, giving the airline an instrument to deter entry or hinder competitors (Leijsen et al, 2002). In addition, as Fridstrøm et al. (2004) point out, incumbent carriers may have an incentive to “baby-sit” some of their premium slots, using them strategically to block new entrants or ensure they do not need to relinquish them, which the authors described as commercially expedient but economically inefficient.

At last, the business model of the legacy network carrier could make it captive to its home base airport. While some new carriers, especially unaligned carriers and LCCs, could see some benefit in operating from secondary airports, this is simply not a feasible option for network carriers or even LCCs which may have established a base at a congested airport. The connectivity between flights necessary for achieving

route density, sunk costs, aero-political constraints and the lack of alternative large-scale airports ties the hub carriers to their hubs. Switching hub operations between airports is unlikely, in particular with regard to long-haul flights. Dependency on a single hub airport is somewhat smaller for short-haul flights operated by non-aligned carriers, given the larger local traffic volumes, marginal, if any, interlining and the absence of aero-political constraints for domestic and European traffic, which makes it more feasible to operate stand-alone short-haul, point-to-point flights out of alternative airports (ITF, 2014).

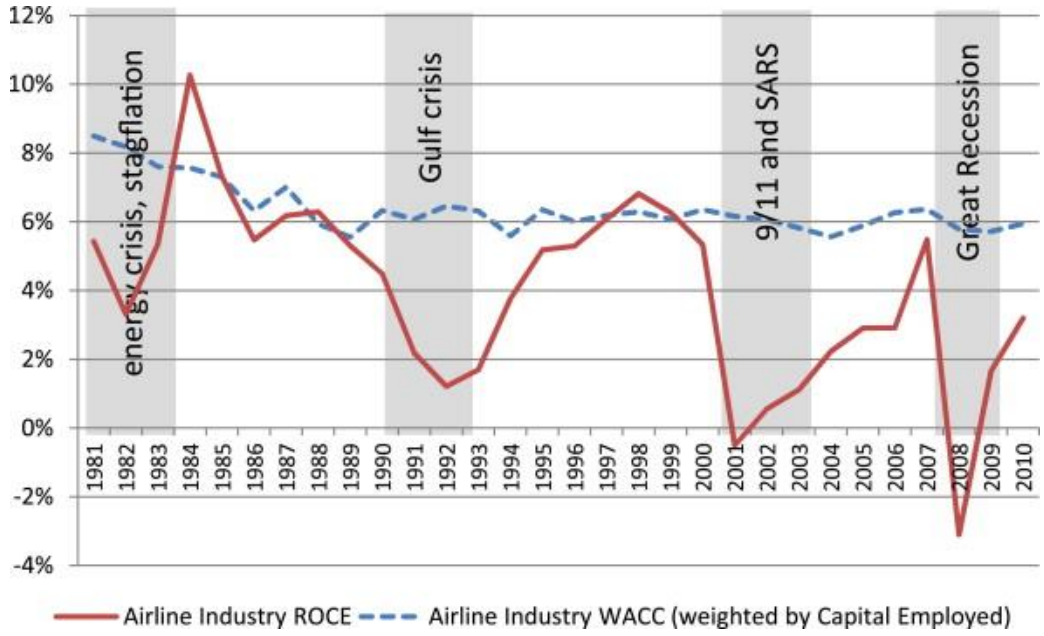
In addition to aviation-related barriers, one cannot discount the highly dissuasive effect that a negative business environment could confer. States with a high degree of corruption, criminality, unethical business practices or an unpredictable judiciary system will have significantly greater challenge in attracting foreign carriers or negotiating ASAs with non-like minded States. Protectionist or inflexible legislation can also become a barrier to entry as they discourage foreign airlines from deploying their aircraft there.

Recognising the challenges that their own airlines face in operating in foreign business environments, governments have taken on the role, when warranted, of actively representing the interests of their national airlines and intervening on their behalf with foreign governments to help resolve issues, ensure equality of opportunity and transparent access to airports. This government role is a natural extension of their role as an ASA negotiator as it helps states ensure that their own carriers are able to exercise the rights that have been negotiated on their behalf.

Regulatory barriers to exit and its impact on airline profitability

Over the years the airline sector has achieved one of the lowest levels of return on invested capital of any industry and is one of the few where the returns on capital[88] employed are consistently lower than its weighted average cost of capital[89] as can be concluded from Figure 2.7 (Wojahn, 2012a).

Figure 2.7 Returns and cost of capital for the listed airline industry



Source: Wojahn (2012a).

Microeconomic theory dictates that in an industry where market forces operate freely to create an efficiently competitive market, return on deployed capital should equal the weighted average cost of capital. If return on invested capital is greater than the weighted average cost of capital, this should attract new entrants until the excess returns are competed away. Similarly, if the return on deployed capital is less than the weighted average cost of capital, this should create an incentive for investors to withdraw their capital, thereby reducing the number of competitors until returns increase to the required level.

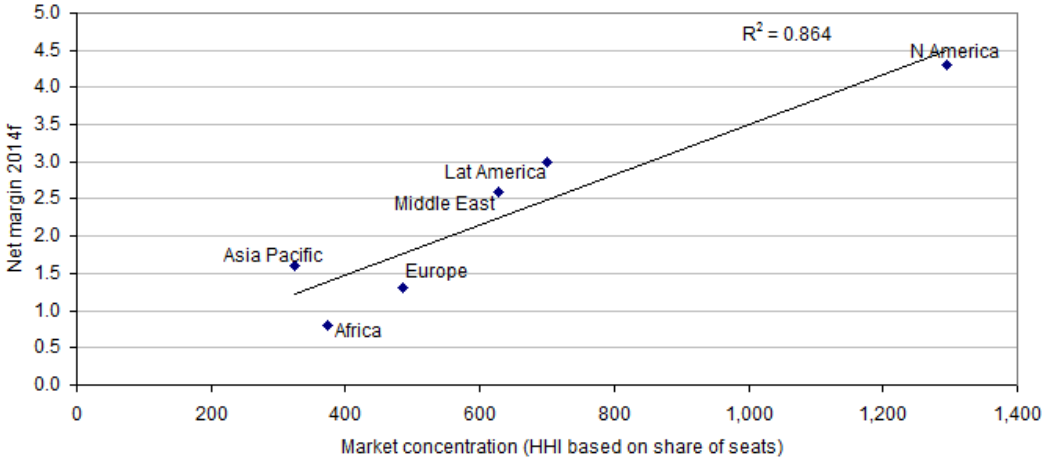
However in economically regulated industries like aviation, barriers to entry and exit can distort the market mechanism. The large majority of airlines have failed to generate a return on employed capital in excess of weighted average cost of capital through the business cycle. LCCs have generated higher returns in aggregate than network carriers and some airlines. In addition profit margins also depend on the market structure, which is different in different regions, but generally remains very fragmented in spite of recent moves towards consolidation. This is because barriers to entry are relatively low, while barriers to exit are high in the air transport sector (CAPA, 2014).

Barriers to exit are established by sunk costs, such as fixed costs that are not recoverable in the case of exit. This includes costs associated with termination payments to workers, costs for contract violations for leases of gates, hangars and office space, and the costs of abandoning valuable slots. In addition, once an airline has invested in an aircraft, there is an option value (a "real option") of keeping it in operation even if prices fall below variable costs. This is because grounding the aircraft and resuming service at a later time is costly and there is a chance that prices recover. So if some parts of the airline industry, like LCCs rationally expand capacity while others are unprofitable and rationally do not cut capacity, over-investment in the industry as a whole may result (IATA, 2012).

The continued existence and volume growth of the airline industry, in spite of its low profit margins is evidence that, at least historically, the returns required by its investors are lower than those normally demanded by rational investors looking for purely commercial returns. For example, governments may accept a lower return on invested capital from their airline investment if the airline brings them wider benefits, for example in the form of economic growth or synergies such as brand building for other business interests. Restrictions on market access and on ownership and control in ASAs largely prevent the consolidation that would otherwise be expected in markets that are very competitive and protect inefficient incumbents in markets with only a few players. In spite of liberalisation within regions (such as within the EU) and between regions (such as the EU-US market), the system is largely unchanged when it comes to ownership and control and internal market access (CAPA, 2014b).

The academic literature has shown that profit margins are a function of many variables and the relationship with these variables changes over time. CAPA (2014b) analysed this relationship between 2009 and 2014 by testing different explanatory variables and concluded that market concentration was the most important factor. To measure market concentration it used the Herfindahl-Hirschman Index (HHI)[90], which is calculated using the share of seats for each airline group in each region. It concluded that the net margins are strongly correlated with the seat share-based HHI for each global region (an R squared of 0.86), making market concentration a far better explanatory factor of regional net margins than the other tested variables. The analysis showed that the net margin is reasonably well correlated to both GDP per capita and airline seats per capita, which suggests that airlines are more profitable in regions that are wealthier and in regions with a higher penetration of air travel. Europe stands out as having a much lower margin than it should have, given its level of GDP and seats per capita. The relation between net margins and load factors was also tested, but no real correlation was found. Again, this was mainly due to the low margins of Europe compared to their high load factors.

Figure 2.8 Net profit margin for fiscal year 2014 (2014f) versus Herfindahl-Hirschman Index of market concentration based on market share by seat capacity



Source: CAPA - Centre for Aviation, OAG (seat data for week of 2 June 2014).

Box 2.6 The relation between market concentration and profit margins in Europe

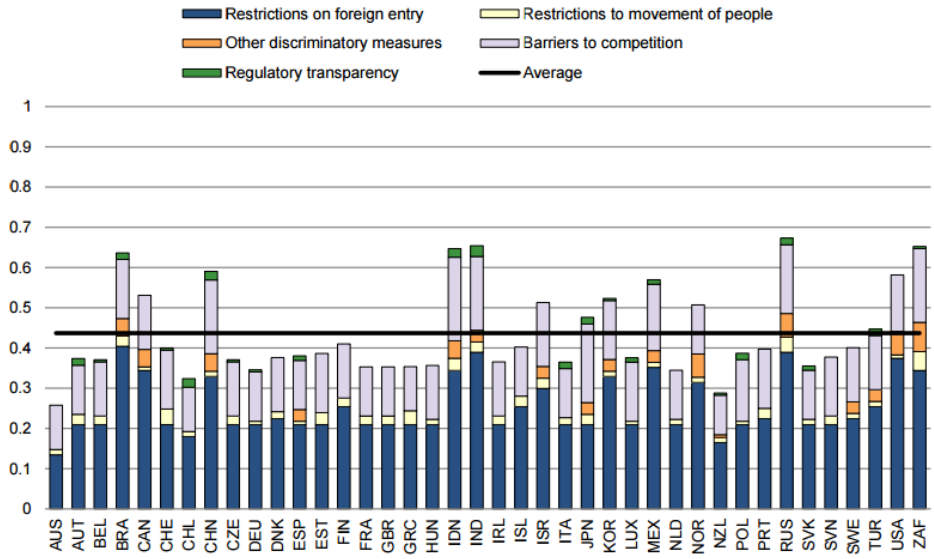
From Figure 2.8 it can be concluded that Europe sits close to the trend line that describes the relationship between the 2014 profit margin and market concentration. CAPA (2014b) concluded that the low market concentration in Europe is an important factor in explaining its low profit margins. This raises the question if market concentration is likely to increase in the years to come.

Based on the supply of seats in the European market by different airlines, it can be concluded that acquisition of the smaller European airlines by the three large European airline groups would have only a minimal impact on market concentration. Merging with or acquiring airlines outside the European Common Aviation Zone, such as Turkish, Etihad or Aeroflot would be far more significant in increasing market concentration, but this is prevented by the current foreign ownership and control rules. A deal involving two of the big three legacy carriers also seems unlikely given that they are currently integrating acquisitions and undergoing significant restructuring, let alone the fact that such a deal would face huge political and competition related obstacles. Nevertheless, as CAPA (2014b) concludes, such a transaction looks necessary at some point if Europe's airline industry is to gain the margin benefits of consolidation more rapidly than by the slower process of market share gains by larger players and market exit by smaller players.

OECD Services Trade Restrictiveness Index for air transport

The OECD Trade and Agriculture Directorate has developed a Services Trade Restrictiveness Index (STRI) to identify which trade and investment barriers as well as domestic regulations restrict trade and tourism for a number of sectors, including the air transport sector.

Figure 2.9 STRI for commercial establishment in air transport by policy area



Source: OECD, Trade and Agriculture Directorate (2015).

The index is developed for 34 OECD member countries and six major emerging economies (Brazil, the People's Republic of China, India, Indonesia, the Russian Federation and South Africa). The STRI takes values between zero and one, one being the most restrictive. They are calculated on the basis of a regulatory database that contains comparable, standardised information on trade and investment relevant policies in force in each country. The measures in the STRI database are organised under five policy categories as indicated in this figure. The index goes beyond discriminatory measures and includes domestic regulations that are important for effective market access and the creation of competitive markets. These include impediments to competition and technical standards, as well as a range of measures related to regulatory transparency and administrative requirements. The STRI covers air passenger and cargo transport services on a scheduled basis.

The figure depicts the indices for commercial establishment in air transport services, broken down by policy categories, together with a line indicating the sample average. The overall level of restrictiveness is quite elevated with an average STRI of 0.43, and limited variation across countries. Restrictions on foreign entry feature prominently in the results. Most countries restrict foreign equity participation in the sector to (at least) less than 50%. In most cases, the limitations affect airlines in both domestic and international traffic. A notable exception is Chile which does not apply any limitations on the foreign ownership of domestic airlines. Ownership restrictions are often coupled with specific limitations on the nationality of board members and managers of air carriers.

The other main category that influences the degree of restrictiveness concerns barriers to competition. Several countries maintain public ownership in aviation, usually also restricting foreign ownership in these firms. Non-competitive slot allocation is common as well, with most countries assigning slots in high demand airports based on historical rights, typically forbidding the commercial exchange of slots.

Lastly, transport and courier services are taken into account in the STRI. These are not only extensively traded but they are also intermediate services at the core of recent developments in global value chains and just-in-time inventory management, with the related demand for door-to-door services. Reducing

unnecessary restrictions and improving productivity in the various sub-sectors can be expected to have significant benefits in downstream industries as well as in the sub-sectors themselves (OECD, 2015).

The OECD[91] website features an interactive policy simulator tool to test the effects of policy changes on the STRI. In addition, the complete and up-to-date regulatory database can be downloaded from the website to review specific laws and regulations that contribute to the STRI.

Traffic rights on low density routes

It is worth elaborating on the relationship between barriers to entry and the feasibility of especially long-haul routes. Generally speaking, competition on low-density markets requires the presence of competing networks of equivalent destination utility. Tan (2014) studied the intercontinental markets between the EU and ASEAN and concluded that most routes already enjoy unlimited or near-unlimited capacity under the existing bilateral agreements. For flights between European hubs and smaller non-hub Asian cities such as Ho Chi Minh City, Yangon, Macau and Bussan the problem is not the lack of traffic rights but the absence of a sizeable market to fill up aircraft. The same applies to direct flights between Asian hubs and secondary European cities such as Bordeaux, Glasgow, Krakow or Zagreb. Due to superior geography and operating economics, the Middle Eastern and Turkish sixth freedom carriers are better positioned to exploit their hub-and-spokes advantage. Indeed, all the above cities are connected by one or more of the sixth freedom carriers through their respective hubs. This competes directly with incumbent European hubs, which would have been the more traditional airports to connect either with a direct flight or by high-speed rail.

Consequently, an EU-ASEAN comprehensive agreement with unlimited third and fourth freedom rights is likely to boost, if at all, only the hub-to-hub operations between the two regions. The thinner routes will remain difficult to fill. Overall, unlimited capacity into points such as Paris and Manila that are currently limited by the relevant bilateral agreements should be welcomed, but unlimited traffic rights alone will not help the EU and ASEAN carriers fill up their flights, particularly on the thinner routes.

The creation of an open aviation market, such as the TCAA and perhaps the EU-ASEAN market in the future may resemble the effects of the earlier deregulation of the US and EU markets. That is, airlines are likely to rearrange their networks in a process of hub-and-spoke network formation and consolidation. Consequently, the airlines using hub-and-spoke networks will stick to their fortress hubs and enter alliance agreements to connect to the hubs of their alliance partners, rather than fly from their own spokes into their partner's hub airport. When the authorities intervene by forbidding co-operation to stimulate competition, airlines are likely to stick to their original networks and refrain from serving new thin markets. The lack of competition on low-density routes may therefore be intrinsic to the aviation sector as demand may be too low to allow more than just a few or even one carrier to obtain a profitable market share. This is largely due to economies of density (on the cost side).

It is frequently argued that the introduction of a new generation of aircraft (Boeing B-787 and Airbus A-350) may undermine the position of network carriers as these efficient long-haul aircraft with their lower operating costs will allow competing carriers (either point-to-point or network) to bypass existing hub airports, as more O&D markets can be served directly. Although a certain level of hub bypassing may indeed take place, the actual impact of new aircraft technology will be much more nuanced. First, the number of O&D markets that can be served with a direct service will remain limited, compared to the vast number of markets with little O&D demand that need via-the-hub services to be connected. Secondly, hub carriers will also be able to use new aircraft technology in order to serve more secondary destinations in a profitable way. In other words, new aircraft technology is likely to result in both a reinforcement of hub systems as well as more hub-bypassing (ITF, 2014).

Box 2.6 The potential benefits of new Emirates' services for Berlin and Stuttgart

Emirates has contracted the Institute of Air Transport and Airport Research at the German Aerospace Center (DLR) to examine the economic effects coming from the provision and use of existing passenger and cargo flights and the additional benefits that could be gained from potential new services to Berlin and Stuttgart (Alers et al., 2012).

The report concludes German benefits from air transport liberalisation are twofold. On the one hand through the economic effects of additional flights and on the other hand through the employment effects in the aeronautical industry. The analyses show that a further liberalisation of aviation markets with third countries is likely to be beneficial for a wide range of stakeholders for Germany's airports, for the aeronautical industry, for shippers of air cargo and last but not least for passengers, who benefit from competitive prices, larger capacities and better connectivity. Overall, it concludes that the German economy significantly benefits from the activities of Emirates in Germany. Moreover, it has been shown that the economic benefits can be further increased when flights to additional German airports will be offered.

It is estimated that with new a daily flight from Stuttgart and Berlin to Dubai, Emirates can generate 210 one-stop connections per week in a transfer window of up to six hours after arrival in Dubai. Furthermore, each additional flight will create approximately 140 000 additional passengers for the respective airport and will potentially increase incoming tourism by about 55 000 overnight stays. This is expected to result in an additional contribution of close to 1 000 jobs through the aviation-related activities and incoming tourism. If both destinations were served twice daily, more than 2 000 new jobs would be created.

In addition, the report concludes that from the viewpoint of economic theory, Emirates has a function as a "countervailing power" against increased "oligopolisation" and "monopolisation" of markets through mergers and alliances. For Germany, this applies particularly to the "fortress hubs" in Frankfurt and Munich, where Star Alliance has a share of 62% and 65%, respectively, in the number of seats offered on flights to Southern/East Africa, Asia and the Middle East.

Thin routes can also provide opportunities to develop new markets where none existed before. For example, in the early 90s and until the turn of the century, Iberia operated a mini hub in Miami. As a result of the 1991 ASA between the United States and Spain, Iberia was allowed to operate fifth freedom flights to Latin America via the United States with a change of aircraft in Miami. The Spanish carrier flew wide–body aircraft (DC-10 and A-340) twice daily between Madrid and Miami and narrow-body DC-9 aircraft from Miami to points in Central America (Guatemala City, Panama, San Salvador etc.) with a dedicated transit facility in Miami to help passengers connect from one flight to the next. This service helped Iberia serve thinner routes to Latin America that could not sustain daily direct services on a wide-body aircraft. The hub was closed in 2004 as the requirement to obtain a visa for passengers transiting through US airports made a non-US connection more attractive to passengers.

On the other side of the Atlantic, first Pan-American and later Delta Airlines, operated a mini hub in Frankfurt where passengers from transatlantic flights could transfer to short-haul, narrow body aircraft flying intra-European routes. In Japan, Northwest Airlines and United Airlines also operated these mini hubs connecting passengers between Asia and the United States.

Tan (2014) concludes that a more significant strategy to increase the number of direct flights on long-haul routes would be to facilitate agreements between airlines from both sides that are immunised for joint venture, "metal-neutral" operations[92]. These will allow hitherto competing players on a particular route to co-operate and engage in joint marketing and revenue-sharing. To illustrate, KLM and Garuda Indonesia could conceivably launch daily flights between Amsterdam and Jakarta that see both carriers jointly marketing and operating those flights beyond simple code-sharing. Each carrier could take one of two daily flights, for instance, or half of the number of weekly flights. In this manner, the co-operating carriers would be "metal-neutral", in that they become indifferent to which between them operates a particular segment, as long as both work toward marketing all seats that are cumulatively on offer. Overall, this represents a more viable strategy against rival sixth freedom carriers and might allow for more direct flights.

Naturally, such close co-operation (presumably along alliance lines) will invite competition or antitrust law scrutiny from regulators. Such "metal-neutral" operations have already received the blessings of regulators in the United States, Japan, Korea and Singapore (for trans-Pacific flights, i.e. by Japan Airlines and All-Nippon Airways) and the United States and EU regulators for operations across the Atlantic. A comprehensive EU-ASEAN agreement could conceivably seek to facilitate such operations between the two regions and to lay down certain safeguards for protecting competition. It follows that in each case, regulators will still have to conduct robust economic analyses to determine the effect on competition. However, to the extent that strong competition is posed by the sixth freedom carriers in the EU-ASEAN market, approving such co-operation by airlines from both ends appears to be straightforward. In addition, potential competition from new entrants could discipline fare-setting of the airlines engaging in partnerships. This is especially true for routes to airports which are operated as hubs by two network carriers, such as Chicago O'Hare (American and United), London Heathrow (BA and Virgin) and Seoul (Asiana and Korean Air). Yet, on most other routes the threat from potential competition may be less, due to the fortress hubs outcome.

The OECD (1997) concluded that the policy challenge is to design regulatory instruments that prevent artificial suppression of competition while ensuring that where there are genuine economic benefits they are fully realised. These types of issues are no different to those found in many other sectors of industry where similar conditions arise. Long-standing traditions of antitrust legislation, mergers policy, consumer protection laws and so on are essentially designed to meet these types of problems. The current situation [OECD, 1997], however, is that government intervention in the international aviation market is frequently designed not to address these issues but rather to protect flag-carriers' market share.

The alignment of different policy goals

Air transport negotiators are faced with demands from various national stakeholders that may be contradictory. Travellers and shippers are looking for the most capacity possible to drive down prices and increase flexibility, with little concern for the flag of the carrier. Hub airports are looking at ways to help the home carrier offer more connectivity through the hub. Non-hub airports may look to attract foreign carriers to operate international point-to-point services in competition with services via the domestic hub. Air carriers are looking at arrangements that align with their network strategy to maximise profits. Faced with these conflicting demands, policy makers are forced to prioritise stakeholders when establishing a negotiation mandate. This raises the question whether the policy goal should include maintaining strong national airlines or should focus entirely on giving travellers and shippers the most aviation mobility choices and them letting them "vote with their feet".

Striking a balance between the benefits of the aviation industry on one hand and the benefits that aviation provides for tourism and trade on the other hand tends to be challenging as they are interdependent and sometimes in conflict. This raises the question whether governments should be indifferent to outcomes of carrier choice and only be concerned by whether or not markets are competitive and efficient.

In general it can be concluded that countries with large designated network carriers, especially if they are or were state-owned or at least considered flag carriers, tend to shape their policies more around the interest of these carriers. This is less the case for countries that are geographically isolated, such as New Zealand or Finland, or countries that have focused on attracting tourists, such as Morocco. This category has clearly focused on liberalising their markets and stimulating competition in order to give travellers and shippers the most and cheapest mobility options. Many countries with designated network carriers tend to make a trade-off between sheltering these carriers from foreign competition and focusing on the needs of passengers and shippers. The focus on carrier interests tends to increase in periods of poor financial performance.

Box 2.7 The impact of airlines on their countries' liberalisation policies

Dominant airlines have exerted significant influences throughout the liberalisation process over the years. It dates back to the time when the current international system was first introduced. The United States argued for liberal international markets after World War II. However, most other countries had reservations over full liberalisation, partly due to concerns that their airlines would lose market share to American competitors.

Several of them have privatised their national airlines in the last two decades. In Europe for example, most governments have reduced their stakes in the national airlines. This is for example the case in France. Governments of other countries, such as Singapore, the United Arabic Emirates and Russia have kept their majority stakes in the national airlines. Also, in China, most airlines are majority owned by either central or local governments although a few private niche players such as Spring Airlines and Juneyao Airlines have entered the Chinese market. The Chinese government recognised a "decisive role" to be played by markets in allocating resources, but there is still no clear separation between its dual-role as the owner of airlines and as a regulator. Fu and Oum (2015) concluded that influences from the dominant airlines in China on various aviation policies are not likely to fade away quickly.

The influence of the commercial interests of national carriers on regulation was straightforward when states owned one or more airlines that mostly operated without extensive collaboration with foreign airlines. However, today most major airlines are privatised and involved in alliances, joint ventures and other collaborative arrangements. Thus, in defending the interest of the airlines from their home state ASA negotiators are also defending the interests of airlines from other states.

Even in countries where all airlines have been privatised such as the United States, Canada, Australia and most European countries, governments are not indifferent to the performances of their national carriers. This is especially the case for network carriers as they operate hubs, which provide connectivity and employment. In addition, airport construction and expansion is usually largely financed by government. As airport assets are usually long-lived with long lead times, airline network strategies pose large financial risks to these investments.

Just as governments can have an incentive to protect their main domestic carrier's operations at their hub airports, regional governments representing non-hub airports would generally welcome foreign

carries that intend to connect their cities to intercontinental destinations. An example is the German capital Berlin which is a spoke city in Lufthansa's network and only enjoys a few direct long-haul connections, provided by Air Berlin. Passengers are therefore required to transfer via another German or European hub for most trips, or to travel by car or train to airports with a larger supply of long-haul flights, such as Frankfurt. New services from foreign network carriers would broaden the choice in frequencies and enhance the accessibility of Berlin.

Emirates has expressed its interest to serve the city but the Germany-UAE ASA limits the number of German destinations that UAE carriers can serve to four. The latter is a result of the trade-off between national and regional interests that the German government faces when negotiating ASAs.

All in all, it is clear that different countries make different choices in determining air trade agreements and policy objectives.

Accelerated liberalisation for air freight

Air freight plays a vital role in the global economy, transporting high value, time sensitive goods to markets around the world. Globally, over 13 billion freight tonne kilometres are produced monthly, representing about 1% to 2% of global trade in terms of tonnage but around 35% of the value of international trade. Air freight generates revenues of about USD 60 billion per year.

Air freight usually carries with it a higher freight rate than the surface modes of transportation and is therefore seen as a premium product. However, because it offers significantly faster transit times, it reduces the amount of pipeline inventory, that is yet to be purchased goods that are no longer warehoused. Furthermore, as air shipments tend to be small but frequent, compared to marine shipments for example, air freight can reduce the amount of inventory held between deliveries cycles and the size of the safety stock the buffer companies keep on-hand to answer higher demand than planned. Thus, when examining supply chains under a total distribution cost framework, Zhang et al. (2002a) argue that air freight can actually lead to lower logistics costs despite higher freight rates.

ASAs have traditionally treated air freight and passengers in a similar fashion. The logic of negotiation of traffic rights, which amount to basically trading traffic between two countries, is inherently a passenger-centric view of aviation. When looking at passenger traffic between two countries, one could argue that this traffic should be divided amongst the national carriers of both countries. However, air freight economics behave in a far different manner than passenger economics, something which ASA do not always properly reflect.

Air freight transport differs from passenger transport in four key areas. First, air freight is mostly, if not always, a one-way proposition. This implies that aircraft may have significantly different loads on each direction of the same segment, contrary to passenger traffic. For example, an aircraft travelling from the Caribbean to Europe may be full of perishable goods on the eastward journey but have very little freight on the westbound journey. This contrasts with the situation experienced in the passenger cabin, where one should expect passenger traffic to be somewhat equivalent, on average, in either direction.

The implications of this situation are two-fold. On the one hand, for combination carriers, this means that on the less freight intensive direction, they may have to forgo freight revenue or sell capacity at a steep discount. Since the expense of the flight is already mostly, if not all, covered by passenger revenue, this situation does not threaten the viability of the route. On the other hand, for freighter operators, this situation forces them to cover the costs of both directions with revenues coming from the heavy-demand direction. In effect, freighter operators must cross-subsidise their directional legs in order to make the round-trip profitable. In so doing, it raises the price of air freight on the heavily travelled route

and makes freighters less competitive with combination carriers, who need not charge such high prices, and maritime shippers, who already offer very low prices on a tonnage basis.

The distinction between all freight and combination services is broadly accepted, as is the idea of separate and more liberal traffic rights for air freight operations. One of the earliest initiatives to liberalise air freight at a faster pace than air passenger transport was the passage of the 1977 Domestic All-Cargo Deregulation Statute in the United States, a full year before the passage of the Airline Deregulation Act in that country as explained in the section on US deregulation earlier in this chapter.

The idea of accelerated international liberalisation of air freight services was discussed at the ICAO 4th World Wide Air Transport Conference in 1994, as well as by the OECD in 1997, and again in workshops held in 1999, 2000 and 2002.

The OECD (2002) recognised that some carriers and their national governments may regard passenger and cargo operations as indivisible. Especially in the case where the national carrier does not operate a freighter service, air freight rights could be used as a negotiation lever to obtain more favourable passenger transportation rights. However, the authors recommended governments to weigh this advantage against the broad economic benefits that market liberalisation can bring to air freight shippers and consignees.

To circumvent this issue, freighters have developed "triangular" routes, where they build up a number of one-way segments into a circular route, made-up of different routing on the outbound and inbound journeys. An example of this is Lufthansa's freighter flights between Frankfurt and Mexico City, which stop in Chicago O'Hare on the westbound journey and in Dallas-Fort Worth on the eastbound journey. The choice of this routing likely reflects some trade imbalances that Lufthansa is trying to leverage. On the passenger side, even though there are significant imbalances from an origin/destination perspective, since most passengers fly a round trip, those imbalances do not affect loads in individual segments[93].

The consequences of this is that freighter operators require some fifth freedom traffic rights in order to be able to pick up freight at the intermediate airport. However, passenger operators would not need to use this complex routing and would likely, as is the case with Lufthansa's passenger aircraft, fly directly between Frankfurt and Chicago, Frankfurt and Dallas and Frankfurt and Mexico City, making fifth freedom rights a non-issue for those three passenger markets.

In addition, freight carriers may want to operate routes completely outside their home country. For example, in the previous Lufthansa example, the German carrier could possibly operate a profitable route from Mexico to a point in South America, flying Mexico-originating freight. This would require seventh freedom traffic rights. Such a scenario seems operationally more effective for freighters than passenger aircraft, as the latter tend to operate international flights mostly from and to their hubs to maximise its connectivity. On the other hand, outside of the air express business, freight operators combine both a hub-and-spoke network and point-to-point services depending on which is most cost effective.

Thus, in both cases, we are presented with a situation whereby freight services require a more liberalised regime than passenger services in order to operate profitably and effectively.

The second differentiating factor between passenger and freight traffic is that demand for passenger traffic is driven by where passengers live and where passengers desire to travel to, whether for leisure, business or visiting friends and family, whereas demand for freight traffic is driven by where goods are produced and where they are consumed. Therefore, both generate specific demand patterns at a city-pair level which are not always aligned. In terms of ASAs, this means that there may be a very different need in terms of frequency between two countries for passenger aircraft and freighter aircraft.

So far, discussion on liberalisation has focused on the supply side, with ASAs setting the framework to determine the capacity, level of service and price offered between city-pairs. However, when analysing air freight liberalisation, one must also consider an added dimension, liberalisation of trade, which in turn becomes a determinant of demand. At the 2014 IATA World Cargo Symposium, FedEx CEO Frederick W. Smith warned of how the growth in protectionist legislation, up by a quarter in just five years according to him, is hampering world trade expansion. The WTO (2013) indicated that protectionism may have played a role in decreasing global trade during the great recession.

Meanwhile, Pierce (2014) shows that the ratio of domestic production to international trade has stopped growing since the great recession and has even shown signs of a downward trend. This can be attributed to a number of factors, including non-tariff trade barriers and the phenomenon of reshoring. Finally, Hughes (2014) explains that supply chains for traditionally air eligible commodities[94] are increasingly shifting to the marine mode, taking advantage of significant lower costs and marked improvements in reliability of the marine mode.

The key message here is that the drivers for demand for air passengers and air freight are from the onset significantly different and that demand for air freight can be influenced by factors beyond the control of airlines, such as trade policies or shifting supply chain models. These factors can significantly alter demand patterns, which must then be overlaid to the passenger demand that drives routes operated by passenger aircraft.

A clear consequence of this fundamental difference between demand patterns in passenger transportation and freight transportation is that they result in distinct spatial distribution patterns. However, an additional distinction, which will be our third differentiating factor, is that the density of demand for air freight services is significantly more concentrated than that for passenger services, while the demand for express services is actually more diffused. There are only a limited number of air freight markets that can economically sustain a daily freighter service (100 metric tonnes in each direction), with other markets being served by passenger aircraft or dedicated charters. On the other hand, express services need to be able to deliver to almost any address, meaning they require a much broader network, have an extensive fleet mix to align capacity and demand and make strategic use of ground services to complement their air network and offer a seamless door-to door service. Thus, it is unreasonable to expect that the optimal network for passenger transportation is aligned with that for freight or express services and points to the need for parallel regimes for passengers, express services and air freight.

A fourth differentiating factor between passenger and freight traffic is preference of gauge. Passengers may prefer to travel on a wide-body aircraft, especially on long-haul flights, but they can easily transfer from a wide-body flight to a narrow-body flight with no additional cost compared to transferring from wide-body to wide-body aircraft. In the case of freight, since it usually travels in unit load devices (ULD), be it standardised containers or pallets, there is a significant monetary and time cost in breaking down a wide-body container or pallet and reloading the freight on equipment designed for narrow-body aircraft. Thus, when leveraging a hub-and-spoke model, air carriers will try to avoid a gauge change in aircraft in order to connect ULDs “fin to fin”, meaning directly from one aircraft to another without a need to deconsolidate and reassemble a ULD, a consideration that is non-existent on the passenger side. This means that air carriers will prefer to operate wide-body aircraft on their most freight intensive routes, which may create issues with ASAs when capacity is capped at that of narrow-gauged aircraft.

In addition to these fundamental economic and operational differences, there is also an intangible differentiation between passenger transport and freight transport that makes the latter somehow less sensitive to economic regulators than the former. Tan (2013a) mentions that there is less sentimental

attachment associated with the transportation of freight than with the transportation of passengers, while the OECD (2002) also noted that air freight services are less subject to "national sensitivities" than passenger traffic. Possibly beyond sentiment though is a difference of outcome.

In the case of freight transportation, countries are interested first and foremost in ensuring that international trade is fluid, efficient and reliable. The interest of countries in logistics performance, efficient international gateways and competitive supply chains reflects a realisation that these factors are intimately tied to economic growth and wealth creation. Removing barriers between local manufacturing and exports markets can have a significant positive economic impact. Thus, the focus for international air cargo transportation is articulated around seeking a market outcome that provides an efficient and low-cost supply chain to connect local exports to global markets and imports to the domestic market rather than supporting national carriers and ensuring that they receive their "fair share" of traffic.

In the case of passenger transportation, it is often taken for granted that the passenger will find a way to travel from origin to destination. Thus, the policy focus turns to how this travel will take place, with, generally speaking, the use of the home carrier being the best outcome, the use of a carrier from the destination country as the second best outcome and the use of a carrier from a third country as the worst outcome, unless viewed from the perspective of that third country where it would now become the best option. Thus, the focus for international air passenger transport is often on the choice of air carrier and the complex web of non-open skies ASAs which generally tries to impose quotas on supply as a way to ensure their home carriers obtain a "fair share" of passenger traffic.

In light of how different the air passenger and air freight markets actually are, there have been significant discussions in having a separate and more liberal ASA for freighter operators. Overall, seventh freedom rights for air freight exist in more than 100 of the 4 000 ASAs currently in force (ICAO, 2013). The United States has seventh freedom rights for air freight with over 70 countries (IITL, 2008). This has led FedEx to develop hubs in Paris, Kansai and Guangzhou and UPS to develop hubs in Hong Kong, Shanghai and Cologne.

These hubs make extensive use of seventh freedom traffic rights to give both integrators a truly global reach and help them play an extensive role in transporting freight that never enters the United States. This is indeed quite different from the situation on the passenger side where nearly all passengers travelling on a US airline travel through at least one US airport during their journey.

Tan (2013a) notes that the ten-country[95] ASEAN Roadmap for Integration of Air Travel Sector (RIATS) called for a two-speed liberalisation regime, favouring air freight with full liberalisation by 2008, seven years before passenger services. The RIATS commitments led to the Multilateral Agreement on Full Liberalisation of Air Freight Services between all member countries. That agreement provided unlimited third, fourth and fifth freedom rights for all cargo traffic in two stages.

The first stage saw the agreement being applied to a specific list of 33 airports, including all the capital airports[96] and Subic Bay, where, at the time, FedEx operated its principle Asia-Pacific hub[97]. The second stage saw this liberalisation being applied to all international airports in the region. By 2009, all ASEAN members, except Indonesia[98], had implemented both stages of the agreement. However, it is important to remember that the agreement only covered intra-ASEAN international air freight. As we have discussed previously, this situation could create an imbalance in commercial potential of ASAs negotiated between ASEAN and single countries or groups of countries behaving as a single market (such as the case of the EU). Thus, the fifth freedom traffic rights enjoyed by ASEAN carriers for the intra-ASEAN market may not exist in a future ASA between ASEAN and a third party.

With regards to air cargo, seventh freedom traffic rights also exist in both the Canada-US and the Canada-EU open skies agreement, although in both cases they have not been extensively used, saved for a Newark to Bermuda freighter flight, operated by Cargojet, a Canadian air operator.

It is clear that air freight and air passengers are two completely different markets but should they be afforded differential treatment? It has certainly been the view of ICAO member states that a separate regime for passengers and freight could be beneficial in situations where states are more willing to liberalise one, usually freight, but not the other, usually passengers. ICAO (2013) notes a number of restrictions facing the growth of air cargo, including limited freedoms under a large number of traditional agreements, a regime focused mainly on passenger services and combination services, night curfews, limited ground-handling rights and burdensome customs requirements. At the 6th Air Transport Conference, ICAO members agreed to continue liberalising air cargo on a bilateral basis, but also that ICAO itself should help develop a multilateral framework articulated around air cargo liberalisation which individual countries could join. This could, in effect, decouple air cargo traffic rights from the significantly more contentious air passenger rights in existing ASAs and significantly streamline the regulatory framework, especially if leading countries agree to it.

A more liberal air cargo regime would have an immediate beneficial impact on the industry as, in effect, it removes production quotas that are derived from passenger demand considerations. In addition, since a more liberalised air freight regime already exists in a number of major ASAs, expanding this fast track to liberalisation to other air services will likely not create overwhelming opposition. Furthermore, if air cargo liberalisation is successful, it could further put pressure on the air passenger segment to make further progress in liberalising.

One key consideration, however, is how a more liberalised freighter environment could be a competitive disadvantage for passenger airlines. At present, nearly 45% of the world's freight, as measured in revenue tonnes-kilometres, travels by passenger aircraft, according to Boeing (2014). While freighter aircraft dominate the air cargo market to and from Asia, passenger aircraft dominate the transatlantic market and most north-south routes.

Any liberalisation in air cargo is faced with the challenge of arriving at a solution that will place the four main types of air cargo service providers, namely passenger carriers, combination carriers operating a mixed fleet of passenger aircraft, freighter operators and integrated express carriers, on the same competitive footing or, at least, to avoid a significant distortion of competitive conditions. A liberalised air cargo market could give freighter and express operators an advantage over passenger aircraft operators, who could react either by opposing efforts to liberalise the air freight market or by pushing for further liberalisation of the passenger market. Combination carriers could find themselves in a difficult position, having to compete with freighter operations benefiting from a more liberalised marketplace that their passenger operations.

This imbalance was recognised by the OECD (1999), which favoured a liberalised regime for freighters and express carriers, but admitted that it would create a distortion for passenger aircraft. On the whole, though, a partially liberalised regime for freight was better than a closed regime, despite the uneven treatment it would afford air carriers.

An additional consideration here would be the role of chartered freighters. Ad hoc charters usually operate outside of the scope of ASAs. This provides carriers with extensive flexibility to meet demand when it is present and sufficient. However, for most small to medium-sized shippers, charters represent an uncertainty since a flight will only be operated when there is sufficient demand for a large shipper or a forwarder to charter an entire aircraft. Thus, charter operators enjoy a level of freedom that scheduled

operators do not, but their revenue stream is far less predictable due to the ad hoc nature of their operation.

Seeing that air cargo represents less than 10% of most passenger carriers' revenues, and that they have progressively withdrawn from freighter operations, it is unlikely that a more open freight regime will lead passenger carriers to demand a more liberalised passenger regime to compete more evenly with freighters. Rather, passenger carriers would likely be more willing to compete on a price basis and, ultimately sacrificing some air freight business in order to maintain a more restrictive passenger traffic rights regime until such a time when it is to their advantage to open up the market.

A preferential treatment for air freight could have some unintended consequences on passenger traffic for routes flown by carriers with a significant belly freight operation. Zhang et al. (2002) demonstrate that if a freighter and passenger operator compete in a market where freighters enjoy more liberalisation than passenger aircraft, the advantage to freighters could translate in them gaining a bigger market share over passenger carriers compared to a situation where there was an equal level of liberalisation. Since the loss of some air freight traffic results in little reduction in operating costs for passenger carriers, they will experience a drop in profitability for a given route.

On routes such as the North Atlantic, where passenger airlines on both sides of the ocean have a relatively low reliance on airfreight revenues, the impact could be marginal. However, on routes between far-east Asia and either Europe or North America, the results can be quite different.

Asian carriers have a far superior reliance on air freight revenues than North American and European air carriers. For example, in 2013, Cathay Pacific's freight revenues were 24.8% of its total aeronautical income[99] compared to 2.6% for United Airlines. United Airlines' significantly smaller reliance on air freight revenues means that it is less likely to adjust its passenger fare to make up for lower air freight loads. Cathay Pacific, on the other hand, would experience a more important revenue drop, which could force it to either revise its passenger fares upwards or even reduce its operating costs by down gauging or reducing frequency. In either case, the passenger air carrier with a heavy reliance on air freight revenues finds itself disadvantaged compared to the passenger carrier with low air freight revenues, in a scenario with a more liberalised air cargo regime and where freighters and passenger aircraft compete on the same market. Zhang et al. (2002) thus warn that separating passenger flight rights from air freight rights may be "fraught with difficulty" as both sides of the business are significantly more intertwined for Asian carriers than they are for North American ones.

The case for Europe is less clear cut, as some leading European carriers, such as Lufthansa and Air France, do have a freighter operation, but that operation is rather modest and in fact has been shrinking in the past few years. As a case in point, in September 2014, Air France announced that it would be shedding two-thirds of its freighter fleet by 2016, going from 14 in 2013 to five in 2016. IAG Cargo, the combined British Airways, British Midland and Iberia's cargo operations, ceased operating freighter aircraft in early 2014 and now relies on belly hold capacity and a single, wet-leased Qatar Airlines B-777-200F freighter[100]. With 14 freighter aircraft, Lufthansa is the only major European carrier with both a significant passenger aircraft and freighter aircraft network and would likely face the same pressures as Asian carriers if freighter liberalisation was accelerated.

A final thought on a liberalised air freight regime goes to defining what is meant exactly by "liberalised". Generally, a liberalised air freight regime refers to granting seventh freedom rights, in addition to unlimited third to sixth freedoms. However, further benefits of liberalisation could be obtained through co-terminalisation, eighth and ninth freedom rights. Liberalisation also presumes conditions that are not usually included in ASAs, such as access to airports at "freight-friendly" times, customs clearance that is timely and an efficient and competitive market for ground handling services.

Co-terminalisation

Co-terminalisation is a rather rare concept as it requires a number of variables to be aligned, namely that there is enough of an air cargo market in a given country to support two destinations, that the loads to and from each point are sufficient to offset the cost of flying a partially filled aircraft between the two domestic points and that geography doesn't allow for other options, such as trucking, to be more cost and time efficient.

Co-terminalisation has been talked about mainly in three contexts:

- in China, where China Southern tries to serve multiple Chinese airports on an international route, such as its Chongqing-Shanghai-Amsterdam freighter route
- in Anchorage Alaska where freight can arrive from transpacific flights, be transferred from one aircraft to another and then continue to points in the United States, or vice-versa
- in the case of US integrators wanting to serve multiple Canadian points on a single flight, with no local traffic rights (i.e. no cabotage).

In this last case, significant debate was generated on the merits and risks of co-terminalisation, with a fear that such an action could hurt the domestic Canadian air freight industry. This issue has been put to rest since 2006 as co-terminalisation was permitted in the Canada-US open skies agreement. The feared impact to the Canadian air freight industry never materialised and most of the co-terminalised routes, such as Memphis-Mirabel (Montreal)-Ottawa, had a domestic segment that was better suited for road haulage than a stand-alone domestic freight operation[101].

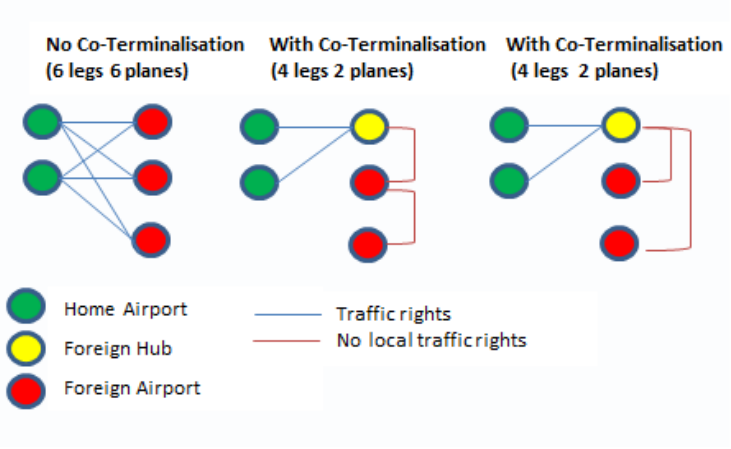
Co-terminalisation can generate two significant benefits to air carriers where the market conditions and geography align to produce favourable conditions to such an activity. First, if the air carrier is flying from its home base to two points in the foreign country using in each case a small- or medium-sized aircraft, it could consolidate both flights into one, using a larger aircraft and generating substantial economies of scale coming from having to use only one aircraft and one flight crew. In addition, the total distance flown by one aircraft serving two destinations is certainly significantly less than two aircraft each serving one destination, which in turn reduces fuel burn and aircraft utilisation. Finally, as a rule of thumb, larger aircraft have a smaller operating and ownership cost per tonne-kilometre flown than smaller aircraft[102]. Therefore, reduced flight distances and the use of more efficient aircraft combine to drive down costs.

Intervistas (2006) simulated a case of co-terminalisation by consolidating two FedEx flights into one. The two flights in question were Memphis-Calgary, using an A300-600F, and Memphis-Vancouver, using a B727-200F. They calculated that the cost to operate each flight separately was CAD 129 400 on a return basis. By consolidating these flights into a single Memphis-Calgary-Vancouver flight using an MD-11, the operating cost could be lowered to CAD 121 700, a 6% reduction in cost with no impact on revenues. Further cost reductions could have been obtained by operating a circular flight, Memphis-Calgary-Vancouver-Memphis; however this would likely be incompatible with FedEx's operational requirements[103], so it was not simulated.

A second case of co-terminalisation involves using a foreign country destination as a foreign hub. In this situation, an airline is flying from two or more different points in its home country (A) to two or more different points in the same foreign country (B). If all possible combinations were flown, this would produce A*B flights. However, if all flights from the home country first flew to the same foreign hub, then the carrier could operate one flight between the foreign hub and the various destinations, now reducing the number of flights to A+B-1[104] which is certainly smaller than A*B.

The simple representation below shows how a network with six flights without co-terminalisation (left) can be simplified to one with four flights (middle and right). In both cases, the carrier would have no local traffic rights, so no instance of cabotage. Instead, it would transport freight from home country airports to foreign airports via the foreign hub. This simplified network also reduces the number of aircraft needed to serve all six city-pairs, although the size of the aircraft may be larger, which in turn leads to economies of density. The difference between the middle and right scenarios is whether the two foreign airports are linked to the hub in a sequential manner by one aircraft or if they each have a non-stop flight to the hub, which requires two aircraft.

Figure 2.10 Schema of network design with and without co-terminalisation



Finally, it should be noted that restricted co-terminalisation seems to be a uniquely air cargo issue. In the case of passenger transport, air carriers routinely operate flights that have one or more segment with no local traffic rights, such as Lufthansa's Frankfurt-Shenyang-Qingdao flights or Air New Zealand's Auckland-Osaka-Tokyo flights.

Why is aviation outside the World Trade Organisation?

The pre-existence of the Chicago Convention and its subordinate resolutions enabled traffic rights from being exempted the General Agreement on Trade in Services (GATS) while still providing them with a global framework. GATS took effect in 1995 and is incorporated as one of the Annexes to the Agreement Establishing the World Trade Organisation (WTO). Aviation is governed by a specific annex of GATS, the Annex on Air Transport Services. The annex excludes from its scope the largest part of international trade rights for aviation, namely traffic rights and services directly related to the exercise of traffic rights, which member states preferred to retain exclusively within the Chicago Convention[105]. Its application is explicitly limited to three ancillary services, namely, aircraft repair and maintenance, selling and marketing of air transport and computer reservation systems[106]. This "unique sectorial exclusion" resulted from a negotiating process in the Uruguay Round agreed unanimously by all 108 delegations[107]. The very limited coverage of air transport services by GATS is explained by the special characteristics of air transport (Mendes de Leon, 2011)[108]. The main issue concerns application of two central elements of the GATS system, namely the most favoured nation (MFN) principle, which is mandatory, and the optional national treatment (NT) principle to international air transport. That being said, given the optional nature of NT and the possibility of awarding MFN exemptions at the time of WTO membership, it would, at least in theory, have been possible to include all aspects of the industry under GATS,

however this would have created a situation where no significant discipline would be applied to the sector.

Under the MFN principle and Article II(1) of GATS, each member state shall accord immediately and unconditionally to services and service suppliers of any member state treatment no less favourable than it accords to like services and service suppliers of any other country. While it may initially appear as a way to spread air liberalisation, MFN can in fact have the opposite effect in aviation. As it does not impose reciprocity it would enable states to take advantage of a liberal regime without being required to do the same. This issue was identified as the "free rider problem" by Havel (2009). Meanwhile, the NT principle would enable foreign airlines to operate on the same footing as national airlines, thus enabling full cabotage (Staniland, 1999).

Both principles lead to an outcome incompatible with the orientation of contemporary international aviation policies, making it unlikely, at least in the foreseeable future, of seeing air transport services incorporated with the GATS.

Air Liberalisation Index

ASAs incorporate many features covering a wide range of topics such as aviation security, incident investigation, immigration, control of travel documents and many others. In a recent study, the WTO Secretariat (WTO, 2006) identified seven features of ASAs as relevant indicators of openness for scheduled air passenger services. These include the "freedoms of the skies", capacity restrictions, fare restrictions, restrictions related to foreign ownership, control and designation, and restrictions related to alliances such as code-sharing agreements.

A very liberal ASA is often referred to as an open skies agreement (OSA). However, the expression "open skies" has no single undisputed definition. It seems to cover at least two kinds of agreements. The US Department of Transportation introduced the term to designate agreements with no control of routes, tariffs and capacity and allowing fifth freedom rights. Such agreements may, however, differ depending on the time of signature and on the bilateral partner concerned. Other countries use the term in relation to more ambitious ASAs, including seventh freedom rights and even cabotage.

Tan (2014) states that the basic philosophy behind all modern open skies aviation agreements is removing restrictions on fares, capacity, frequency and aircraft type for airlines designated by both sides of the market. Such relaxation is provided for under the EU-US and EU-Canada ASAs, the ASEAN-China agreement as well as in certain bilateral agreements between individual countries on both sides.

Countries are obliged to register any co-operative agreement and arrangement relating to international civil aviation with the Council of ICAO (pursuant to Article 83 of the Chicago Convention and Assembly Resolution 37-20). ICAO displays the full bilateral agreements and amendments in an online database. However, getting the information about the actual capacity is difficult since they are typically confidential.

Several intergovernmental organisations and companies have developed indices to provide an indication of the overall degree of liberalisation introduced by ASAs, without disclosing the actual written content or the names of the operating carriers. The construction of an index involves the choice of weight to assign to each provision to denote its marginal contribution to the liberalisation of the aviation market. However, the choice of the weight is arbitrary and many options exist.

One of the indices most used in economic literature is the Air Liberalisation Index (ALI), constructed by the WTO Secretariat (WTO, 2006) and made available via an analytical tool on their website, called the

Air Services Agreements Projector (ASAP). The ASAP tool was last updated on 16 January 2013 and is based on ICAO's ASA database of 2011 and IATA's traffic data from the same year. According to WTO, not all ASAs are included as ICAO contracting states do not always comply with their notification obligations. In addition, confidential memoranda are not notified to ICAO. Thus the ALI only presents a partial view of all ASAs in force.

The ALI is constructed by assigning weights to the different provisions of ASAs. The weights were defined by the WTO in consultation with a group of experts on aviation industry with the aim of capturing the relative importance of each provision in liberalising the sector. The ALI ranges between 0 and 50, where 0 is associated with the most restrictive agreement and 50 denotes the most liberal agreement.

Four different weighting schemes have been proposed, thus originating four different indexes. The weighting scheme of the so-called standard ALI assigns a weight between 0 and 8 to each of the seven components of ASAs. Each of the three other indexes emphasises one specific feature of ASAs. These are the ali_fifth freedom, the ali_ownership and the ali_designation. The ali_fifth freedom assigns a weight of 12 to fifth freedom. The ali_ownership assigns a weight of 14 to the provision that allows foreign airlines to service a country if their principal place of business is in the foreign country. The ali_designation assigns a weight of 7.5 to multiple designations (the right to designate more than one airline to operate a service between two countries).

The reason for introducing these alternative indexes is to account for specific geographical and economic factors that may in some circumstances render these provisions more relevant to improve market access. However, the four ALI indexes are highly correlated among themselves, with correlation coefficients and the Spearman rank correlations around 90% or above (WTO, 2008).

ICAO 2013 Initiative

Pursuant to Article 44(d) of the Chicago Convention, one of the aims and objectives of ICAO is to foster the planning and development of international air transport so as to meet the needs of the peoples of the world for safe, regular, efficient and economical air transport[109].

Resolution A38-14 of the 38th Session of the ICAO Assembly[110], in its Appendix A, refers to the economic regulation of international air transport. With regard to the issue of liberalisation of market access, the assembly urged member states to continue to pursue liberalisation at a pace and in a manner appropriate to needs and circumstances. With regard to air cargo services in particular, the assembly urged member states to give due regard to the distinct features of air cargo services when exchanging market access rights in the framework of ASAs.

The assembly requested the council to develop and adopt a long-term vision for international air transport liberalisation, including examination of an international agreement by which states could liberalise market access. With regard to air cargo services in particular, the assembly requested the council to develop a specific international agreement to facilitate further liberalisation of air cargo services.

With regard to co-operation in regulatory arrangements, the assembly acknowledged that the strict application of the criterion of substantial ownership and effective control could deny many states a fair and equal opportunity to operate international air services. It urged member states to continue to liberalise air carrier ownership and control, according to needs and circumstances, through various existing measures such as waivers of ownership and control restrictions in bilateral ASAs or designation provisions recognising the concept of community of interest within regional or sub regional economic

groupings. Moreover, it requested the council to initiate work on the development of an international agreement to liberalise air carrier ownership and control.

With regard to competition, the assembly urged member states to take into consideration that fair competition is an important general principle in the operation of international air services. It further urged member states to develop air transport-specific competition law and policies and to encourage co-operation among regional and national competition authorities. Moreover, it requested the council to develop a compendium of competition policies and practices in force nationally or regionally. It further requested the council to develop a set of high-level, non-binding, non-prescriptive core principles on consumer protection. Last, it requested the council to develop tools such as an exchange forum to enhance co-operation, dialogue and exchange of information on fair competition between states.

With regard to the issue of including aspects of international air transport under GATS, the assembly requested the WTO to accord due consideration to:

- air transport's particular regulatory structures and arrangements and the liberalisation taking place at the bilateral, sub regional and regional levels
- ICAO's constitutional responsibility for international air transport
- ICAO's existing policy and guidance material on the economic regulation of international air transport[111].

Last, it requested the council to:

- continue to exert a global leadership role in facilitating and coordinating the process of economic liberalisation
- pursue in a proactive manner developments in trade in services that might impinge on international air transport
- promote communication, cooperation and coordination between ICAO, the WTO and other intergovernmental and non-governmental organisations dealing with trade in services.

Over the past decade, air liberalisation has gained considerable momentum. It is characteristic that the 2003 ICAO Air Transport Conference concluded that "conditions were not ripe at that stage for a global multilateral agreement for the exchange of traffic rights" and that states should "continue to pursue liberalisation […] at their own choice and own pace". Then ten years later, the 38th session of the ICAO Assembly requested the council "to develop and adopt a long-term vision for international air transport liberalisation, including examination of an international agreement by which States could liberalise market access", as well as "to develop a specific international agreement to facilitate further liberalisation of air cargo services". By the same token, whilst the 2003 ICAO Air Transport Conference adopted a model airline designation clause for optional use by states, the 38th session of the ICAO Assembly requested the council "to initiate work on the development of an international agreement to liberalise air carrier ownership and control".

Country case studies

The following sections present a short case study of strategic states and where they stand in terms of domestic and international air transport liberalisation.

Australia

Aviation plays a critical role in connecting Australian travellers and goods to the world. Its insular location, combined with vast geography and low population density makes aviation particularly important to Australia. Its tourism industry is almost solely dependent on air, as that is the mode of entry for over 99% of its visitors.

There were over 31.7 million international passengers in Australia in 2014, flying mainly to and from Sydney (41%), Melbourne (24%) and Brisbane (15%). Four countries, New Zealand, Singapore, the United Arab Emirates and the United States, account for almost 52% of Australia's international market on an enplaned/deplaned basis. Qantas carried over five million international passengers and five carriers account for half the international traffic of Australia. International air cargo plays an important role in Australian transportation, with 880 000 tonnes of airfreight carried in 2014 and 41 000 tonnes of air mail. The international market, in addition to Australian carriers, is served by 49 foreign passenger carriers and five foreign freighter operators (BITRE, 2014).

Australia pursued two distinct aviation policies until the 1990s, one for the domestic sector and one for the international sector. Domestically, the *Two Airline* Policy of 1952 enabled Ansett Airlines and Australian Airlines to operate a virtual duopoly in the domestic market. The *Two Airline* Policy was abolished in 1990 and the interstate domestic sector was fully deregulated[112]. Between 1990 and 2014, domestic traffic increased by 370% or 6.7% per year on a compounded basis. This was significantly better than the 1% drop per year experienced in the previous decade. In the process, Australia has given itself one of the most liberal domestic aviation regimes as it places no limits on foreign ownership and control of its own domestic carriers, subject to regulatory review. However it does not allow cabotage, meaning that to operate a domestic flight, an air carrier must be registered in Australia, independent of its ownership and management structure. Australia also privatised 22 airports between 1997 and 2002.

Internationally, Qantas was the only Australian airline permitted to operate international flights until 1992 with the advent of multiple designations. Australia established the International Air Services Commission in 1992 to distribute capacity and frequency rights defined in ASAs to Australian carriers who apply to operate on a given route. In allocating capacity, the commission assesses the merits of claims by applicants under specified public benefit criteria stemming from policy statements by the Australian government.

Qantas and Australian Airlines, both state-owned, merged in 1992 to become the Qantas Group, which was privatised a year later. Today, to operate international flights, Australian air carriers must meet certain ownership and control requirements as set out by the *Air Navigation Act 1920*. It requires Australian air carriers operating international flights to be at least 51% owned by Australian nationals. It also requires two-thirds of the board members, including the chairperson, to be Australian citizens.

Qantas initially faced additional requirements as per the *Qantas Sale Act 1992* (QSA). That act limited the concentration of foreign ownership to 35% for a single foreign airline and 25% to a foreign individual, while it maintained a cap on foreign ownership at 49% similar to any other Australian international carrier. These Qantas-specific requirements were abolished in 2014 when the QSA was amended and

Qantas is now governed by the same ownership and control requirements as any other Australian carrier operating international flights.

The Australian government has a policy of pursuing international aviation liberalisation where it is in the national interest. Australia has ASAs with 94 partners as of early 2015 (Australian government Productivity Commission, 2015). The Trans-Tasman agreement[113], signed in 2000 and ratified in 2002, was Australia's first open skies agreement and remains its most liberal. It allowed for New Zealand-based carriers to operate unlimited domestic flights in Australia, flights to Australia and beyond (fifth freedom flights) and for freighters to operate seventh freedom flights. Since then, Australia has also entered into open skies agreements with Japan, Singapore, Switzerland, the United Kingdom and the United States. Open skies with China is reportedly a desired outcome for Australia but China has preferred to take a more gradual approach. Nonetheless, in January 2015, Australia and China expanded their existing ASA to add close to 50% more capacity between key Australian and Chinese gateways as well as remove the requirement for Australian carriers to seek fare approval by China (CAPA, 2015b).

Australia has a very high degree of liberalisation, especially for the region, as one of its main concerns is being amply connected to the rest of the world. Zhang et al. (2014) found that Australia had the most liberal aviation policies across the Asia-Pacific region. They examined factors such as the presence of LCCs, foreign ownership of domestic carriers, open skies agreements and privatised national carriers. Australia also has established a regional open skies policy, the "Regional Package", in effect unilaterally granting open skies for any of its airports, except Sydney, Perth, Melbourne and Brisbane. It will not include flights to one of these four airports in a foreign carrier's capacity entitlements if the flight originates in, is destined for or stops at an Australian airport not on the list. This policy is meant to help its regional airports attract foreign air carriers and increase their international connectivity. However, to date, few carriers have taken advantage of this policy, indicating that commercial viability may have been a greater barrier than air traffic rights.

Australian carriers have established strong partnerships with carriers from the UAE. Since March 2013, Qantas and Emirates have formed a partnership and operate jointly about ten daily flights between Australia and Dubai, where passengers can connect onwards to destinations in Europe, Africa or the Indian Subcontinent. Co-operation between both carriers extends to co-ordinating schedules to facilitate connections in Dubai, code-sharing, joint marketing and mutual recognition of frequent flyer programmes. Following this new partnership, Qantas withdrew from the German market and put an end to its flights to London via Hong Kong or Bangkok[114]. Meanwhile, Australia's second largest carrier, Virgin Australia, is 21% owned by Etihad Airways with whom it offers a number of code-share services. Through this partnership, Virgin flies to Abu Dhabi where it connects with Etihad's network and provides feeder traffic to Etihad's Australian flights.

Policy priorities: Australia

Australia's 2009 white paper on aviation policy highlighted the success that domestic deregulation has had on the Australian market for over two decades, but also the need to improve regional services, particularly in areas with low tourist demand. Internationally, Australia takes a liberal approach with so-called "like-minded" markets, with a view to maintaining a "strong and vibrant" Australian airline industry. However, one area where Australia remains quite vigilant is the market with the United States. While it has entered into an open skies agreement with the United States, it has refused carriers such as Singapore Airlines from operating flights to the United States on a fifth freedom basis to protect the lucrative Trans-Pacific market.

In early 2015, the Productivity Commission released a research report looking at the country's tourism policy. The report devotes a whole chapter to the question of international air services, illustrating the importance of the aviation sector to Australia's tourism industry. The report found that Australia's international aviation policy is generally successful but did suggest greater transparency in sharing the cost-benefit analysis that underpins the government's decisions on further liberalisation. The report included a statement from the government on how it defines the national interest and how it balances the divergent needs of various stakeholders. Finally, it suggested unilaterally extending the Regional Package to Brisbane, Perth and Melbourne.

Belgium

In 2013, 26.6 million international passengers travelled through Belgium's six international airports. These serve over 200 airports worldwide. Among the ten largest markets are Spain, Italy, Turkey and Morocco, which are mainly tourist destinations from Belgium. The United Kingdom, the United States, Germany, Switzerland and Denmark are also important destinations with a more diversified mix of passengers. Three of these six airports are used mainly for charter flights. Liege-Bierset is one of the busiest cargo airports in Europe with over half a million tonnes of throughput in 2013 and more than 300 000 passengers. It is home to TNT's main hub and acts as a European hub to a number of freighter operators, leveraging its advantageous geographical position and efficient logistics operations, despite a relatively small domestic market.

The other two airports are both located near the capital Brussels, but fulfil a rather different role. Brussels Airport, also known as Brussels-National or Brussels-Zaventem, is the closest to the city and has always been Belgium's most important airport. It handled close to 22 million passengers in 2014 and over 450 000 tonnes of freight on passenger and freighter flights, making it also one of the top ten cargo airports in Europe. It was the hub of Belgium's former national airline Sabena. The latter was founded in 1923 and has built up a large intercontinental network over the years, with connections to several African countries that were not served by any other European airline. The airline folded in 2001 in the wake of the 9/11 terrorist attacks and a failed plan to be bought out by Swissair. The other airport, Charleroi, is mostly geared towards leisure travel. It is an important base for Ryanair and Jetairfly and handled about 6.4 million passengers in 2014. Charleroi is a prime example of an airport that benefited from a liberalised regulatory framework and entry of an LCC stimulating strong growth in the market. Passenger traffic at Charleroi has grown 25-fold since 2000, the year before Ryanair opened a base there.

Belgium has five national carriers operating international flights. None of them provide domestic services due to the limited size of the country and Belgium's extensive railway network. Brussels Airlines, the country's largest carrier, was established in 2006 as a result of the merger between SN Brussels Airline, which can trace its lineage back to Sabena, and Virgin Express. However it has not been able to provide the same international coverage as Sabena. Its network is largely short- and medium-haul, with a few North-American routes (no points west of Chicago) and a large African network reminiscent of Sabena's network but no Asian or Latin American routes.

In addition to Brussels Airlines, Jetairfly, part of the TUI group, is an important Belgium leisure carrier. It has a fleet of 22 aircraft and serves mainly seasonal and year-round leisure destinations in the Mediterranean basin, Europe, Africa, the United States and the Caribbean. Meanwhile, TNT Airways operates a fleet of 32 freighters and operates a global freight network from its main hub in Liege. Belgium in general and Brussels in particular, enjoy strong air connectivity. Brussels Airport ranked 12th in Europe in terms of direct connectivity and has seen its connectivity grow by a third in the past decade.

With the expansion of the high-speed rail network, Brussels' indirect connectivity has been further improved during the last decade. A direct connection links Brussels to Paris Charles de Gaulle and Amsterdam Schiphol in about one and a half hours, while Dusseldorf Airport, London Heathrow and Frankfurt Airport can all be reached in less than three hours. Brussels is also very well connected by high speed rail to the key European business centres, Paris, Amsterdam, Cologne, Frankfurt and London. High speed rail both feeds passengers to Brussels Airport and offers Brussels passengers additional connectivity through other European hubs. To make the air/rail connection appear seamless, Thalys' high speed trains have code-share agreements with:

- Jet Airways, Brussels Airlines and Hainan Airlines to bring passengers from Paris (Gare du Nord) to Brussels Airport and connect to flights to India
- Delta and KLM to bring passengers from Brussels or Antwerp to Schiphol Airport
- Air France and American Airlines to bring passengers from Brussels to Charles de Gaulle Airport.

The proximity of these competing hubs and competition from high-speed rail on key short-haul routes makes a restoration of a hub in Brussels comparable in size to Sabena's former operation rather challenging. However, the abundance of choice for consumers helps discipline the prices for medium and long range destinations. It introduces a rich intermodal component into Brussels' aviation connectivity that is unique. This connectivity offers travellers increased travel options but pushes Brussels into the catchment area of the largest airports in Europe.

Limited long-haul direct connectivity, especially with regard to intercontinental routes, is often put forward by policy makers as a threat for the attractiveness and business environment of Brussels and Belgium. At the same time empirical studies have showed that less time-sensitive passengers might actually have benefited from the absence of a strong network carrier in Brussels, at least in the short run. For example, Lijesen et al. (2001) found that British Airways, Air France and Swissair charged significantly lower fares for flights from Brussels via their hubs to US destinations. On average the fares were less than 50% of the fares on comparable routes. They suggested that this was due to the fact that Brussels, being the only airport in the densely populated North-West of Europe without a strong international home carrier, was the stage for a fierce price war.

Following Sabena's bankruptcy in 2001, it took Brussels Airport about 15 years to reach the same annual number of passengers of 22 million annually. Brussels Airlines, which only operates from this airport, still accounts for the majority and currently has a total share of around 25% of the total Belgium market. This is low compared to the market shares of the large European airlines at their main hubs and reflects the strong competitiveness present in the Belgium market.

Irish carrier Ryanair is currently the second largest carrier serving the country, accounting for just over 20% of the seats. It is by far the largest airline at Charleroi Airport, where, in 2001, it established its first base outside Ireland or the United Kingdom. Ryanair's expansion at Charleroi has helped it become one of Europe's fastest growing airports, reaching the level of the 6.8 million passengers in 2013. Since then the number of passengers has decreased as Ryanair has shifted some of their services to Brussels Airport¸ which has also seen rapid expansion by other LCCs and leisure carriers, including Jetairfly, EasyJet and Vueling. LCCs now (Jan-Aug 2014) account for 39% of all international seats in Belgium, up from 17% before the global financial crisis in 2007. This reflects the fact that despite positive growth from full service carriers, LCCs and leisure carriers have been growing capacity at a more rapid pace.

Policy priorities: Belgium

Belgium has not published global international air transport policy yet. However, due to its geographical location, proximity of competitive global hubs, structure of the airline industry and diversity of its airports, Belgium pursues a policy that seeks to establish better global passenger and freight connectivity. The government takes a balanced approach in accordance with (EC) Regulation 598/2014 taking into account the nuisances caused by airport activities and at the same time seeking to better the interests of carriers, airports, shippers, passengers and all the support industries that form the aviation value chain within a fair and reciprocal marketplace. Belgium is particularly concerned with value creation within the country, something which both national and foreign carriers take part in creating. Thus it seeks policy outcomes that enable all carriers to grow within a competitive marketplace in order to provide the most connectivity choices to passengers and shippers.

Canada

Canada's air transport market is almost evenly split between the domestic market (48.8 million O&D passengers in 2013) and the international market (46.8 million O&D passengers in 2013). The international market is largely dominated by the United States, accounting for about half of it, while the United Kingdom, France and China, as well as leisure destinations in Mexico, Cuba and the Dominican Republic are also important international markets. Canada has open skies agreements with six of its ten largest partners and ASAs with unlimited third and fourth freedom rights with two others, namely Mexico and Cuba. There are 246 Canadian airports with scheduled domestic flights, of which 34 also have international flights to one of 188 foreign destinations. The airports in Toronto, Montreal and Vancouver account for over 85% of non-US international traffic.

Nine Canadian carriers operate international scheduled passenger flights, with the most significant being Air Canada, WestJet, Air Transat, Sunwing and Porter Airlines (only to the US). Air Canada is the only Canadian carrier to be part of an airline alliance, the Star Alliance, while its main domestic competitor, WestJet, has code-share agreements in place with seven SkyTeam members, five OneWorld members and one unaligned carrier and interline agreements with nearly 30 carriers. Cargojet is the only Canadian operator of international scheduled freighter flights.

Canada deregulated its domestic market in 1987 following the passage of the National Transportation Act. That same year, the government announced the privatisation of Air Canada, which was completed a year later. Canada's domestic market is now fully liberalised but may only be served by air carriers where Canadians have at least 75% of voting equity. The domestic market has a long tradition of having trunk routes dominated by two large carriers, supplemented by feeder, regional and northern carriers.

Policy priorities: Canada

Internationally, Canada's Blue Sky policy, established in 2006, defines Canada's approach to international air transport negotiations. It aims for the negotiation of open skies agreements (modelled on the 2005 Canada-US open skies agreement) when it deems it in the country's national interest. Canada takes a number of different factors into consideration as it establishes its negotiating priorities, including the interest of Canadian carriers and airports, the potential of the market to grow and Canada's international trade. The policy does permit the negotiation of less open agreements when marketplace conditions are believed to unfairly advantage a foreign carrier or when the entry of a new carrier would significantly reduce or eliminate competition. Canada currently has open agreements covering 45 countries, including

the United States and the 28 member states of the European Union. Since the Blue Skies policy came into place, the number of Canada's bilateral partners has gone from 73 to 116.

Canada will continue to pursue opportunities to negotiate more liberalised agreements that will maximise prospects for the introduction of passenger and all-cargo services, according to market forces.

Chile

In 2015, total annual passenger traffic in Chile reached 18.1 million passengers (JAC, 2016). International passenger traffic in Chile totalled 8.3 million passengers, up 11.1% compared to 2014, while domestic traffic reached 9.9 million passengers, up 0.9% from 2014. Chile expects its passenger traffic to reach 31.2 million by 2030 and 49.4 million by 2050 of which international passengers would account for 16.4 million and 26.6 million respectively.

With respect to air freight, which is particularly important in that country especially for its exports of fresh fruits and fish, 271 000 tonnes of freight were transported, almost all internationally. International airfreight tonnage was down 8.3% in 2015 and there was a significant shift in capacity from LAN's freighter aircraft to its passenger aircraft, as LAN's freighter fleet has been reduced by a fifth over the last couple of years (Air Cargo News, 2014). Chile's domestic passenger traffic is the fourth highest in Latin America despite a relatively small population (18 million). Chileans have a high propensity to fly as a result of economic prosperity and a geographical situation that makes surface transportation a less feasible option. In 2014, Chile produced 0.97 passenger per capita, a number expected to rise to 2.6 by 2030 according to Chile's Civil Aeronautics Board (Junta de Aeronáutica Civil or JAC) at which point it would reach a level commensurate with that of the United States today.

There are 19 Chilean airports with domestic scheduled flights and over 5 000 passengers in 2014, of which 8 also have international scheduled flights to one of 23 countries with direct air services from Chile. Santiago's Comodoro Arturo Merino Benítez International Airport is by far Chile's largest airport, handling 99% of Chile's international traffic in 2014 and 44% of its domestic traffic (JAC, 2015). This indicates that nearly all commercial passenger air transport in Chile, both domestically and internationally, originates or ends in Santiago. In addition, 72.4% of domestic freight originates in Santiago and nearly all international freight enters or exits Chile through Santiago.

There were six carriers operating domestic flights in Chile, with the LAN Chile, which includes regional feeder LAN Chile Express, accounting for 7.3 million passengers or 74% of domestic passenger traffic and 24 000 tonnes or 90% of the domestic freight market. Chile's second largest air carrier, Sky Airline, carried 2.4 million passengers in 2014.

On the international market, Chile is served by LAN Chile, Sky Airlines and 26 foreign carriers. Chilean carriers account for 57% of the market, with LAN Chile alone having a 51.3% market share with its 4.2 million international passengers in 2015. Major foreign airlines include Brazil's TAM, COPA and LAN Peru. The LATAM group accounts for 61% of international traffic and explain OneWorld's dominance in Chile, with a 68.4% market share of international traffic.

Chile's flag carrier LAN Chile was founded as a state-owned airline in 1929 and privatised in 1989. In 1995 it acquired Chile's second largest airline Ladeco and in 2002 it started its internationalisation process by setting up and/or acquiring international subsidiaries. In 2004 LAN Chile and its subsidiaries, LAN Perú, LAN Ecuador, LAN Dominicana and LAN Express, became unified under the unique LAN brand and livery, eliminating each airline country name on the brands. LAN Argentina and LAN Colombia followed in 2005 and 2011. In 2012, LAN merged with Brazilian airline TAM Airlines to form the LATAM Airlines Group, which has been incorporated under Chilean law. The merger was

approved by a divided three against two decision of the Chilean Competition Tribunal, subject to 11 mitigation measures aimed at maintaining a certain degree of competition, including the surrendering of slots at Sao Paulo to carriers willing to operate between that city and Santiago, extending for five years LATAM's frequent flyer programme to airlines wishing to participate in its relinquishment of membership of either OneWorld or Star Alliance (LATAM eventually left Star Alliance) and a commitment by LAN to publicly support unilateral cabotage in Chile by foreign carriers (OECD, 2014d). The merger of Grupo LAN with TAM resulted in what is by far the largest airline group in Latin-America.

Argentina is Chile's largest international market, with 1.7 million passengers in 2014. It was followed by Brazil (1.3 million), Peru (938 000), the United States (853 000) and Panama (412 000). Two-thirds of Chile's international traffic is to or from South America. With respect to air cargo, the market is tilted towards outbound freight, as outbound tonnage is over 50% higher than inbound freight. This reflects the commodity mix of Chile's air freight, such as perishable fruits and fresh fish. The main markets for international air freight are the United States (133 000 tonnes in 2014), which accounts for almost half the market, Brazil (22 300 tonnes) and Peru (20 800 tonnes).

Chile's aviation policy is crafted with free market principles in mind, with minimum state intervention. It is based on clear and stable regulations which aim to facilitate efficient, high quality and lowest cost air services. The policy rests upon three pillars: free market access, no intervention on air fares and a liberalised ownership and control framework. It has pursued a reciprocal open skies policy since the late 1970s. Chile has abolished all of its caps on foreign investment in its air carriers and since 1979 it has offered cabotage rights on a unilateral basis. It is one of the few countries with a sizeable domestic market to actually do so. Thus, airlines are required simply to have their principal place of business in Chile, no matter how their ownership is structured. This has allowed foreign carriers to set up subsidiaries in the Chilean domestic market. For example, in 2004, Spanish Grupo Marsans established Air Comet Chile to operate domestic services in Chile. The carrier ceased operations in October 2008 due to financial problems. Other carriers, such as Mexico's Aerolineas Damojh and Sweden's West Air have also operated domestic flights but both ceased their operations in 2013, for economic reasons. At present, no foreign carrier is operating scheduled cabotage flights in Chile although Xtra Airways of the United States is operating domestic charters on behalf of Chile's One Airlines.

A number of Latin American countries have relaxed their foreign ownership rules to enable Chilean-owned and controlled LAN to acquire large (even majority stakes) in their carriers. In addition, the 2006 EU-Chile ASA acknowledges Chile's liberal regime by allowing a number of Latin American countries (namely, the member states of the Latin American Civil Aviation Commission) to own or control Chilean airlines without jeopardising those airlines' market access to EU member states[115].

As of December 2015, Chile had ASAs in place with 55 partners. Of those, 15 were full open skies covering all nine freedoms of the air, 14 more had provisions covering the first seven freedoms[116] and 10 more met the definition of open skies used in this document. Overall, 49 of Chile's 55 ASAs provide for, at a minimum, unlimited third and fourth freedoms.

Chile has signed open skies agreements with a relatively large number of partners, either on a bilateral or multilateral basis. Bilateral agreements include those with the United Kingdom, the Netherlands, the UAE, Qatar, Paraguay, Panama, Jamaica and the Dominican Republic. Multilateral agreements to which Chile is a signatory include the MALIAT agreement with Brunei, New Zealand, Singapore and the United States, allowing unlimited traffic rights between each country under third, fourth and fifth freedoms, as well as unlimited seventh freedom traffic rights for freighter flights. There is also the Fortaleza Agreement of the Southern Common Market (Mercosur), with Argentina, Bolivia, Brazil, Paraguay, Peru and Uruguay; this agreement seeks to liberalise air services between these South

American countries[117]. Furthermore, Chile was the first country to sign a horizontal agreement with the EU in 2005, allowing a carrier in one EU country to be designated to use traffic rights meant for a carrier in another EU country. Finally, in January 2015, Chile and Australia renegotiated their ASA to allow a doubling of capacity to 4 000 seats per week between both countries. This should benefit both LAN Chile and Qantas, who code-share on the Santiago-Sydney route.

The impacts of further liberalisation of the Chilean international air market have been estimated by InterVISTAS-EU (2009a) using a gravity model. Liberalisation of market access is forecast to increase international traffic to and from Chile by 1.2 million passengers, an increase of 24% from 2007 levels. Liberalisation would also provide considerable benefits for passengers. Average fares are forecast to decline by 18% with market access liberalisation, resulting in an increase in consumer surplus of USD 73 million. The increase in air service and passenger traffic is forecast to generate employment in the aviation and tourism sector. In addition, InterVISTAS-EU (2009a) assessed the catalytic impacts due to the role of air transportation in facilitating growth and productivity in the general economy by increased trade, business activity and greater personal productivity. In total, liberalisation of market access is forecast to generate 35 200 full-time equivalent jobs and an incremental GDP of USD 650 million.

Policy priorities: Chile

Chile's policy priorities aim to promote the development of civil aviation, particularly domestic and international commercial air transport, and aims to generate the largest number of accessible, efficient, competitive, safe and quality air services for the benefit of current and future air transport users. This is done against a policy backdrop that includes implementing a new 20-year concession at Santiago's Arturo Merino Benitez International Airport, developing a land-planning bill that balances the need for an airport to develop with the negative impacts on the environment and local health, reducing carbon emissions from aviation and putting into application a new Chilean law on air passenger rights.

Chile, through work carried out by the JAC (2015) focuses its aviation policies on:

- promoting connectivity and international air transport of people and goods via the negotiation of new air transport agreements and the implementations of best practices
- promoting international air transport facilitation through the coordination of appropriate public services maintaining and improving the system for granting commercial aircraft insurance policies
- developing and managing tools to measure the performance and quality of air transport in Chile and generate market information.

Chile is looking to prioritise its next ASA negotiations first around the Pacific Alliance, which it is a part of with Columbia, Mexico and Peru and for which it hopes to obtain at least fifth freedom rights for passenger and freighter flights. Chile will also seek to liberalise as much as possible its ASAs with other South American countries and within the Latin American Civil Aviation Commission[118] region.

It will also pursue negotiations in order to obtain fifth and sixth freedom rights from European Union members, either on a bilateral or multilateral basis, beyond the 11 ASAs it currently has in place with EU members, including ten that allow for unlimited third and fourth freedom rights. Alvarado and Marcos (2012) studied the economic impact of full open skies between Chile and the EU and found that unlimited third, fourth and fifth freedoms with the EU would generate between 183 000 and 198 000 new passengers on top of the half a million already flying between both markets and open new direct

routes. This would generate an economic impact of EUR 138-165 million per year for the EU and an increase in consumer surplus of EUR 35-89 million per year. Finally, it intends to seek sixth freedom rights in its ASAs within the Asia-Pacific region.

The People's Republic of China

Airports in China handled over 390 million passengers and almost 6 million tonnes of air freight in 2014 (CAAC, 2014). The country has 51 commercial carriers and 202 airports, including seven that handled over 30 million passengers each.

The Chinese aviation market has experienced phenomenal growth in the past four decades, mirroring the developments of its broader economy. Passenger traffic grew at an annualised pace of 14.9% between 1990 and 2010 (Fu, 2015), helping propel China's rank in terms of passenger-kilometres performed from thirty-seventh place in 1978 to second place in 2008. During that time, China witnessed important aviation policy changes that re-regulated the market, consolidated it and progressively liberalised it.

Initially, commercial aviation in China was both regulated and operated under the authority of the air force as an extension of the armed forces. A first set of reforms between 1978 and 1986 saw operations being first transferred to the State Council and the Civil Aviation Administration of China. In 1987, the six CAAC regional bureaus set up regional airlines that began competing against each other although they were all state-owned. In effect, this removed the central office of the CAAC from the operational aspect of commercial aviation and allowed it to focus on its regulatory mandate only. Air fares were deregulated in 1997 triggering a price war amongst the 20 or so Chinese airlines, which reported a combined loss of USD 250 million in 1998, the first loss in 20 years. Prices were re-regulated the following year (Lei et al., 2011).

The Chinese airline industry experienced significant consolidation, first in October 2002, when ten airlines controlled by the CAAC were consolidated into three state-owned carriers, Air China, China Southern and China Eastern, which are the largest carriers in China today, and in 2010, when China Eastern and Air China acquired regional carriers. At the same time, China allowed privately-owned carriers to operate in the Chinese domestic market that remained regulated but relatively open.

Fu et al. (2015) states that it is not straightforward to measure the performance and competitiveness of Chinese airlines. In 2010 the total earnings of Chinese carriers reached CNY 35.1 billion (Yuan renminbi) (USD 5.18 billion), about 60% of the industry's global profit that year. On the other hand, China Eastern Airlines, the second largest carrier in the country, received a government capital injection of CNY 10 billion (USD 1.45 billion) in 2009, and another injection of more than CNY 3 billion (USD 0.44 billion) in 2012 to reduce its exceedingly high debt ratio. The other two large airlines, China Southern and Air China, received capital injections of CNY 2 billion (USD 0.29 billion) and CNY 1 billion (USD 0.15 billion) respectively in 2012 as an urgent measure to boost capital and reduce debt. In addition, Chinese carriers are recipient of significant levels of public subsidies. In 2014 alone, the four largest carriers received USD 1.1 billion in subsidies and grants (CAPA, 2015e), half of which was directed to China Eastern Airlines.

The domestic market in China is regulated in a two-tier system and reserved exclusively for Chinese carriers. The more liberalised tier, which includes freighter flights, routes that do not involve high traffic airports or routes between a carrier's hub and any point except Beijing, Shanghai Pudong, Shanghai Hongqiao and Guangzhou, only require the carrier to register with the regulator, whereas flights to slot controlled airports or on existing busy routes require regulatory approval. Fu (2015) finds that as of

December 2013, 88% of China's 3 353 domestic routes fall under the liberalised tier and do not require regulatory approval.

China's international air policy seeks to develop its three international carriers by protecting their respective hubs from competition by other Chinese carriers. Thus, Air China, China Eastern and China Southern have been able to develop large hubs in Beijing, Shanghai-Pudong and Guangzhou respectively. An innovative component in China's international air policy is an open skies agreement between Korea and the Chinese province of Shandong. This is a very rare case of an ASA at a sub-national level.

China remains the largest market without an open skies-type agreement with the United States. The strong growth of the US-China market creates increasing opportunities that could only be fully realised by a liberalised market, something both countries had committed to in 2007. In 2015, for the first time, Chinese carriers overtook US carriers in the capacity share on direct China-US flights, operating 2 028 flights during the summer peak season compared to the 1 853 operated by US-based carriers (CAPA, 2015e). This is an important development in the aviation relationship between the countries; only four years ago, US carriers were operating twice as many flights as their Chinese counterparts. The number of direct flights between the countries nearly quadrupled in the last decade with the trend looking to continue or even accelerate in the coming years as new long range aircraft coming on-line, such as the Airbus A-350 and Boeing B-787 may help increase the number of viable routes. China's geographical position also enables it to efficiently funnel sixth freedom traffic from Eastern and Central Asia to the United States via Chinese hubs whereas economically viable sixth freedom opportunities of US carriers are more limited.

Finally, it should be noted that until an open skies agreement is reached, USDOT is not expected to grant antitrust immunity to a joint venture between a US and a Chinese carrier. This creates an additional impetus for establishing an open skies agreement. But in the wake of the negative attention subsidies from Gulf countries have attracted, it remains to be seen if subsidies to Chinese carriers will impede the progress of liberalisation.

With respect to air freight, China adopted very liberal policies in order to help its time-sensitive exports better reach their markets. Taking advantage of seventh freedom rights, integrators such as FedEx and UPS established hubs in Guangzhou and both Shanghai and Shenzhen respectively.

Policy priorities: The People's Republic of China

China is seeking to establish a more open and liberal regime with its neighbours in central and western Asia. However, those countries have concerns that their home carriers may not be able to compete against the much larger Chinese carriers.

With respect to the United States, Delta Airlines CEO Richard Anderson has speculated about the establishment of a Shanghai hub modelled on its Amsterdam hub. To succeed, it would require close cooperation or even a joint-venture with its SkyTeam partner, China Eastern Airlines, whose Shanghai hub could feed traffic to flights operated by Delta or its partners.

Denmark

Copenhagen International Airport, Denmark's top gateway, processed 25 million passengers in 2014, including 23.6 million international passengers (Københavns Lufthavne A/S, 2015). Billund, the country's second largest airport, had 2.9 million passengers in 2014. There are seven other airports with over 12 000 passengers per year.

Denmark liberalised domestic aviation in 1993 and its domestic market is fully market-driven, in line with general EU regulation. Domestically, aviation has been challenged by improving road and rail networks, particularly the construction of the Great Belt fixed link, connecting Zealand, the most populous of Denmark's islands, with Funen, itself already connected to the Danish mainland.

The Scandinavian co-operation on aviation policy matters (originally stemming from the creation of the joint carrier SAS) is a significant element when formulating and implementing Denmark's aviation policy. It is based on a liberal approach towards aviation, meaning that Denmark seeks to conclude liberal open skies ASAs with other countries (i.e. third countries outside the EU) or seeks to conclude such agreements through a multilateral system that includes Denmark. If it is not possible to conclude an open skies ASA with a given country, Denmark seeks to conclude an agreement that is as liberal as possible. The ASAs concluded are based on reciprocity between the contracting parties, providing a level playing field for airlines.

Internationally, Copenhagen has faced strong competition from other northern European hubs to maintain a position of gateway to Scandinavia. Today, Copenhagen's 10 most important destinations are all located within Europe. Copenhagen however, is also well connected to major overseas airports, with direct flights to Asia (Tokyo, Beijing, Shanghai, Hangzhou, Bangkok, Singapore, Lahore), North America (Newark, Washington D.C., Chicago, San Francisco, Fort Lauderdale,Toronto), Africa (Cairo, Marrakech,) and the Middle East (Dubai, Doha, Tel Aviv). In addition, Danish and foreign carriers operate numerous seasonal (charter) flights to leisure destinations in the Caribbean, Europe and Asia.

Denmark and Sweden formed a joint venture in 2012, Nordic Unified Air Traffic Control, which provides air navigation services for both countries. This has enabled both countries to operate as a single functional block.

Policy priorities: Denmark

In recent years Denmark has been increasingly concerned with the issue of social dumping in several areas. This concern includes the aviation sector, since new employment models have led to a race-to-the-bottom approach, which is a threat, not only to the Danish welfare model, but also to the so-called "Nordic model" where employees and employers jointly agree on working conditions. The Danish Ministry of Transport created a working group looking at social dumping in aviation in June 2013 (Trafikstyrelsen, 2014). The working group, composed of government, industry and labour representatives, was tasked to provide an overview of what social dumping entails, report on the possibility of addressing the issue within a national context, examine how the issue is pursued in other EU countries and in other Danish ministries and monitor activities at the European Commission related to social dumping.

The working group found that new forms of recruitment and employment appeared legitimate and in compliance with EU rules. They are the result of rule shopping by carriers and, in some instances, taking advantage of differences between national legislations within the EU in ways unforeseen by national legislators. However, it did raise a number of issues including in relation to social security, a consistent definition of what determines a home base, standardising the rules for on-board working environment and ensuring a fair and equal competition between EU airlines for internal flights within the EU and in relation to third-county airlines for flights to and from third countries. The working group also found it necessary to look into the impact on safety of new employment models and is therefore active in a European Aviation Safety Agency working group studying this issue.

A particular issue highlighted in the 2014 report was that the double taxation convention between Denmark and Ireland did not permit Denmark to tax Danish residents employed by Irish carriers, as opposed to the situation that prevailed with most other countries. The working group suggested Denmark renegotiate this agreement based on the principles of the OECD model convention with regard to taxes on wages. On July 2014, Denmark and Ireland signed a new double taxation convention that took effect on 1 January 2015 and allows Denmark to tax wages of Danish residents working on Irish aircraft.

Finally, the working group proposed a three-pillar strategy for Denmark to follow in order to address the issue of social dumping (Trafikstyrelsen, 2015), namely:

- working within the EU to ensure consistent interpretation and application of EU rules
- avoiding creating Danish laws that would make rule shopping more attractive
- ensuring that there is no deliberate circumvention of rules by having aviation stakeholders test the legality of possible circumventions in the court system.

The European Union

The European Union, as a whole, forms the largest aviation market in the world with 842 million passengers carried in 2013 (Eurostat, 2015). In some regards, EU aviation policy extends to an area beyond the 28 member states to the European Common Aviation Area (ECAA) which also includes Albania, Bosnia and Herzegovina, Iceland, Kosovo, the Former Yugoslav Republic of Macedonia, Montenegro, Norway, and Serbia, adding another 34 million passengers[119]. In addition, around 14 million tonnes of air freight travelled to and from the ECAA, with 13.4 million tonnes in the EU alone. It is home to some of the largest aviation hubs in the world and lynchpins of the three global alliances, including London (Heathrow), Paris (Charles de Gaulle), Frankfurt and Amsterdam airports, ranked respectively third, eighth, eleventh and fourteenth busiest airport in the world (ACI, 2015).

Within the EU market, aviation related regulations are determined by the European Union. Since the establishment of the EU Single Aviation Market of 1997 (see Section above), EU members have in effect behaved as one state, with all nine freedoms granted to any EU carrier. Thus, at least from an economic regulatory perspective, carriers do not have a nationality but are rather European Union carriers. The EU Single Air Transport Market was expanded to include ECAA countries in 2006[120].

An EU carrier is defined as one that has at least 50% of its ownership held by EU states or EU nationals, that has its principal place of business within the EU and that is effectively controlled by EU nationals (Burghouwt et al., 2015).

EU states are gradually transitioning from a national perspective in aviation to a community of interest. The European Commission, which is the executive body of the EU, was granted competency for aviation as a result of a 2002 open skies judgment[121] in the European Court of Justice. Since then, it has negotiated full or partial open skies agreements, with limited fifth freedom rights, with several partners, such as, Canada, Georgia, Israel, Jordan, Morocco, and the United States. In addition, it has added the concept of horizontality to air service agreements with 120 partners, enabling any EU-based carrier to take advantage of traffic rights granted to carriers from one EU member under the principle of EU designation.

The framework of European multilateral negotiations offers opportunities for European carriers to open or develop new routes and it aims at progressive regulatory convergence. One question remaining open for discussion is whether the EU should tailor its approach to the context of individual partners, as it did

in its open skies negotiations with Canada and the United States or if it should formulate a consistent mandate based on its own goals, as the United States does for open skies agreements.

The European Union and Russia

Russia is an important aviation neighbour of the European Union. With more than 40% of all scheduled Russian passenger traffic directed towards EU destinations, the EU is Russia's largest international aviation market. In air freight, Russia is the 8th most important EU partner with an average growth rate over the last five years of about 16%[122].

Aviation relations between Russia and the EU have been difficult over the last decade, the main issues being EU airline designation and Siberian overflight royalties. With regard to airline designation, Russia is one of the few countries in the world that refuses to recognise the EU designation clauses and the principle of horizontality and, thus, indirectly the authority of the European Court of Justice to bind member states in their relations with third countries. As a result of Russia exercising its right not to allow the designation of airlines which are not majority owned and effectively controlled by the other contracting party or its nationals, member states' bilateral agreements with Russia have not been updated following the open skies judgments. Russia's insistence on the status quo before the open skies judgment creates problems not only when member states want to designate EU airlines established in their respective territories, owned and controlled by nationals of other EU countries, but also in cases of airline mergers.

Following the takeover of Austrian Airlines by Lufthansa, for instance, Russia argued that flights operated by Austrian airlines to Russia would no longer be covered by the ASA between Austria and Russia because the airline was no longer owned by Austrian interests. This created uncertainty as to whether Austrian Airlines not being recognised as an EU carrier might continue to have the right to fly over Russian territory. Obviously, similar considerations arise in all intra-EU airline merger and acquisition cases.

In view of the fact that these problems stem from the bilateral ASAs between Russia and the member states, the commission initiated infringement proceedings under Article 258 of the Treaty on the Functioning of the European Union (TFEU) against almost the totality of the member states on the grounds, *inter alia*, that the nationality clauses infringe upon the freedom of establishment, as declared by the court in the open skies cases.

Following the initiation of infringement proceedings by the commission against Finland over its bilateral ASA with Russia in October 2010, it appeared that EU-Russia relations entered a new era. Finland and Russia undertook, in December 2010, to commence negotiations with a view to amending their bilateral concluded in 1993. A first meeting was held in Helsinki on 17-18 February 2011, where the delegations of the aeronautical authorities agreed to a number of amendments to the 1993 Protocol to bring it into conformity with EU law, subject to approval by the respective governments. The next round of formal consultations was held in Russia in June 2011. The consultations culminated in a 2011 Protocol amending the 1993 ASA, signed in Moscow on 26 September 26 2011, by the Finish and Russian Transport Ministers. The 2011 Protocol does away with the nationality principle, setting as a standard of designation the criterion of establishment and the possession of a valid operating licence and air operator certificate (all elements being regulated in accordance with the law of the designating country).

The EU-Russia aviation summit, held on 12-13 October 2011, in St. Petersburg, created a feeling of optimism regarding EU-Russia aviation relations. The first session of the summit was dedicated to the "Policy framework for the development of EU-Russia aviation relations and the prospects of the EU-

Russia aviation market". In a memo dated 12 October 2011, the commission stated that "Russia has recently for the first time accepted the principle of EU designation in its bilateral agreement with one EU Member State and has agreed to use this "pilot" agreement as a basis for restoring legal certainty to all its bilateral ASAs with EU Member States". Although Russia was expected to introduce the necessary changes in all its bilateral ASAs with the EU member states, it unilaterally decided to put this process on hold.

EU airlines overflying Siberia on their way to Asian destinations are obliged to pay special royalties, most of them directly to the Russian airline Aeroflot. According to the European Commission, in 2008 alone EU carriers were subjected to charges of approximately USD 420 million. The Siberian overflights issue is not new and has constituted an area of disagreement for a considerable period of time. In May 2004, the Russian government submitted a commitment to the European Commission, according to which the system of overflight payments would be abolished and modernised by December 2013 at the latest. In March 2006, the commission was mandated by the council to negotiate an agreement with the Russian government assuring:

- the complete abolition of payments at the latest by 31 December 2013
- progressive reduction of payments during the transition period from 2006 onwards
- the end of mandatory commercial agreements related to the overflight of the territory of the Russian Federation by 2013 at the latest
- gradual removal of restrictions on overflights over Russian territory between Europe and Asia and complete elimination of all non-technical restrictions by 2013 at the latest.

Later in that year, at the EU-Russia summit in Helsinki, the parties did indeed initial an agreement entitled "Agreed Principles". Nevertheless, while the agreement was adopted by the council in May 2007, the Russian Federation did not sign it, as it linked its implementation with the need to first be allowed to become a fully-fledged WTO partner.

On 21 October 2011, the EU's Trade Commissioner announced the settlement of the last outstanding issues in EU Russia relations before Russia's accession to the WTO: "We have struck a deal on the final outstanding bilateral issues, leaving the way open for Russia to join the WTO by the end of this year. Concerning the issue of Siberian overflights, "the EU has secured a guarantee from Russia that an agreement to amend the system of Siberian overflight payments ... will be implemented in the coming weeks".

However, Russia then linked the overflight resolution to objectives for the inclusion of aviation in the EU's Emission Trading System (ETS). The European Commission has expressed the opinion that the two issues are entirely separate and cannot be linked.

The 2011, Russia-Finland Protocol removes obligatory commercial agreements between airlines, therefore resolving the issue of overflight payments to Aeroflot and effectively pre-empting the commission's infringement proceedings against Finland. The European Commission in its infringement proceedings against the member states alleged that the obligatory charges for Siberian overflights may violate international law, since pursuant to Article 15 of the Chicago Convention "no fees, dues or other charges shall be imposed by any contracting State in respect solely of the right of transit over or entry into or exit from its territory of any aircraft of a contracting State or persons or property thereon". It further claimed that the obligation of EU airlines to pay overflight charges directly to Aeroflot may infringe "EU antitrust law whereby airlines should not be forced into concluding a commercial agreement with a direct competitor".

The European Union's policy priorities

The top policy priority right now for the EU is the issue of the Gulf carriers and fair competition. There is a serious concern that these carriers have altered the competitive landscape to an extent beyond which European network carriers are able to compete. While traffic has increased overall, the rate of growth to Asia and Africa has been rather low as European carriers have seen their market share in those markets decline. Meanwhile, European carriers have shed a number of smaller destinations claiming competition from Gulf carriers made them unviable. For example, Lufthansa (2015) lists 16 destinations, mainly in and around the Indian subcontinent, Ho Chi Minh City and Sydney that it dropped because of competition from Gulf carriers and seven destinations in Africa. It also points to Austrian Airlines and Swiss Airlines International dropping 20 and 33 destinations respectively in Africa and Australasia.

This has also resulted in European hubs experiencing a drop in the market share for connections, despite growing traffic. ACI-Europe (2014) shows that while direct connectivity between EU and the Asia-Pacific is at an all-time high, the market share of European airports has actually been receding. Thus, for example, when looking at onward connectivity from Europe, in the last decade connectivity grew by 28% for EU hubs, compared to 307% for non-EU European hubs and 53% for non-European hubs. This has in turn pushed down the combined market share of Heathrow, Charles de Gaulle and Frankfurt from 33% to 29% since 2004 as those airports have faced both increased competition from emerging mega-hubs and the global financial crisis that affected EU hubs more significantly than non-EU hubs.

In addition, the equity position that Etihad has taken in Aer Lingus (4%), Air Berlin (29%), Air Serbia, Alitalia (49% each) and Darwin Airline (33%) has raised concerns that European carriers become feeders for Etihad.

The issue of subsidies of Gulf carriers is particularly important for the EU, where state aid is in principle prohibited and, when authorised, tightly monitored. This creates an unlevel playing field when EU carriers compete against airlines that receive public subsidies. Already under pressure from LCCs in the internal EU market, European network carriers also face increased competition on their profitable long-haul network from Gulf and Turkish carriers.

The EU finds itself in a position where its own fair competition rules are hampering its own carriers' ability to compete in markets which are not similarly governed. The clear solution for the EU is to export its fair competition philosophy to other markets, but understandably this may not always be welcome. Therefore, the EU aims to include fair competition clauses in its future ASA, as it has done with Brazil, Canada and the United States for example.

Another policy issue for the EU is the social and labour dimension of aviation. European LCCs have been on the vanguard of aggressive cost cutting labour frameworks, such as zero-hour contracts, pay to fly and the use of cheaper flight attendants based outside the EU[123]. While not illegal, it does raise social acceptability issues and is forcing regulators to catch up with a very agile and rapidly evolving sector.

Beyond economic considerations, the environment remains an important issue for the EU. While the EU-Emissions Trading Scheme (ETS) is currently in effect for flights entirely within the European Economic Area (EEA)[124] its application to flights to and from the EEA from non-EEA states is suspended until 2016 to provide the opportunity for a global market-based solution to be negotiated at ICAO. The EC is to report to the European Parliament on the result of this negotiation, in the wake of ICAO's 2016 General Assembly and will propose measures to adopt to meet the EU's carbon emission goals.

The EC is currently preparing a new aviation package for approval by the European Parliament. While not defined at the time of writing, it is expected to seek new negotiation mandates with ASEAN[125] and

members of the Gulf Cooperation Council, especially Qatar and the UAE. It will also likely include a review of Regulation (EC) No 868/2004 which is meant to protect EU air carriers from injury caused by unfair pricing practices by non-EU carriers and subsidies granted to them by their government (EC, 2013). The regulation has never been applied as both the EC and EU airlines agree that it is impractical in its current form. Amongst the issues is that the EC needs to access financial data from non-EU carriers to prove unfair pricing but these carriers have no obligation or incentive to provide such data. The remedies and procedural aspects of this regulation are also considered insufficient to change the behaviour of the offending party. Finally, the regulation fails to take into account the specificity of aviation, basing itself on general trade defence notions that do not apply within the bilateral context set out by the Chicago Convention.

In December 2015, the EC adopted a new Aviation Strategy proposal for Europe. This policy proposal, which requires approval from the European Parliament, aims to maintain the competitiveness of the European aviation sector and provides European travellers and shippers with more choices and lower fares while maintaining and enhancing the highest levels of safety and security. It lists four priorities:

- place the EU as a leading player in international aviation, whilst guaranteeing a level playing field
- tackle limits to growth in the air and on the ground
- maintain high EU standards for safety, security, the environment, social issues and passenger rights
- make progress on innovation, digital technologies, investments and unmanned aerial systems.

The EC proposal includes seeking permission from parliament to engage in bilateral air services negotiations with Armenia, ASEAN - which would be the first block to block ASA - Bahrain, China, Kuwait, Mexico, Oman, Qatar, Saudi Arabia, Turkey and the UAE as well as to open dialogue with India and negotiate bilateral aviation safety agreements with China and Japan.

Furthermore, it proposes negotiating fair competition provisions in EU comprehensive air transport agreements, which would include measures to correct what it would consider unfair practices. In response to the increasing share-ownership of EU carriers by non-EU carriers, it proposes clarifing and bringing greater legal certainty to Regulation 1008/2008 which governs ownership and control of EU carriers. And finally, it will seek to clarify the legal framework governing flight and cabin crews based in a country different than that of the carrier they work for, in hopes to address some of the concerns raised around social dumping in European Aviation and described further in this document.

Finland

There were 14.7 million international passengers in Finland in 2014 in addition to 5 million domestic passengers (Finavia, 2015). Helsinki-Vantaa international airport accounted for 13.4 million international passengers and 186 000 tonnes of air freight.

In 2010, with passenger traffic levels at similar levels as 2014, the aviation sector contributed directly and indirectly EUR 5.8 billion to Finland's economy or 3.2% of that country's GDP. Aviation also had a EUR 7 billion catalytic effect through tourism development. The sector was responsible for employing 104 000 people and made a fiscal contribution of EUR 2.7 billion (Oxford Economics, 2011b).

Finland's geography has presented both challenges and opportunities. It is challenged by being at the north-easternmost corner of the EU and relatively distant from the economic heart of Europe. However,

this position has enabled it to create a niche market to act as a connecting point between Western Europe and Eastern Asia, taking advantage of a shorter distance than going via Turkey or the Middle East. In 2014, Helsinki handled 2.1 miilion passengers connecting between international flights, with likely a large share of that being between Europe and Asia. National carrier Finnair, established in 1923, leveraged this geographical advantage to be the first Western European carrier to fly non-stop between Europe and Japan (1983) or China (1988). In 2014, 32% of Finnair's Asia traffic originated in Finland, while over 56% originated elsewhere in Europe (CAPA, 2015c).

Finnair's success on the Europe-Asia market has helped it leap-frog past SAS on that market by offering flights to 13 Asian destinations compared to four for SAS[126]. Whereas in 2005 both had similar capacity to Asia, around 400 000 seats per year, today Finnair's capacity to Asia is around 1.1 million seats, compared to about 350 000 for SAS (CAPA, 2015c). From a route connectivity perspective, Finland's position is not unlike that of Gulf countries: a small home market combined with very favourable geography and an extensive network in Europe and Eastern Asia.

Finnair's strategy over the North Atlantic, where it is actually geographically disadvantaged is quite the opposite, having only direct flights to New York and seasonal services to Toronto. Thus, the importance of the fast growing Asian market is relatively higher in Finnair's long-haul network than for any other European carrier.

Finnair is involved in two joint ventures, one with IAG and American Airlines for the North Atlantic and one with IAG and Japan Airlines for flights between Europe and Japan. In October 2015, it will become the first European operator of the Airbus A-350 which will replace its older and less efficient Airbus A-330 and A-340s giving it a new cost advantage against competing carriers.

Finnair's Asian development also has an important air freight component. Air freight generates 17% of revenues on Finnair's long-haul passenger flights and 11% of their profit (Finnair, 2014). The addition of the A-350, with 50% more freight capacity will help that proportion grow. Finnair established a cargo hub at Brussels connected by a McDonnell-Douglas MD-11F freighter aircraft to Helsinki. This enables Asian freight to reach the largest markets in Europe, leveraging excellent road connectivity available from Brussels.

Policy priorities: Finland

In light of its geographical position, Finland's primary concern is with connectivity. It has a liberal policy when it comes to traffic rights, placing significant importance in making sure that passengers and goods can easily connect to the rest of the world. Its small home market makes it difficult for international carriers to profitably operate long-haul flights. Japan Airlines, Finnair's joint venture partner, is one of the only foreign carriers operating year-round long-haul flights into Finland and connecting it to Finnair's extensive intra-European network.

France

In 2014, 144.8 million air passengers travelled in France, including 112.9 million international passengers, and 1.7 million tonnes of freight, almost all international. There are 130 French airports with domestic scheduled flights, of which 60 also have international scheduled flights and 55 have over 10 000 passengers. Paris Charles de Gaulle, Paris Orly and Nice are the country's three busiest airports with 63.6 million, 28.8 million and 11.7 million passengers respectively in 2014. The United Kingdom is the largest international market for France and, together with Italy and Spain; they are the only markets

with over 10 million passengers each. Germany, the United States and Morocco each generated traffic in excess of 5 million passengers (DGAC, 2015).

There are about 200 domestic and foreign air carriers operating in France with over three-quarters of them operating international flights. Air France is the most important carrier in France with 49.7 million passengers, followed by LCCs EasyJet (17.3 million), Ryanair (8.4 million) and Vueling (3.5 million)[127]. About 35% of the international O&D traffic originating in France is carried by French carriers, while 10 to 15% of the international passengers connect via third counties. The share of sixth freedom traffic is between 15 and 20%.

In continental (or metropolitan) France, the market share of French carriers varies significantly for international flights whether these operate from Paris or from outside of Paris; hence, French carriers have a 48% market share for traffic between Paris and foreign destinations but only 9.5% market share for flights between other French cities and foreign destinations. The overall market share of French carriers has been declining, going from 54.3% in 2003 to 44.88% in 2014 as foreign carriers have captured a larger share of the growth witnessed on the French market (Le Roux, 2014; DGAC, 2015).

The Single European Market led to the entry of foreign airlines, mainly LCCs on the French market. Together with the development of the French high-speed rail network (TGV) this has stimulated consolidation between French carriers. In 2001, the French regional airlines Flandre Air, Proteus Airlines, and Regional Airlines merged into Régional, now an Air France subsidiary. In 2013 Régional merged again with regional airlines Airlinair and Brit Air to form HOP!, which together with Transavia France now form the Air France low-cost subsidiaries that increasingly operate short- and medium-haul flights that were previously operated by Air France.

In this process, some French regional airports have been dehubbed, such as Clermont-Ferrand, the former hub of Regional Airlines. At the same time foreign LCCs have increased their operations to and within France, making up for some of the losses at these airports. Yet, overall France still has one of the lowest LCC penetrations of the larger EU countries, particularly in domestic capacity where just 17% of seats are operated by LCCs, mostly because of the competition of high speed trains for connexions with Paris. This also reflects the strength and dominance of Air France which accounts for 74% of the domestic seats, amounting to over 2 million seats in May 2013. Domestic LCC seats reached just under 500 000 in May 2013, recording growth of 28% on May 2012 and continuing the trend of the last couple of years, as LCCs have been able to develop the market of "transversal lines" (between large provincial cities of the French Metropole).

Part of this growth comes from the Spanish carrier Volotea which increased its supply with 73 000 seats in 2013 but the strong growth of the French LCC, Transavia France, is also remarkable. Both are far behind the LCC leader in the French market, EasyJet. LCCs have a share of 28% in the overall French international capacity, while this percentage is 41% for intra-European traffic to and from France. The latter is also lower than in most major European countries, but higher than the Netherlands (33%) and Germany (38%) (OAG, 2013). Le Roux (2014) points out that a number of foreign LCCs such as Vueling, EasyJet and Volotea have established bases in France, while Ryanair has been sentenced for not having respected labour laws for its activities in France, but French carriers have not established significant bases in other EU countries.

During the gradual liberalisation of the EU's internal air transport market, the French government facilitated the merger of a unified, national French carrier with the size and global reach deemed necessary to compete with the other large European airlines. In 1990, government-owned Air France, semi-public Air Inter and wholly private Union de Transports Aériens (UTA) merged into an enlarged Air France group. This group remained government-owned, but in 1999, the government approved Air

France's partial privatisation and its shares were listed on the Paris stock exchange. The French government held the majority of shares.

In 2004, Air France merged with the KLM, forming the Air France-KLM group in which the stake of the French government was reduced to 44%. Subsequently, the French government announced that it would additionally sell 18.4% of its equity, reducing its shareholding to just under 20%. About 19% of the shares were allocated over the former KLM stakeholders, including the Dutch government (less than 3%).

Air France-KLM's heritage of being a former state-owned carrier with legacy social costs and rigid union agreements that newer carriers do not carry has forced it to seek innovative solutions to be able to compete on a cost-basis with those carriers. It is discussing amendments to collective labour agreements with its various unions. As the largest cost category, and one over which management has some control, labour cost efficiency improvements are deemed to be crucial to restoring the group's profitability.

Including those negotiated at the EU level, France has 130 bilateral and multilateral ASAs. France's international aviation policy rests on three main priorities:

- To maintain and grow Air France' hub operations, especially at Paris CDG. These operations are important with regard to France's connectivity and employment, two key issues for France.
- Easing travelling abroad for French citizens and developing tourism at home by helping national airports grow.
- Establishing new routes and better connectivity.
- The government aims to offer French passengers and shippers better air transport choices and prices, while eliminating trade barriers and being a role model for market-based policies.

France supports the framework of European multilateral negotiations and offers opportunities for European carriers to open and develop new routes, provided a level playing field can be guaranteed. Moreover, it aims at progressive regulatory convergence.

Policy priorities: France

Increased competition from LCCs and emerging sixth freedom carriers from the Gulf and Turkey are amongst the biggest challenges for the French regulators. The presence of these carriers in Bordeaux, Lyon, Marseilles, Nice and Toulouse has diverted significant traffic from more traditional European hubs, such as Paris, to the growing hubs in Turkey and the Middle East. This has contributed to Paris Charles de Gaulle's hub connectivity, the second highest in the EU, growing by only 21% between 2004 and 2014, compared to 1 222% for Istanbul for example. It also raises important strategic questions as to whether or not, from a connectivity perspective, communities are better off with prestigious links to distant hubs compared to links with short-haul hubs which offer far greater potential for connections.

As most European national carriers are suffering from competition with LCCs in Europe and Gulf carriers on long-haul flights towards Asian destinations, France is increasingly concerned with fair competition between carriers and pays careful attention to the social and fiscal regulation compliance by foreign carriers operating in France. It seeks progressive regulatory convergence towards the EU *acquis* with a large number of States which is the key to further liberalisation. Thus, the granting of new rights is now linked to the respect for fair competition principles. Air transport development is essential to the improvement of direct connectivity. Mature economies are interested in developing trade and exchanges with the developing countries, such as India, China, Southeast Asia and Brazil. Traffic rights would have to be linked with regulatory convergence as to ensure a level playing field. On the contrary,

when it deems competition unfair or the market unbalanced, France will restrain air transport liberalisation until the situation is addressed and corrected.

Finally, a working group on competitiveness in air transportation in France suggested that granting of traffic rights, especially with Gulf carriers, be associated with fair competition and non-discriminatory treatment of French carriers. It also suggested six short-term and six medium-term measures to improve the competitive landscape of aviation in France (Le Roux, 2014). One of those proposed measures, the elimination of the Civil Aviation Tax for connecting passengers, was fully implemented in January 2016[128] to help Paris maintain and grow its hubbing role.

Germany

Germany had a record 163 million departing and arriving international passengers in 2014, with over 120 million of these passengers to and from Europe (Statistisches Bundesamt, 2015). In addition, the German domestic market accounted for over 20 million passengers bringing total traffic to over 180 million. Germany is home to the largest carrier in Europe, Lufthansa, a founding member of Star Alliance and owner of a number of smaller airline subsidiaries across Europe, such as Eurowings, Germanwings, Brussels Airlines, Austrian Airlines and Swiss International Airlines. Germany's second largest carrier, Air Berlin, is part of the OneWorld alliance and is 29.21% owned by Etihad Airways. In 2013, 133 carriers operated domestic flights within Germany, 28 German carriers operated scheduled international flights, while 272 foreign carriers operated flights in Germany.

In 2013, there were 41 German airports with scheduled domestic flights, of which 27 also had scheduled international flights. German airports enjoyed direct connections with 904 destinations abroad. Germany's largest market is Spain, followed by Turkey, the United Kingdom, Italy and the United States. German carriers handle more than half of that country's international traffic.

ACI-Europe (2014), in their report on connectivity at European airport, found that Frankfurt had the second direct highest connectivity[129] in Europe, after London Heathrow, and the highest hub connectivity of any airport in Europe (Munich ranked fifth for direct connectivity and 6th for hub connectivity). In fact, about 15-20% of Germany's international traffic is made up of international connections. Conversely, between 25-50% of Germany's international passengers connect via a third country.

In the last decade, the growth of connectivity at those two airports has been relatively low. Direct connectivity grew 4% between 2004 and 2014 in Frankfurt, while it declined by 3% in Munich. Hub connectivity at Frankfurt and Munich grew by 32% and 65% respectively. While impressive, this was much lower than the hub connectivity increases of 1 913%, 1 861%, 1 222% and 485% experienced in Abu Dhabi, Doha, Istanbul and Dubai respectively over the same period. The result of this is that while Frankfurt, for example, enjoys far greater hub connectivity than any of those four airports, and has seen its connectivity grow, albeit modestly, its market share, especially on the lucrative Europe-Asia routes has been declining.

However, in Berlin-Tegel, the situation has been far different with direct connectivity increasing by 52% over 10 years and hub connectivity increasing by 2 232%. This is a reflection of Air Berlin's strong growth during that period, which led to traffic nearly doubling at that airport.

Germany was at the forefront of liberalisation efforts in Europe, encouraging the creating of a single EU market and signing an open skies agreement with the United States in 1996. Germany considers liberalisation to be a long-lasting process with full benefits only to be accrued over time after a period of possibly challenging transition (government of Germany, 2003). It points to its own overall positive experience when the European Single Market led to the entry in the market of Deutsche British Airways

(DBA), Eurowings and other LCCs to compete with incumbent Lufthansa. While carriers entered and exited the market, with DBA being fully integrated into Air Berlin in 2008, German consumers experienced lower fares, increased capacity and better connectivity within the German domestic market.

Germany's international aviation policy is based on a careful balance, providing passengers with better choices and better connectivity, supporting and growing an important industrial sector and mitigating the negative externalities that it causes. It also seeks to leverage the air transport sector to encourage tourism and support its large manufacturing base in seeking better and cheaper transportation options. By the second quarter of 2015, Germany had ASAs in place with about 90 partners.

Eschemann (2007) explains the seemingly contradictory policies of growing the national airport system to better sustain economic growth, develop regions, sustain jobs, promote German exports and pursue lofty goals of reducing greenhouse gas emissions. He shows that due to significantly higher activity as a result of the growth of LCCs within a liberalised European market, emissions from aviation in Germany rose by 52.1% between 1990 and 2004, while they declined by 14.4% for all other industries combined. However, it should be noted that CO_2 emissions from domestic aviation in Germany fell by 21% between 1990 and 2012 (Umweltbundesamt, 2014), reflecting relatively stable traffic, especially since 2000, and improving aircraft technologies.

Policy priorities: Germany

To strengthen the aviation market Germany in principle advocates the liberalisation of the entire aviation market taking account of, among others, the environmental and social standards. What is important here is to safeguard the competitiveness in the global market and to lobby to ensure that airports and airlines can participate in the worldwide growth of air transport. The transport policy parameters at national, European and international level have to be structured in a way that takes account of the rapidly changing market conditions.

A liberalisation of the aviation market needs a common playing field of binding regulations. The experience gained in the past few years shows that in particular this requires regulation on illegal state aids, mechanisms for their observance and for the settlement of disputes. This applies especially to the area of air transport agreements. Mutuality according to the principle of reciprocity has to be ensured for the implementation of the scheduled air traffic connections. This is the only way to make sure that there are fair opportunities between airlines which are run privately and those which are state-controlled.

In order to take account of potential imbalances between the states/markets, air transport agreements have to contain, among others, the regulations mentioned above and should in addition gradually be oriented towards the markets where growth originates. This is one of the main priorities in the area of air transport agreements. Germany will also pursue these objectives in the negotiations of the 11 EU mandates and of the multilateral air transport agreement in the framework of the Air Transportation Regulations Panel (ATRP) of ICAO which covers the aspects "liberalisation" and "fair competition".

With the help of competition promoted by liberalisation it is the aim to achieve a comprehensive air transport supply to strengthen Germany as an economic site and to reach the best possible results to the benefits of all stakeholders in the air transport system. The interests of all parties involved have to be taken into account as equivalent and to the same extent. Therefore liberalisation must not have the consequence of giving up or weakening safety, social and environmental standards.

At a national level, Germany is working on the development of an aviation concept. To determine its foundations, the Federal Ministry of Transport and Digital Infrastructure at first commissioned an

extensive market development and competition analysis by taking into account international aviation markets. Based on the results of this analysis a national aviation concept will be developed to strengthen Germany as an aviation site and the position of Germany in international bodies.

As regards the environmental standards (noise and other emissions) the transport policy parameters should continue to be determined by ICAO. The limitation of the CO_2 emissions of international air transport in particular should be effected through a global, market-based measure adopted by ICAO, and not through the introduction or continuation of regional measures, since they could lead to competitive disadvantages, as discussed later in the section on environmental protection in an era of liberalisation.

India

India's aviation sector was effectively nationalised by the enactment of its highly restrictive Air Corporation Act in 1953. The provision of air services became a state-owned domain with the two largest players, Indian Airlines and Air India, carving up the domestic and international sectors between them respectively. The two airlines each enjoyed an effective monopoly until 1994, when the act was repealed and scheduled air services were opened up to private players.

More recent policy changes can be traced to the recommendations of a government study known as the Naresh Chandra Committee Report that was released in November 2003. Among the report's key recommendations were the encouragement of private operators and relaxation of ownership rules for the aviation industry. At the time, a number of privately-owned airlines (many of them operating a low-cost model) had already been allowed to enter the market, including Jet Airways, Air Sahara, Air Deccan and Kingfisher. As a response Air India set up a low-cost subsidiary in 2004 called Air India Express to commence services on several international routes. A consolidation process followed and the two most successful private carriers, Jet Airways and Kingfisher, took over Air Sahara and Air Deccan in 2007. In the meantime, the government had also approved a merger between Air India and Indian Airlines, paving the way for the creation of one of Asia's biggest airlines by fleet and passenger volume. Air India itself had five successive years of losses since the 2007 merger and is running on a financial lifeline from the government.

The Indian government has implemented a series of changes on ownership and investment. In 2008, the limit for foreign direct investment in scheduled airline services was raised from 40% to 49%, with non-resident Indian citizens being allowed to own up to 100%. In 2012, the government announced that foreign airlines would be allowed to own up to a 49% stake in the paid-up capital of scheduled and non-scheduled airlines.

According to Tan (2013a), this was viewed as a necessary move to recapitalise and save the struggling Indian airline sector. The decision has paved the way for several foreign airlines to take up stakes in Indian carriers. Etihad Airways has announced a 24% purchase in Jet Airways, while AirAsia group launched a low-cost subsidiary, AirAsia India, holding a 49% stake in a joint venture with India's Tata Group.

India has traditionally been very conservative in negotiating bilateral ASAs with other countries. In particular, market access for foreign carriers has been tightly controlled, making India one of the most restrictive states in Asia when granting air rights to foreign airlines. On their part, Indian carriers had consistently been under-utilising their own bilateral entitlements. In 2003, barely 40% of international rights were being exercised. At the time, this was due largely to the rights being granted only to state-owned carriers. By 2013, even after the entry of the private airlines, Indian carriers were still utilising only around 40% of their total international rights. In contrast, carriers from foreign countries

were typically utilising close to their maximum entitlements: for instance, Oman (100%), Dubai (99%) and Malaysia (86%). For new private Indian carriers, there were initial restrictions in place requiring them to acquire five years of prior operating experience in the domestic market and a minimum fleet size of twenty aircraft before they could begin to fly international routes. As Air India did not (and still does not) have sufficient aircraft to make full use of the international routes, the Indian government has always maintained a restrictive policy of refusing greater access to foreign partners' carriers. According to Tan (2013a), this policy has been upheld even when demand far exceeds supply on popular routes, leading to reduced seats and high fares on those routes. This protectionist policy has done little to provide Air India with the incentive to procure new planes and to provide a higher and more competitive standard of service.

In the past decade or so, a more liberal attitude toward international competition has been discernible. With new private carriers such as Jet Airways offering international services, India's aviation policy has gradually evolved to reflect not just greater reciprocity of market access for foreign carriers, but also capacity expansion in tune with market demands. In particular, there has been recognition that greater connectivity is essential for overall growth in trade, investment and tourism, particularly in the secondary cities. Indeed, the Naresh Chandra Committee Report had recommended that India seek more liberal ASAs with its partners. The report also recommended that private carriers be allowed to operate international services, even in the face of objections by state-owned carriers. To these ends, the government began re-negotiating several agreements with key trading partners, and total seat entitlements under India's bilateral ASAs more than doubled in the three years after 2003.

The biggest changes can be seen in the new or amended agreements with the United States, the European Union and China as well as the Middle Eastern and Southeast Asian states. Pursuant to these agreements, multiple designations for carriers on both sides as well as expanded frequencies to existing and new destinations became the norm. In 2005, the key year in which negotiations with several countries were held, India also abandoned the practice of requiring commercial agreements as part of bilateral arrangements. These agreements mandated some form of benefit for Indian carriers, including royalty payments. All new operations by foreign carriers were henceforth freed from mandated commercial agreements and existing government-mandated commercial agreements were progressively phased out. The government also dropped (at least formally) the practice of tying increased access for foreign carriers to Air India's ability to match the increase. In 2005, the government lifted restrictions on private carriers' ability to operate international services, paving the way for Jet Airways' rapid overseas expansion.

Policy priorities: India

India currently has one state-owned airline, Air India, and six private airline groups, which between them carried just over 60 million domestic and 13 million international passengers in 2013-2014. Total passenger numbers handled at Indian airports were close to 170 million, making it one of the ten largest markets globally. Strong GDP growth is expected to see India achieve some of the fastest growth of any aviation market in the world over the next 20 years. In addition, if costs can be continually brought down and competition remains strong, low fares should serve to stimulate new demand and draw millions of passengers away from the extensive rail network to faster and more comfortable air services (CAPA, 2015).

It can be expected that more foreign airlines will increasingly seek partnerships with Indian carriers. This will both provide opportunities for the latter and increase competition for India's Air hub operations. Tan (2013b) concluded that the cautious policy of protecting the interests of Indian carriers will persist for

some time, although the continuing growth in Indian private carriers' international operations will provide incentives to negotiate more liberal bilateral and multilateral agreements.

Apart from engaging regional bodies like ASEAN, the broader strategic question seems to be how the South Asian states could move to develop a more liberalised air services arrangement among them in order to improve air connectivity in the region. This might prove to be the most challenging but also the most strategic aviation leadership role that India could assume in the South Asian region.

Japan

In 2014, there were over 95 million domestic passengers and 60 million international air passengers travelling in Japan, making that country the world's third largest aviation market, behind the United States and China. It is home to the world's fourth busiest passenger airport, Tokyo International Airport (Haneda) and eighth busiest airport in terms of cargo traffic, Narita International Airport (Tokyo), although it should be noted that both these airports enjoy very important passenger and freight traffic. In addition, Japan has three other airports, domestic/international hubs, namely Osaka-Kansai, Osaka-Itami and Chubu-Centrair (Nagoya). Japan also has 92 other airports, some of which serve for both civilian and military operations.

Japan has adapted its geographical features in building airports. Kansai, Chubu and Nagasaki airports are all built on artificial islands, while Tokyo-Haneda, built on the shores of Tokyo Bay has been extended into the bay to alleviate noise concerns and develop away from built-up areas. High domestic traffic and limited airport capacity has also made Japan the biggest user of wide-body aircraft for domestic flights in the world. Boeing developed variants of the B-747 specifically tailored for the domestic Japanese market. Today, Boeing B-777 and B-787 routinely operate short-haul domestic flights, especially in and out of slot-constrained airports.

Japan's main full service network carriers are Japan Airlines (JAL) and All Nippon Airways (ANA), members of OneWorld and Star Alliance respectively. Japan is also home to a number of smaller carriers, such as full service carriers AirDo, Skymark and Solaseed Air, LCCs Jetstar Japan, Peach Aviation, Spring Japan and Vanilla Air and domestic regional carriers Amakusa Airlines and Oriental Air Bridge. Some of these airlines are partially or fully owned by JAL or ANA.

Japan's domestic market was regulated from the time civil aviation resumed in 1951, after the ban on commercial aviation imposed by the occupying powers had been lifted. At first fully regulated, gradual deregulation took place from 1985 to 2000 (Ida and Tamura, 2003). Initially state-owned JAL, ANA and six regional carriers shared the domestic marketplace. Over the years, mergers and acquisitions reduced that number to three major carriers. Under a 1970 cabinet resolution concerning airline administrative systems and a Minister of Transport Notification in 1972, the domestic market was segmented under a structure called the 70/72 scheme. It provided for JAL and ANA to compete on trunk routes (from or to Fukuoka, Okinawa, Osaka, Sapporo and Tokyo) and ANA and Toa Domestic Airlines (renamed Japan Air System in 1988) to compete mainly on regional routes (Alexander, 1996). There were no new entrants in the domestic sector until the arrival of Air Do and Skymark Airlines in 1998. These were established in response to higher air fares on trunk routes, following fare-setting liberalisation on those routes in 1996 (Yamaguchi, 2013). Japan's domestic market was fully liberalised in 2000 and two years later JAL and JAS merged.

Lieshout et al. (2012) modelled connecting traffic shares for various airports using the NetCost model and OAG flight schedules. Their analysis was meant to show how the significant increase of scheduled international flights at Haneda affected that airport's connectivity. They found that between 2010 and

2013, Haneda's connectivity ranking went from tenth to second on the Japan-Asia market and went from non-existent to sixth and second on the European and North American markets respectively.

CAPA (2015d) shows that in the same period international capacity at Narita declined by 1.6 million seats, of which 879 000 were transferred to Haneda with the balance removed from the Tokyo market. Overall, 27 carriers reduced capacity at Narita, of which 10 increased their capacity at Haneda. The study showed that international connecting traffic at Narita has been on a decade-long decline. Meanwhile, Narita has seen increasing activity from domestic LCCs. Non-existent back in 2008, it now accounts for nearly a fifth of the capacity serving Narita and led to the opening of a new Low-Cost Terminal (Terminal 3).

On the issue of ownership and control, under Japan's Civil Aeronautics Law, Japanese licensed air carriers may have at most a third of their voting rights held by foreigners and foreigners may not represent more than a third of the carrier's board.

Policy priorities: Japan

Japan is determined to maintain and grow its competitive position as an aviation hub for Eastern Asia. To that effect, the Japanese government has strategically pursued open skies with key partners which would include access to both of Tokyo's metropolitan airports, to respond to changes in the competitive climate resulting from global trends towards air service liberalisation. Since 2010, Japan has signed 27 open skies agreements, with unlimited third and fourth freedoms except to Haneda and limited fifth freedoms with the United States, the United Kingdom and most of the Asian countries. These agreements cover 94% of the passengers to and from Japan.

Japan aims to maximise the role of Tokyo's metropolitan airports by taking advantage of the characteristics of Haneda and Narita International Airports. While Haneda Airport plays the key role as a major domestic airport, the number of international flights from Haneda has also been rapidly increasing from 2010. Currently, international flights at Haneda mostly serve for the high-demand and business-oriented routes. With regard to the capacity at Haneda, it went up from 303 000 to 447 000 slots per year between 2010 and 2014. Of those, 90 000 slots are for international flights. On 18 February 2016, Japan agreed to convert four nightime slot pairs into more favourable daytime ones and create two slot pairs, one for daytime flights and the other for nightime flights (DoT, 2016). These changes took effect on 30 October 2016. Haneda remainsan IATA Level 3 airport, meaning that due to high congestion it requires a slot allocation regime. Haneda is currently the most congested airport in Japan.

On the other hand, Narita International Airport plays a key role as a major international airport. Narita serves various demands including transfer passengers, growing LCCs and air-cargo. Annual slot capacity at Narita was raised from 220 000 to 300 000 between 2010 and 2015. However, Narita also remains a Level 3 airport due to capacity constraint during peak hours (from 3pm to 6pm and from 9pm to 11pm). As a result, the total capacity of the Tokyo metropolitan airports reached 750 000 slots in 2015.

In parallel, Japan is pursuing an ambitious tourism policy with a goal to see yearly tourist arrivals grow from today's 13 million to 20 million by 2020, when it will host the Tokyo 2020 Olympic and Paralympic games, and 30 million by 2030, nearly all arriving by air. It has relaxed visa requirements on nationals from China, Thailand, Indonesia and a number of other Asian countries. Meanwhile, to ensure infrastructure capacity can keep pace with the expected demand growth in the Tokyo metropolitan area and rising in-bound travel which may compensate, to some level, decreasing long-term demographic trends, Japan aims to raise slot capacity at both Haneda and Narita International Airports by 80 000 by 2020.

With respect to airport policy development, Japan is making use of Public-Private Partnerships (PPPs) to increase the efficiency of operation and management in several airports. Under Japan's Act for Integrated and Efficient Establishment and Administration of Kansai International Airport and Osaka International Airport, the New Kansai International Airport Company has started privatising the operation of Kansai International Airport and Osaka International Airport under joint management with guidelines for applications published in November 2014. Also, under the Japan's Act on Operation of National Airports Utilizing Skills of the Private Sector of 2013, the Ministry of Land, Infrastructure, Transport and Tourism of Japan started the process of establishing a PPP for the Sendai Airport with guidelines for applications published in June 2014.

Korea

Korea had almost 57 million international passengers in 2014 and 50 million domestic passengers. Of these 50 million, the market between Jeju Island and the rest of Korea accounted for more than 22 million passengers. In total, there are 15 Korean airports with domestic scheduled flights, of which some also have international services. With 45 million passengers annually, Incheon is by far the largest Korean airport. It has emerged as an important hub with almost 7 million transfer passengers in 2014. On an enplaned/deplaned basis, Korea's biggest markets are China, Japan and the United States. Thailand, the Philippines, Taiwan, Viet Nam, Singapore and Malaysia complete the top ten.

Almost 4 million tonnes of cargo are transported from Korean airports. Incheon is one of the largest cargo hubs in the world, handling 3.2 million tonnes of air freight, almost all international. In total 3.4 million tonnes of air freight are transported from Korea internationally, while 0.5 million tonnes of air freight are transported domestically.

Until 1988 the Korean air transport market was a regulated monopoly with only Korean Air, which had been established with government funds in 1962 and privatised in 1969, being designated by the Korean government to provide air transport services. In the wake of the 1986 Seoul Asian Games and the 1988 Seoul Olympic Games the Korean government realised the necessity of increased supply to effectively meet rising airline demand. This demand had both been fuelled by the strong economic growth that Korea had gone through and the international trend towards liberalisation.

In 1988, the government granted a licence for domestic services to a second commercial airline, Asiana Airlines (initially named Seoul Airlines), although the market remained heavily regulated. From 1991 onwards the Korean government started to assign traffic rights for short- and middle-haul international flights to Asiana, while all the rights for long-haul flights continued to be assigned to Korean Air. At the end of the 1990s, the Korean Aviation Act was amended and a licensing system for air transport providers was introduced as a first step to gradual liberalisation. This induced the foundation of new airlines, mainly low-cost or regional airlines. These were mostly private, but some were set-up with government funds. The goal of this funding was mainly stimulating demand at the local airports that had seen a decrease in passenger numbers as the two main airlines had cut services after the opening of the first high-speed rail link in 2004. Jeju Air was founded in 2005 and was the first successful Korean low-cost carrier. Korean Air and Asiana reacted by setting up the low-cost subsidiaries Jin Air and Air Busan in 2008.

As of 2013, the domestic market share of LCCs was almost 50%. In addition, LCCs increasingly gained market share on short-haul international routes for which Korea has liberalised ASAs. In 1998 an ASA was signed with the United States that allowed for unlimited third and fourth freedom rights and limited fifth freedom rights. Since 2006 Korea has started liberalising the ASAs with surrounding Asian countries. In 2006 open skies agreements with Thailand, Cambodia and Myanmar were signed, while Japan (except

Tokyo) and Malaysia followed in 2007. Moreover, in 2006 the Korean and Chinese government agreed to open up the market between Incheon and Shandong province in China in addition to a Memorandum of Understanding to expand this agreement to all Chinese and Korean cities by 2010.

In the year after the Incheon-Shandong open skies agreement was signed, flights and passengers grew by 65%, air cargo by 15% and air fares dropped more than 30% due to the large increase in competition[130]. The latter eroded the profits for the incumbent Chinese and Korean carriers in this market. Especially the Chinese network carriers, which at that time were considered to be in a weaker financial position than their Korean competitors, started lobbying against the open skies agreement scheduled for 2010. This proved successful as the Chinese government decided to cancel its implementation. Since then hardly any progress in liberalising the China-Korea market has been made[131].

On the issue of ownership and control, a legal maximum of 49% foreign ownership and control applies to Korean airlines. In 2008, the Incheon Municipal government tried to launch a joint-venture budget carrier with Singapore's Tiger Airways, but a successful petition led by Korean airlines prevented the entry. The argument was that Tiger Airways would effectively be controlled by the Singapore government, providing it an unfair advantage over private airlines and alleging that: "Under the mask of `Korean carrier', Tiger is attempting to get a free ride in the big Northeast Asian market of Korea, China and Japan, as Singapore has no domestic market. Its operation here will attack Korea's aviation sovereignty. If the government permits Incheon Tiger's business, similar cases will follow. We hope the government will not approve the licence and prevent the problem from getting worse."

CAPA Aviation[132] concluded in its analysis that this petition was misleading as Singapore Airlines is only a minority shareholder in Tiger Airways and it competes head to head with Singapore Airlines on several routes. In addition, Tiger Airways has also been admitted freely by all other countries in Asia Pacific, from India to Australia, Indonesia, Thailand, China as well as the Special Administrative Regions of Macau and Hong Kong. Moreover, other LCCs, such as AirAsia and Jetstar Asia, with similar partial local ownership, have also been treated as valuable market entrants and have massively stimulated traffic growth and economic activity.

Similarly, Korea's smaller airports would likely have seen their number of direct international connections increasing due to the entry of new LCCs. It might well be the case that passengers who currently travel by train to Incheon before boarding an international flight would switch to a direct flight from a local airport if one is offered by a low-cost carrier. This leads to diverted demand and will have direct consequences for the demand for airport capacity at the local airports. As such, the Korean government is faced with the question of how capacity expansion at these local airports would compare, as a solution, with expanding Incheon or constructing a new large airport near Busan, Korea's second largest city in the Southeast.

Policy priorities: Korea

Busan's current airport faces capacity constraints as its runway only provides around 60% of the normal runway capacity. This is due to the proximity of mountains and the military use of the airport. For these reasons, several options for airport expansion are considered. One of them is the construction of a new large airport with large transfer facilities. In the past, many countries of the size or population of Korea have seen plans for a second hub airport. In many cases this was partly for political reasons. However most of these attempts were unsuccessful and the overall international experience suggests that it is unlikely that a full service airline would be willing to operate an intercontinental hub in the Southeast

region of Korea, as it would face a comparative disadvantage with regard to full service airlines operating a hub in Seoul which provides both the largest O&D market and the largest airport capacity of Korea.

For example, in Europe both the Spanish flag carrier Iberia and its Italian counterpart Alitalia each operated a dual hub strategy across their two largest domestic cities for a while. However, as in both cases it turned out to be inefficient and commercially unsuccessful; both airlines decided to switch to a single hub operation in their capital cities. Similarly, the wave of mergers among airlines in the United States resulted in the dehubbing of many airports that were deemed located too close to other, more efficient hubs within the newly integrated networks. Cleveland was recently dehubbed due to its proximity to United's large hub in Chicago. Previously, Lambert-Saint Louis, Pittsburgh and Memphis were dehubbed for the same reasons.

To put this into perspective, the distance between the dehubbed and remaining hub airport is about 500 km in all the examples above, while the distance between Seoul and Busan is only 330 km. In addition, a new high-speed rail has been opened linking Incheon directly to Korea's high-speed rail network which is still being expanded. As a result passengers departing from regions such as Busan, Gwangju, and Daegu are able to connect both more quickly and less expensively (compared to short-haul feeder flights) to connecting flights at Incheon International Airport. Consequently the rail mode has gained market share at the expense of the domestic air transport mode. All in all, the high-speed train network has both improved Korea's connectivity as well as Incheon's catchment area, increasing the viability of intercontinental hub operations of Korean Air and Asiana. This increases the comparative advantage that Incheon has, due to scale economies, over other Korean airports.

Southeast Korea can still be expected to provide sufficiently large enough markets to make viable direct services to other large cities, both domestically and internationally, that can compete with services via the hubs in Seoul, Tokyo and Shanghai, particularly for business travellers. These flights might be offered by Korean full service carriers as well as LCCs. European experiences have shown that in short-haul markets LCCs can rapidly expand to market shares exceeding 33% in some instances. Foreign full service carriers, such as Emirates, might choose to offer long-haul flights to both Incheon and Southeast Korea as part of a strategy to offer a high frequency and capture high yield business class passengers.

Finally, the market may be large enough to support hub operations for regional, medium-haul international flights. A foreign owned network airline might consider establishing a regional hub if it provides access to the national market and if it is located in a geographically strategic location for its long distance routes. However, the possibilities available to such airlines depend on the conditions attached to ASAs. Granting access under such agreements to secondary airports may be less contentious than granting access to the national hub airport where competition with the national flag carrier is more direct. Where airports compete for demand, airlines determine their network structures on the basis of slot availability and prices as well as passenger demand characteristics.

Mexico

In 2014, over 67 million[133] passengers travelled through Mexican airports, an 8.5% increase compared to the previous year. Domestic traffic accounted for 32.8 million passengers, up 7.9% compared to 2013, while international traffic accounted for 34.2 million, up 9.1% (Datatur, 2015). With respect to freight, Mexican airports handled 617 000 tonnes of freight in 2013, still below the 653 000 tonnes reported in 2011. The air freight market is split about evenly between Mexican and foreign operators. Aerounion, Mas Air, FedEx, Aeromexico and UPS are respectively the five most important freight carriers in the country.

Mexico's international air traffic is mainly geared towards its NAFTA[134] partners, Canada and the United States, reflecting the close tourism and business ties that exist between Mexico and those two countries. Thus, flights to and from the United States carried 14.3 million passengers, while those to and from Canada carried 3.3 million passengers. The United Kingdom, Colombia and Spain were respectively the third, fourth and fifth largest air markets for Mexico.

Tourism plays an important role in Mexico's economy, directly contributing an estimated 8.7% to the country's GDP in 2013 (INEGI, 2015), a proportion expected to grow as Mexico grows its tourism industry and diversifies to emerging new markets. Of the nearly 16 million that visited Mexico in 2014, 84.2% arrived in the country by air, indicating the importance air connectivity has to help develop that country's tourism sector.

Mexico has 76 airports with commercial services as of 2013. Of those, 64 have international services, including 20 new international airports opened during the last two decades. Mexico City's Benito Juarez International Airport is by far the busiest airport in the country with over 35 million passengers per year. However, Cancun International Airport actually receives more international passengers, reflecting its importance as a tourist destination. Compared to Mexico City, Cancun receives three times as many visitors from the United States and ten times as many from Canada. However, Mexico City remains the key international gateway for business travellers and lays at the heart of the Mexican domestic network, as eight of the ten busiest domestic city-pairs include Mexico City[135] (SCT, 2014). Other major international gateways in Mexico include Los Cabos, Puerto Vallarta and Guadalajara.

Since 1998, Mexico's airports have been organised around four state-owned airport groups, covering the southeast, the centre north, the Pacific and Mexico City. Fifty-year concessions were then granted for each airport. Except for Mexico City, all other airport groups have now been privatised.

Aeromexico is Mexico's largest carrier and a member of SkyTeam. Combined with its regional feeder, Aeromexico Connect, it has a fleet of 123 aircraft and is the only Mexican operator of long-haul aircraft. It started as a private company in 1934, nationalised in 1959 and 1993 and privatised in 1989 and 2007 (OECD, 2014c). LCCs Volaris and Viva Aerobus fly mainly within Mexico and to the United States, while Interjet also serves Colombia, Costa Rica, Cuba and Guatemala.

Domestic aviation in Mexico is governed by the Aviation Act[136] of 1995. Air carriers wanting to operate domestically must have at least 75% Mexican ownership, in line with the United States and Canada, but significantly higher than other Latin American countries. They must apply to the Ministry of Transport and Communication (SCT), who regulates the industry, for a concession and permits to operate specific routes. Fares are set by air carriers and filed with the regulator that may set minimum and maximum fares if it believes there are predatory or monopolistic pressures on the market. Carriers wanting to operate a new route must obtain permission from the SCT and launch a service within 90 days of approval. In addition, they risk losing their permits on a given route if they suspend operations for over 180 days (Ros, 2010). Air carriers are free to respond to market pressures, but the process for obtaining permits can cause a delay in implementation.

Increased competition in the domestic airline sector has yielded positive results, both from a traffic growth perspective and from a market concentration perspective. To that last point, in 1992, 78% of the domestic market was split between Aeromexico and the now defunct Mexicana; 20 years later, as LCCs have entered the market, Aeromexico has a 43% market share while the three main LCCs have a combined domestic market share of 53%, making the domestic market far more competitive. During that 20-year period, domestic traffic nearly doubled (SCT, 2014).

Airports in Mexico are governed by the Airports Act[137], which sets a methodology for charging for slots. This enables private airports to operate profitably by auctioning slots to the highest bidders, charging higher rates for slots during periods of congestion and price discriminate based on a number of factors, including aircraft type, route and carrier. Airports may take back slots if not fully utilised[138] and re-auction them to the highest bidder. Mexico City airport, still being government-owned, is subject to a slot allocation policy directed by the federal Treasury (*La Hacienda),* where the emphasis, unlike private airports, is on efficiency and not maximising profits (Ros, 2010). Mexico City International Airport is severely slot constrained and the 2010 law on Airport Regulation sets out the framework for slot allocation that includes a requirement to surrender 10% of slots every year for re-auctioning to the highest bidder. This mechanism is designed to ensure slots go to services with the highest value. However, Mexico City airport has never conducted a slot auction so far as surrendering slots in use would be highly controversial.

Internationally, Mexico has pursued a policy by which it tries to improve its global connectivity. As of 2013, Mexico had ASAs with 48 countries located in the Americas (19), Europe (16) and Asia (13). However, while very well-connected to the Americas, it only enjoys year-long connections with seven European countries and two Asian countries, namely China and Japan. In 2011, it signed an expanded ASA with Canada, with whom traffic has been growing by 18.3% per year over the last two decades and signed a Memorandum of Understanding with the United States in 2015, enabling a significantly more open ASA, with unlimited third and fourth freedoms.

The most significant issue facing the Mexican air transport system at present is the lack of capacity at Mexico City airport, whose two parallel runways were built too close together to allow for simultaneous operations. By some estimates, Mexico's runway system is used at over 97% capacity and the airport is handling nearly twice as many passengers as it was optimally designed to handle (CAPA, 2012). Since 2005, the SCT has declared the airport saturated, thus capping the number of available slots. Capacity constraints at Mexico City have had significant impact on air transport and the overall economy.

The World Bank (2012) finds that air fares to and from Mexico City are between 40% and 80% higher compared to similar routes within Mexico as a result of restrictive slot allocation and higher ground service fees. The report suggested a number of measures including improving slot allocation to increase its transparency and stimulate new entry, allowing greater foreign ownership of national carriers and entering into open skies agreements.

The Mexican Competition Commission[139] has criticised the failure to implement the slot allocation process in Mexico City, saying that it should be implemented with a view to benefiting consumers rather than incumbent carriers. In a report published in October 2007, it recommended the use of an independent slot co-ordinator, making slot allocation more transparent and efficient and promoting competition between airports (OECD, 2014c). In addition, it found that the airport was saturated which created a competition issue as its lack of capacity was a barrier to entry (Ros, 2010). In a separate report published in 2010, it also recommended not allocating slots based on routes and to limit the accumulation of slots to avoid excessive market concentration.

With expansion at the current site of the airport impossible, as it is surrounded by built-up areas, the Mexican government plans to build a new international airport in the Lake Texcoco area at a cost exceeding USD 13 billion to which all flights will be transferred. The airport is expected to open in 2018 and should resolve the airport congestion issues in Mexico City. It is located near the existing international airport and will occupy an area five times larger. In addition, the Toluca airport, located some 40 kilometres from the city, has become a significant LCC airport, providing much needed capacity to Mexico City. Mainly focused on the very significant domestic sector, Toluca handled close to 900 000

domestic passengers in 2014 and the single-runway airport ranked fourth in the country in terms of aircraft movements.

Morocco

Morocco reported 17.3 million air passengers in 2014, made up of 1.7 million domestic passengers and 15.6 million international passengers (METL, 2014a). Of those passengers, about 12.5 million travelled to and from Europe, 1 million to and from the Middle East, about 1 million to and from Africa and about 0.7 million to and from other Maghreb countries (METL, 2014b). Morocco enjoyed direct flights to 113 foreign airports located in 51 countries, compared to 43 airports in 29 countries a decade earlier. Moroccan airports also handled 54 000 tonnes of air freight, 20% below the 67 000 tonnes record established in 2007.

Morocco's largest air carrier is Royal Air Maroc (RAM) which carried 7.1 million passengers in 2014. Its ownership includes the Moroccan State (53.9%), the Hassan II State Fund (44.1%) and Air France (1.25%). It has a fleet of 54 aircraft including seven wide-body aircraft. Morocco's second largest carrier, Air Arabia Maroc, is privately-owned and significantly smaller, operating five Airbus A-320s and carrying over 800 000 passengers. European LCCs play an important role in the Moroccan air transport market, particularly in both the leisure and visiting friends and relatives segment of the market. The five most important on that market, Ryanair, EasyJet, JetairFly, Transavia and Vueling combine to carry about 5.3 million passengers between Europe and Morocco.

Morocco's airport network is made up of 19 international airports with a combined capacity of 24 million passengers per year. Ground handling services have been fully liberalised since 2005, now with three companies, SwissPort, Globalia and RAM Handling competing in this lucrative market. Casablanca's Mohammed V International Airport is the country's main international gateway and RAM's hub, able to connect Europe and the Americas to 35 destinations in Africa and the Middle East. It handled 8 million passengers in 2014 or 46% of all Moroccan traffic. Marrakech (3.8 million passengers) and Agadir (1.2 million passengers) are the nation's second and third largest airports.

Morocco has the most flights to Europe out of all African countries and third most amongst non-European countries, after the United States and the UAE. This reflects both the important presence of Moroccan nationals living in Europe and the very developed tourism and business markets between Morocco and Europe. Morocco defines a Moroccan carrier as one belonging in majority to Moroccan nationals or the Moroccan state, as per decree 2.61.161 of 10 July 10 1962. Control is determined by the number of votes held by Moroccan nationals on a board, with a majority being required for the carrier to be deemed Moroccan controlled, except in cases where Morocco has signed an agreement with another country to allow less stringent requirements.

Since 1962, in accordance with a decree related to Moroccan civil aviation, domestic air transport can only be operated by a Moroccan owned and controlled carrier, holding a valid Moroccan airworthiness certificate (*Certificat technique d'exploitation)*. Since June 2000*,* those Moroccan carriers are free to set routes, capacity, frequency and tariffs according to market conditions. Non-Moroccan carriers are not permitted to operate in the domestic market.

In the early 2000s, Morocco launched an ambitious tourism policy, "Vision 2010" which became "Vision 2020", aiming to grow tourist arrivals from 4.3 million in 2000 to 20 million by 2020. With the EU being home to about 80% of its visitors, Morocco concluded that achieving such ambitious goals would require far greater connectivity with the European Union than what was already in place (Dobruszkes et al.,

2013). The EU's important share of tourism to Morocco is also reflected in the fact that in 2013, about 78.5% of Morocco's international airline capacity was from and to the EU[140].

In December 2006, Morocco signed a very liberal ASA with the EU that provided unlimited third and fourth freedom traffic rights and in the second phase limited fifth freedom opportunities to 16 countries mainly bordering the Mediterranean for EU carriers and to other EU countries for Moroccan carriers, excluding in both cases cabotage. To date, no EU or Moroccan carrier has taken advantage of these fifth freedom rights, reflecting the economic challenges of operating fifth freedom flights in short-haul markets rather than any regulatory or policy constraints.

The EU-Morocco ASA recognises that subsidies distort competition and allow subsidies from one of the contracting parties in the pursuit of a "legitimate objective" and that are designed to minimise the impact of the adverse effect on a carrier from the other contracting party. This may reflect Morocco's policy of fare incentives in which it invested MAD 1.2 billion (about EUR 1.1 million) to lower fares and incentivise traffic.

The immediate impact of this ASA was creating new connectivity between secondary European airports and Morocco. Thus, the number of routes grew from 57 in January 2005 to 118 by January 2012, with the establishment of 70 new routes and the discontinuation of nine existing routes. The number of EU airports with direct air services to Morocco grew from 65 in 2005 to 77 in 2010 (European Parliament, 2013). All types of carriers grew from 22 in 2005 to 42 in 2015. LCCs, which did not operate between the EU and Morocco, had a 45% market share on capacity by January 2012. Some of this growth came at the expense of existing charter carriers, a number of which have folded or were consolidated. However, the net result is that tourist arrivals nearly doubled between 2000 and 2010 to reach over 9 million. Traffic between Morocco and the EU grew by two-thirds between 2006 and 2010, going from 6.6 million to 11 million. It also affected tourism patterns as the lower cost air fares offered by LCCs encouraged Europeans to do weekend visits to Morocco, shifting a share of the tourism product from a typical week in a resort to a weekend escape.

The EU-Morocco liberalised ASA is part of a broader aviation liberalisation strategy that includes an open skies agreement with the United States (2001) and an ASA with unlimited third and fourth freedoms with 75 countries.

The case of Morocco clearly shows how aviation liberalisation can be a catalyst for a more ambitious tourism policy. The combination of market-driven routes and frequencies with the arrival of LCCs has created new tourism opportunities for the country. However, this has come at the expense of a declining market share for the national carrier, Royal Air Maroc, which saw its share of the Morocco-EU decline from 57% in 2005 to 35% in 2012, despite a 48% increase in capacity. Meanwhile, the second largest carrier on the Morocco-EU market, Air France, decreased capacity by 3% and saw its market share decline from 16% to 6%. Thus from a public policy perspective, the liberalised ASA with the EU did stimulate the tourism market as the Moroccan authorities had wished, but it also transformed the market dynamics of air carriers and shifted the tourism offering to reflect the tastes of new passengers travelling increasingly on LCCs.

Policy priorities: Morocco

Morocco is currently looking at developing its domestic market and has launched a study to that effect to determine a short-, medium- and long-term plan to improve domestic connectivity in terms of routes, schedules and fares and better serve remote regions. This study is expected to be completed in the end of 2015.

Internationally, Morocco is focused both on its long-haul market and the EU, where 80% of its passengers fly to and from. They are also trying to position the country as a gateway hub for Africa. Morocco has a 20-year policy vision, AJWAE 2035, which discussed how to ensure airport infrastructure, labour, investments and the Moroccan airspace will be ready to meet the expected demand in 20 years while positioning the country as an aviation leader, both globally and within Africa.

The Netherlands

The Netherlands currently has five airports with scheduled flights and carriers with international services (TUIfly[141] Corendon, KLM, KLM Cityhopper and Transavia). None of the carriers provide domestic scheduled services due to the limited size of the country and the extensive railway network. However, Transavia does operates a handful of unscheduled domestic as consecutive calls at two Dutch airports before or after an international flight, but these are not destined to serve the Dutch domestic market. A small Dutch political party, GroenLinks, argued that flying is too polluting and proposed a ban on Dutch domestic flights as they would be of limited value to passengers, due to the presence of alternative and efficient surface modes of transport. The Dutch government determined that such a ban would be illegal, violating the rights of European airlines to offer domestic flights within the European internal market.

In 2013, there were 36 million international O&D passengers. About 50% of the international O&D traffic originating in the Netherlands is carried by a Dutch carrier, mainly KLM, which only operates from Amsterdam Schiphol, the fourth largest airport of the European Union.

KLM, Royal Dutch Airlines, was founded in 1919 and is the oldest carrier still operating under the same brand name. Although it had started off as a private company, the Dutch government obtained the majority ownership during several periods in KLM's history. The oil crisis of 1973 resulted in the purchase of KLM shares by the Dutch government to provide it with a 78% stake in the company although management remained under control of the private stakeholders. In 1986 this stake was reduced to below 50% and, anticipating the liberalisation of the European internal market, preparations were made to fully privatise the company again. In 1987 and 1991 KLM acquired 80% of the Dutch carriers Netherlines and Transavia and acquired the remaining 20% in 2003. Netherlines and NLM Cityhopper were merged into KLM Cityhopper in 1991. It also bought stakes in foreign airlines, including a 20% stake in the US carrier Northwest in 1993. In addition, several options for mergers and take-overs were negotiated with different foreign airlines. This included talks with British Airways (in 1991) as well as with Swissair, Austrian Airlines and SAS (in 1993), but no merger agreement was reached.

In 1994, KLM intensified its successful collaboration with Northwest but it was still said to be in need of a European partner to be able to survive in the more competitive European internal market that was being formed. KLM purchased a 26% stake in Kenya Airways in 1996 but failed to complete a successful merger with Alitalia in 2000.

In 2004, Air France merged with KLM, forming the Air France-KLM group in which the stake of the French government was reduced to 44%. Subsequently, the French government announced that it would additionally sell 18.4% of its equity, reducing its shareholding in the Air France-KLM group to just under 20%. About 19% of the shares were allocated to former KLM stakeholders. At present, the Dutch government owns 5.9% of KLM's outstanding shares but not shares in the Air France-KLM group.

As an attempt to limit the risk that the merger would negatively affect the Dutch economy, it imposed a condition in the merger agreement that assured that KLM's hub in Amsterdam would not be dismantled in the eight years following the merger. That agreement has been extended indefinitely; it ensures the

Air France-KLM group will continue to operate a dual hub strategy articulated around Schiphol and Paris-de Gaulle.

The international air transport policy of the Netherlands has been directed towards the development and continuation of Amsterdam as a major aviation hub. The Dutch government has emphasised the importance of Amsterdam Schiphol Airport and its network carrier KLM for the economy of the Netherlands and has stated that its aviation policy will continue to be directed to maintaining and possibly expanding its position in the international aviation market. It has announced that once Schiphol airport faces capacity constraints, it will devote the scarce capacity to carriers that contribute to Schiphol's hub function, while trying to attract LCCs that don't contribute to Schiphol's hub function and charter airlines into moving to Lelystad airport, which will be expanded for this purpose. For the moment, LCCs have been given access to the slot-constrained airport and in 2014 EasyJet even opened a base at Schiphol. In 2018 Lelystad Airport will open as the sixth Dutch airport providing international scheduled services as a reliever for noise and capacity constrained Amsterdam Airport Schiphol.

The other four Dutch airports are mainly served by LCCs, mainly Ryanair and Transavia. The latter is the second largest Dutch airline and was taken over by Air France-KLM in 1991. It now serves as its low-cost subsidiary mainly targeting leisure passengers. Due to the strong presence of Air France-KLM at Schiphol, which accounts for 53% of movements at Schiphol, the penetration of LCCs into the Dutch market is relatively small by European standards. Eindhoven Airport (4 million passengers annually) has mainly grown because of Ryanair's expansion. It is still mainly served by charter and ultra-low-cost carriers such as Ryanair and Wizz. Rotterdam the Hague (1.7 million passengers) is also a spoke in the network of full-service carriers, such as British Airways (service to London Heathrow), Lufthansa (service to Munich) and Turkish Airlines (direct connection to Istanbul Atatürk), although the majority of its flights are provided by Transavia.

The United Kingdom is by far the largest international market (5 to 10 million annual passengers) for the Netherlands on an enplaned/deplaned basis. This is largely due to KLM's strategy of serving a broad range of destinations within the United Kingdom to feed its hub in Amsterdam. As British Airways only serves a limited number of UK destinations, many UK passengers departing from secondary cities use Schiphol to connect to intercontinental flights, rather than London Heathrow. Spain and Turkey (2-5 million passengers annually) are the second and third largest markets for the Netherlands. These are predominantly leisure markets that are mainly served by LCCs and charter airlines. Next are Italy, the United States, Germany, France and Switzerland (1-2 million passengers annually), while Greece and Portugal complete the top 10 of largest international market (each having between 0.5-1 million passengers annually). All of these countries belong to the European internal market except for Turkey, which has an ASA with the Netherlands that allows for unlimited third and fourth freedom traffic.

Policy priorities: The Netherlands

An extensive aviation network is deemed necessary for the broader Dutch economy and for maintaining an attractive climate for foreign investment. The Dutch government's policy is therefore directed towards maintaining and possibly strengthening the network of destinations that are being served from Amsterdam Schiphol Airport. Opening up new aviation markets is a means to accomplish that goal, but priority is given to (groups of) countries that have an aviation policy that closely resembles that of the Netherlands.

New Zealand

More than 8.4 million passengers travel on domestic services and 3.7 million arrive in New Zealand on international air carriers each year. New Zealand's national carrier is Air New Zealand, based at Auckland Airport.

Air New Zealand was nationalised in 1965. It was partially privatised in 1989 but returned to public ownership in 2001, in the wake of the collapse of the merger with Ansett, the Australian carrier which ceased operations that same year. It currently operates a domestic and regional network within New Zealand and the Pacific and international services to Australia, Asia, North America and Europe. Air New Zealand has been a member of the Star Alliance since 1999.

Australia is by far its largest international market (2-5 million annual passengers annually), followed by the United States, China and the United Kingdom (0.5-1 million passengers annually). Fiji (250 000-500 000 passengers annually), Japan, Germany, Canada (100 000-250 000 passengers annually each) and India (around 75 000 passengers annually) complete the top 10 of New Zealand's most important international markets.

Policy priorities: New Zealand

New Zealand is a leader in aviation liberalisation, having followed an increasingly liberal air services policy for more than three decades. Its policy on international aviation is articulated around the benefits aviation can bring to its trade and tourism and not on the benefits to its national carrier. In bilateral negotiations, New Zealand usually defines carrier nationality based on principal place of business rather than nationality of ownership. This is in keeping with its decision in 1986 to remove any foreign ownership restrictions on domestic carriers.

New Zealand is both a signatory and the depository state for the Multilateral Agreement on the Liberalisation of International Air Transport (MALIAT) which provides for a multilateral open skies-type regime (open route schedule, open traffic rights and open capacity but no fifth freedom) between nine countries[142]. New Zealand is also a signatory of a MALIAT protocol with Brunei, Chile, The Cook Islands and Singapore to allow eighth freedom rights on international flights between those countries.

Norway

The Norwegian air transport market has been historically dominated by SAS and Braathens through a system of route licensing. In 1994, most entry barriers on domestic routes were removed and consequently a third carrier, Color Air, entered the market in August 1998. In October 1999, Color Air filed for bankruptcy, while SAS and Braathens merged in 2001. This resulted in a de facto monopoly on domestic routes and a strong market position on international ones. In an effort to reopen the market for competition, the Norwegian Competition Authority implemented a ban on frequent flyer point (FFP) collection on domestic routes from August 2002. A new carrier, Norwegian Air Shuttle (NAS), entered the domestic market in September the same year and quickly set out to expand their network even to international routes. Since 2013, NAS also operates intercontinental flights to Asia and the USA. The ban on FFP collection was terminated in May 2013, when NAS had obtained market shares comparable to those of SAS and the degree of market competition was deemed satisfactory.

At present, Norway has four national carriers and three of them operate internationally. In 2014 there were 26.2 million domestic O&D passengers and 19.4 million international O&D passengers. The United Kingdom, Denmark, Sweden, Spain and Germany are the largest international markets

(1-2 million annual passengers annually), followed by the United States, France, Poland and the Netherlands (0.25-0.5 million passengers annually). About 15-20% of the international O&D traffic originating in Norway is carried by Norwegian carriers, while more than half of the international passengers connect via third counties. The share of sixth freedom traffic is between 2% and 5%.

Policy priorities: Norway

The position of the Norwegian government is that all carriers should have equal and non-discriminatory access to the market. Furthermore, the Norwegian government considers ASAs with other countries as useful for economic efficiency and consumer welfare. In addition, it has stated that it is generally supportive towards NAS's application for a permanent licence from USDOT to operate low-fare flights between Europe and the United States. Finally, it has reviewed its interpretation on its immigration law and the obligation it places on Norwegian carriers operating Norwegian-registered aircraft to do so with crew made up of Norwegian citizens or residents with a valid work permit. Norway is currently looking at amending this law.

NAS currently depends on a temporary exemption from these regulations for their intercontinental routes operated by means of crew based in a third country. SAS has challenged this exemption as incompatible with a level playing field for competition.

Despite these issues, the Norwegian government remains positive towards further liberalisation of ASAs. Increasing competition and lowering fares is stated as the main objective, followed by increasing efficiency, economies of scale and consumer welfare. Enlarging the influx of tourists is considered as another reason for liberalising ASAs.

As demand is rapidly increasing for intercontinental travel between Europe and Asia/Oceania and many of these routes still rely on bilateral agreements, there is a large potential for growth if and when the markets become liberalised. In addition, the Norwegian government emphasises that there is also room for growth in the transatlantic market, if and when open skies agreements come into force on all corridors and/or if these are made to include all nine freedoms of the air. A drawback of liberalisation that is raised by Norwegian policy makers is the increased impact of aviation on environmental issues, including climate change. In addition, they mention that the possibility of granting state aid to non-European airlines by their respective governments could be a reason to refrain from liberalisation agreements with those countries.

All in all, the Norwegian government states that their main objective is to provide passengers and shippers with more travel options (establishing new routes) and lower prices. Developing domestic airports' hubbing capabilities and helping domestic airports to attract foreign carriers is considered of secondary importance. The Norwegian government states having no interest in supporting national airlines.

Turkey

Turkey had over 165 million passengers in 2015 (TUIK, 2016), almost evenly split between the domestic and international sectors. This represents an 11% increase over 2013 and the fifth consecutive year of double-digit growth. Passenger traffic nearly doubled between 2009 and 2014, after already having doubled between 1994 and 2004 and again between 2004 and 2009. In this century, Turkey only experienced one year, 2001, with decreasing traffic. Since 2003, Turkey's airports have experienced passenger traffic growth of about 14% per year (DHMI, 2015). As for air freight, it handled almost 2.9 million tonnes of freight in 2014, up 11% in a year and nearly quadrupling in the last 15 years.

Turkey enjoys very strong air connectivity with its largest carrier, Turkish Airlines, serving 283 destinations in 111 countries, more countries than any other airline, with a fleet of 298 aircraft, including ten freighters. Other major carriers in Turkey include LCC Pegasus Airlines, SunExpress, a joint venture between Turkish Airlines and Germany's Lufthansa, Corendon Airlines and Onur Air. These last four, privately-owned Turkish carriers, all began as leisure charter airlines, catering mostly to European travellers vacationing in Turkey. Today, their focus remains European tourists as well as an extensive domestic network. Turkey is also home to MNG Airlines, a freighter airline operating scheduled and charter cargo flights with a fleet of 9 aircraft. It is based in Istanbul, where it operates a hub as well as one in Cologne.

Overall, there are 67 airports in Turkey with commercial services, including about 35 with both domestic and international flights. Of those airports, 47 are operated by DHMI, the publicly-owned air navigation service provider and state airport authority, five are public-private partnerships and 15 are operated by the military. The most important airport, by far, is Istanbul Atatürk International Airport with 61 million passengers in 2015, followed by Istanbul's Sabiha Gökçen International Airport and Antalya International Airport with about 28 million passengers each and Ankara and Izmir International Airports with about 12 million passengers each.

Turkey was connected to 258 foreign destinations at time of writing, mainly in Europe and Asia and, increasingly, in Africa. Turkey's prime geographical location, straddling Europe and Asia, makes it a strategic connection point between major global markets. It's strong popularity as a leisure destination, which places it sixth in the world (fourth in Europe) in terms of international tourist arrivals with 39.8 million tourists (UNWTO, 2015), distributes international flights across a wide number of airports, rather than only a few main international gateway airports, as is the case in many European countries.

Commercial aviation in Turkey traces its roots back first to the Turkish Aeroplane Society (1926) which launched civilian aviation in Turkey (Gerede, 2010) and Turkish Airmails, established in 1933 with a fleet of five aircraft which had a combined capacity of 28 seats (Dursun et al, 2014). It was rapidly renamed State Airlines Administration and finally Turkish Airlines in 1955 when air transport and aerodrome operations were separated (Çetin et al., 2011). Starting as a domestic carrier, it expanded to international routes in the 1960s. The airline was first part of the Ministry of Defence, then Public Works and finally Transport. From the onset of commercial aviation in Turkey, all aspects of the industry were state-owned, including manufacturing. In fact, in the mid-1940s, Turkey had the third most important aircraft manufacturing industry in Europe (Gerede, 2010).

Until 1983, aviation in Turkey was almost exclusively run by state owned enterprises, but that year Turkey significantly liberalised its economy and sought to reduce the role of the state. Private air carriers, training institutions and maintenance facilities were allowed to be established thanks to Civil Aviation Law 2090 (1983). Ground handling, which had been a private monopoly, operated by Celebi until then, was regulated and the sector was opened to competition from a new state-owned enterprise, Havas, which would be fully privatised in 1998. The catering company USAS was privatised in 1987. Turkish Airlines, meanwhile, was gradually privatised, with the government selling a 1.82% share of the company in 1990, an additional 23% of the company in 2004 and an additional 28.75% in 2006 before a small share (2.7%) was repurchased by the state; today, Turkish Airlines is 50.88% private. In terms of ownership and control requirements, Turkey is on par with those found in the EU, with a limit of 49% foreign ownership of air carriers registered in Turkey.

Meanwhile, the Turkish Government, through the General Directorate of State Airport Authorities (GDSAA), an autonomous state economic enterprise under the Ministry of Transport, Maritime Affairs

and Communication, manages Turkish airports which have not been privatised as concessions as well as being that country's air navigation services provider.

The GDSAA has successfully implemented the Build-Operate-Transfer model at a number of airports, including Istanbul-Ataturk, Istanbul Sabiha Gökçen, Antalya and Dalaman. Using this model, it builds a terminal and starts operating and then transfers it for a number of years to the private sector against a concession fee which is then returned to the national treasury. Çetin et al. (2011) found that this process brought in USD 12 billion to the national treasury, including USD 3.1 billion from privatisation of domestic and international terminals.

Meanwhile, Turkish Airlines had a monopoly on the domestic market and was the only Turkish carrier operating international flights. In 1994, the SHY-6A regulation on commercial air carriers enabled the establishment of new, private carriers, but, as we saw with both the US domestic and EU internal market deregulation, this brought on a number of new entrants that quickly became financially non-viable and exited the market. Amendments to this regulation in 1992 imposed a minimum capital threshold of USD 1 million per aircraft and a minimum fleet of five aircraft for any carrier wishing to fly internationally. In 1996, the domestic market was reregulated and private carriers could only operate routes that were not flown by Turkish Airlines or on days when Turkish Airlines was not operating that specific route. Gerede (2010) found that between 1984 and 1992, 22 carriers entered the market and nine exited. He also found that a main impetus for reregulating the domestic market was to ensure the maximum value could be obtained when Turkish Airlines would be privatised. Thus, Turkish Airlines had once again a near 100% market share of the scheduled domestic market.

In 2001, Turkey liberalised prices for the domestic market by amending the Civil Aviation Law, allowing them to be set by market conditions rather than through a regulatory authority. Two years later, in 2003, the 1996 decision to reregulate the domestic market was abolished. Turkish carriers were now free to choose their routes, decide when and how often they would be operated and set their own prices. The Turkish domestic market was now fully deregulated.

The results of domestic deregulation in 2003 were very quick and quite pronounced. Domestic traffic jumped from 8.7 million passengers in 2002, the last full year before deregulation, to a record of 14.4 million in 2004. Airports with regular domestic services jumped from eight to over 40 (Demirsoy, 2012). Two years later, in 2006, domestic traffic had doubled again to reach 29 million passengers and it doubled again by 2011 to reach 58 million. By 2014, that number had reached 85 million and shows no signs of levelling off. This rapid growth rapidly created congestion issues at Istanbul's main airport, Atatürk International, with capacity becoming increasingly scarce. This provided an opportunity for Istanbul's other airport, Sabiha Gökçen, to rapidly develop. Opened in 2001, it first handled a million passengers a year in 2005. By 2010, traffic had grown to 11.6 million and reached 28 million by 2015, with two-thirds of that traffic being domestic.

Deregulation brought three important changes to Turkey's domestic market. First, prior to 2003, the network was articulated between Istanbul and Ankara, both in the north-western part of the country and the country's roughly 25 other airports, whereas post-deregulation, a network of point-to-point routes between those other airports made air travel far more convenient and efficient, eliminating the need to connect in one of the two major hubs. Second, the deregulation enabled the establishment of a number of new, privately-owned carriers and the transformation of existing private domestic charter carriers into domestic scheduled carriers. These carriers espoused different variants of the low-cost model, leading to third major change, namely lower air fares, especially on the domestic market.

Increasingly favourable supply-side conditions took place during a period of exceptional economic growth for Turkey and the enactment of tourism-friendly policies, enabling demand to be able to

respond to this new environment. Between 2004 and 2014, real GDP per capita in local currency grew at 2.9% per year, despite the financial crisis from which Turkey had quickly rebounded. Thus falling air fares were available to an increasingly wealthier population, who had seen their GDP per capita rise by a third between 2004 and 2014 in an increasingly pro-tourism environment. Demirsoy (2012) modelled the impact on passenger demand of various exogenous variables and found that income had a long-run elasticity of 2.6 on demand and that population has a 1.3 long-run elasticity. He also found that the 2003 liberalisation package had a significant impact on demand but that the 1983 package did not.

As the nation's leading carrier, Turkish Airlines took full advantage of this new liberalised environment, combined with the strategic location of its main hub, Istanbul Atatürk, located less than three hours flying time from 50 countries and the fact there are no night operating restrictions at that airport. Dursun et al. (2014) show that Turkish Airline's network out of Istanbul grew from 96 destinations in 2003 to 234 destinations by 2014 and over 260 today. In Europe alone, Turkish Airlines flew to 97 destinations, more than any network carrier. This has helped traffic grow from 10.4 million passengers in 2004 or an estimated 61.7 million in 2015 (Turkish Airlines, 2015).

The absence of a curfew enabled it to increase its fleet utilisation by adopting a rolling type hub[143] between 5am and 2am. Dursun et al. (2014) found that when combined with its network structure, Turkish Airlines had an average utilisation of its Airbus A-321 of 13 hours and 16 minutes a day, compared to between 8 and 9 hours for Air France, British Airways and Lufthansa. For an A-320, utilisation was 11 hours and 27 minutes. Higher aircraft utilisation, combined with a lower cost base prevalent in Turkey and significantly higher employee productivity, at least based on the number of passengers per employee, has helped it maintain a lower cost per available seat kilometre than other European network carriers.

Growth in passenger traffic was paralleled by growth in freight transport. Between 2010 and 2015, airfreight carried by Turkish Airlines grew from 314 000 tonnes to about 720 000 tonnes, supported by a fleet of 10 freighters and 73 wide-body aircraft[144].

Internationally, Turkey has negotiated 165 ASAs, reflecting the global aspirations of its leading international carrier, Turkish Airlines, however most are not open skies. Turkey experienced a decade of intense ASA negotiations, seeing the number of ASAs jump from 81 in 2003 to 143 by 2012 (Dursun et al, 2014). A notable exception to this is the ASA with the United States, signed in 2000. Aside from that ASA, most of Turkey's ASAs tend to be restrictive in nature. A challenge Turkey faces in negotiating more liberal ASAs is common with other countries trying to establish a global hub, such as the UAE, Qatar, Singapore or Panama, is that partner countries may want to limit the ability of Turkish carriers to carry sixth freedom traffic and limit traffic rights to third and fourth freedom, to protect the direct market to third countries from the indirect market via Turkey. However, there may also be issues where Turkey attempts to limit the openness of its own markets, especially with respect to fifth freedoms for freighter flights. InterVISTAS-EU (2009b) found that at the time, of Turkey's ASAs with its 20 largest origin/destination country markets, only one, the one with the United States, did not specify authorised points, was fully open on the issue of capacity and required double disapproval of pricing.

InterVISTAS-EU (2009b) developed a gravity model to estimate the impact of liberalising market access and ownership and control in Turkey. They found that a fully liberalised market would increase traffic by 33% whereas fully liberalised ownership and control would increase traffic by 23% as a result of a 16% reduction in fares. They estimated that fully liberalising both would increase employment in the airline industry by 75 600 full-time equivalent employees and would add USD 7.7 billion[145] to Turkey's GDP.

Turkey has a horizontality agreement with the EU in place since March 2010 which allows for a carrier from one EU member to make use of air traffic rights of another EU member; however it has individual

ASAs with EU members. As part of its Aviation Strategy presented in December 2015, the European Commission has requested the authority to negotiate a comprehensive EU-Turkey ASA. At present, there has been no decision by the Council of the EU and the European Parliament as to whether or not to authorise that request. Turkey has also indicated a willingness to integrate the Single European Sky and is a Pan-European Partner of the European Aviation Safety Agency (EASA), which facilitates its cooperation in implementing aviation safety rules in the EU.

Policy priorities: Turkey

One of Turkey's major policy challenges will be the construction of Istanbul's new airport to replace the existing and Atatürk International Airport, now operating at capacity. The new airport, which once fully completed could be the largest in the world, would have six 3 750 metre-long runways and capacity for over 200 million passengers per year. The first of four phases of the airport is expected to be completed by the end of 2017. Turkish Airlines expects the new airport to significantly contribute to its goal of carrying 135 million passengers by 2023, more than double its current traffic. Meanwhile, Eurocontrol (2013) forecasts Turkey to experience a 4.4% growth per year of the number of Instrument Flight Rules (IFR) movements[146] between 2012 and 2035 in its most likely scenario, the fourth highest in Europe[147] and highest amongst countries with more than a million annual. Finally, Turkey expects its passenger traffic to reach 170 million by 2018, compared to 123 million in 2014 (Turkish Airlines, 2015). Managing this growth could represent an important challenge but also a unique opportunity for Turkey to position itself as a global aviation leader.

The United Kingdom

The United Kingdom had over 238 million passengers in 2014, including 199 million international passengers, 19.4 million domestic passengers and 18 million transit passengers. London's six airports[148] account for the majority of international traffic, with close to 135 million international passengers and 11.8 million domestic passengers. Heathrow is London's primary gateway with about 70% of scheduled flights amongst the six airports. On an enplaned/deplaned basis, the UK's biggest markets are Spain, the United States, Germany, Italy and France, which are responsible for 40% of the market. UK airports also handled 2.3 million tonnes of air freight, almost all international, and with over 1.6 million tonnes transported on passenger aircraft (CAA, 2015).

The United Kingdom enjoys very strong global air connectivity. In 2014, it had direct scheduled flights to 114 states and London's Heathrow airport ranked first in Europe for both direct and indirect connectivity (ACI-Europe, 2014). There are 37 airports in the United Kingdom with international flights, but three-quarters of international traffic is concentrated at Heathrow, Gatwick, Stansted, Manchester and Luton. This enables the United Kingdom to have more international seats and destinations than any other European country.

Until the late 1960s, scheduled air services in the United Kingdom were operated by government-owned airlines, with British European Airways (BEA) operating domestic and European flights and British Overseas Airways Corporation (BOAC) operating flights overseas. In 1969, the Edwards Committee[149] recommended fostering the creation of privately owned airlines, which led to the creation of British Caledonian airlines in 1970. In 1972, BEA and BOAC were merged into British Airways. From then on, the Civil Aviation Authority (CAA), the UK's air transport regulator, would allocate most long–haul flights to either British Airways or British Caledonian with little or no overlapping services between them. The Civil Aviation Act of 1980 required the CAA to consider the benefits of designating multiple British carriers and the government's Airline Competition Policy White Paper of 1984 set the promotion of a

competitive, multi-carrier marketplace, both domestically and internationally, as well as the prevention of anti-competitive behaviour by air carriers as national policy goals. It also recommended the privatisation of British Airways which occurred in 1987 (Yarrow, 199?).

The United Kingdom has a long history of international air services, as British carrier Air Transport and Travel operated the first scheduled international flight on 25 August 1919, flying from Hounslow Heath in Middlesex to Paris and "carrying one passenger, a consignment of leather, several brace of grouse and some jars of Devonshire cream". British transport policy planners were already looking beyond Europe to establishing a global network of trunk routes connecting the United Kingdom to Australia, Canada, India, New Zealand and South Africa. On 28 February 1921, all British air carriers ceased operating cross-channel flights to Paris, Amsterdam and Brussels due to competition from heavily subsidised carriers from continental Europe. The British government responded by creating its own subsidy scheme 19 days later. Initially meant to be temporary, airline subsidies by the British government continued until May 1979 (British Airways, 2015). This absence of new public funding extends to the Civil Aviation Authority, whose costs are financed by the stakeholders it regulates.

Policy priorities: the United Kingdom

The policy goals set out thirty years ago are still relevant to modern-day UK aviation policy. The United Kingdom has generally adopted a very liberal stance when it comes to traffic rights, prioritising a fair and competitive marketplace and maintaining and increasing global connectivity, particularly with emerging economies, where most of the UK's economic growth opportunities are expected to be found in the future (UK, 2013). It has placed particular importance on developing markets with Latin America, India and Southeast Asia and seeks ASAs that are open, fair and competitive. It favours a mix of point-to-point and hub & spoke services and is one of the rare countries with a significant domestic market to exchange ninth freedom (cabotage) rights with another country, Singapore. However, it also recognises the importance of mitigating the negative externalities generated by aviation, especially aviation emissions and aircraft noise. Finally, it defines the role of government as a facilitator to achieve a competitive and fair aviation marketplace that is safe, secure and articulated around the interests of the user of the UK air transportation system[150].

In addition, a leading policy priority for the United Kingdom at the moment is determining how to grow airport capacity in the Southeast of England. The question of how to expand the capacity of the airport system to cope with growing air travel demand is an issue that successive governments have struggled with since the 1950s. A previous commission, the Third London Airport Commission, was chaired by Eustace Roskill, who sat between 1968 and 1971 and recommended that a site at Cublington to the northeast of London should be developed as the new large London airport. Partly due to protests the plan was not endorsed by the government, which decided to opt for a Thames Estuary Airport at Maplin Sands instead. However this project was cancelled in 1974 in the wake of the 1973 oil crisis and the existing airport at Stansted was subsequently developed. The latter grew rapidly and became an important point-to-point airport, besides London Gatwick, Luton and the much smaller London City airport that was opened in 1987.

Since then no additional runway capacity has been provided in the London region and Heathrow has remained the only hub airport within the United Kingdom. Consequently the latter reached full capacity in terms of runway use in 2010; Gatwick, the world's busiest single runway airport, is expected to face the same situation in 2020. Aircraft movements at Heathrow are about at the same level as a decade ago, while passenger traffic has grown 9%, indicating a mix of both larger and fuller planes flying into Heathrow. This makes it challenging for Heathrow to develop new routes, attract new carriers and

remain competitive against other European and Middle East hubs. It can also create a disconnect between a very liberal aviation policy that seeks to grow international traffic in the United Kingdom and the physical limitations at the UK's premier international gateway, which can make it difficult for the economic gains expected from liberalisation to fully materialise.

Also, as larger aircraft have squeezed out smaller ones for limited slots, it has limited Heathrow's domestic connectivity. Today, Heathrow is connected to seven UK destinations, ten less than in 1991, compared to 24 for Amsterdam Schiphol, Europe's fourth best connected airport (ACI-2014). While other London area airports enjoy better domestic connectivity, the transfer between airports is far from seamless and passengers would reasonably be expected to avoid it when possible. This results in long-haul traffic from and to UK communities not located in the Southeast using Amsterdam and other European hubs rather than Heathrow as their transfer point (HAL, 2013). Capacity constraints at Heathrow have enabled airline scarcity rents to develop as air carriers raise air fares to align demand with supply. Expanding runway capacity at either Heathrow or Gatwick would reduce airline scarcity rents and lead to lower air fares for consumers (ITF, 2014c).

The British government established an independent Airports Commission in November 2012 to examine the merits of various expansion scenarios. After two and a half years of research, many submissions by public and private sector organisations, businesses and members of the public and an Interim Report the UK Airports Commission announced its "clear and unanimous" recommendation on the 1 July 2015 to construct an additional runway at Heathrow. Its underlying analysis showed that the welfare benefits stemming from increased connectivity and competition from this expansion are much larger than from any of the alternative expansion options (ITF, 2015). Yet, as the recommendation is not binding it remains to be seen whether it will be endorsed by the British government given the sensitivities.

The United States

The United States is home to the largest air transport market in the world. For the 12 months ending June 2014, there were 451 million domestic passengers and 184 million international passengers travelling in the country. In 2013, there were 506 airports with scheduled domestic flights, of which 88 also had scheduled international flights. That year, the United States had direct flights to 237 airports around the world.

The top international markets for the United States are Canada, Mexico, the United Kingdom, Japan and Germany. Each of these markets generates over 10 million passengers per year. The United States has open skies agreements in place with seven of its top ten markets. In November 2014, it also initialled a more liberal agreement with Mexico, its second largest market, to remove restrictions on third and fourth freedoms that limited the number of US carriers serving a given Mexican destination to two or three. The new agreement does however limit fifth freedom opportunities.

US aviation policy is articulated around the belief that the availability of efficient, affordable international air service with foreign destinations greatly enhances the expansion of international commerce as travellers and shippers demand more service to more locations.

The United States deregulated their domestic interstate market between 1977 (air freight) and 1978 (passengers) leading to the emergence of the hub–and-spoke[151] system in the domestic market, sharp overall fare reductions and strong passenger growth.

Internationally, the United States initially developed services through exchanges of rights based on the Bermuda models it had established with the United Kingdom. By the mid-80s, it had adopted a more liberal aviation policy and focused on developing a series of procompetitive bilateral and multilateral

ASAs. Its market-oriented policies, as we know them today, were shaped by the belief that minimal government interference in business decisions allows carriers the flexibly to respond to changes in the aviation market.

The open skies policy, as defined in the Open Skies Order of 1992 and the United States International Air Transportation Policy Statement of 1995, set the continuing United States approach to ASAs. This policy seeks to develop safe, affordable, convenient, and efficient air service for consumers, relying on the marketplace and unrestricted fair competition to determine the variety, quality, and price of air service.

In 1992, the United States signed its first open skies agreement with the Netherlands. That agreement would serve as a basis for agreements with 115 more partners. These agreements have liberalised traffic rights and related provisions in ASAs. Open skies agreements have shown positive results for the US economy with strong growth of inbound and outbound tourism as well as exports and imports by air. They have also enabled more US airports to access international flights and ensured consumers and shippers have access to a competitive marketplace.

While the United States has been at the forefront of liberalisation of traffic rights, it has been more cautious when it comes to the question of ownership and control of its carriers. Its current legislation caps the level of foreign ownership in US carriers to 25% of voting interest. Legislation on foreign ownership of air carriers dates back to the Air Commerce Act of 1926, which capped foreign ownership at 49% and the Civil Aeronautics Act, which lowered that threshold to its current level. The rationale for such limits included, at least originally, the protection of a nascent US airline industry, regulation of international air service through bilateral exchanges of traffic rights, concerns about allowing foreign aircraft access and to US airspace and the military reliance on civilian airlines to supplement airlift capacity (GAO, 2003).

Over the years, there has been discussion about raising this limit, such as:

- In 1991, when the US Secretary of Transportation, Samuel Skinner, proposed raising foreign ownership limits to 49% in response to mounting losses of US carriers.
- In 2003, when the US Administration proposed raising foreign ownership limits to 49% but maintaining control by US citizens[152]
- During negotiations on the US-EU open skies agreement, where the Europeans were seeking the right for EU citizens to own up to 49% of a US carrier.

Generally speaking, air carriers tend to be favourable to raising or even eliminating foreign ownership requirements, while labour groups are more cautious, citing both national security and the economic welfare of US workers amongst their concerns (GAO, 2003). In addition, it would raise a number of questions such as how this would benefit the US economy, how more liberalised ownership requirements could impact the Civil Reserve Air Fleet[153] how to ensure reciprocity, how to alleviate national security concerns and how to ensure national security issues and, finally, how this could impact airline labour (Byerly, 2008).

Policy priorities: the United States

The United States continues to pursue open skies agreements with its partners. The United States is also concerned with ensuring the marketplace remains a competitive one with government-supported facilitation to ensure all stakeholders can fully benefit from more liberalised air transportation. Thus, for example, it routinely invites airports, air carriers, consumer interest groups or shippers to observe the ASAs negotiation process and provide input to the US negotiation team.

Competition in the marketplace is an increasingly significant concern as consolidation in the industry, through mergers, alliances and metal-neutral joint ventures, has drastically altered the global marketplace and placed very important international markets, such as the US transatlantic market, in the hands of very few players.

Finally, the US government sees an important role for itself in ensuring that it protects its airlines, airports, passengers and shippers' rights to take part in the international marketplace. Thus, the concept of an open and free market does not end at the open skies ASA but rather starts from there.

Prospects for Africa

In the case of Sub-Saharan Africa, rather than taking a country by country approach it was decided to examine liberalisation at a regional perspective, both in its current and potential future shape.

Sub-Saharan Africa is characterised by a relatively poor state of land infrastructure. However, its population is young and increasingly better educated, political stability has returned to most part of the regions and there is strong interest in exporting its natural resources, particularly to China and, to a lesser extent, India. Africa is expected to enjoy economic growth that could surpass even Eastern Asia. Long-term prospects for the continent are quite good; ITF (2014a) points out that throughout the 2010 to 2050 period, the share of the population over 65 years in age will be lowest in Africa, while urbanisation during that period will be strongest.

Against this backdrop, aviation in Africa is poised to experience some of the strongest relative growth in traffic of any region in the world. This is already evident in the case, for example, of Ethiopian Airlines, a Star Alliance member, which saw its traffic more than quadruple within the last decade or SkyTeam's Kenyan Airways, whose traffic doubled in the last decade.

There already exists some degree of liberalisation of air services in Africa. Morocco, for example, has an open skies agreement with the European Union in place since 2006. Twenty-four countries, including Morocco, also have open skies agreements in place with the United States, with 20 of them having provisions for seventh freedom freighter operations.

Regarding intra-African liberalisation, on 14 November 1999, African ministers responsible for civil aviation adopted the Yamoussoukro Decision (YD) on the liberalisation of access to air transport markets in Africa (UNECA, 1999). The Yamoussoukro Decision is a multilateral agreement among 44 of the 54 African States. It allows the multilateral exchange of up to fifth freedom air traffic rights between any Yamoussoukro Decision state, using a simple notification procedure. In addition, Article 7 of the Declaration encourages states to "ensure fair opportunity on non-discriminatory basis for the designated African airline, to effectively compete in providing air transport services within their respective territory".

The Yamoussoukro Decision became fully binding on 12 August 2002, following its endorsement by heads of states and governments of the Organisation of African Unity in July 2000. However, a decade and a half later, only a few cases of the exercise of new air traffic rights granted by applying the principles and mechanism of the Yamoussoukro Decision have been observed (Abeyrante, 2013).

Implementation of the Yamoussoukro Decision is managed by the seven African Regional Economic Communities (REC). Progress has been made on the regional and sub-regional level as realistically facilitated by the YD and exemplified by East African Community (EAC), the Common Market for East South Africa (COMESA) and the South African Development Community (SADC). These are three of the seven organisations with overlapping memberships that have a mandate for the establishment of a competition law regime whose provisions, procedures and remedies are based on EU or US standards

and a competition authority. They have succeeded in creating them in supranational regulations but as far as we know their involvement with the examination of cases is limited or even absent.

Implementation of YD has enjoyed mixed success, which varies by region. In North Africa, Morocco, which is not a signatory to the YD, signed an open skies-type agreement with the European Union in 2006, excluding certain fifth freedoms. In West-Africa, the Banjul Accord Group has agreed to a multilateral ASA that liberalises in line with the YD, while the West African Economic and Monetary Union (WAEMU) went beyond YD to include cabotage rights. Members of the Central African Economic and Monetary Community (CEMAC) have implemented all the necessary legal instruments to implement the YD, while this is still in progress in Southern and Eastern Africa (Schlumberger, 2010).

The YD may not have been successful at the pan-African level, but its elements did find themselves in many bilateral ASAs between African States. For example, in 2006, of the 46 intra-African bilateral air services involving Ethiopia, 19 were aligned with the Yamoussoukro Decision (Schlumberger, 2010).

The YD has helped new airlines to enter markets that were abandoned by failing carriers. In many regions, new carriers made up for some of the lost capacities. In 2007, there were 163 African air carriers, 64 more than a decade earlier. During that decade, the African commercial airline fleet grew from 564 to 962, with strongest growth in Northern and Southern Africa. Ethiopian Airlines and Kenyan Airways, both East African carriers, gained market share predominantly in West and Central Africa.

Interestingly, while unlimited fifth freedom rights were specified by the YD, in actuality, as was the case in the rest of the world, these types of flights have fallen out of favour. Schlumberger (2010) finds that the percentage of flights that are fifth freedom for all regions of Africa experienced moderate to substantial decline between 2001 and 2007. African carriers, particularly the four fully-fledged alliance carriers[154], have adopted a hub-and-spoke sixth freedom network design, transiting traffic through their hubs rather than through the use of multi-leg flights.

The growth of aviation in Africa would be stimulated by a more liberal regime. The liberalisation of air services in Africa would, in general, have a major impact on the development of the air transport sector, leading to a significant economic impact on various other sectors, particularly aviation support services, and become a generator of hard currency to support the local financial sector. Liberalisation could also lead to improved trade, mobility and economic exchanges within Africa, which is currently stymied by the poor land infrastructure network. Finally, in the all-important and growing tourism sector, 20% of jobs are supported by international visitors arriving by air, compared to only 4% in North America. Thus, increased liberalisation should lead to increased tourism and new employment opportunities (Schlumberger, 2010).

Beyond international tourism, one should also look at the vastly untapped market of intra-African travel. At present, air transportation within Africa is an unaffordable proposition to many of the local population. However, liberalisation in North America, Europe and Australasia has usually been accompanied by strong decreases in air fares, except in the case of monopolistic routes or routes that were subsidised prior to liberalisation. Liberalisation in Africa would likely have the same effect and can help make air transportation more accessible to a greater share of Africans.

Looking forward, as the basic socio-economic conditions of Africa seem poised to improve and set the stage for significant economic growth, wider adoption of Yamoussoukro and extending that principle beyond Africa will become necessary. It is likely only a matter of time before we start seeing open skies agreements between the European Union and various REC, after some resistance from traditional, non-aligned, African carriers, which may find themselves unable to compete in an open market.

Liberalisation of air services with China is also a distinct medium to long-term possibility, in light of growing economic ties, particularly countries with strong energy or agricultural industries.

Challenges and issues

Sixth freedom traffic

Sixth freedom traffic rights are the right to carry traffic from one foreign country to another via the home hub. A sixth freedom is not as such recognised by ICAO, since in actuality it constitutes combining third and fourth freedom rights between the origin and transit country with third and fourth freedom rights between the transit country and the destination country.

Sixth freedom traffic is necessary to realise the full economies of hub operations and international connectivity. However, sixth freedom traffic can amplify imbalances in the market. This can arise, for example, when the origin and destination (O&D) market between the transiting country and either the origin or the destination is significantly smaller than the O&D market between the origin country and the destination country. This can take place when the transiting country represents itself a small market, such as, for example, the Netherlands, Panama, Qatar, Singapore or the UAE, all with relatively small populations and who rely mainly on international transiting and connecting passengers for much of their national carrier's global network rather than just pure O&D traffic (i.e. third and fourth freedoms).

While this situation may create an issue of fairness, it is akin in international trade to the situation of a small country trading with a larger one. While the small country has a greater advantage in accessing the larger country's market, the larger country would still pursue liberalised trade because trade is not a zero-sum game and if the smaller country possesses a comparative advantage in some domain, it is to the benefit of the larger country to take advantage of this by importing goods from that country. If the desired outcome of a country's international aviation policy is to move people and goods in the most efficient possible way, if that is via a third country then it is immaterial whether or not the country can also attract sixth freedom traffic from that country.

This approach dissociates national policy from national carrier interests. As airlines operate in an increasingly integrated manner with a growing trend for metal-neutral joint ventures, policy makers may want to reflect on the merits of continuing to pursue home-carrier-friendly policies. Logically this would have to be extended to defending alliance partners. Focusing on consumer (passenger and shippers) interests is simpler and more efficient.

Some countries have responded to the issue of sixth freedom traffic by limiting third/fourth freedoms in their ASAs with countries whose through-market far outweighs its O&D market. In so doing, states end up managing supply through what amounts to the use of quotas to ensure that demand on the O&D market is fully met but that through demand is not. International trade theory shows quotas to be very disruptive to international trade as they destroy part of the demand and its associated consumer and producer surplus. Because of this, the WTO favours the use of tariffs to address unfair terms of trade. Tariffs are far less disruptive to trade and very transparent. However, the use of tariffs against certain carriers would violate the spirit and the letter of both the Preamble[155] and Article 15 of the Chicago Convention, which prohibits price discrimination, leaving states with few other choices than managing supply through limited third/fourth freedoms.

Responding to sixth freedom traffic raises a significant policy question in defining the role of the state in supply management when it believes that travellers and shippers, if let unconstrained, would make

decisions that would be unfavourable to the national carrier and the local airline industry. In those cases, it finds itself in a position of having to conciliate diametrically opposed views with no solution able to please all stakeholders.

Box 2.8 Can sixth freedom be too much?

Sixth freedom traffic is oft-maligned and treated almost like "stolen traffic". A common argument against liberalising with Gulf States is that most traffic is sixth freedom. This raises the question whether there is a tipping point to when sixth freedom traffic is "too much" and could encourage states to take a defensive or protectionist stance?

Most governments have at least rough data on how many of the passengers departing their country transfer in third countries. This information could be used to limit the traffic rights to these third countries in order to prevent them from gaining a large market share in the transfer market. The basic problem some governments have with carriers being allowed to use sixth freedom rights is that it benefits themselves much more than the countries they connect. It does ensure competitive pricing to consumers but it also weighs on the profitability of the carriers on both sides of the market and likely to decrease the viability of some direct connections.

Representatives of these airlines have therefore been very vocal and stated that sixth freedom carriers should not be given additional traffic rights. For example, Delta CEO Richard Anderson claimed that the US government should revisit its air treaties with other nations, such as the Gulf nations, to ensure there is "equity in commerce". Several other critics also claim that the rise of the Gulf carriers points to a weakness in two decades of US efforts to sign open skies agreements that offer reciprocal access to national airspace, resulting in more than 115 such agreements.

These pacts have opened large aviation markets such as Japan, Germany and the United Kingdom. But the Gulf carriers, critics say, have used the resources of their state backers to exploit the huge US market, while American carriers have gotten access only to their small Middle-East city-states. Many of them therefore urge that further liberalisation leads to an unlevel playing field and use this as one of the arguments to lobby their governments against allowing further market access for certain foreign carriers. There is no consensus as to what "equity in commerce" or a "level playing field" means, but over the last five years many governments have imposed protectionist measures against the Gulf carriers. In 2010 the Canadian government refused landing rights to Toronto in order to protect the interests of Air Canada, while in 2012, at the insistence of Lufthansa, the German government rejected a request from the United Arab Emirates to negotiate an expansion of their traffic rights to Stuttgart and Berlin.

These are interesting developments as the issue that the domestic markets of states negotiating bilateral air services are of different volumes and thus likely to benefit the airlines designated by the smaller state relatively more than those designated by the larger state, is not at all new. A clear illustration of this observation can be found in the first bilateral open skies agreement, which was between the United States and the Netherlands. It introduced open route access. This enabled Dutch designated airlines to provide third and fourth freedom operations to any point in the United States, while US designated carriers were allowed to do serve "any point" in the Netherlands. Given the small Dutch market it was only viable for American airlines to serve Amsterdam, while the Dutch flag carrier could now directly serve several American cities (Doganis, 2002; de Wit, 2014).

A similar story holds for Singapore, which has an even smaller domestic market, but has been successful in signing liberal ASAs with many large countries. In 2007 it signed an open skies agreement with the United Kingdom that removed all restrictions on passenger and all-cargo air services operated by

Singapore and UK-designated carriers. This agreement inevitable provides more potential benefits to Singapore Airlines than to British Airways. Nevertheless, both airlines should be able to benefit and arguably even more important, consumers from both countries will benefit from more travel options and/or lower prices due to increased competition.

Consequently, which position governments take in the negotiations with countries that mainly rely on sixth freedom traffic will largely depend on how they have aligned their policy goals. Countries that have focused on giving their travellers and shippers the most mobility options, such as New-Zealand, have been much less concerned about "losing traffic" to foreign sixth freedom carriers, than countries which historically have been more supportive towards their national carrier.

Defining a level playing field

Airlines should be able to compete internationally on a level playing field. The concept lacks precise definition, as noted in a recent ICAO Working Paper entitled Fair Competition in International Air Transport[156] but there is broad acceptance that it is based on the principle of equal opportunity to compete rather than intervention to equalise outcomes. The Preamble to the Chicago Convention underscores the need for international air transport services to be established on the basis of equality of opportunity. This boils down to non-discrimination in access to markets.

In identifying what constitutes a level playing field, it is useful to start by discarding factors that should not be considered of legitimate concern. These include:

- Geographical advantages or disadvantages: geographical advantages are natural advantages that should not be negated by punitive provisions in ASAs. Equally, geographical disadvantage does not provide a basis for preferential treatment.
- Airline size: large carriers should not be penalised because of their success.
- Factors of production: factor of production advantages, such as lower labour costs, lower fuel costs, lower airport charges, lower cost of capital due to exposure to lower risks, and lower corporate or other taxes applicable in the country of airline establishment, are not elements that should be addressed in trying to level the playing field, as long as all carriers operating in a given location have an equal possibility of benefiting from these factor of production cost advantages.
- New entrants: Being a relatively young carrier can generate some marked advantages, such as the absence of legacy costs including generous defined benefits and pension plans, a modern Information Management/Information Technology (IM/IT) infrastructure and the advantages that come from a relatively young fleet (low maintenance cost, greater fuel efficiency).
- Sixth freedom traffic: the argument that capacity should be limited to that needed to meet the needs of third/fourth freedom traffic between the city-pair market, and not for any connecting traffic to beyond points, is not in line with open skies agreements. Moreover, restricting sixth freedom traffic undermines the economics of hub operation. If a hub is located where it can serve many spokes, this is not evidence of a legitimate concern about the playing field. Finally, it should be noted that, while sixth freedom traffic connecting through a foreign airport has been decried by some parties as unfair, sixth freedom traffic connecting through one's own airports is always encouraged.

- Airport slots: fostering competition through access to slots at congested airports is primarily an issue for competition law. ASAs are not the appropriate tool to address access to airport slots. Decisions to grant antitrust immunity to alliances (facilitated by liberalisation of an ASA) may nevertheless be made conditional on giving up slots at congested airports.

There are a number of parameters that contribute to defining what a level playing field actually is. Some are derived from policy decisions, either as an intended positive result for aviation or as a constraint that aviation must adapt to in order to fulfil other policy goals (i.e. noise reduction). Other parameters derive from airport development policies, air navigation policies and national legislation pertaining to taxation, labour, access to capital and bankruptcy.

Legitimate concerns raised by the concept of a level playing field are the following:

1. Improper incentives and flags of convenience: aviation's high safety levels must be maintained and flags of convenience as a means of avoiding strict safety laws and regulations must be prevented. This is possible by rendering the country of airline establishment responsible for the safety oversight of its airlines. Exploitation of national labour laws as a means of keeping costs artificially low is a practice that distorts the level playing field. Ground staff should be employed in accordance with the labour law of the country where they are based. When it comes to flight crew labour that operates to various countries, the law applicable should be the (labour) law of the crew member's home base. However, this opens the possibility of social dumping and regulatory shopping by basing crews in states with either lower wages or more lenient labour laws.

   The European Union has adopted special rules regarding social security for mobile workers in air transport to address the practice adopted by some airlines of using the least onerous social security systems irrespective of the crew member's home base[157]. Legal loopholes in European legislation have in the past allowed a few low-cost airlines to apply social security systems that are deemed to be the least onerous, irrespective of the crew member's home base[158].

   Regulation (EU) No 465/2012 establishes the "home base" principle, whereby the concept of "home base" becomes the criterion for determining the applicable legislation for flight crew and cabin crew members[159]. The concept of "home base" is defined as the location nominated by the operator to the crew member from where the crew member normally starts and ends a duty period, or a series of duty periods, and where, under normal conditions, the operator is not responsible for the accommodation of the crew member concerned.

   The EU rules practically mean that cabin and flight crews are subject to the social security rules of the country in which they usually start and end their work.

2. Subsidies: a distinction should be drawn between subsidies that do or do not affect the level playing field. The European Commission has adopted guidelines on state aid to airports and airlines. Special rules have been adopted also for the public funding of services of general economic interest. European airlines and airports are subject to strict state aid control, which, as of April 2014, have been tightened with the adoption of new guidelines on state aid to airports and airlines. The EU state aid regime provides for transparent conditions for the granting of aid (binding upon both the member states and the commission) and strong enforcement mechanisms. There is an issue as to whether airline and airport operators in other parts of the world comply with similar rules.

The WTO Agreement on Subsidies and Countervailing Measures was developed for trade in goods and is not likely to provide an ideal model for services. This discrepancy creates a need for transparency in the

granting of subsidies, as well as regulatory convergence. Liberal ASAs, such as the 2007 US-EU ASA or the 2009 Canada-EU ASA, provide for a mechanism of consultations and dispute settlement, but do not go as far as devising common rules for the control of subsidies (Tretheway et al., 2015).

In the absence of a common definition of a level playing field, geographic advantages and variance in national laws on issues such as labour and taxation and regulations in the aviation field, such as environmental limits on the use of airports, some governments tend to become more protectionist when they perceive that the interests of some of their national stakeholders are negatively affected by an open market. Thus, for example, in the case of the carriers from the United Arab Emirates, Qatar, Singapore and Panama, we have seen a number of countries, including Germany, Belgium, France and Canada, forego fully liberalised ASAs with those countries because markets were unevenly distributed, i.e. carriers from small countries from a traffic-generating perspective at the crossroads of aviation are able to access a far larger market base than foreign carriers operating services into this crossroad. As a result, there is a deadweight loss to society as carriers are willing to supply more capacity in those markets but are restricted from doing so by the regulatory authorities.

In addition, the success of state-owned air carriers has raised significant concerns regarding state subsidies and its result on competition with the private sector. Concerns raised regarding these carriers are quite similar to general concerns regarding the effect of State-Owned Enterprises (SOEs) on the competitive landscape. Due to their privileged position, SOEs may negatively affect competition and it is therefore important to ensure that, to the greatest extent possible, they are subject to similar competition disciplines as private enterprises, while still fulfilling the public service obligations that justified the need for them to be state-owned (OECD, 2009).

Competition concerns that arise in relation to the conduct of SOEs may vary depending on the form in which the state exercises its control over them and whether they occupy monopoly positions or actively compete in a market with private entities. There is also the question of their public service obligation and the need to sometimes cross-subsidise their activities, using income from the competitive activities to help sustain the public service ones.

A marked difference with the sixth freedom state-owned airlines, which are causing a call for less liberalisation, is that they have little or no domestic public service obligation, save perhaps from making their home airport a global hub. They are state-owned not because of the need to deliver some unprofitable services, but more as a reflection of the important role state ownership plays in these countries' economic model.

Thus, the success enjoyed by air carriers which have greatly benefitted from liberalisation by being able to establish themselves as global carriers despite a very small home market may also turn into a threat of liberalisation. Partnership for Open & Fair Skies (2015) called for the United States to re-open its open-skies agreements with both the UAE and Qatar in order to limit what they deem to be subsidised capacity. Such a precedent could encourage other countries to also impose limits on traffic rights for countries whose carriers are subsidised or deemed to be, which could contribute to liberalisation receding. It would also constitute a major departure from a 25-year US policy which has spearheaded open skies and liberalisation across the world.

Even when no state subsidies are involved, the perception of an unlevel playing field can be a threat to liberalisation. For example, in the Norwegian Air International case discussed earlier in this chapter, the response to accusations of social dumping of introducing flags of convenience to aviation has been withholding a decision to allow it to fly more routes between the EU and the United States. NAI's actions, in line with Ireland's legal requirements, are seen by US carriers and organised labour as distorting the marketplace and as a response have pressured the US government to limit traffic rights.

In either case, what we are witnessing is that even in markets where open skies agreements are in place and providing travellers and shippers with as much connectivity as the market can bear, policy makers can still face domestic pressure to limit market access in response to a situation deemed unjust by parties with a vested interest. While conflicts and divergent views will appear now and then in any trade relationship, the reflex to limit market access as a defence mechanism against practices deemed unfair is a worrisome trend. Policy makers should resist that option and favour negotiated or arbitrated solutions that do not rescind the advancement of liberalisation but rather help determine whether or not unfair competitive practices are taking place in the market and if so, how to mitigate them transparently, while keeping markets free and open.

Level playing field: the case of Gulf Carriers

Limited access rights have been used by a number of countries, including Germany, France, Spain and Canada to counterbalance the real or perceived issue of an unlevel playing field and competition from Gulf State carriers. By imposing what amounts to quotas, states are attempting to pre-empt any potential for capacity dumping, which would harm home carriers.

It is true that market conditions in Europe, Asia and North America differ greatly from those in the Gulf States. However, this is a common feature in international trade and not a sufficient reason to limit liberalisation. Nevertheless, concerns have been expressed over advantages arising from the operating conditions Gulf carriers enjoy in their home markets alongside suggestions that these carriers have benefited from inappropriate financial support.

Operating conditions are significantly more favourable to airlines in the UAE and Qatar than in many European and North American countries. Taxation, labour conditions and infrastructure capacity are all more competitive in Gulf countries although social standards, human rights and income equality are more favourable in Europe and North America. Labour costs for Emirates Airlines, for example, are in line with those of major carriers based in Southeast Asia, but still less than half those of major European carriers (Emirates, 2012). This reflects a significant comparative advantage for that area, able to offer top quality services within the cost structure of an emerging economy.

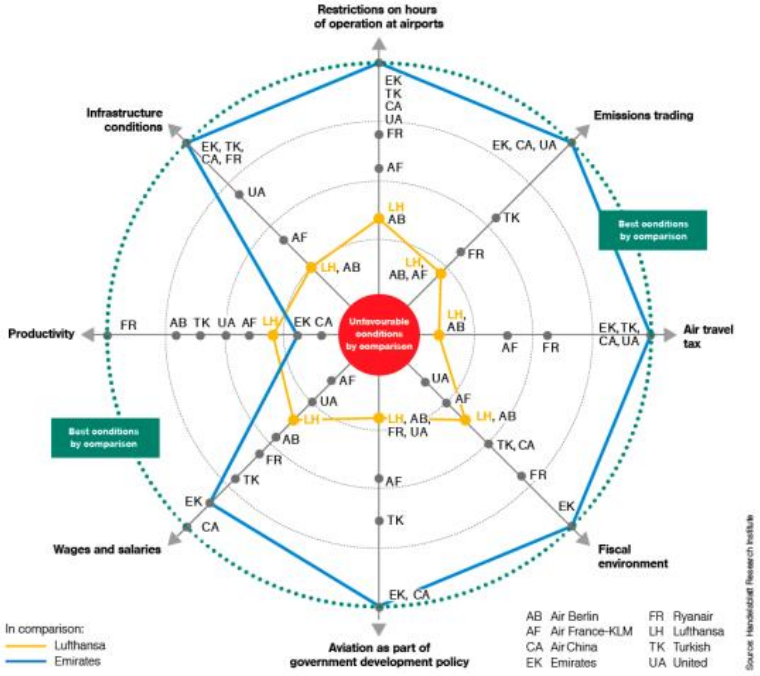
Lufthansa Group (2014b) points to a number of other areas in which companies based in Dubai enjoy an environment more favourable to business including:

- low or no taxation
- low airport fees
- low air traffic control fees
- low aviation security fees
- no environmental or noise fees
- no curfews
- no unions
- no right to strike.

However, all these advantages reflect general societal choices rather than specific aviation policy measures; the competitive advantages of operating in the UAE or Qatar are available to the more than 150 carriers present in those countries. Of course, home carriers benefit more from these advantages simply because such a substantial part of their operations is undertaken in their home country's hub

airports. Figure 2.11 compares eight carriers in relation to key competition factors. Aside from productivity, all other factors are the result of public policy decisions. The diagram indicates that carriers from China, Turkey and the United Arab Emirates benefit from policies that are relatively aviation-friendly in comparison to the European carriers examined.

Figure 2.11 Degree of aviation friendly policies of selected carriers in their home country



Source: Lufthansa Group (2014a).

Financial support is a complicated issue to examine because, whilst there is general agreement that governments should not provide financial support to carriers, states have come to the rescue of ailing national carriers, either directly through subsidies, or indirectly through the application of bankruptcy laws that allow airlines to reorganise and write-off their debt. Many airlines also benefited from start-up funding from governments. All three Gulf carriers benefited from state support to begin their operations. While this creates a market distortion, it also replicates a situation experienced by many non-US network carriers which started as state-owned carriers with an injection of public funds. Thus, while the injection of start-up capital distorts the playing the field, there is such a wealth of precedence for state-funded start-up capital, that it would be hard to argue that this is a sufficient condition to impose restrictions on the liberalisation of traffic rights for Gulf carriers. Operating subsidies are of greater concern as they can lead directly to capacity dumping by enabling carriers to operate despite continuously losing money. Such subsidy distorts the playing field by forcing non-subsidised carriers to match prices offered by subsidised carriers, while absorbing the financial loss.

De Wit (2014) shows that while the cost per available seat kilometre of Emirates is significantly lower than the cost of continental European carriers this can be explained by the hourglass-shaped long-route network it operates and the newer, fuel-efficient fleet of aircraft it flies. Its cost structure resembles that of Singapore Airlines and, to a lesser extent, that of British Airways. He also points out that, contrary to Lufthansa, Air France-KLM or Iberia, Gulf carriers do not operate a money-losing short/medium-haul

network in competition with LCCs. Thus they are able to focus on the most profitable parts of an airline network, the long range route, without having to contend with a money-losing short-haul feeder network.

Possibly the biggest financial help Gulf carriers receive is the willingness of their home governments to invest massively in infrastructure. While this benefits all carriers serving the region, clearly the home carrier will derive the most benefit. Dubai, for example, is investing USD 33 billion in expanding the brand new Al Maktoum International Airport and growing the new Dubai World Central Airport; Abu Dhabi is investing USD 6.8 billion in expanding its airport; Qatar is investing USD 16 billion to build the new Hamad International Airport in Doha. The amounts of public funds invested and the speed at which the airports are being built are unimaginable by today's European or North American standards. However, the major airports in those regions were also initially built with public funds and most are still, partially or fully, owned by public entities. Therefore, what some may see as an unlevel playing field can also be seen as a region establishing its aviation presence in a way not unlike that in which most OECD countries did half a century ago, with state-owned airlines and airports, start-up capital funding and major infrastructure investment.

Another form of indirect assistance comes from how airport fees are calculated in Dubai, Abu Dhabi and Doha. In order to be more competitive, hub airports often grant passenger facility charge (PFC) discounts for connecting passengers, which can vary from 25% at Heathrow to 58% in Amsterdam (De Wit, 2014). However, the three gulf hubs do not charge any passenger facility charge for transiting passengers. While these discounts are available to all carriers, they are clearly almost entirely used by the home carrier. Combining this discount with very low security and air navigation charges and no noise or passenger taxes, Zuidberg (2013) calculates that an A-330 with a 79.7% load factor and 80% of passengers connecting will pay EUR 1 810 in Dubai, compared to EUR 6 441 in Amsterdam, EUR 10 406 in Frankfurt and over EUR 12 000 at either London-Heathrow or Paris-Charles de Gaulle.

In their analysis of Dubai's aviation model, Oxford Economics (2011a) show that airport charges in Dubai in 2010 were located close to median for the 96 largest airports in the world. In fact, about 70 of them, including Dubai, had charges in the USD 20-45 range per passenger. Landing fees in Dubai and Abu Dhabi were on par with London Heathrow and within about USD 10 of Frankfurt, Paris or Amsterdam. However, the structure of the airport charge in Dubai places significantly more weight on passenger charges than landing fees. Thus, when the PFC is waived for transiting passengers, Dubai's airport fees become one of the lowest in its peer group.

The Partnership for Fair and Open Skies, a coalition made up of the three US network carriers and four labour unions, estimated that over the last decade, the three Gulf carriers have received USD 39.2 billion in subsidies and USD 3.1 billion in benefits which they called unfair (Partnership for Fair and Open Skies, 2015). By far the two biggest beneficiaries were Etihad (USD 18 billion) and Qatar Airways (USD 17.5 billion). These figures are collated from a wide variety of sources and include loans, shareholder advances, land transfers and benefits from operating at state-funded, lower cost airports. Without commenting on the validity or otherwise of these figures and approach, the complex methodology employed by the study's authors and the variety of sources employed reflect a general lack of transparency on the issue or a set of clear rules as to what should or not be considered a subsidy and which subsidies should be considered problematic.

On the issue of direct operating subsidies, in the case of Emirates Airlines, whose financial results are independently audited and publicly available, there seems to be no state aid from the government of Dubai; rather, Emirates provides financing to the state through dividend payments. The issue is far less clear on the question of other subsidies, such as the ones raised by Partnership for a Fair and Open Skies

(2014) on fuel hedging, airport infrastructure and purchases of goods and services from other state-owned companies.

In the case of Etihad and Qatar Airways, lack of transparent financial reporting, which is entirely within their right, makes it challenging to establish a judgment and, especially, to quantify the exact size of any subsidy.

An additional complexity in measuring the extent of subsidies received is the fact that all three are state-owned enterprises and operate in a business environment where many of their local suppliers are also state-owned enterprises. State-owned airlines are not new and a number of today's largest, global, non-US-based carriers were at one time or still are state enterprises. However, they usually operated at arm's length from the state and their local suppliers were usually private companies.

Where there is more transparency in the financial support received over the years by network carriers, either through direct capital injection, loans, debt write-offs, pension fund contributions or favourable debt restructuring legislation. The point here is that over the years, most flag carriers have at some point or another benefitted from state aid. It is often the result of a crisis situation that threatens the viability of the carrier. In analysing support to Gulf carriers, it is important to distinguish start-up capital and rescue funding from sustained funding.

There would be merit in conducting a thorough, objective, transparent and neutral analysis of the level playing field issue, which would dissociate direct state aid from comparative advantages resulting from better geography or airline-friendly policies. This being said, the issue of subsidies should not be used selectively to justify limiting granting traffic rights. Too many airlines from all parts of the world have benefitted from direct contributions, indirect subsidies, preferential national treatment or advantageous creditor protection legislation. Over the years, responding to aeropolitical pressures, governments have regularly taken actions that have unleveled the playing field in support of their home carrier. Going forward, states should be encouraged to limit the extent of their financial intervention in this industry, choose a method that is the least disruptive to market forces and when they do intervene, do so in a transparent manner.

Level playing field: looking beyond Gulf carriers

Competition can be distorted for a number of reasons, including:

- a history of financial support that has enabled a carrier or an airport to achieve a significant size to be considered today a market leader
- public spending on airport or navigation services infrastructure in some countries, but not in others
- operating subsidies for airports or air navigation services providers in some countries, but not in others
- more flexible creditor protection regimes in some countries rather than others enabling carriers in financial hardship to reorganise in a more efficient fashion
- the presence or not of aviation-friendly national policies and the importance within a state's international aviation policy framework of protecting the interest of national carriers compared to the interest of travellers and shippers
- being based in a low-tax, low-cost jurisdiction compared to a higher-tax, higher cost one.

Concrete examples from the list above, which could certainly be expanded, are found around the world and beg the question: was there ever a level playing field in aviation?

From the onset, differences in geography and size of the local market mean that carriers start off from a better or worse position simply based on which country they are registered in. Afterwards, since there are no global rules for public funding within the aviation supply chain, for local aviation policies (curfews, taxes, fees) or for negotiating priorities for ASAs, this will necessarily produce opportunities which are different for carriers from one jurisdiction compared to carriers from another.

Therefore, a level playing field in aviation may just be a theoretical construct never to be achieved for the simple fact that far too many variations exist between countries to ever achieve full equality between carriers and a true equality of opportunity between them, as prescribed by the Chicago Convention. That being said, this is not a situation that is unique; competitors in any sector have access to different sets of opportunities and as much as the playing field tries to be level, there will always be some comparative advantages between competing firms. Thus, perhaps the goal should not be as much equality of opportunity between carriers but rather equivalent opportunities for carriers within a given market.

In the absence of a level playing field, policy makers should be seeking to define some consistent rules that would apply to all, but also accept that distortions will exist within the playing field. To make a sport analogy, even when two players or two teams play by the same set of rules, very often one enjoys some clear advantages over the other, including financial resources. This puts an onus on regulators to properly define the rules and how to enforce them. It also requires them to accept that there will be inherent inequalities between competitors and that this situation is actually prevalent across most industries; it is not just limited to aviation.

Social dumping

The liberalisation of air transportation across the world has removed barriers to entry that used to exist. Indeed, a generation ago, in a number of countries, it was the norm that most scheduled international air services were offered either by state-owned flag carriers or in some form of stable duopoly between private carriers[160] or a mix of state-owned and private air carrier[161]. Air carriers had a single or multiple home base in their country of nationality and most if not all crews were based in these locations. Labour regulations reflected these situations and the general norm was that the labour laws of the jurisdiction where the base was located applied to all crews. Privatisation and liberalisation have led to both a consolidation of incumbent carriers and the establishment of new carriers. It has presented air carriers with the opportunity to develop new labour models which the existing regulatory framework was not fully equipped to handle.

A peculiarity of the EU is that the single market combined with differences in labour, social security and fiscal legislation in member countries have enabled some carriers to take advantage of more favourable conditions in one EU member state compared to another. They have introduced employment models that, while legal, have sparked a debate on their social acceptability.

Commission regulation (EU) No 83/2014 defines as home base “the location, assigned by the operator to the crew member, from where the crew member normally starts and ends a duty period or a series of duty periods”.

A key change introduced mainly by LCCs has been to contract out as much as possible the different facets of their operations. By outsourcing ancillary services, airlines have been able to introduce greater flexibility and cost savings to their operations in effect moving towards becoming a “virtual airline”,

meaning that it focuses solely on scheduling, sales and overall responsibility for the operations of the flight (Trafikstyrelsen, 2015). Within the EU, an added complexity brought on by the European Single Aviation Market is the possibility to establish transnational carriers, with a carrier being based in one EU country, having a subsidiary in another EU country and employing flight crews via placement agencies located in third countries.

There are also numerous cases where flight crews are self-employed, meaning they establish a single-employee company and the airline hires that company to supply a pilot. In this case, the carrier is contracting out the service of flying the aircraft to a third party, who may be flying for multiple carriers on multiple contracts. The case of the self-employed pilot raises significant issues from a labour law standard perspective. Labour laws usually treat employees and the self-employed quite differently, as employees are at the service of the employer, whereas self-employed contractors sell a service to carriers. Jorens et al. (2015) in a survey of 6 633 European pilots found that 21% of respondents had atypical employment arrangements, a proportion that rose to 47.4% for pilots flying for a low-cost carrier. The survey also found that 16.7% of pilots flying for LCCs were employed through a temporary work agency, compared to 1.7% for network carriers and 1.3% for regional carriers.

The ability to execute these new labour models varies greatly between EU carriers. Low-cost, non-unionised and start-up carriers face lower internal barriers to create such arrangements than do heavily-unionised legacy carriers, which have faced strong labour actions when they have tried to reduce labour costs (i.e. Air France, Lufthansa, Iberia, Alitalia etc.…).

Going back to the definition of home base, one can easily see how crews can do most of their flying from an airport in one EU country for a carrier from another EU country while starting and ending their duty period, which can span multiple days, in a third country, inside or outside the EU and only be subjected to the laws of that third country.

These innovative employment models have helped drive down labour costs for airlines that make use of them. They have also enabled carriers to select the EU country in which to establish themselves, based on which one offers the most advantageous fiscal and labour conditions. Since labour and fiscal laws vary significantly from one EU member to another, a situation is created where carriers can legally rule shop and take advantage of the most favourable conditions within the EU. Booz and Co (2009) suggested that labour mobility required the development of an intra-EU framework clearly defining the opportunities, rights and obligations of individuals and corporations.

These new employment models raise two important policy issues: do they impact the safe operation of a flight, which is of paramount concern in aviation, and do they create a labour situation that is socially incompatible with EU values and principles? On the issue of safety, the European Air Safety Agency has set up a regulatory advisory group to assess the potential safety implications of these new employment models.

In addition, Jorens et al. (2015) found that the safety management style of an airline, be it a culture of safety or a culture of cost-savings, and not the actual form of employment determines whether safety issues are reported or not. However, they also pointed out that since there is no global monitoring of a pilot's flying hours, atypical employment makes it impossible for airlines and regulators to properly monitor the total flight hours of pilots flying for multiple carriers and make sure that they remain below the regulated threshold. They recommend instituting a system to monitor all flight hours of European pilots, no matter which carrier they happen to fly with as a means to address this information gap. What is abundantly clear though is that innovation in the labour marketplace cannot lead to any compromise on aviation's very high safety standards.

With respect to the social implications of atypical employment, the European Commission has been very concerned with social dumping and rule shopping in aviation. Rule shopping is a particular concern in the EU with LCCs. Outside the EU, nationality rules usually prevent an air carrier from enjoying the benefits of being a national carrier except in the country it is registered. Inside the EU, network carriers can of course in theory practice a form of regulatory shopping, by using their fundamental right of establishment to locate themselves in the EU jurisdiction whose national and local laws are most optimal for the carrier's business model. However in practice it would be very difficult for a carrier such as Lufthansa or British Airways to move their entire network to another country. However, EU-registered LCCs operate under a business model that affords them far greater flexibility, establishing numerous bases around the EU. As a case in point, Ryanair operates 68 bases in 19 countries[162] and Easyjet 24 bases in seven countries, making it far more straightforward to shop and shift regulatory activities from one country to another.

The EU held a conference on the issue in the spring of 2015 and expects to introduce measures by 2016 that would foster a more socially responsible aviation sector. The challenge for the commission will be putting forward measures that do not impede the free movement of people and capital within the EU, that take into account the fact that labour and fiscal laws are not harmonised across the EU and that ensure that all employees are subject to socially acceptable working conditions.

Norwegian Air International

One model that has raised significant controversy was proposed by Norwegian Air Shuttle group, Europe's fourth largest low-cost carrier, in 2014. The Oslo-based carrier established a subsidiary airline in Ireland, Norwegian Air International (NAI), to fly long-haul, low fare flights from London to various points in Europe and the United States and, in particular, on routes to countries where existing ASAs allowed only airlines from the EU (but not Norway) to operate. On 2 September 2014, US Secretary of Transportation, Anthony Foxx, rejected a request from Norwegian Air International for a temporary exemption authority to enable it to operate scheduled flights between the European Union and the United States but indicated that USDOT would continue to study its request for a permanent foreign air carrier permit. On April 15th 2016, USDOT proposed to grant a permit following an extensive inter-agency review that concluded that the airline was legally entitled to authorisation under the US-EU (plus Iceland and Norway) Air Transport Agreement of 21 June 2011 and that a provision underscoring the importance of high labour standards did not provided a legal basis for unilateral denial of a permit. It found that the EU-US open skies agreement did not provide the basis for rejecting NAI's request and that the carrier meets the department's standards for awarding a permit. This tentative decision was subject to review following objections it may receive. With no final order issued yet, on 26 July 2016 the European Commission advised the USDOT that it would begin arbitration procedures. On 2 December 2016, USDOT finally approved NAI's request which will start flying ten routes between five European cities and three US East coast destinations during the summer of 2017. This section discusses some of the history of this case as well as the important issues that it raised, particularly that of flags of convenience in aviation.

Norwegian Air International was vigorously opposed by incumbent air carriers on both sides of the Atlantic, including. Secretary Foxx's order cites opposition from *inter alia*, Delta Air Lines, United Airlines, American Airlines, Lufthansa, Air France and KLM Royal Dutch Airlines. It was also opposed by a number of pilot unions, flight attendant unions and the International Association of Machinists and Aerospace Workers. The proposal did garner support from airports expecting to be served by NAI, the tourism sector and freighter operators Atlas Air and Federal Express.

At first glance, it might seem surprising to observe such strong opposition to new entry in the largest long-haul market in the world and one that is fully liberalised. The crux of the issue though is a fear that NAI's proposal sets a precedent for a regime that would mimic flags of convenience in the maritime industry[163].

The concept of flags of convenience dates back to antiquity when ships would use various flags to disguise their nationality and avoid potential conflicts. In its modern day form, the concept is a result of commercial developments reflected in the 1958 amendments to the Geneva Convention of the High Seas whose Article 5(1) states that "each state shall fix the conditions for the grant of its nationality to ships, for the registration of ships in its territory, and for the right to fly its flag. Ships have the nationality of the state whose flag they are entitled to fly. There must exist a genuine link between the state and the ship; in particular, the state must effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag." This gives states the exclusive right to decide under what conditions to register a ship but does not define at all what constitutes a link, except for the administrative, technical and social oversight (D'Andrea, 2006).

In the case of the maritime industry, Mendelsohn (2014) explains that in the late 1950s, ship-owners were driven to flags of convenience, mainly from Panama, Honduras and Liberia for three main reasons: taxation, the compliance costs to higher safety regulations and labour. He goes on to draw parallels between the maritime situation and the Norwegian Air International proposal, using the maritime experience and arguing that how it all but virtually eliminated the US Merchant Marine fleet from international operations.

It is important to keep in mind that there are some significant differences between the two cases. On the taxation issue, it is certainly plausible that Norwegian Air International's decision to base itself in Ireland was at least partially, if not wholly, influenced by that country's lower corporate tax rates. According to OECD (2014), Ireland's combined corporate tax rate of 12.5% is the lowest amongst the 34 countries that make-up the OECD. It compares quite advantageously to the United Kingdom's 21% combined rate, Norway's 27%, France's 33.3% and the USA's 40%. Thus, since the US-EU (plus Iceland and Norway) ASA of 21 June 2011 does not discriminate amongst the 30 European signatory countries, Ireland's competitive fiscal framework can act as an incentive for European carriers to establish themselves there, benefiting from both the same traffic rights and a lower tax regime.

In addition to providing fiscal advantages, establishing NAI in Ireland enabled the Norwegian Air Shuttle group to establish an EU-based carrier and take advantage of EU (and also Irish) traffic rights. While this is a moot point for service between the EU and the United States, as the open skies agreement includes Norway since 2011, it is relevant for other countries that have a comprehensive ASA with the EU, such as with Canada, Israel or Morocco. These agreements are limited to actual EU members only.

In the maritime sector, safety requirements and the resulting costs of complying with them were certainly an important driver in the trend to adopt flags of convenience. Individual countries set the safety standards for ships flying their flag and the higher the safety standard, the higher the operating costs. Thus, ship owners were attracted to jurisdictions with lower safety standards. However, beginning in 1982 with the Paris Memorandum of Understanding, port state control enabled states to inspect ships and crews docked in their ports, independently of the flag they fly, and order corrective measures if needed. In case of major issues, inspectors may also detain the ships until proper corrective actions are taken.

In aviation, global safety standards, established by ICAO and augmented and enforced by national civil aviation authorities, ensure that this is not an issue. The success of this regime is evident in the very high safety record that international aviation enjoys and its continuing efforts to make the air transportation

system even safer. Therefore, in that respect, there should not be a noticeable difference in safety standards whether the company is based in Ireland or Norway.

The third factor, labour, is probably the most contentious. Continuing on the maritime parallel, ships usually employ multinational crews, especially for international transport[164]. The working conditions on-board ships, including pay scales, hours worked and benefits, are determined by labour laws of the country whose flag the ship flies. These labour laws reflect the working conditions in the country where the ship is registered and, in the case of flags of convenience, are generally less favourable to labour than labour laws in developed countries.

According to an earlier interpretation of the Norwegian Immigration Act, crews flying for a foreign registered aircraft on international routes were exempt from the requirement of being Norwegian citizens or holding Norwegian residency and work permits. Norway does allow Norwegian carriers to operate foreign registered aircraft for 12 months or less, thus enabling the exemption to be applied. Norwegian Air International operated Irish registered aircraft for 12 months with foreign crew. Norwegian Air International hired Thai cabin crew through a placement agency in Singapore. The crew, based in Bangkok, where Norwegian also operates flights, and would thus be subject to Thai labour laws and pay scales, as opposed to significantly more expensive Norwegian ones, since the location where crews are based determines the applicable labour laws. The Norwegian flight attendant union reports pay scales as low as USD 520 per month, significantly less than wages paid to Norwegian flight attendants, but 20% more than the Thai average wage in 2013. However, the European Commission provided information to USDOT showing that the salaries of the Thailand-based flight cabin crew were substantially greater than the salaries of Norwegian cabin crew based in Spain and only marginally below the salaries paid to Norwegian cabin crew based in the United States.

Once the 12 month period was up, it then continued to use those crews on Norwegian registered aircraft and challenged that interpretation, claiming it was contrary to Norway's international obligations, notably the Schengen rules that Norway has adopted. In the fall of 2015 the Norwegian Department of Justice agreed with NAI, and the Norwegian government proposed to amend the wording of the immigration regulation to reflect this legal position.

Ireland, for its part, does not have such a provision for crew flying on Irish-registered aircraft, which was another key factor in choosing Ireland as the jurisdiction in which to register its aircraft. In this respect, Ireland is not alone in the EU in accepting non-citizens to crew aircraft registered in their country, but combining the labour and taxation factors certainly gives Ireland a cost advantage compared to Norway or other European countries.

The Norwegian case raises two significant policy issues: first, to what extent will aviation parallel the maritime sector when it comes to flags of convenience and, second, is this a case of social dumping and, if so, should anything be done?

The first question is treated extensively by Mendelsohn (2014) who thinks the Norwegian Air International model will set a precedent leading aviation to a regime of flags of convenience. His arguments were picked up and supported by labour unions, including the Air Line Pilots Association (2013), in recommending USDOT to reject Norwegian's request. However, it does not seem very likely that a maritime-like outcome would be feasible. As previously discussed, the global application of safety standards negates much of the cost savings that marine carriers witnessed by using flags of countries with less demanding safety regimes. In addition, as airline heavy maintenance is increasingly outsourced to lower wage countries while maintaining the highest safety standards, any savings derived from lower maintenance costs without compromising safety can already be obtained.

It should also be noted that the ASA framework which stems from Article 6 of the Chicago Convention does not have an equivalent in international marine transportation. In aviation parlance, the maritime world generally operates under an unlimited seventh freedom regime, something that is relatively rare in aviation, especially in the passenger market.

The Norwegian case has a unique feature in that it is taking advantage of an ASA where one party is in fact a community of interest with no limitations on rights of establishment. This is a rather unique situation which in aviation is limited mainly to the EU. Outside of the EU, there are very limited opportunities for a carrier from a high-cost country to establish a subsidiary in a low-cost country and use that subsidiary to operate flights between that country and a third country, basically amounting to a seventh freedom flight.

The situation in the European Union, Norway and Iceland (EU+2) is rather unique in that a carrier can be owned and controlled by nationals of one EU+2 country, registered in a second and operate under the EU-US open skies agreement from a third. This is not generally the case and explains why carriers such as Virgin Blue, Virgin America or Air Asia Thai have all to partner with majority local interests in order to be registered in Australia, the United States or Thailand respectively.

On the second point, that of social dumping, the issue is somewhat more complex. The Norwegian case is clearly an example of a company looking abroad to seek lower labour costs. The current shortage in qualified, European-licensed widebody pilots limits the ability of Norwegian (or any other airline) to cut the cost of pilots. On the other hand, establishing multiple cabin crew bases in countries outside Norway allows the Norwegian group to minimise hotel and per diem expenses as well as the costs of using seats that could otherwise be sold in order to ferry crew between a home base (e.g., Oslo) and cities where journeys commence (e.g., London, Barcelona, or New York). This is not objectionable. More problematic, however, is where salary levels in the home country (e.g., Norway) are significantly higher than what the airline needs to pay at foreign bases to recruit and retain crew. This can be quite problematic as it forces countries to either engage in a race to the bottom in terms of labour cost or accept that is unable to compete on a cost basis and allocate its resources where it is better suited. This is a classic Ricardian outcome. However, across all sectors of the economy, companies seek ways to reduce their labour costs, including through the use of foreign workers, either in the form of outsourcing or temporary migrant workers. This is a reflection of a globalised marketplace and, when labour laws are obeyed, is generally positive for the economy as it enables higher wage labour to focus on high value add activities while providing lower wage labour with opportunities that would not otherwise exist.

The Norwegian Air International case has stirred a lot of debate but many fears seem overstated. As explained above, it is highly unlikely that the current international aviation regime will ever give rise to the flag of convenience concept that prevails in international maritime transport and the cost savings garnered by Norwegian Air do not seem substantial enough to entice other carriers to follow suit. It does however highlight the fact that when various states unite as a block, such as the EU, but do not achieve full and complete regulatory convergence, such as the labour and fiscal differences between Norway and Ireland, it will create opportunities for air carriers to seek to take advantage of the most favourable conditions offered to it. However, the stringent aviation safety standards prevalent across the EU ensure that the situation prevalent in international maritime transport could not be replicated in aviation.

Subsidies

Aviation subsidies are almost as old as aviation itself. In international markets, the history of public subsidies in aviation can be traced back to as early as 1920 as Western European governments provided subsidies to their national carriers to operate cross-channel air services. In the subsequent 95 years it

would be difficult to find a single state which did not at one point or another provide subsidies to commercial aviation, either through direct financial contributions or indirectly by publicly funding infrastructure and air navigation services and through single designation, where a state would only designate one of its national carriers to operate in a given market, in effect providing it with the economic rent[165].

Table 2.5. Examples of granted subsidies

Airline	Subsidy (in EUR million)	Year
British Airways	200	1981
Emirates	100	1985
Sabena	1 600	1991
Air France	300, 500, 3 000	1991, 1992, 1994
Iberia	1 000, 600	1992, 1996
Qantas	1 400	1992
Air Lingus	200	1993
TAP	1 000	1994
Olympic	2 000, 2 600	1994, 2009
Lufthansa	800	1995
Alitalia	1 500, 1 200	1997, 2005
Swiss	1 300	2002
US network carriers	4 500	2001
Chinese network carriers	2 500	Since 2009
Japan Airlines	2 600	2010
Astana	2 900	2010
Air India	700	2012

Source: OECD (1997) ; Emirates Airlines (2012) ; CAPA (2014a).

Table 2.5 provides an incomplete list of major airlines that have been granted subsidies in the past in different parts of the world. All figures have been converted to Euros and have been rounded to the nearest one hundredth.

The OECD (1997) concluded that it is very difficult to assess the scale or full implications of subsidies. Not all financial aid comes through direct government sources. Many airlines have enjoyed the benefits of cross-subsidisation by having monopoly handling rights at airports. Legislative measures can also force the granting of what are effectively private sector subsidies. For example, in the United States, loss-making airlines are enabled to operate without having to make interest or pension fund payments under Chapter 11 of the US Bankruptcy code. Similar provisions exist under Article 12 of the European Union's Council Regulation on the Licensing of Air Carriers.

For any comparative assessment to be made it is important to develop some form of conversion factor. Comparable evidence on the relative scale of the different types of subsidies remains a serious gap in the

understanding of the international aviation market and of the degree of unevenness of the playing field. More than 15 years later this is still the case.

State intervention, by definition, introduces a distortion in the market. This can be positive if its aim is to pursue a worthwhile national policy goal, but it remains a distortion. In addition, public subsidies may induce greater inefficiencies in the system, for example by sending other carriers a clear signal that the government is open to rescuing failing carriers. For example, OECD (2014b) indicates that the challenge for policy makers is determining if the adverse consequences of a carrier failing outweigh the risks of unlevelling the playing field and inciting long-run inefficiencies.

Subsidies can take many shapes in aviation but can be categorised along the following lines:

- operating subsidies for commercially viable routes
- operating subsidies for commercially non-viable routes (i.e. public service obligations)
- capital subsidies for carriers to purchase aircraft, engine and spare parts
- airport infrastructure subsidies
- air navigation subsidies.

In addition, governments can provide significant non-monetary support to air carriers through aviation friendly policies, by restricting traffic rights when not in the interests of national carriers and by having business-friendly labour and bankruptcy protection legislation.

Subsidies also create long-term stock effects that can far outlive the flow of public funds injected into the air transport system. For example, outside of the United States, most of today's privately owned legacy carriers can trace their roots back to being a government-owned airline receiving a fair amount of public funding. This situation was a reflection of the times in which these subsidies were granted and the purpose of this section is not to review the degree of soundness of past decisions. However, the effect of those subsidies are still broadly felt in aviation today as they enabled airlines to grow relatively shielded from competition and with access to public funding. When privatisation occurred, these airlines were not start-up companies but rather fully mature, decades-old aviation leaders which continued to develop as private entities on top of their publicly-funded foundation.

As previously discussed, there has been significant media attention given to accusations against the three large Gulf carriers, Emirates Airlines, Etihad Airways and Qatar Airways of receiving unfair subsidies by their local governments. These have been met with strong denials and counter accusations by the carriers in question as well as some questioning as to what exactly constitutes a subsidy and under what conditions, if any, can a subsidy be fair.

The prevalence of subsidies in the air transport industry, across time and geography, means that these carriers are not alone in receiving subsidies. Examples of direct public funding of airlines span all continents. Over the years a number of leading European carriers, for example, such as Swiss International, Air France, Lufthansa and Alitalia, have received financial support, particularly prior to privatisation and the three largest Chinese carriers have openly reported receiving over USD 2.5 billion in public subsidies since 2009 (Fu, 2015). A broader aviation value-chain perspective also shows that airports and air navigation service providers have benefitted from public subsidies.

In the case of Emirates Airlines, it has published an extensive response to the accusation that it has received USD 6.8 billion in subsidies from the Emirate of Dubai. The rebuttal includes a number of arguments on legal interpretations, definitions and counter-accusations that US full-service network

carriers benefited from local, state and federal support of USD 100 billion since 2002 while other carriers receive USD 24 billion in subsidies every year (Emirates Airlines, 2015).

Subsidy framework

When taken together, both the accusations made by the Partnership for a Fair and Open Skies and the rebuttal from Emirates show how reasonable people can disagree on what is acceptable behaviour. For example, the case against Emirates includes treating a low labour cost unionised environment as USD 1.9 billion benefit whereas the rebuttal includes a USD 58 billion benefit by US carriers stemming from debt relief under Chapter 11 of the US Bankruptcy code. Of course the low labour cost environment in Dubai and Chapter 11 protection in the United States is available to all companies operating in those jurisdictions and would not be viewed as a subsidy or unfair benefit in any other sector. It is simply a reflection that different states live under different labour conditions and different bankruptcy legislation.

Thus there is a significant level of ambiguity when interpreting what is actually a subsidy, and beyond that, what is an acceptable subsidy. This is a clear consequence of not including that sector under the WTO rules and not developing under the auspices of ICAO an enforceable regime for subsidy discipline.

While there has been no consensus within ICAO on the need for safeguards, ICAO's Air Transport Regulation Panel (ATRP) has discussed a number of options that member states could consider to safeguard fair competition. Amongst them, adding to air service agreements a definition of unfair competition that includes sustained charging below cost and adding excessive capacity with the intent to cause serious economic harm to competing carriers, driving them out of the marketplace in a manner that indicates abuse of a dominant position (ICAO, 2015).

Subsidies threaten the competitive landscape of international civil aviation when they are used by a carrier to engage in such anti-competitive behaviour. In such a case, subsidies would be harmful to travellers and shippers in the long run, as they would reduce competition, despite initial short-run benefits of having lower fares subsidised by a foreign government. It is important, however, to note that preventing this type of anti-competitive behaviour already falls under the purview of competition authorities, whether or not it is funded through public subsidies; the issue is not so much subsidies as how they are used to support anti-competitive behaviour.

Despite the best efforts of ICAO, the European Commission and some member countries, there is as yet no globally accepted definition of what constitutes an acceptable or non-acceptable subsidy. This lack of clear boundaries between acceptable and unacceptable behaviour by governments in the air transportation sector makes any policy dialogue on the issue of subsidies more difficult as there may not even be an agreement that a problem actually exists.

Air transport services are generally excluded from the framework developed by the World Trade Organisation (WTO), except for aircraft maintenance and repair, selling and marketing of air transport services and computer reservation systems. That framework is articulated around two guiding principles of the General Agreement on Trade in Services (GATS) treaty, namely the Most Favoured Nation principle and the National Treatment principle.

At the forefront, it is important to note that GATS does not define what a subsidy is nor does it define what an acceptable or unacceptable subsidy is for trade in services, contrary to the General Agreement on Tariffs and Trade (GATT) which focuses solely on trade in goods, as we will discuss later.

For the last two decades, the WTO has had a mandate to negotiate a subsidies framework to cover services included under GATS. That issue remains under discussion as part of the Doha round and seeks

to develop the proper multilateral framework on the issue of subsidies in order to avoid distortive effects on trade.

Thus, even if aviation were covered by GATS, it would not impose any discipline on subsidies beyond a national treatment rule that states may voluntarily choose to apply or not. Practically speaking, it is doubtful any state would apply national treatment to the airline sector, as that would apply giving a matching subsidy to foreign airlines when it subsidised its own national carriers.

Most Favoured Nation (MFN) applied to aviation would enable all members to immediately become fully liberalised as soon as they liberalise with one member. While arguably a desirable outcome, most member countries would probably not be in favour of such a broad open regime. In addition, there would be a "free riding" incentive for states to hold back and let other states open their markets unilaterally, a strategy that would lead to a stand-off and closed markets. Thus, one could expect that most states would require an MFN exemption making the whole issue moot.

In the case of National Treatment, this already applies to slot allocation and use of airport facilities and ground services, but within the context of the Chicago Convention. However, if applied under a subsidy lens, it would mean that if a country provided a subsidy to one of its national carriers, it would have to provide an equivalent subsidy to all foreign carriers operating on its territory. The implausibility of this being a desirable outcome explains why subsidies are generally carved out from National Treatment.

GATT, on the other hand, defines a subsidy as a financial contribution from a public entity that confers some benefit to a firm. It sets clear rules as to which subsidies are allowed, which are prohibited and which are actionable. Furthermore, it require parties to both prove injury and the causal link between the subsidy and the injury prior to being able to apply countervailing duties against the injurious party. GATT allows certain classifications of goods to be excluded from these subsidy control mechanisms, such as the agricultural sector. The WTO's Agreement on Subsidies and Countervailing Measures (ASCM) establishes the multilateral disciplines on subsidies provided in relation to goods, and on the use of countervailing measures in respect of subsidised imports of goods. It therefore sets the framework for subsidies, determining what subsidies are permitted and the appropriate disciplinary actions when non-permitted subsidies are granted. However, the ASCM only applies to trade in goods and does not apply to services such as air transport.

An ASCM-inspired framework to define permissible and non-permissible subsidies in aviation would be a major step forward towards establishing fair competition within aviation. In addition, clear and transparent reporting would at least remove the information deficit that currently exists in the industry and would allow comparisons between carriers and over time. This could facilitate multilateral open skies agreements. However, until such an agreement can be reached, ASCM standards should not simply be applied unilaterally.

An ASCM-inspired framework approach would have two issues: first, countervailing duties may only be applied in sectors covered by the WTO under GATT or GATS, which aviation transport services are not a part of, and, second, proving a causal link between the subsidy and injury could be quite challenging.

Another proposed approach is to turn to competition authorities to act as arbiters on the legitimacy or not of a subsidy. This may, however, be outside of the scope and mandate of competition authorities. Generally speaking, their role is to ensure that companies, not states, do not distort the playing field. In addition, competition authorities apply competition law and would give equal treatment to a given behaviour whether done by a subsidised or non-subsidised carrier. Finally, since there are no rules as to what a legal or acceptable subsidy is and what it is not, competition authorities would have no legal basis to support a ruling on a complaint related to public subsidies.

By the same token, outside of the EU, which has a very specific and well-defined state aid regulatory regime, few, if any, countries have legislation in place that specifically limits the amount of subsidies a government can grant. Thus, one could argue that from the onset, the concept of an illegal subsidy in aviation outside the EU is actually a myth as these subsidies do not violate any national laws. They certainly do distort the market but that, in itself, is not actually illegal. This situation will remain as long as there is no clear, global definition of an acceptable aviation subsidy, a transparent reporting mechanism and an enforceable regime to remedy situations where unacceptable subsidies would still exist.

Inside the EU, there are very clear rules of what constitutes an acceptable and an unacceptable form of subsidy. In fact, OECD (2014b) finds that the EU is the sole jurisdiction in the world that has adopted binding and enforceable public subsidy laws aimed at imposing a subsidy discipline to all EU states across various sectors, including air transportation. This set of rules limits the ability of European governments to provide state aid to their carriers or airports and the European Commission has often taken member states to court to reverse a subsidy. The purpose of these limitations was to try to achieve a level playing field within the internal EU market. However, these rules only apply to EU-based carriers and airports and thus foreign carriers in Europe are not subject to them, which does create an unlevelled playing field in that EU carriers compete with some carriers that receive generous public subsidies. Because of the global nature of aviation, it is impossible for one region of the world, such as the EU, to impose its rules on others, especially considering the system-wide benefits to a carrier that public subsidies can bring.

In addition, a number of countries have in place subsidies regime aimed at offering some level of air connectivity to remote areas or smaller domestic markets, generally referred to a service level obligations. Subsidies for these services should be distinguished from subsidies to operate international and potentially financially viable routes. These routes are usually domestic and have little or no impact on international routes or on an airline's network. This type of service will not be discussed in this section, as it is more akin to a form of public service than a commercial, profit-driven operation.

The following table provides a summary of situations when subsidies may be more or less problematic.

Table 2.6. Qualitative assessment of the impacts of subsidies

Situation	More problematic	Less Problematic
Operating subsidies on commercially viable routes	Subsidised carrier forces the withdrawal of incumbent carriers from the market; Predatory pricing as a result of subsidies leading to drop in competitiveness;	Subsidy results in added competition while maintaining incumbent carriers.
Operating subsidies on non-commercially viable routes	Subsidies awarded through a non-transparent process; Subsidy endures even after the route becomes viable; Subsidies to one carrier act as a barrier to entry for another.	Open tender process to operate the route helps meet public service obligations while combining with a competitive element.
Capital subsidies	Enables carrier to grow faster than the pace predicted by their own organic growth; Enables to establish market dominance as the carrier could flood a market with capacity.	Capital is used to grow the fleet to a sustainable size at which point subsidies end; Carrier required to pay dividends to its state owners to off-set the cost of capital used to acquire an expanded fleet.
Airport infrastructure subsidies	Airport infrastructure only designed to meet the needs of the local hub carrier. This is problematic with or without subsidies but subsidies could further incentivise airport development and design to focus only on national carriers	Airport is accessible by all carriers, domestic and foreign – no discrimination.
Air navigation subsidies	Air navigation service providers give preference to national carriers compared to foreign ones. Again this is an issue with or without the use of subsidies.	Air navigation service providers give equal treatment to all carriers.

From the table above, a few guiding principles could be established: First, that if subsidies distort a given market, then the end result must be a more competitive marketplace, not a more monopolistic one. Second, that any subsidies be the result of a competitive, transparent and clear process. Third, that throughout the aviation value-chain, the principle of non-discrimination must predominate, as called for by Articles 11 and 44 of the Chicago Convention. And, finally, that a subsidy should be awarded for a particular purpose with a sunset or review clause, rather than in perpetuity.

More importantly though, it points to the fact that there needs to be clear rules about what is acceptable and what is not, clear, transparent and harmonized reporting of subsidies and effective enforcement mechanisms to discourage the harmful effects of subsidies without compromising the competitive landscape or limiting the degree of liberalisation in a given market.

Environmental protection in an era of liberalisation

According to the United Nations Intergovernmental Panel on Climate Change (IPCC), aviation accounts for about 2.5% of global CO_2 emissions from fuel combustion and about 12% of the CO_2 emissions from all transport sources. Aviation emissions are believed to be two to four times[166] as harmful to the climate as surface emissions, because of the production of contrails and of nitrogen oxides which causes the formation of ozone at high altitudes. Ozone, like CO_2, is a greenhouse gas.

Despite growth in passenger numbers at an average of 5% each year, aviation has managed to maintain its emissions growth to around 3%, not fully decoupling growth in emissions from growth in traffic, but still achieving partial mitigation. The IPCC forecasts that aviation's share of global manmade CO_2

emissions will increase to around 3% in 2050 due to the growing demand for air transport, particularly in emerging economies[167]. Thus, while its contribution to global greenhouse gas emissions is quite small, the fact that its volume and share of global emissions are both growing are a matter of concern.

As states increasingly move towards a more liberalised marketplace in hopes of taking advantage of its economic spin-offs, they are also confronted with the environmental externalities that a more liberalised market can bring, through growth in demand and more options for indirect and thus longer routings. Sustainable growth in aviation requires discussions on aviation's contribution to climate change to also take into account a broader opening of aviation markets. This reinforces the need for decoupling traffic and emissions growth and the development of a globally-agreed upon carbon framework to ensure carbon-neutral growth, even in the context of further liberalisation, of air transport.

The 38th session of the ICAO Assembly, held in Montreal in 2013, requested through Appendix A of Resolution A38-14 that the Organisation develop:

- a long-term vision for international air transport liberalisation, including examination of an international agreement by which states could liberalise market access, taking into account the past experience and achievements of states, including existing market access liberalisation agreements concluded at bilateral, regional and multilateral levels, as well as the various proposals presented during the Sixth Worldwide Air Transport Conference (ATConf/6)
- a specific international agreement to facilitate further liberalisation of air services, taking into account past achievements, states' views on existing arrangements and suggestions made during ATConf/6.

This is in no small part as a result of Directive 2008/101/EC, which subjected the EU emissions trading scheme to all flights that arrive at or depart from an EU aerodrome, intra-European and foreign alike[168]. It applies to the entire distance between the point of departure and the point of arrival. Requiring airlines to surrender allowances for CO_2 emitted outside EU airspace (for example, when overflying the high seas) amounts to extraterritorial application of EU law, an outcome which does not sit well with public international law.

Opposition to the scheme from major trading and aviation partners resulted in the EU suspending its application to non-intra-European flights but prompted states to seek a solution within ICAO. Resolution A38-14 charged ICAO with the development of a "hard law" solution to the aviation emissions problem to be discussed at the 39th session of the Assembly (autumn 2016), with an eye to full implementation in 2020.

If fully implemented, the EU directive would have introduced significant distortions to competition because of the unilateral way in which it would have been applied. It would have provided a marked advantage to non-EU carriers and non-EU hubs. For example, an airline flying from New York to India via London would have to surrender CO_2 allowances for the entire 12 000 km journey, despite the fact most of the flight takes place over the Atlantic or over non-EU states, whereas the airline would not be subject to this requirement were it flying instead via Istanbul.

The 1997 Kyoto Protocol to the United Nation Framework Convention on Climate Change mandates that developed countries that have ratified the instrument must pursue limitation or reduction of greenhouse gases from aviation by working through ICAO. The Chicago Convention does not expressly vest ICAO with custody over aviation emissions reduction but vests it with the power (through the consent of its membership) to develop legal mechanisms to address this issue. Annex I of that Protocol established a list of developed countries concerned, which excluded a number of global aviation leaders, such as China, the world's second largest aviation market, Singapore, the United Arab Emirates, Qatar or Brazil.

Although the Kyoto Protocol calls only a select number of its signatories to work within ICAO, an ICAO solution to the problem of aviation emissions would appear to reflect the wishes of developing and developed countries alike.

At ICAO's triennial General Assembly meetings in 2007, 2010 and 2013, the Organisation's member states adopted Resolutions A36-22, A37-19 and A38-18 respectively, reaffirming ICAO's legitimacy as the lead international body to devise a global solution to the problem of aviation emissions[169].

Until a global agreement can be reached under the auspices of ICAO, bilateral and plurilateral agreements, such as the 2007 EU-US ASA, which calls for cooperation and information exchanges between the parties on environmental issues, can perhaps be one way to address these issues, although significantly less effectively than through a global agreement. This would have a strong "demonstration" effect for other States.

Threats to liberalisation

The overview of the history of air transport liberalisation presented in section 2 clearly shows that international aviation is far more liberal today than when Bermuda I-inspired ASAs first came into place. Open skies agreements have now become the benchmark against which all other ASAs are measured. Meanwhile, most of the feared consequences of an open aviation market have failed to materialise, while opening markets, especially if combined with the entrance of LCCs, has helped international aviation experience significant growth over the last two decades. Despite this progress, there exist some threats to liberalisation.

Protection against an unlevel playing field

The most visible threat is a recent resurgence of protectionist attitudes particularly against carriers whose business model is articulated around international through traffic, i.e. using sixth freedom rights. There have been numerous allegations of unfair competition against such carriers on the grounds that they receive excess subsidies, causing marketplace distortions and loss of employment in Europe and the United States. The solution proposed is usually to restrict traffic rights in order to limit the disruptive effects these alleged subsidies can have.

This contrasts greatly with other global services industries, where mechanisms under the framework of the General Agreement on Trade in Services provide some form of adjudication and compensation when issues of perceived or real unfair trade practices arise. This also allows for states who have been found to be victims of unfair trade practices to impose tariffs or countervailing duties against the offending country, a remedy that still manages to maintain the advantages of trade liberalisation while exerting strong pressure to remedy the situation. In aviation, most ASAs have a formal dispute resolution mechanism but very few specifically refer to the issue of fair competition. ICAO also offers to mediate or arbitrate conflicts, but only when all parties involved agree to resolve their dispute with the help of the organisation.

Gaming ownership and control

One area where the aviation industry remains far from liberalised is airline ownership and control (O&C). In most sectors of the economy, investment restrictions are relatively rare, with countries actively seeking foreign direct investment as a means to create wealth. Aviation in that regard is quite different. While this can reflect a protectionist sentiment in some cases, in others, restrictions on O&C are closely tied to a fear of "nation shopping" where airlines would take advantage of liberalised O&C regulations to

increase their profitability, shifting at the same time the jurisdiction in which they pay corporate taxes. Arguably, the Norwegian case above could be an example of this, with their goal being to locate their activities in EU member states which provide the most lenient labour and fiscal environment in which to operate.

Enforcing ownership and control restrictions can be subject to several tests. For ownership, this can be straightforward by determining the nationality of the shareholder and their proportion of shares they own. In some countries, such as Brazil, Canada and Japan, there is a distinction that is made between voting and non-voting shares, with the foreign ownership limit placed solely on voting shares. However, as shares in any carriers are openly traded on the stock market, it can be quite challenging at any given time to truly know the nationality of shareholders.

Control is a far more complex issue to test for as control can take on many forms. Waluik (2016) notes that control of a carrier can be acquired through minority ownership with disproportionate voting rights, veto rights, credit arrangements, loan guarantees, buy-out clauses, personal relationships of key managers or the dependency of one carrier on the network of another. Clearly, one could argue that testing for ownership is a quantitative exercise whereas testing for control is far more a qualitative one.

More market-oriented O&C requirements could be positive for travellers and shippers alike, helping them benefit from closer integration between airlines, better connectivity and the emergence of new carriers, while permitting airlines to access greater sources of capital, foreign management talent and opportunities to diversify their activities beyond their borders.

However, liberalising O&C requirements does raise a number of concerns, chief amongst them in the area of aviation safety. This was examined in depth by the British Civil Aviation Authority (CAA, 2004). The principal issue would be air carriers relocating to reduce safety regulation compliance costs as, within a fully liberalised environment, carriers would seek to locate in jurisdictions with the lowest regulatory compliance costs and most favourable labour and fiscal regime.

Furthermore, O&C requirements being a matter of national legislation, there could certainly be an incentive for "free riders", meaning a first mover disadvantage, where countries would game the system by waiting for other countries to liberate their O& C requirements without liberalising their own.

On the issue of safety, it bears keeping in mind that regulatory oversight is not a function of the nationality of shareholders or management but of the jurisdiction in which an air carrier is based. However, in a fully liberalised environment, then indeed a carrier could be based in one country and serve mainly another. This is the case in the EU, where for example, about 85% of Irish LCC Ryanair's flights do not actually touch Ireland and are actually seventh and ninth freedom flights operated within the context of the Single European Market. These types of operations do not raise safety concerns as there is a consensus amongst EU members of an equivalent level of aviation safety amongst all member states. Thus one would expect that a regulatory context where O&C and traffic rights are fully liberalised would be accompanied by some mutual recognition of equivalent safety standards between countries involved, which would likely curtail safety compliance cost savings and thus one of the major negative drawbacks of flags of convenience.

A better option could be combining two concepts: first, full regulatory convergence of selected countries' safety regimes, which would imply that carriers based in any of these countries would be subject to an equivalent safety regime and, secondly, to decouple ownership and control from regulatory oversight, thus enabling a carrier based in one country and subject to the safety oversight of that country to be owned and controlled by nationals from other countries.

The first concept reflects the current situation within the European Union, where safety regulations should be equivalent across all EU members. Thus, from an aviation safety perspective, there should be no material difference between a carrier based in one EU country and one based in another EU country. The second concept reflects the existing situation in Australia, for example, where the nationality of a domestic carrier's ownership and management has no incidence at all on the Australian aviation safety framework to which it, like any other Australian carrier, must comply. Finally, on the legitimate issue of preventing free-riders, one could envision the creation of a multilateral agreement fully liberalising O&C restrictions with signatory countries, thus creating a two-tier regime and confining potential free riders to restrictive O&C requirements.

In addition, national legislation in ITF member countries currently treats all foreign investment on the same footing. However, if the goal is to mitigate free-riders, legislation could be amended to offer a more liberal regime to foreign institutional investors while remaining more restrictive for foreign airlines conducting a strategic investment. This could ensure that national airlines owned by foreign capitals are run in a profit-maximising way and not in a way to support the activities of the parent carrier.

The way forward

Throughout a century of aviation liberalisation marked by ebbs and flows of liberalisation, the airline industry has adapted, and in many cases prompted an evolution of thinking on the economic regulation of the industry. The following section presents a discussion of what the future may hold for liberalisation in the medium to long-term.

Liberalisation in the next decade

The airline industry is dynamic and innovative so making predictions for its future evolution is perilous. Every decade sees major change, from US deregulation to the EU Single Air Transport Market, with new entry, new business models, market consolidation and deepening international alliances. What evolution the next decade will bring is uncertain but the following trends in air liberalisation seem the most likely to occur.

In North America and Europe, airport and airspace congestion may begin to limit the full benefits of liberalised ASAs with capacity insufficient to meet demand in already highly congested markets. Therefore, it will be important to accelerate consolidation of air traffic management and devise more efficient ways to make use of the existing infrastructure as well as prioritising investments in new infrastructure so that the full social welfare gains permitted by a liberal regime can materialise.

Africa should experience a decade of strong growth with new carriers joining Ethiopian Airlines, Kenya Airways, and South African Airways in providing Africa with global connectivity. We will likely see the emergence of a strong group of airlines operating under a common brand, similar to the LATAM or Air Asia groups, and centred on a financially robust carrier. The first signs of this have appeared with the acquisition of 49% of Air Malawi by Ethiopian Airlines. Growth in LCCs could help make flying more affordable and stimulate growth.

Gulf and Turkish carriers are poised to continue to grow their market share of traffic, taking advantage of their favourable geographic location in proximity to the world's economic centre of gravity, aviation-friendly public policies, massive infrastructure airport investments and a growing fleet of modern aircraft to link major population centres in Africa, the Middle East, the Indian Subcontinent and Central and Southeast Asia, with Europe or the Americas. They are likely to benefit from a gradually increasing

number of more liberal ASAs. The trend could be reversed in the short-term as accusations of subsidised competition and potential impacts on network efficiencies are investigated. This illustrates the need for cooperation in developing agreed frameworks for fair competition, including high standards of transparency in annual accounts and enforcement mechanisms. Gulf carriers are likely to be increasingly active in seeking partnerships or even buying stakes in other carriers in order to both feed Gulf country hubs and access those carriers' secondary markets.

ASEAN countries need to continue their integration towards a single market if agreements with external partners are not to cause difficulties for competition between ASEAN airlines within the region. We can expect more ASAs where ASEAN will negotiate in accordance with the principle of "Community of interest". However, it is not clear that ASEAN will achieve the same degree of integration and openness as the EU in the next decade.

In Northeast Asia, China will eventually open up its domestic market and allow LCCs to operate at its major airports, thus removing the protections it put in place for its three large carriers. When this will happen is difficult to predict. ASAs will probably only be liberalised further when the major national carriers are judged to be ready to compete. Japan will continue to liberalise both air services and the management of its international airports. Liberalisation in Northeast Asia will be accompanied by strong growth in LCCs and significantly higher passenger traffic volumes, placing additional pressures on existing infrastructure.

Integration between air carriers will continue in their quest to derive the maximum benefit from mergers, despite ownership and control restrictions. These commercial developments may affect the impetus for further liberalisation. Large, multinational carrier blocks, either in the form of subsidiaries, joint ventures or alliances, may force policy makers to not only consider national interest but also the aviation block to which its national carrier belongs to in order to determine the policy actions that maximise social welfare. This could force states whose policy priorities include defending the interest of their national carriers to also take into account the needs of foreign carriers aligned with their national carriers.

Air freight will continue to be on the leading edge of liberalisation, particularly with respect to seventh freedom rights[170]. This increased level of liberalisation is due to the needs of the globally integrated air express business and because the one-way nature of air freight forces airline planners to find creative routings to make a flight profitable. Meanwhile, as more than half of air cargo is carried in the belly of passenger aircraft, and this proportion is growing, it will be dependent on traffic rights obtained for passenger flights for non-express business.

Cabotage

Cabotage, whether as part of an international service (eighth freedom) or as a stand-alone operation (ninth freedom), is the transportation of freight or passengers solely between two points in one country by a carrier from another country. Cabotage is usually frowned upon and generally explicitly out of scope of most bilateral or multilateral ASAs.

Some rare cases do exist, such as the unilateral acceptance of cabotage by Chile, which has a limited domestic market, and mutual cabotage rights between Singapore and the United Kingdom, the United Arab Emirates or Uruguay, between China and Albania and between New Zealand and Brunei. Some cases are an offshoot of significantly deep economic ties that go beyond the realm of aviation, such as between Australia and New Zealand (Closer Economic Relations Trade Agreement) or between EU member states[171]. Piermartini et al. (2008) conducted an analysis of the ICAO World Air Services

Agreement (WASA) database and concluded that of the 2 299 ASAs studied, 353 contained some form of cabotage provision, although that included the cabotage rights within EU countries which should account for at most 351[172] of them.

Historically, there have been provisions for eighth freedom rights on the Geneva-Zurich routes and on flights between Dublin-Shannon and the United States. However, in those two last cases, the fact that these were domestic segments of low-frequency, long-haul international routes limited their market penetration. Finally, as a vestige of war, carriers from the United States, the United Kingdom and France, but not West Germany, were allowed to operate domestic flights to and from West Berlin prior to German re-unification, as only aircraft from those countries could freely fly in one of the three air corridors over East Germany that connected West Berlin to the rest of West Germany.

The OECD (2002) viewed cabotage in air freight under a favourable lens and argued that, if full traffic rights were given to that sector, including cabotage, it would lead to cost-efficient, freely supplied services from which users, namely exporters and importers, would derive great benefits. However, recognising the barriers that could exist in granting cabotage rights, the authors recommended full liberalisation of rights of establishment. This would allow foreign capital to set up and operate a domestic air freight operation that would not be considered as cabotage, since the aircraft would be registered in the country where the domestic flight occurs and would be operated by citizens from that country. The air carrier would be required to have its principle place of business in that country and it would be licensed by that country, which would avoid having "flags of convenience".

The approach proposed is not unlike that used by Air Asia, Virgin and LAN, where a carrier from one country establishes a subsidiary in another country and operates domestic and international flights. However, in most of those cases, the foreign subsidiary is a joint venture with local investors, who usually retain majority ownership and control (i.e. the Virgin Group only owns 25% of Virgin America).

In the case of air freight, we routinely witness some form of de facto cabotage from the fact that large integrators, such as FedEx or UPS, will carry domestic shipments outside of the United States. This is often done through ground operations, with a trucking fleet that is registered in the country in question. The same can be done by chartering space on a carrier registered in the country in question, yet providing the same customer experience as if the integrators operated their own fleet.

An example of this is in Canada, where both integrators contract out Canadian air freight carriers (Morningstar, Cargojet, Carson Air, Skylink Express) to provide domestic service and a feeder to their international gateways in that country. In fact, Morningstar's aircraft are even painted with the FedEx livery; however, all their aircraft are Canadian-registered and they meet Canadian ownership and control requirements. They simply charter their aircraft to a foreign client, namely FedEx, which is perfectly legal and are in charge of all operational aspects of the aircraft (flying, maintenance, insurance etc.). Meanwhile, from a client's perspective, the experience is the same whether sending packages from Montreal to Vancouver or Montreal to Paris via Memphis.

In conclusion, air freight currently enjoys a regime that is at least as liberal, if not more, than that witnessed for passenger transport. ICAO is working with a number of countries to accelerate the pace of air freight liberalisation, which will likely produce substantial benefits to the air freight industry. However, barriers to a complete free market continue to persist, and will likely continue to in the foreseeable future. As for cabotage, while perfectly legitimate if the sole purpose of transport policy is to move travellers and goods between origin and destination, it remains a very sensitive issue across much of the world and there likely will not be a political appetite to liberalise it in the foreseeable future.

Concluding remarks

Liberalisation by means of less restrictive ASAs has an established track record of producing societal benefits. The effects of liberalising markets where governments tightly control the supply of air services can be transformational, stimulating, for example, the emergence of LCCs. Incremental liberalisation is likely to have less visible effects where markets already enjoy a large degree of freedom, as economically efficient patterns of supply and airline organisation will already have been established, but enhanced opportunities for competition will always exert pressure on prices, even when new entry is potential rather than apparent. Liberalisation has opened up aviation to the whole of society and greatly facilitated tourism and trade.

The momentum that liberalisation has gained reflects the geopolitical changes and market developments that have occurred since the signing of the Chicago Convention. Today's international aviation marketplace is more connected than ever, with major global airlines aligned in one of three network alliances and metal neutral joint ventures appearing on most trunk routes. Liberalisation has shown itself to be highly beneficial; in the United States, it enabled a transition from a point-to-point domestic network to a far more efficient hub and spoke model, fully integrated into the international network. In the EU, the creation of a single market for aviation supported by regulatory convergence, including common rules for the operation of air services has seen the emergence of LCCs, sharply falling air fares and significantly improved connectivity for secondary airports. In ASEAN countries, a more liberal interpretation of airline control has enabled the growth of the Air Asia group and other low-cost airlines, bringing lower air fares to that region of the world.

Liberalisation has the potential to deliver large consumer welfare gains in the aviation markets of Northeast Asia and Africa, two of the areas of the world with the largest potential for growth in air travel if their markets are liberalised.

Liberalisation should not only be seen under the prism of air traffic rights. Ownership and control of air carriers remain quite restricted compared to other global industries, including in transportation. For example, the nationality of the owners of international shipping lines, trucking companies or railways is a far less significant issue in most ITF countries than the nationality of airline owners. This has made it more challenging for some airlines to access capital, particularly in small capital markets, and has forced them to find creative ways to derive the benefits that mergers between air carriers could produce. One of the most effective means used by air carriers is metal-neutral joint ventures, which, in effect have removed the concept of majority national ownership. This should encourage national legislators to further explore bilaterally or multilaterally removing restrictions on ownership and control and allowing foreign ownership and control of national airlines, first for domestic services and eventually for international services, where allowed by ASAs, as the EU has successfully done. Such a policy would be consistent with IATA's Agenda for Freedom. It would also provide a framework around ownership and control in the airline industry that is in line with that which exists in other modes and the economy at large. Finally, because the airline would remain under the same regulatory control, no matter the nationality of its ownership, the amount of foreign capital invested in a carrier should have no incidence on safety, security or environmental performance.

Lifting ownership and control restrictions, especially when the investor is not an airline, would likely result in an increase in foreign direct investment as airlines establish operations in new markets and consolidate through mergers and acquisitions. This increase in investment would lead to a more efficient use of capital, debt reduction and a more rational use of resources, providing financial benefits to airlines and their balance sheets. In addition, a capital-intensive industry such as the airline industry would

greatly benefit from being able to access the lowest cost capital, independent of its nationality, as most other sectors of the economy already do.

The success of air carriers from countries with a small home market but a significant geographical advantage has prompted much debate over slowing, halting and even reversing liberalisation. Some of the protectionist arguments can be put to rest through more transparency by air carriers, particularly on the issue of operating subsidies, but it should also be noted that factors such as better geographical position, lower costs and aviation-friendly policies are comparative advantages that do not run counter to the principle of equality of opportunity and thus should not be used as arguments against liberalisation. In order to engage in further liberalisation some countries will continue to require safeguards against unfair competition, in order to unlock the societal welfare gains associated with liberalisation while containing the negative effects on their domestic industry of increased foreign competition.

Air transport development is essential to the improvement of direct connectivity. Mature economies are interested in developing trade and exchanges with the developing countries, such as India, China, South-East Asia and Brazil. Traffic rights would have to be linked with regulatory convergence as to ensure a level playing field. On the contrary, unfair competition, unbalanced market will restrain further air transport liberalisation.

Notes

1. Here the term national security refers to threats by one country against another, as opposed to the modern understanding of aviation security of threats posed by a small group against aviation.

2. For example, if there were 21 other states aside from those four, each one of those four states would have 5 votes.

3. The right by a carrier from one country to carry passenger and/or freight traffic exclusively between two points in another country

4. Bolivia, Burundi, Costa Rica, El Salvador, Ethiopia, Greece, Honduras, Liberia, Netherlands, Paraguay and Turkey

5. Or PICAO, the provisional ICAO between the signing of the agreement in 1946 and the establishment of ICAO in 1947

6. US Gen. Accounting Office, GAO/RCED-90-102, Airline Competition: Higher Fares and Reduced Competition at Concentrated Airports 12 (1990).

7. Office of Economic Analysis, Civil Aeronautics Board, Competition and the Airlines: An Evaluation of Deregulation 125 (1982).

8. 49 USC. 40101(a) (6), (9), (10), (13).

9. In 1975, FedEx had petitioned the Civil Aeronautics Board, the US economic regulator of air transportation, to operate 5 larger aircraft. The request was denied.

10. Revenue per kg-km

11. Prices adjusted for inflation using the US Producer Price Index

12. Air express being a premium product, it should be expected that their share of total revenue is significantly higher than their share of tonne-km

13 . DOT Final Order 93-1-11

14 . As with a number of open skies agreements, this right can be restricted by customs, technical, operational, security or environmental reasons only. However, these are not liberalisation of market issues

15. Available at: http://www.sice.oas.org/trade/mrcsr/TreatyAsun_e.asp#CHAPTER_I.

16. See Section 2.1.7 on the EU Aviation Single Market

17. Gazeta Mercantil Latinoamericana, 22/28 Dec. 1996.

18. Hubert Drabbe, Directorate-Gen., Competition of the European Commission, Remarks at the 10th Annual Conference of the European Air Law Association: Extension of EU Air Transport Competition Rules to Air Transport to and from the EU (Nov. 6, 1998), available at http://ec.europa.eu/competition/speeches/ text/sp1998_058_en.html.

19. Case 13/83, Parliament v. Council, 1985 E.C.R. 1556, 1557.

20. 1 Case 209-213/84, Ministre Public v. Asjes, 1986 E.C.R. 1457, 1459.

21 . See Commission Proposal for Progress Towards the Development of a Community Air Transport Policy, at 13, COM (1984) 72 final (Mar. 15, 1984).

22 . The United States entered into open skies agreement with the Netherlands (1992) Denmark, Sweden, Finland, Belgium, Luxembourg, and Austria (1995) and Germany (1996). See the section on EU-US open skies.

23 . See ICAO Document 9587, Policy and Guidance Material on the Economic Regulation of International Air Transport, Third Edition 2008, Part 2 (Airline Ownership and Joint Operations).

24 . The EU's External Aviation Policy – Addressing Future challenges, COM (2012) 556 final, 27.09.2012.

25. This discussion paper is included in a subsequent chapter of this publication.

26. It could be argued that Air Berlin is a sort of hybrid between a network carrier and a low cost carrier due to its OneWorld membership, long-haul network and little or no use of 7th/9th freedoms

27 . The agreement is available at http://www.maliat.govt.nz/agreement/index.php

28 . These being the Convention on Offenses and Certain Other Acts Committed on Board Aircraft, Tokyo, September 14, 1963, the Convention for the Suppression of Unlawful Seizure of Aircraft, The Hague, December 16, 1970, the Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation, Montreal, September 23, 1971, and the Protocol for the Suppression of Unlawful Acts of Violence at Airports Serving International Civil Aviation, Montreal, February 24, 1988.

29. Renamed Virgin Australia (NZ) in 2011

30. Communication from the Commission to the Council Regarding Air Transport Relations with Third Countries, at 21, COM (1992) 434 final (Oct. 21, 1992).

31. Contribution of the European Communities to the Development of Air Transport Services-Memorandum of the Commission, COM (1979) 311 final (July 6, 1976) at 15.

32. Commission Proposal for Progress Towards the Development of a Community Air Transport Policy, COM (1984) 72 final (Mar. 15, 1984).

33. Comité des Sages, Expanding Horizons: Civil Aviation in Europe, an Action Programme for the Future, at 5 (Jan. 1994), available at http://aei.pitt.edu/8690/.

34. See, i.e. Case C-467/98, Commission v. Kingdom of Den., 2002 E.C.R. 1-09519.

35. Case C-466/98, Commission v. U.K., 2002 E.C.R. 1-09427; Case C-467/98, Kingdom of Den., 2002 E.C.R. 1-09519; Case C-468/98, Commission v. Kingdom of Swed., 2002 E.C.R. 1-09575; Case C-469/98, Commission v. Republic of Fin., 2002 E.C.R. I09635; Case C-471/98, Commission v. Kingdom of Belg., 2002 E.C.R. 1-09681; Case C-472/98, Grand Duchy of Lux., 2002 E.C.R. 1-09741; Case C-475/98, Commission v. Republic of Austria, 2002 E.C.R. 1-09797; Case C-476/98, Commission v. Fed. Republic of Ger., 2002 E.C.R. 1-09855.

36. Press Release, European Commission, New Era for Air Transport: Loyola de Palacio Welcomes the Mandate Given to the European Commission for Negotiating an Open Aviation Area with the US (IP/03/806), at 1 (June 5, 2003).

37. Press Release, European Commission, 2515th Council Meeting: Transport, Telecommunications and Energy (9686/03), at 19-20 (June 5, 2003).

38. ASA Protocol, art. 3 & pp. 16-17 & attachment c.

39. Compare Air services agreement, art. 21, with ASA Protocol, art. 6.

40 . Vancouver, Calgary, Edmonton, Winnipeg, Toronto (Pearson), Ottawa, Montreal (Trudeau) and Halifax

41. Until then, only US domestic flights were allowed at Washington National

42. The term hub busting is a bit misleading as most flights would still originate from one of Air Canada's hubs (Toronto, Montreal, Vancouver)

43. The 1974 agreement over charters being more permissive, it was extensively used by Canadian carriers to bring Canadians to US sun destinations (Florida, Hawaii). These flights would have third freedom rights, but not fourth, meaning passengers had to originate in the home country of the carrier. The nature of the Canadian and US tourism markets limited the charter opportunities for US carriers and thus the number of conversions from charter to scheduled flights.

44. For example, United can match the lowest direct air fare between Montreal and Paris.

45. Traditionally, Canadian carriers, first CP Air, then Canadian International and finally Air Canada, used fifth freedom rights on the Vancouver-Sydney route as aircraft did not have the range to operate the flight non-stop. They would make a stop in Honolulu in each direction. This allowed carriers to offer layovers in Hawaii and also sell each leg separately, which was more lucrative than selling both legs together. When Air Canada introduced the Boeing-777-200LR on the route in late 2007, it made the fuel stop in Hawaii unnecessary and the carrier started flying the route non-stop. At 12 500 km, it is the second longest route in Air Canada's network on an orthodromic basis.

46. Ownership restrictions of Canadian and American carriers are subject to national legislation whose scope extends beyond this air services agreement. The Canada-US agreement does not afford any preferential treatment to capital from one country in being invested in an airline from the other country.

47 The ownership restrictions of a Canadian air carrier are set out in Part II of the Canada Transportation Act.

48 For an analysis of the EU-Canada ASA, see Brian Havel & Gabriel Sanchez (2011): "Restoring Global Aviation's 'Cosmopolitan mentalité' ", 29(1) Boston University International Law Journal, 1.

49 Phase one of the Agreement applies where the foreign ownership of airlines is limited to 25%, as was the case when the negotiations on the agreement were completed. Phase two starts as soon as Canada has taken the steps necessary to enable European investors to own up to 49% of a Canadian carrier's voting equity. Canada introduced this possibility in March 2009 however it did not pass and foreign ownership oif a Canadian carrier remains capped at 25 percent.

50 . Jetstar also established Jetstar Japan which is a third own by its parent company, QANTAS

51 The United States had close to 40 hubs at the turn of the century; today, it has half of that

52 . Council Regulation 1/2003, on the Implementation of the Rules on Competition Laid Down in Articles 81 and 82 of the Treaty, 2003 O.J. (L 1) 1 (EC).

53 . Council Regulation 411/2004, Repealing Regulation (EEC) No 3975/87 and Amending Regulations (EEC) No 3976/87 and (EC) No 1/2003, in Connection with Air Transport Between the Community and Third Countries, 2004 OJ. (L 68) 1 (EC).

54 . Both agreements were opened for signature on December 7, 1944 and entered into force January 30 1945

55 . See Article I, para. 5 and Article I, para. 6.

56 . US-U.K., Feb. 11, 1946, 60 Stat. 1499

57 International Civil Aviation Organisation Manual on the Regulation of International Air Transport, at 4.1-8, ICAO Doc. 9626 (1st ed. 1996).

58 See Article 3 thereof. Agreement available at: http://www.state.gov/e/eb/rls/othr/ASA/c/co/index.htm

59 See Memorandum of Consultations, available at: http://www.state.gov/documents/organization/151588.pdf.

60 Agreement available at: http://www.state.gov/e/eb/rls/othr/ASA/a/aa/index.htm.

61 Regulation (EC) No 1008/2008 of 24 September 2008 on common rules for the operation of air services in the Community (Recast), OJ L 293/3, 31.10.2008.

62 See Commission Decision of 19 July 1995 on a procedure relating to the application of Council Regulation (EEC) No 2407/92 (Swissair/Sabena), OJ L 239/19, 07.10.1995.

63 . See Article 2(g) of Regulation (EEC) No 9407/92 and Article 2(9) of Regulation (EC) No 1008/2008.

64 . See Commission Decision of 19 July 1995 on a procedure relating to the application of Council Regulation (EEC) No 2407/92 (Swissair/Sabena), OJ L 239/19, 07.10.1995.

65 . The actual decision mentions that "companies from third countries must not be allowed to take full advantage, on a unilateral basis, of the Union's liberalised internal air transport market".

66 . See https://www.transportation.gov/sites/dot.gov/files/docs/Certificated_ Packet_2012_final.pdf for more information on the USDoT's notions of airline control

67 . See Press Release of Feb. 23, 2012 , at: <http://www.virginaustralia.com/us/en/about-us/media/2012/VIRGIN-AUSTRALIA-NEW-STRUCTURE/>. See also Havel, B & Sanchez, G, supra note 23, at 2.5.15., 3.3.9. and 4.4.4.

68 . See Ley 2.564 de 1979, Articles 1 and 2, referred to in Havel, B & Sanchez, G, ibid.

69 See Havel, B & Sanchez, G, supra note 23, mentioning that LAN has apparently acquired majority control of LAN Argentina after the local law on ownership was changed. LAN also owns significant (possibly majority) stakes in LAN Colombia, LAN Ecuador, and LAN Peru, and other affiliates. See also García-Arboleda J (2012): "Transnational Airlines in Latin America Facing the Fear of Nationality", 37(2) Air and Space Law, 92.

70 See Article 2(4) (c) of Council Decision of 27 June 2005 on the signing and provisional application of the Agreement between the European Community and the Republic of Chile on certain aspects of air services, OJ L300/45, 31.10.2006.

71 . See http://ec.europa.eu/transport/modes/air/safety/air-ban/doc/list_en.pdf

72 . See Part 2 of Doc 9587, Policy and Guidance Material on the Economic Regulation of International Air Transport, 3rd ed., 2008, available at: http://www.icao.int/sustainability/Documents/Doc9587_en.pdf

73 These were carriers flying mainly domestic routes prior to deregulation.

74 In Northwest/KLM, the DOT stated: "The Department has always recognised that the public interest standard in [49 USC. § 41308] is a much more stringent standard than [49 USC. § 41309's] public interest standard". Supra note 47, at 11.

75 For a more in depth discussion of the KLM/Northwest alliance, see Havel, supra note 37, Chapter 3 VIII, B and Chapter 4, III, C.

76 Westjet biggest competitor is Star Alliance founding member Air Canada. This shows that airlines can work with one airline within an alliance and its rival within a tactical alliance.

77 See Havel & Sanchez, supra note 21, at 4.6.9. and 4.9.

78 See L.E.K. Consulting/Executive Insights, Reaching New Heights Together: How Airlines Can Maximize the Value of Joint Ventures, Volume XVI, Issue 4, Jan. 27, 2014.

79 See Commission Decision of 11 February 2004 in Case COMP /M.3280, supra note 180 11-12.

80 See European Commission an USDOT [EC/DOT] Transatlantic Airline Alliances: Competitive Issues and Regulatory Approaches at 1.4 (Nov 16 2010).

81 Or first degree price discrimination meaning that consumers face different prices for the same product based on an airlines belief about the consumer's willingness to pay.

82 In this document, the term national airline refers to airlines based in a "home" country as opposed to foreign airlines. National airlines may or may not be state-owned and are not meant to convey the idea of a flag carrier.

83 Where each airline adds a mark-up for profit, the sum of which is larger than the profit margin required by a single operator.

84 . Large countries consist of more than one region, the United States comprising 15 regions for instance, but regions in sparsely populated areas, may cover more than one country.

85 . There is much debate about the best way to measure competition in the aviation market, relating to what constitutes a market and which airlines are actually competing. For the modelling exercise, the constraints lie in the available data and competition on flights between any pair of regions is measured through Herfindahl–Hirschman Index (HHI) at the alliance level. This simplified indicator uses airlines as the base unit when measuring competition and do not take code shares into account.

86 . Prices are handled with a sub-model which relates distance, number of transfers, overall competition and the presence/absence of low-cost carrier to an average price.

87 This is an economic concept that describes a situation where the decision maker may have different interests than the one financing the decision.

88 . Returns on capital employed (ROCE) are calculated as the operating profit after taxes, divided by the capital employed, which consists of equity and interest-bearing debt.

89 . The weighted average cost of capital (WACC) is calculated taking into account after-tax costs of equity and debt and their relative weights in the capital structure.

90 The HHI is calculated by squaring the percentage market share of each firm in the market and summing these numbers. The index would be 10 000 if a market were a pure monopoly (100 squared). The lower the index the more competitive the market, while a high number indicates market concentration and possible monopoly power.

91. http://www.oecd.org/tad/services-trade/services-trade-restrictiveness-index.htm

92 Metal neutrality is a relatively new term in aviation that describes a joint venture where partners share revenues and costs for a given route independently of who the actual operator of the aircraft (i.e. “the metal”) is.

93 There may be a short-term effect at the tail-end of seasonal events.

94 Commodities whose weight to value ratio and time sensitivity makes them economically efficient to carry by air.

95 Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam

96 In ASEAN countries, national capitals are often also their country’s metropolis and home to their country’s busiest airport.

97 The Subic hub was moved to Guangzhou in 2009, reflecting the growing strength of air freight in China.

98 According to Tan (2013a), Indonesia did not ratify the agreement for fear that it would be detrimental to its own carriers.

99 Excludes revenues from ground activities such as catering and ground handling.

100 IAG’s flight operates between London Stanstead and Hong Kong, via various stops in India (i.e. Delhi, Mumbai, Chennai) or Bangladesh (Dhaka)

101 The 160 km that separate Mirabel and Ottawa airports is too small to make a stand-alone freight operation competitive against a trucking service.

102 There could be exceptions in the extreme case where the larger aircraft is a few generations older than the smaller ones, i.e. comparing the operating costs of two A320 Neo with that of a DC-8, but this case is more theoretical than practical.

103 Early morning arrivals, evening departures, Memphis turnarounds in the middle of the night.

104 The “-1”term reflects the fact that there cannot be a flight from the foreign hub to the foreign hub.

105 It is worth noting that the pre-existence of the Chicago Convention would not in and of itself preclude aviation from being within the WTO.

106 . For an account of how air transport got into GATS in the first place, see Brian F. Havel, Beyond Open Skies – A New Regime for International Aviation, Wolters Kluwer, 2009, Chapter 6, p. 526, footnote 34. See also, Brian F. Havel, "Rethinking the General Agreement on Trade in Services as a Pathway to Global Aviation Liberalisation", 45 Irish Jurist 47, 2011, footnote 43.

107 . See WTO Council for Trade in Services, Background Note by the Secretariat, S/C/W/59, 05.11.1998.

108 . See Pablo Mendes de Leon, OECD Background Note, Competition Issues in the Air Transport Sector, 07.09.2011.

109 Convention on International Civil Aviation, Doc 7300/9, 9th edition, 2006, available at: <http://www.icao.int/publications/pages/doc7300.aspx>.

110 See Doc 10022, Assembly Resolutions in Force (as of 4 October 2013), available at: <http://www.icao.int/Meetings/a38/Pages/resolutions.aspx.

111 See Section IV, para. 5.

112 Some intrastate routes remain regulated at the state level. For example, in Western Australia, regional services from Perth to 14 airports remain regulated.

113 The Trans-Tasman Agreement is discussed at length in the second part of this paper.

114 Qantas maintains a twice-daily service to London Heathrow with a stopover in Dubai.

115 . See Article 2(4) (c) of Council Decision of 27 June 2005 on the signing and provisional application of the Agreement between the European Community and the Republic of Chile on certain aspects of air services, OJ L300/45, 31.10.2006.

116 . Seventh freedom for passenger flights available in 15 of the 29 ASAs with seventh freedom rights; seventh freedom for freighter flights are available in all 29 cases.

117 . See the respective sections on MALIAT and MERCOSUR for more details on these agreements.

118 . A gathering of civil aviation authorities from Argentina, Aruba, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela

119 . Based on an ad-hoc request calculation conducted by Eurostat.

120 . The inclusion of Switzerland reflects the existing EU-Switzerland ASA.

121 . Refers to a judgement rendered by the European Court of Justice in eight cases brought by the EC against member states that had concluded open skies agreements with the United States.

122 See http://ec.europa.eu/transport/modes/air/international_aviation/country_index/russia_en.htm.

123 . See further the Social Dumping section for a more in-depth discussion on the topic.

124 . The EU, Iceland, Liechtenstein and Norway.

125 . See the ASEAN-EU Air services agreement earlier in this document and Tan (2014).

126 SAS opened a fifth Asian destination, Hong Kong, in September 2015

127 Figures for Air France include its regional carrier Hop!. Figures for EasyJet include EasyJet Switzerland.

128. The tax was reduced by half in April 2015

129 Connectivity in this particular case was defined as the sum of a quality index of weekly direct and indirect flights, placing a time penalty on the indirect (and thus longer) routing. Hub connectivity was the number of connections possible at a given hub airport factoring in total travel time.

130 Lee, Yeong-Heok (2010). The Effects of Open Sky and the Growth of LCCs in NE Asia. Presentation at the 6th ITPU International Seminar in Osaka: "Further Liberalization and Cooperation in North East Asia" on June 11, 2010.

131 On behalf of the International Transport Forum, Fu and Oum (2014) studied the Chinese policy towards liberalization and the protection of the national carriers in detail. Their paper has been attached to this report.

132 See CAPA Aviation: http://centreforaviation.com/analysis/korea-steps-back-into-the-dark-airline-protectionism-flourishes-in-seoul-3619

133 . When converting arrivals data into enplaned/deplaned data

134 . North American Free Trade Agreement

135. Mexico City to and from Cancun, Monterey, Guadalajara, Tijuana, Merida, Villahermosa, Tuxtla Gutierrez and Hermosillo

136. Ley de Aviacion Civil

137 . Ley de Aeropuertos

138 Less than 85% of the time

139. Comisión Federal de Competencia

140 . Based on airlines schedules for a random summer and winter week

141 . Formerly Arkefly

142 . Only freight in the case of Mongolia

143 . Continuous arrivals and departures with no idle periods as opposed to a hig number of arrivals, followed by a high number of departures and then a period of low activity until the next wave of arrivalks and departures.

144 . As of January 1 2016

145 . At 2008 prices

146 . A proxy for the demand of air navigation services

147 . Armenia, Azerbaijan and Georgia are all expected to grow faster than Turkey, but starting from a much smaller base amount.

148. Gatwick, Heathrow, London City, Luton, Southend and Stansted

149. Committee of Enquiry into Air Transport Policy

150. This requirement was already set-out in the Civil Aviation Act of 2012 and replaced

151. Hub and spoke was already present in many small countries but in the United States, prior to deregulation, the network had a railway-inspired point-to-point configuration

152. Through two separate amendments of the FAA reauthorisation Act (H.R. 2115 and S. 824). They were never enacted.

153. A US government programme by which air carriers volunteer their aircraft during a national emergency crisis in exchange for being given preference in carrying commercial cargo and passenger traffic during peace time for the US Department of Defence.

154. Star Alliance (Egyptair, Ethiopian Airlines, South African Airways) and SkyTeam (Kenyan Airways)

155. The Preamble of the Chicago Convention speaks of equality of opportunity, which is incompatible with the notion of price discrimination

156 . ICAO, Working Paper No. ATConf/6-WP/4, Dec. 4, 2012.

157. See Commission Communication, The EU's External Aviation Policy – Addressing Future Challenges, COM(2012) 556 final, 27.06.2012.

158. See European Parliament Press Release, 18.04.2012, at: < http://www.europarl.europa.eu/news/en/news-room/content/20120418IPR43186/html/Better-social-protection-for-airline-staff-and-cross-border-workers>.

159 Regulation EU) No 465/2012 of 22 May 2012 amending Regulation (EC) No 883/2004 on the coordination of social security systems and Regulation (EC) No 987/2009 laying down the procedure for implementing Regulation (EC) No 883/2004, OJ L 149/4, 08.06.2012.

160 For example in the case of the United States, prior to deregulation most intercontinental services were split between PanAm, Trans World Airlines and Northwest Airlines (Northwest Orient).

161 Such was the case in France (Air France and UTA), the United Kingdom (British Airways and British Caledonian), Japan (Japan Airlines, Japan Air System and All Nippon Airways) and Canada (Air Canada and CP Air/Canadian Airlines)

162 . 17 in the EU and one each in Morocco and Tunisia

163 In maritime transportation, owners of ships based in one country are allowed to register their vessels in another. By so doing, the laws aboard the vessel, the taxes paid by the vessel and the registration fees of the vessel are all subject to the country whose flag the vessel flies.

164 For domestic transport (cabotage), some national laws mandate that the ship's owner, and entire crew must be citizens of that country. This is the case for example in the United States (Jones Act).

165 . Presuming both countries in the bilateral market each only designate one carrier.

166 There is scientific debate on the exact magnitude but broad acceptance that these additional effects are real

167 see http://aviationbenefits.org/environmental-efficiency/aviation-and-climate-change/

168 Directive 2008/101/EC of 19 Nov. 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community, OJ 2009,L 8/3.

169 ICAO, Consolidated Statement of Continuing ICAO Policies and Practices Related to Environmental Protection, app. A, Assem. Res. A36-22 (2007), compiled in Assembly Resolutions in Force, ICAO Doc. 9902 (2007); ICAO, Consolidated Statement of Continuing ICAO Policies and Practices Related to Environmental Protection – Climate Change, Assem. Res. A37-19, compiled in Assembly Resolutions in Force, ICAO Doc. 9958 (2010). Resolution A38-18 (Consolidated Statement of continuing ICAO policies and practices related to environmental protection – Climate Change), Resolutions adopted at the 38th session of the Assembly, provisional edition, November 2013.

170 . Operating flights between two countries, neither one of which is the country where the carrier is based (i.e. US-based FedEx flying from France to China).

171 In the case of the EU, any EU-based carrier can operate a flight between two EU points, whether or not in the same country, effectively meaning that EU carriers enjoy all 9 freedoms for intra EU operations.

172 At the time of writing the report, the EU had 27 members, which would imply 351 ASAs if there was an ASA between each country pair, as the maximum number of combinations is n(n-1)/2. However, it is very likely that some EU countries did not have an air services agreement in place between them, which is why 351 is only a maximum amount

References

Abeyratne, R. (2013), "Reinventing ICAO's Role in Economic Regulation – A Compelling Need". *Issues in Aviation Law and Policy*, Vol 13/1, pp. 9-29. De Paul University College of Law, Chicago.

Abdennebil, N. (2014) Liberalisation and air transport connectivity index. Paper presented at the ITF session of the Air Transport Reasearch Society 18th annual world conference, Bordeaux, France.

Alers, T., Berster, P., Ehmer, H., Fuhrmann, M., Gelhausen, M., Grimme, W., Horn, S., Keimel, H., Maertens, S. and Nieße, H. (2012), *The Impact of Emirates Airline on the German Economy*. DLR, Institute of Air Transport and Airport Research. Germany.

Alvarado, A., Marcos, G. (2012), *Evaluación del Impacto Económico de un Acuerdo de Cielos Abiertos Chile- UE.* Online. Available from http://www.jac.gob.cl/wp-content/uploads/2014/10/ESTUDIOS-017-EVALUACI%C3%93N-IMPACTO-ECON%C3%93MICO-DE-ACUERDO-CIELOS-ABIERTOS-CHILE-UE.pdf

Air Cargo Management Group (ACMG). (2012), *Air Freight and Performance Analysis 2012*. Seattle.

Air Cargo News (2014), *LAN Cargo: The shift to belly capacity*. December 17th. Online. Accessed January 27th 2016. Available from http://www.aircargonews.net/news/single-view/news/the-shift-to-belly-capacity.html

Air France-KLM. (2014), *Présentation du nouveau plan stratégique PERFORM 2020*. Online. Accessed November 10 2014. Available from: http://www.airfranceklm.com/fr/presse/communiques/article/item/journee-investisseurs-presentation-du-nouveau-plan-strategique-perform-2020/

Air France-KLM. (2015), *Résultats annuels 2014*. Online. Accessed April 29 2015. Available from: http://www.airfranceklm.com/sites/ default/files/communiques/fy_2014_fr_def.pdf.

Air Line Pilots Association (ALPA), (2013), *ALPA to US Government: Reject Norwegian Air's Evasive Scheme.* ALPA News December 17th 2013. Washington.

Airbus. (2007), Flying by Nature. *Global market forecast, 2007-2026*. Blagnac

Airport Council International (ACI), (2015), Preliminary world airport traffic and rankings for 2014. News Release. Accessed March 26 2015. Available on: http://www.aci.aero/News/Releases/Most-Recent/2015/03/26/ACI--World-releases-preliminary-world-airport-traffic-and-rankings-for-2014--DXB-becomes-busiest-airport-for-international-passenger-traffic- accessed June 24 2015.

Airport Council International – Europe (ACI-Europe), (2014), *Airport Industry Connectivity Report 2004-2014*. Prepared in cooperation with SEO Aviation Economics. Brussels.

Alexander, A.J. (1996), *Domestic Aviation in Japan: Responding to Market Forces Amid Regulatory Constraints*. Working Paper No. 115. Columbia Business School, Centre on Japanese Economy and Business, New York.

Armantier, O. and Richard, O. (2008) " Domestic Airline Alliances and Consumer Welfare" *RAND Journal of Economics.* Vol 39 (3) pp 875-904. Wiley, Hoboken.

Arvis, J.F and Shepherd,B. (2011), *The Air Connectivity Index: Measuring Integration in the Global Air Transport Network* . Policy Research Working Papers. June. World Bank Group, Washington.

Australian Government Productivity Commission. (2015), *Australia's International Tourism Industry*. Commission Research Paper. Canberra

Bailey, E.E. & Panzar, J.C. (1981), The Contestability of Airline Markets during the Transition to Deregulation. *Law and Contemporary Problems.* Vol 44/1, pp. 125-145. Duke University School of Law, Durham.

Bailey, E.E. (2008), *Air Transportation Deregulation*. The Wharton School of the University of Pennsylvania, Philadelphia.

Bamberger,G.E., Carlton, D.W., Newman, L.R. (2004) 'An empirical investigationof the competitive effects of domestic airline alliances'. *Journal of Law and Economics*. Vol 47 pp 195-222

Baumol, W. J. (1982), "Contestable markets: An uprising in the theory of industry structure," *American Economic Review*, Vol. 72, No. 1, pp. 1-15. American Economic Association, Pittsburgh.

Bèl, G. & Fageda, X. (2008), Getting there fast: globalization, intercontinental flights and location of headquarters. *Journal of Transport Geography.* Vol 8, pp. 471–495. Elsevier in association with the Transport Geography Research Group of the Royal Geographical Society.

Berry, S., Carnall, M., Spiller, P.T. (1996), *Airline Hubs: Costs, Markups and the Implication on Custommer Heterogeneity*. NBER Working Paper 5561, pp 1-38.

Bilotkach,V. (2007) "Price effects of airline consolidation: Evidence from a sample of transatlantic markets'. *Empirical Economics*, Vol 33, pp. 427-448, Institute for Advanced Studies, Vienna.

Boeing. (2014), World Air Cargo Forecast 2014-15. Available from: http://www.boeing.com/resources/boeingdotcom/commercial/about-our-market/cargo-market-detail-wacf/download-report/assets/pdfs/wacf.pdf

Booz & Co. (2009), *Effects of EU Liberalisation on Air Transport Employment and Working Conditions.* Produced for the European Commission, Directorate – General for Energy and Transport. London.

Borenstein, S. (1989), "Hubs and high fares: dominance and market power in the US airline industry". *RAND Journal of Economics.* Vol 20, pp. 344–365. The RAND Corporation, in conjunction with Wiley-Blackwell Publishing, Santa Monica.

Borenstein, S. (2014), "Three Legacy Airlines and Southwest. Now What?". *Milken Institute Review*, Second Quarter. Milken Institute, Santa Monica.

Brattle Group (2002), *The Economic Impact of an EU-US Open Aviation Area.* Prepared for the European Commission Directorate-General Energy and Transport. Online. Available from: http://www.brattle.com/system/publications/pdfs/000/004/875/original/The_Economic_Impact_of_an_EU-US_Open_Aviation_Area_Moselle_et_al_Dec_2002.pdf?1378772136

British Airways (2015), *Explore our Past*. Online. Accessed April 19 2015. Online. Available on: http://www.britishairways.com/fr-fr/information/about-ba/history-and-heritage/explore-our-past

Brueckner, J.K., Dyer, N., and Spiller, P. T. (1992), "Fare determination in airline hub-and-spoke networks". *Rand Journal of Economics.* Vol. 23/3, pp. 309–333. The RAND Corporation, in conjunction with Wiley-Blackwell Publishing, Santa Monica.

Brueckner, J.K. and Spiller, P.T. (1994), Economies of Traffic Density in the Deregulated Airline Industry. *Journal of Law and Economics.* Vol. 37, pp. 379-415. The University of Chicago Press Books, Chicago.

Brueckner, J.K. and Whalen, W.T. (2000) "The price effects of international airline alliances". *Journal of Law and Economics*, Vol 43 (2), pp 503-545, University of Chicago Press, Chicago.

Brueckner, J.K.(2001) "The economics of international codesharing: An analysis of airline alliances". *International Journal of Industrial Organisation,* Vol 19 (10) pp. 1475-1498. Elsevier, Amsterdam.

Brueckner, J. K. and Pels, E. (2003), *Institution, Regulation and the Evolution of European Air Transport*. Research Memorandum No. 2003-10. Free University of Amsterdam, Faculty of Economics and Business Administration, Amsterdam.

Brueckner, J.K. (2003), Airline traffic and urban economic development. *Urban Studies*, Vol 40, pp. 1455–1469. Sage Publishing, London.

Brueckner, J. and Proost, S. (2009), *Carve-Outs Under Airline Antitrust Immunity*. CESifo Working Paper 2848 Category 11: Industrial Organisation. CESifo Group, Munich.

Burghouwt, G. (2007), *Airline network development in Europe and its implications for Airport Planning.* Ashgate Publishing, Hampshire.

Burghouwt, G., De Wit, J.G., Veldhuis, J. and Matsumoto, H. (2009), Air Network Performance and Hub Competitive Position: Evaluation of Primary Airports in East and Southeast Asia. *Journal of Airport Management.* Vol. 3, pp. 384–400. Henry Stewart Publications, in cooperation with Airports Council International, London.

Burghouwt, G. (2014), "Long-haul specialization patterns in European multihub airline networks – An exploratory analysis". *Journal of Air Transport Management*. Vol. 34, pp 30-41. Elsevier, Amsterdam.

Burghouwt, G, Mendes de Leon, P. and de Wit, J. (2015), *EU Air Transport Liberalisation : Process, Impacts and Future Considerations*. Discussion Paper 2015-04. International Transport Forum / OECD

Button, K. (1996), Liberalising European aviation. Is there an empty core problem? *Journal of Transport Economics and Policy* Vol. 30/3, pp. 275-291. University of Bath, Bath.

Button, K., Lall. S, Stough, R, Trice, R. (1999), High technology employment and hub airports. *Journal of Air Transport Management.* Vol. 5, pp. 53–59. Elsevier, Amsterdam.

Button, K & Drexler, J. (2005), Recovering costs by increasing market share – an empirical critique of the S-curve. *Journal of Transport Economics and Policy*. Vol 39/3, pp. 391–404. University of Bath, Bath.

Button, K. (2008), The impact of US–EU "Open Skies" agreement on airline market structures and airline networks. *Journal of Air Transport Management.* Vol 15/2, pp. 59-71. Elsevier, Amsterdam.

Byerly, J.R. (2008), *US International Aviation Policy Challenges*. ACI-NA International Aviation Issues Seminar, December 4th Washington. Online. Available at: http://2001-2009.state.gov/e/eeb/rls/rm/2008/112998.htm.

Cambon, J., Von Jagow, G. (1913), Exchange of Notes Between France and Germany Concerning Aerial Navigation. *The American Journal of International Law.* Vol 8/3, pp. 214-217. The American Society for International Law, Washington. Online. Available from: http://www.jstor.org/stable/2212310

CAPA Centre for Aviation (2012), *Mexico City ponders a second airport, again.* Online. Accessed June 4th 2015. Available from: http://centreforaviation.com/analysis/mexico-city-ponders-a-second-airport-again-67284

CAPA Centre for Aviation (2013), *Japan's aviation liberalisation may stall under a new government as Gulf airlines use new rights*. Online. Accessed April 22nd 2015. Available from: http://centreforaviation.com/analysis/japans-aviation-liberalisation-may-stall-under-a-new-government-as-gulf-airlines-use-new-rights-96117

CAPA Centre for Aviation (2014a), US airline attacks on Gulf carriers: more rhetoric than consistency - but it makes for good politics. Online. Accessed April 22nd 2015. Available from: http://centreforaviation.com/analysis/us-airline-attacks-on-gulf-carriers-more-rhetoric-than-consistency--but-it-makes-for-good-politics-192138.

CAPA Centre for Aviation (2014b), *Airline consolidation: could Europe follow North America's path to improved margins?* Online. Accessed on June 22nd 2015. Available from: http://centreforaviation.com/analysis/airline-consolidation-could-europe-follow-north-americas-path-to-improved-margins-170975.

CAPA Centre for Aviation (2014c), *Norwegian Air Shuttle's long-haul business model. "Flag of convenience" or fair competition?* Online. Accessed on November 14th 2014. Available from: http://centreforaviation.com/analysis/norwegian-air-shuttles-long-haul-business-model-flag-of-convenience-or-fair-competition-146928.

CAPA Centre for Aviation (2015a) *Thai Airways exit from air freight reflects trends in Asian air cargo.* Online. Accessed on April 3rd 2015. Available from: http://centreforaviation.com/analysis/thai-airways-exit-from-air-freight-reflects-trends-in-asian-air-cargo-217330.

CAPA Centre for Aviation (2015b), *China-Australia traffic rights will permit a capacity increase of 49% over 22 months.* Online. Accessed on April 6th 2015. Available from: http://centreforaviation.com/analysis/australia--china-expand-airline-traffic-rights-on-the-way-to-open-skies-xiamen-airlines-to-sydney-207117.

CAPA Centre for Aviation (2015c), *SAS Scandinavian Airlines vs Finnair: the original Europe-Asia Nordic leader tries to fight back*. Online. Accessed on April 15th 2015. Available from: http://centreforaviation.com/analysis/sas-scandinavian-airlines-vs-finnair-the-original-europe-asia-nordic-leader-tries-to-fight-back-214963.

CAPA Centre for Aviation (2015d), *Tokyo Narita Outlook Part I and II: once a mega hub, international and transit passengers decline.* Online. Accessed on April 23rd 2015. Available from: http://centreforaviation.com/analysis/tokyo-narita-outlook-part-1-once-a-mega-hub-international-and-transit-passengers-decline-215202.

CAPA Centre for Aviation (2015e), *Chinese airlines overtake US carriers across the Pacific. The big dilemma: US-China open skies?* Online. Accessed on June 23rd 2015. Available from:. http://centreforaviation.com/analysis/chinese-airlines-overtake-us-carriers-across-the-pacific-time-for-us-china-open-skies-222454

Carrey, B. (2014) U.S. Denies Exemption as it Mulls Norwegian Air Permit. Aviation International News (AIN) Online. September 3rd . Available from: http://www.ainonline.com/aviation-news/air-transport/2014-09-03/us-denies-exemption-it-mulls-norwegian-air-permit

Cathay Pacific Airlines (2014), *Annual Report 2013*. Hong Kong.

Caves, D. W., Christensen, L. R. and Tretheway, M. W. (1984), Economics of density versus economies of scale: why trunks and local service airline costs differ. *RAND Journal of Economics.* 15(4), pp. 471–489. The RAND Corporation, in conjunction with Wiley-Blackwell Publishing, Santa Monica.

Çetin,T. and Benk, S. (2011) Regulation, Deregulation and Competition in the Turkish Airline Industry. *The political Economy of Regulation in Turkey*. Eds T. Çetin and F.Oguz. pp. 193-214. Springer-Verlag, NYC.

Channel News Asia (2014), *ASEAN Open Sky policy spells bad weather for Indonesian airlines*. 17 October. Singapore.

Chen, J. (2006), Differences in average prices on the Internet: evidence from the online market for air travel. *Economic Inquiry*. Vol. 44/4, pp. 656–670. Western Economic Association International, Fountain Valley.

Clemons, E. K., I. Hann, and L. M. Hitt. (2002), Price Dispersion and Differentiation in Online Travel: An Empirical Investigation. *Management Science.* Vol 48/4, pp. 534–49. The Institute for Operations Research and the Management Sciences, Catonsville.

Civil Aviation Administration of China (CAAC). (2014), Civil Aviation Statistics for 2014. Beijing. Online. Available from: http://www.wcarn.com/news/40/40218.html

Civil Aviation Authority of the United Kingdom (CAA). (2006), *Ownership and Control Liberalisation*. Discussion Paper CAP 769. London.

Civil Aviation Authority of the United Kingdom (CAA) (2015), *UK Airport Statistics: 2014.*

Committee of Danish Aviation. (2012), *Danish Aviation: Summary of the report from the committee of Danish aviation.* Copenhagen: Transport-og Bygningsministeriet (Danish Ministry of Transport and Building).

Cook, G. (2010), *A Historical Background of International Air Law--The Madrid Convention of 1926*. Online. Available from: http://www.glenncook.net/aviation/85-a-historical-background-of-international-air-law-the-madrid-convention-of-1926

Creel, M and Farrell, M. (2001), 'Economies of scale in the U.S. airline industry after deregulation: A Fournier series approximation'. *Transportation Researchj Part E*, pp 321-326.

Datatur. (2015), *Results of Tourism Activity. Mexico, 2014*. Secretarià de Turismo de Mexico, Mexico City.

D'Andrea, A. (2006), *The "Genuine Link" Concept in Responsible Fisheries: Legal Aspects and Recent Developments*. FAO Legal Papers Online 61. Food and Agriculture Organization of the United Nations, Rome.

De Wit, J. (2012), The growth limits of the low cost carrier model. *Journal of Air Transport Management.* Vol. 21, pp. 17–23. Elsevier, Amsterdam.

De Wit, J. (2014), Unlevel Playing Field? Ah yes, you mean protectionism. *Journal of Air Transport Management.* Vol 41, pp. 22-29. Elsevier, Amsterdam.

Demisroy, Ç. (2012), *Analysis of Stimulated Domestic Air Transport Demand in Turkey.* Master Thesis. Erasmus University, School of Economics. Rotterdam.

Devlet Hava Meydanlari Isletmesi (DHMI), (2015). *Annual Report 2014.* Online. Accessed on January 21st 2015. Available from http://www.dhmi.gov.tr/dosyalar/annualreport/2014/ANNUAL_REPORT_2014.pdf

Dennis, N. (2007), Competition and change in the long-haul markets of Europe. *Journal of Air Transportation.* Vol 12/2, pp. 4-26. American Institute of Aeronautics and Astronautics, Reston.

Direction générale de l'aviation civile de France (DGAC) (2015), *Bulletin Statistique. Trafic aérien commercial année 2014*. Ministère de l'Écologie, du Développement durable et de l'Énergie, Paris. Online. Available from : http://www.developpement-durable.gouv.fr/IMG/pdf/Bulletin_Stat_2014_1.pdf .

Dobruszkes, F., Mondou, V. (2013), Aviation Liberalization as a Means to Promote International Tourism: The EU-Morocco Case. *Journal of Air Transport Management*. Vol 29, pp. 23-34. Elsevier, Amsterdam.

Doganis, R. (2002), *Flying Off Course: The Economics of International Airlines.* 3rd edition. Routledge, London.

Doove, S., Gabbitas, O.,Nguyen-Hong, D. & Owen, J. (2001), *Price Effects of Regulation: Telecommunications, Air Passenger Transport and Electricity Supply*. Australia Productivity Commission staff research paper. Online. Accessed May 13th 2015. Available from: http://www.pc.gov.au/research/supporting/regulation-on-air-transport-telecommunications-electricity/peor.pdf

Dresner, M., Lin, J.S.C., Windle, R. (1996), "The Impact of Low-Cost Carriers on Airport and Route Competition". *Journal of Transport Economics and Policy* Vol 30, pp 309-329, Bath.

Dubey, S. and Gendron, F. (1999), "The US – Canada Open Skies Agreement: Three Years Later". *Statistics Canada Travel-Log*. Catalogue no. 87-003-XIB. Vol 18/3, pp. 1-9. Statistics Canada, Ottawa.

Dursun, M.E., O'Connel, J.F., Lei, Z and Warnock-Smith, D. (2014), The Transformation of a Legacy Carrier – A case study of Turkish Airlines. *Journal of Air Transport Management*. Vol 40, pp 106-118. Elsevier, Amsterdam.

Elwakil, O.S., Windle, R.J. and Dresner, M.E. (2013), Transborder Demand Leakage and the US-Canadian Air Passenger Market. *Journal of Transportation Research Part E.* Vol. 57, p. 45-57. Elsevier, Amsterdam.

Eschemann, R. (2007), *German Civil Aviation Policy – A Threat for Long Term Climate Targets?* Catholic University of Eichstaett-Ingolstadt, Ingolstadt.

Emirates Airlines (2012), *Airlines and Subsidy: Our Position*. Online. Available from: http://www.emirates.com/english/images/airlines%20and%20subsidy%20-%20our%20position%20new_tcm233-845771.pdf

Emirates Airlines. (2015), *Emirates' Response to Claims Raised About State-Owned Airlines in Qatar and the UAE*. Online. Accessed July 15th 2015. Available from: http://content.emirates.com/downloads/ek/pdfs/openskies_rebuttal/EK_Response_Main.pdf

Eurocontrol (2013), *Challenges of Growth 2013. Task 4: European Air Tarffic in 2035.* Online. Accessed on January 18th 2016. Available from http://www.eurocontrol.int/sites/default/files/article/content/documents/official-documents/reports/201306-challenges-of-growth-2013-task-4.pdf

European Commission. (EC). (2003), *European Union and the United States of America Agree on Opening Negotiations on Open Aviation Area.* Press Release. June 23rd. Brussels. Online. Available from: http://europa.eu/rapid/press-release_IP-03-897_en.pdf

European Commission (EC). (2005), *Developing a Community civil aviation policy towards New Zealand.* Communication from the Commission COM(2005), 407 final. Brussels. Online. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52005DC0407&from=EN

European Commission (EC). (2008), *EU-US Open Skies: A New Era in Transatlantic Aviation Starts on 30 March*. Press Release. March 28th. Brussels. Online. Available from: http://europa.eu/rapid/press-release_IP-08-474_en.htm

European Commission (EC). (2010), *Negotiations on a Second Stage EU-US "Open Skies" Agreement and Existing First Stage Air services agreement - Frequently Asked Questions*. Memorandum MEMO/10/74.

European Commission (EC). (2013), *Roadmap - Protection Against Subsidisation and Unfair Pricing Practices causing Injury to Community Air Carriers in the Supply of Air Services from Countries not Members of the European Community*. Online. Available from: http://ec.europa.eu/smart-regulation/impact/planned_ia/docs/2014_move_009_unfair_pricing_practices_en.pdf

European Commission (EC). (2014), *State aid: Commission adopts a package of decisions regarding public support to airports and airlines in Belgium, Germany, Italy and Sweden.* Press Release. Brussels. Online. Available from: http://europa.eu/rapid/press-release_IP-14-1065_en.htm

European Commission (EC). (2015), *An Aviation Strategy For Europe.* Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2015), 598 final. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52015DC0598&from=EN

European Parliament. (2013), *An Overview of the Air Services Agreements Concluded by the EU*. Directorate General for Internal Policies. Policy Department B: Structural and Cohesion Policies. Available from: http://www.europarl.europa.eu/RegData/etudes/note/join/2013/495849/IPOL-TRAN_NT(2013)495849_EN.pdf

Eurostat (2015), *Air Transport of Goods (TTR00011) and Air Transport of Passengers (TTR00012)*. Online. Accessed June 24th 2015. Available from: http://ec.europa.eu/eurostat/web/transport/data/main-tables.

Evans, W.N and Kessides, I.N. 'Localized Market Power in the U.S. Airline Industry'. *The Review of Economics and Statistics*. Vol. 75 (1) February pp 66-75. MIT Press, Cambridge.

Feldhoff, T. (2003), "Japan's Capital Tokyo and its Airports: Problems and Prospects from Subnational and Supranational Perspectives". *Journal of Air Transport Management.* Vol. 9, pp. 241-254. Elseveir

Finavia (2015), *Passenger Statistics 2014*. Online. Available from: https://dxww91gv4d0rs.cloudfront.net/file/dl/i/-O6w9w/ zekiqcqNnyMXp7wKGN8zBA/Matkustajatlentoasemittaineng-fi12.pdf

Finnair. (2014), *Differentiated cargo strategy – Driving Asian growth*. Finnair Capital Markets Day. May 22nd. Online. Available from: http://www.finnairgroup.com/linked/en/sijoittajat/CMD_Juha_Jarvinen_220514_final.pdf

Flight Magazine. (1946), *Bermuda Agreement. International Control of Airline Rates: Basis for Acceptance of 5th freedom Principles*. February 21st p.193.

Freidman, J.J. (1976). *A new air transport policy for the North Atlantic : saving an endangered system*. Atheneum, New York

Fridstrøm, L., Hjelde, F. Lange, H., Murray, E., Norkela, A., Thorø Pedersen, T., Rytter, N., Sandvig, C., Skoven, M. and Solhaug, L. (2004), "Towards a More Vigorous Competition Policy in Relation to the Aviation Market". *Journal of Air Transport Management.* Vol (10), pp. 71-79 Elsevier, Amsterdam.

Foxx, A. (2014), *Order Dismissing Exemption*. US Department of Transportation, Washington.

Fu,X., Oum, T.H. (2015), *Dominant Carrier Performance and International Liberalisation: The Case of North East Asia*. Discussion paper 2015-03. International Transport Forum/ OECD, Paris. Online. Available from: http://www.internationaltransportforum.org/jtrc/DiscussionPapers/DP201503.pdf

Furlan, C. (200?), *Air Cargo Foreign Ownership Restrictions in the United States*. University of Miami School of Law, Miami.

García-Arboleda, J. I. (2012) , 'Report on the 2012 IATA Legal Symposium, Shanghai, China, 5–7 February' *Air and Space Law*, Vol 37, Issue 3, pp. 281–284. Vol. 22 Issue 2, pp.73-76. Kluwer Law, Alphen aan den Rijn.

Gaspari, F. (2012), Recent Developments in EU Air Transport Liberalization and Re-Regulation Policies and the New Legal Order of International Air Transport. *Issues in Aviation Law and Policy.*Vol. 11/3. De Paul University, Chicago.

Gerede, E. (2010), The Evolution of Turkish Air Transport Industry: Significant Developments and the Impacts of the 1983 Liberalization. *Yonetim Ve Ekonomi - Journal of Management and Economics*. Vol 17/2, pp.63-91. Celal Bayar University, Faculty of Economic and Administrative Sciences, Manisa.

Gillen, D.W., Hansen, M., Ramos, R., (1994), "Free Trade in Airline Services - Assessing the Proposals to Liberalize the Canada-US Air Transport Bilateral". *Institute of Transportation Studies*. Working Paper 407. University of California, Berkeley.

Gonenc, R. & Nicoletti, G., (2001), "Regulation, market structure and performance in air passenger transportation". *OECD Economic Studies.* Vol. 32 , pp. 183–227. OECD, Paris.

Goodhart, D. (1998), "Social Dumping within the EU". *Beyond the Market: The EU and National Social* Policy, pp.79-90. London, Routeledge.

Government of Australia. (2009), *Flight Path to the Future: National Aviation Policy White Paper*. Department of Infrastructure, Transport, Regional Development and Local Government, Canberra.

Government of Australia. Bureau of Infrastructure, Transport and Regional Economics (BITRE), (2014), Aviation: International Airline Activity 2013-2014, Statistical Report. Department of Infrastructure, Transport, Regional Development and Local Government, Canberra.

Government of Germany. (2003), *The Development of the German Domestic Aviation. Paper submitted to ICAO in the context of liberalisation case studies.* Online. Accessed on April 14th 2015. Available from: http://www.icao.int/sustainability/CaseStudies/StatesReplies/Germany_En.pdf

Government of the Republic of Turkey, (2011). *Transportation in Turkey.* Ministry of Transport and Communications. Ankara.

Government of Singapore. (2013), *Singapore And Uruguay Sign New Open Skies Agreement.* Accessed on November 10th 2014. Available from: http://www.news.gov.sg/public/sgpc/en/media_releases/ agencies/ mot/press_release/P-20131002-2

Government of the United Kingdom (UK). (2013), *Aviation Policy Framework*. Presented by the Secretary of State for Transport by Command of Her Majesty. London, The Stationary Office.

Government of Western Australia. (2015), *Intrastate Air Services*. Accessed on April 13th 2015. Available from: http://www.transport.wa.gov.au/aviation/intrastate-air-services.asp

Graham, D.R. and Kaplan, D.P. (1982), "Airline Deregulation is Working". *AEI Journal on Government and Society.* May-June. Washington, American Enterprise Institute for Public Policy Research.

Haanappel, P. P.C. (1980), "Bilateral Air services agreements 1913-1980". *Maryland Journal of International Law.* Vol. 5/2 pp. 241-267. Baltimore, University of Maryland Francis King Carey School of Law.

Hanaoka, S., Takebayashi, M., Ishikura, T. and Saraswati, B. (2014), "Low-cost carriers versus full service carriers in ASEAN: The impact of liberalization policy on competition". *Journal of Air Transport Management.* Vol. 40, pp 96-105. Elsevier, Amsterdam.

Hardaway, R.M. (1985), "Transportation Deregulation (1976-1984): Turning the Tide." *Transportation Law Journal.* Vol 14. pp. 101-152. Denver, University of Denver, Sturm College of Law

Havel, B.F. (2009), "Rethinking the General Agreement on Trade in Services as a Pathway to Global Aviation Liberalisation". *The Irish Jurist*. Vol. 44 Dublin, University College.

Havel, B.F. and Sanchez, G. (2014), *The Principles and Practice of International Aviation Law.* Cambridge, Cambridge University Press.

Heathrow Airport Limited (HAL). (2013), *Airports Commission: Long-term hub capacity options. Heathrow Airport Limited response.* London Borough of Hounslow, HAL.

Hofer, C., Windle, R. and Dresner, M. (2008), "Price premiums and low cost carrier competition". *Transportation Research Part E. Logistics and Transportation Review*. Vol 44/5, pp. 864–882. Elsevier, Amsterdam

Hooper, P., Walker, S., Moore, C. and Al Zubaidi, Z. (2011), "The development of the Gulf region's air transport networks: The first century". *Journal of Air Transport Management*. Vol.17 pp. 325-332. Elsevier, Amsterdam

Hörstke, S. (2003) "Air Carrier Ownership and Control Revisited at the Fifth Worldwide ICAO Air Transport Conference" *Annals of Air and Space Law*, Vol. 28. Mc Gill University, Montreal.

Hughes, G.(2014), *Air Cargo Media Briefing. Presentations at the IATA Annual General Meeting, Doha, Qr, June 2014*. Online. Available from: http://www.IATA.org/pressroom/facts_figures/Documents/cargo-media-briefing-agm2014.pdf

Hurdle, G.J., Johnson, R.L., Joskow, A.S., Werden, G.J. and Willimans, M.A. (1989), "Concentration, Potential Entry, and Performance in the Airline Industry". *The Journal of Industrial Economics,* Vol. 38, No. 2, December, pp. 119-139. Wiley, Hoboken.

Ida, N. and Tamura,T. (2003), "Revitalization of Regional Airports on Airline Deregulation in Japan". *Proceedings of the Eastern Asia Society for Transportation Studies.* Vol.4 pp. 168-178. Eastern Asia Society for Transportation Studies, Tokyo.

Instituto Nacional de Estadística y Geografía (INEGI). (2015), *Sistema de Cuentas Nacionales de México. Cuenta satélite del turismo de México 2013*. INEGI, Mexico City.

International Air Transport Association (IATA). (2015), *Worldwide Slot Guidelines (WSG) - Annex 11.12 - Contact List for Level 2/3 Airports*. As of June 23. IATA, Montreal.

International Civil Aviation Organization (ICAO). (2002), *Report Of The Air Transport Regulation Panel Working Group on Air Carrier Ownership and Control.* Online. Accessed on May 5th 2015. Available from http://www.icao.int/Meetings/ATConf5/Documents/Atrp10WgReport.pdf.

International Civil Aviation Organization (ICAO). (2007) *Trans-Tasman Single Aviation Market*. Online. Accessed on November 27th 2014. Available from http://www.icao.int/sustainability/CaseStudies/StatesReplies/TransTasman_EN. pdf

International Civil Aviation Organization (ICAO). (2012), *Expanding Market Access For International Air Transport*. ATConf/6-WP/13. Working Paper presented at the 6th Worldwide Air Transport Conference, March 2013, Montreal.

International Civil Aviation Organization (ICAO). (2013), *Liberalisation of Air Cargo Services*. Working Paper presented at the 6th Worldwide Air Transport Conference, March 2013, Montreal.

International Civil Aviation Organization (ICAO). (2013b), *Antitrust Immunity for Airline Alliances.* Paper presented by the Republic of Korea at the ICAO 6th Worldwide Air Transport Conference, March 2013

International Civil Aviation Organization (ICAO). (2013c), *Antitrust Immunity for Airline Alliances.* Paper presented at the 6th Worldwide Air Transport Conference, March 2013, Montreal

International Civil Aviation Organization (ICAO). (2014), *The Postal Story of ICAO.* Online. Accessed on November 24th 2014. Available from http://www.icao.int/secretariat/PostalHistory/1928_the_havana_convention.htm

International Civil Aviation Organization (ICAO). (2015), *Existing ICAO Policy and Guidance Material on Competition. Information paper.* Online. Accessed on June 25th 2015. Available from http://www.icao.int/sustainability/Documents/Competition_Existing%20Guidance.pdf

International Institute of Transport & Logistics (IITL). (2008), *Analysis of Canada's Bilateral Air services agreements: Policy Focus on Asia-Pacific Region*. Prepared for the Ministry of Transportation of British Columbia. Ministry of Transportation and Infrastructure of British Columbia, Victoria.

International Transport Forum/ OECD (ITF) (2014a), *Transportation Outlook 2014*. ITF/OECD, Paris.

International Transport Forum/ OECD (ITF) (2014b), *Air services agreement Liberalisation and Airline Alliances*. Country-Specific Policy Analysis. Prepared by InterVISTAS. ITF/OECD, Paris.

International Transport Forum/ OECD (ITF) (2014c), *Impacts of Expanding Airport Capacity on Competition and Connectivity. The Case of Heathrow and Gatwick*. Country-Specific Policy Analysis. Prepared by seo economic research. ITF/OECD, Paris.

International Transport Forum/ OECD (ITF) (2015), *Expanding Airport Capacity: Competition, Connectivity and Welfare Discussion of Options for Gatwick and Heathrow*. Country-Specific Policy Analysis. Prepared by seo economic research. ITF/OECD, Paris.

InterVISTAS (2006), *The Economic Impact of Air Service Liberalization*. InterVISTAS-ga2 Consulting, Inc., Washington.

InterVISTAS-EU (2009a), *The Impact of International Air Service Liberalisation on Chile*. Prepared for IATA's Agenda for Freedom. London. Online. Accessed on June 16th 2015. Available from: https://www.iata.org/policy/liberalization/agenda-freedom/Documents/chile-report.pdf

InterVISTAS-EU (2009b). *Impact of International Air Service Liberalisation on Turkey*. Prepared for IATA's Agenda for Freedom. London. Online. Accessed on January 22nd 2016. Available from: https://www.iata.org/policy/liberalization/agenda-freedom/Documents/turkey-report.pdf

Insituto Nacional de Estadistica y Geografia (INEGI) (2015), *Indicadores principales del Banco de Información INEGI*. Online. Available from : http://www3.inegi.org.mx/sistemas/mexicocifras/

Jansen, B. (2014), *DOT rejects, for now, Norwegian airline amid dispute*. USA Today, September 2nd. Online. Accessed on November 12th 2014. Available from: http://www.usatoday.com/story/travel/flights/2014/09/02/DoT-norwegian-air-alpa-foxx/14810499/

Jara-Diaz, S.R., Basso, L.J. (2003) "Transport cost functions, network expansion and economies of scope". *Transportation Research Part E: Logistics and Transportation Review,* Vol. 39 (4), July, pp. 271-288, Pergamon, Oxford.

Jeanniot, P. (2005), *Liberalization of Air Traffic - Open Skies Pacts Good for Canada: Opening Up to More Airline Competition Would Lower Fares.* The Montreal Gazette, May 15 page A-15.

Jorens, Y., Gillis, D., Valcke, L. and De Coninck, J. (2015), *Atypical Forms of Employment in the Aviation Sector.* European Social Dialogue. European Commission, Brussels.

Joint European Commission-US DOT (2010) , *Transatlantic Airline Alliances: Competitive Issues and Regulatory Approaches*. 16 November.

Journal of the European Union (EU) (2006), *Decision Of The Council And Of The Representatives Of The Member States Of The European Union Meeting Within The Council (2006/682/EC)*. Online. Available from: http://eur-lex.europa.eu/resource.html?uri=cellar:ac9f91aa-a013-4ef7-9f48-78f3ef9ce36b.0005.02/DOC_1&format=HTML&lang=EN&parentUrn=CELEX:42006D0682

Junta de Aeronáutica Civil de Chile (JAC) (2015), *Estadísticas año 2014*. Online. Accessed on July 31st 2015. Available from: http://www.jac-chile.cl/wp-content/uploads/2015/01/ResumenMensualEstadisticasDiciembre2014.xls

Junta de Aeronáutica Civil de Chile (JAC) (2016), *Resumen Estadístico Transporte Aéreo Comercial En Chile*. Online. Accessed on January 28th 2016. Available from: http://www.jac.gob.cl/wp-content/uploads/2016/01/INFORME-MES-Diciembre-2015.pdf

Kaduck, R.J. (1997), "Canadian Carrier Strategies and the 1995 Open Skies Agreement". *Journal of Air Transport Management.* Vol 3/3 pp. 145-153. Elseveir, Amsterdam.

Kahn, A. E. (1993), "The competitive consequences of hub dominance: A case study". *Review of Industrial Organization*, Vol 8/4, pp.381–405. Springer Science+Business Media, Berlin.

Kahn, A. E. Year unknown. *Change, challenge, and competition: A review of the airline commission report*. The Cato review of business and government. Cato institute, Washington

Kincaid, I., Tretheway, M., Gros, S.and Lewis, D. (2012), *Addressing Uncertainty about Future Airport Activity Levels in Airport Decision Making*. Airport Cooperative Research Program report 76. Transportation Research Board of the National Academies, Washington.

Københavns Lufthavne A/S (2015), *Passenger record at Copenhagen Airport*. Press Release. Jan 13. Online. Available at: https://www.cph.dk/en/about-cph/investor/traffic-statistics/traffic-december-14/

Larson, P.D. (1998), "Air Cargo Deregulation and JIT: Two 20th Anniversaries in American Logistics." *Transportation Quarterly*. Vol 52/2, pp. 49-60. Eno foundation for transportation, Westport.

League of Nations (1922), *Convention relating to the regulation of Aerial Navigation,signed at Paris, October 3, 1919, with Additional Protocol, signed at Paris, May, 1920 (Paris Convention of 1919).* League of Nations Treaty Series 177-310

Lee, D., and Luengo-Prado, M. (2005), "The Impact of Passenger Mix on Reported" Hub Premiums" in the US Airline Industry". *Southern Economic Journal*, Vol 72/2, pp.372–394. Southern Economic Association, The University of Tennessee, Chattanooga.

Le Roux, B. (2014), *Rapport du Groupe de Travail Compétitivité du Transport Aérien Français*. Assemblée nationale, Paris. Online. Available at http://www.fnam.fr/uploads/default/files/d12725bd2ac566dcf22aa0f781b9d4b4.pdf

Lei, Z. and O'Connell, J.F. (2011) "The Evolving Landscape of Chinese Aviation Policies and Impact of Deregulating Environment on Chinese Carriers". *Journal of Transport Geography.* Vol.19 pp. 829-839. Elsevier in association with the Transport Geography Research Group of the Royal Geographical Society.

Levine, M.E. (1987), "Airline Competition in Deregulated Markets: Theory, Firm Strategy, & Public Policy". *Yale Journal on Regulation*. Vol 4, pp 393-494. Yale Law School, New Haven.

Leyco, C. (2014), *PH still not ready for 'open skies'*. Manilla News Bulletin. May 22. Manilla. Online. Accessed on January 22nd 2015. Available at http://www.mb.com.ph/ph-still-not-ready-for-open-skies/

Lijesen, M.G., Nijkamp, P. and Rietveld, P. (2001), "Hub premiums in European civil aviation". *Transport Policy*. Vol. 8/3, pp 193–199. Elsevier / World Conference on Transport Research Society, Amsterdam.

Lijesen, M.G., Nijkamp, P. and Rietveld, P. (2002), "Measuring competition in civil aviation". *Journal of Air Transport Management*. Vol 8/3 pp 189-197. Elsevier, Amsterdam.

Lin, M. H. and Kawasaki, A. (2012), "Where to enter in hub-spoke airline networks". *Papers in Regional Science*. Vol 91 pp 419–436. Wiley-Blackwell, Hoboken.

Lieshout, R. and Matsumoto, H. (2012), "New International Services and the Competitiveness of Tokyo International Airport". *Journal of Transport Geography*. Vol. 22, pp. 53-64. Elsevier in association with the Transport Geography Research Group of the Royal Geographical Society, Amsterdam.

Lufthansa Group. (2014), *EU: Use power to shape aviation policy.* Policy Brief 2/2014. Deutsche Lufthansa AG, Frankfurt.

Lufthansa Group. (2014a), *Unfair competition: Responses to strategic challenges.* Policy Brief 3/2014. Deutsche Lufthansa AG, Frankfurt

Lufthansa Group. (2015), *Subsidies to carriers from the Gulf – Impact on Airlines of the Lufthansa Group.* Gulf Carriers Stakeholder Engagement Process. Docket No. DOT-OST-2015-0082, DOS-2015-0016, DOC-2015-001. Letter from Lufthansa Group to the Government of the United States of America. June 11. Online. Available from: http://skift.com/wp-content/uploads/2015/06/Gulf-Carriers-submission-LHGroup-to-US-Docket-Gulf-subsidies-11062015.pdf

Lykotrafiti, A. (2015), *Liberalisation of International Civil Aviation – Charting the Legal Flightpath*. Discussion paper 2015-18. International Transport Forum/ OECD, Paris.

Maciel, R.N. (1997), 'Opening Southern Skies'. *Air and Space Law* , Vol. 22 Issue 2, pp.73-76. Kluwer Law, Alphen aan den Rijn.

Mendelsohn, A. (2014), "Flags of Convenience: Maritime and Aviation". *Journal of Air Law and Commerce*. Vol 79/1 pp. 151-159. Southern Methodist University, Dedman School of Law, Dallas.

Mendes de Leon, P. (2002), "Before and After the Tenth Anniversary of the Open Skies Agreement Netherlands-US of 1992". *Journal of Air and Space Law.* Vol 27/ 4/5 pp. 280-314. Kluwer Law, Alphen aan den Rijn.

Micco, A. and Serebrisky, T (2006), "Competition regimes and air transport costs: the effects of open skies agreements". *Journal of International Economics*. Vol 70, pp. 25–51. Elsevier, Amsterdam

Ministère de l'équipement, du transport et de la logistique du Royaume du Maroc (METL). (2014a), *L'Observatoire du transport aérien. Suivre…Analyser…Pour mieux décider*. Vol 1. Rabat.

Ministère de l'équipement, du transport et de la logistique du Royaume du Maroc (METL), 2014b) *Dévelopement du Transport Aérien au Maroc*. Online. Accessed June on 22nd 2015. Available from http://www.icao.int/Meetings/Moroccan-Economic-Forum/Documents/MrManar_pr%C3%A9sentation_D%C3%A9veloppment Transport.pdf

Morrison, S., and Winston, C. M. (1995), *The evolution of the airline industry*. Brookings Institution Press, Washington.

Mueller, C.E. (2006), "Beginning of the End of Monopoly in the US Airline Industry". *Antitrust Law and Economic Review*. Vol 33/1, pp. 1-12. McLean.

Nero,G. (1999) "A note on the competitive advantages of large hub and spokes networks'. *Transportation Research*, pp. 225-239.

Official Airline Guide (OAG) (2013), *OAG Facts* Online. Available from: www.oag.com/sites/default/files/May%20FACTS.pdf.

Official Airline Guide (OAG) (2015), *Chile's Domestic Pax Stable in Dec-2014, int'l pax up 12%*. OAG Industry News January 29. Online. Accessed on July 31st 2015. Available from: www.oagcargo.com/Industry-News/chiles-domestic-pax-stable-dec-2014-intl-pax-12

Official Journal of the European Union (2006), *Decision Of The Council And Of The Representatives Of The Member States Of The European Union Meeting Within The Council*. October 16th . Brussels.

Organisation for Economic Co-operation and Development (OECD) (1997), *The future of international air transport policy. Responding to global change*. OECD, Paris.

Organisation for Economic Co-operation and Development (OECD) (1999), *Regulatory Reform in Air Cargo Transportation*. Publication DSTI/DOT(99)1. OECD, Directorate for Science, Technology and Industry, Division of Transport, Paris.

Organisation for Economic Co-operation and Development (OECD) (2002), *Liberalisation of Air Cargo Transport*. Puiblication DSTI/DOT (2002) 1/REV1. OECD, Directorate for Science, Technology and Industry, Transport Division, Paris.

Organisation for Economic Co-operation and Development (OECD) (2009), *State-Owned Enterprises And The Principle Of Competitive Neutrality*. Publication DAF/COMP(2009)37. Online. Available from http://www.oecd.org/daf/competition/46734249.pdf. OECD, Directorate for Financial and Enterprise Affaires, Competition Division, Paris.

Organisation for Economic Co-operation and Development (OECD) (2011), *Latin America Competition Forum. Session IV: Competition Issues in the Air Transport Sector*. Background Note DAF/COMP/LCAF(2011)9. OECD, Directorate for Financial and Enterprise Affaires, Competition Division, Bogota.

Organisation for Economic Co-operation and Development (OECD) (2014), *Corporate Income Tax Rates. May 2014.* Online. Accessed on November 14th 2014. Available from: http://www.oecd.org/ctp/tax-policy/Table%20II.1-May-2014.xlsx

Organisation for Economic Co-operation and Development (OECD) (2014b), *Airline Competition.* Background paper DAF/COMP (2014)14 Online. Available from http://www.oecd.org/daf/competition/airlinecompetition.htm. Directorate for Financial and Enterprise Affaires, Competition Division, Paris

Organisation for Economic Co-operation and Development (OECD) (2014c), *Airline Competition. Note by Mexico*. Note DAF/COMP/WD(2014)47. Directorate for Financial and Enterprise Affaires, Competition Division, Paris

Organisation for Economic Co-operation and Development (OECD) (2014d), *Airline Competition. Note by Chile*. Note DAF/COMP/WD(2014)27. Directorate for Financial and Enterprise Affaires, Competition Division, Paris

Organisation for Economic Co-operation and Development (OECD) (2015), *Services Trade Restrictiveness Index for Air Transport*. Online. Accessed on September 20th 2015. Available from http://www.oecd.org/tad/services-trade/services-trade-restrictiveness-index.htm.

Oum, T. and Tretheway, M. (1990). Airline Hub and Spoke System. *Journal of Transportation Research Forum*, Vol 30, pp. 380-393.

Oum, T.H. (1998), "Overview of regulatory changes in international air transport and Asian strategies towards the US open skies initiatives". *Journal of Air Transport Management*. Vol. 4/3, pp. 127-134. Elsevier, Amsterdam.

Oum, T., Yu, C., Zhang, A. (2001). Global Airline Alliances: International Reugulatory Issues. *Journal of Air Transport Management*, Vol 7, pp.57-62.

Oxford Economics (2011a), *Explaining Dubai's Aviation Model*. Oxford

Oxford Economics (2011b), *Economic Benefits from Air Transport in Finland*. Oxford

Park, J-H. (1997), 'The effects of airline alliances on markets and economic welfare'. *Transport Research E: Logistics and Transportation Review* vol 33 pp 181-195.

Partnership for Open & Fair Skies (2015), *Restoring Open Skies: The Need To Address Subsidized Competition From State-Owned Airlines in Qatar and the UAE*. Online. Available from: http://skift.com/wp-content/uploads/2015/03/White.Paper-2.pdf

Pearce, B. and Doernhoefer, G. (2011), *The Economic Benefits of Airline Alliances and Joint Ventures*. IATA Economics Briefing, 28 Nov. Online. Available from https://www.iata.org/whatwedo/Documents/economics/Economics%20of%20JVs_Jan2012L.pdf

Peoples, J. H., ed. (2014). "The Economics of International Airline Transport".*Advances in Airline Economics* 323p. Emerald Press, Bingley.

Pels, E. (2008), "Airline network competition: Full-service airlines, low-cost airlines and long-haul markets". *Research in Transportation Economics.* Vol. 24, pp. 68–74. Elsevier, Amsterdam.

Pels, E. (2009), Network competition in the open aviation area. *Journal of Air Transport Management.* Vol 15/2, pp 83–89. Elsevier, Amsterdam.

Pierce, B. (2014), *Adding Value Despite Difficult Business Conditions*. IATA. Presentations at the IATA Annual General Meeting, Doha, June. Online. Available from: https://www.iata.org/whatwedo/Documents/economics/Economic-Performance-of-the-Airline-Industry-mid-year%202014-slides.pdf

Piermartini, R. and Rousova, L. (2008), *Liberalization of Air Transport Services and Passenger Traffic*. Staff Working Paper ERSD-2008-06. World Trade Organisation, Geneva.

Redondi, R.,Malighetti, P. and Paleari, S. (2012), "De-hubbing of airports and their recovery patterns". *Journal of Air Transport Management*. Vol 18/1. Elsevier, Amsterdam.

Ros, A.J. (2010), *A Competition Policy Assessment of the Domestic Airline Sector in Mexico and Recommendations to Improve Competition*. Online. Available from: http://www.oecd.org/daf/competition/45049588.pdf

Sasso, M. (2015), *Delta is Expanding in China and Shanghai May Become Its International Hub. Bloomberg Business*. Online. Accessed June 23rd 2015. Available from: http://www.bloomberg.com/news/articles/2015-04-06/delta-ceo-sees-shanghai-hub-as-carrier-plots-growing-china-plan

Schlumberger, C.E. (2010), *Open Skies for Africa: Implementing the Yamoussoukro Decision*. The International Bank for Reconstruction and Development / The World Bank, Washington.

Secretaría de Comunicaciones y Transportesde Mexico (SCT) (2014), *La Aviacion Mexican en Cifras, 1992-2013*. Online. Accessed June 4th 2015. Available from: http://www.sct.gob.mx/fileadmin/DireccionesGrales/DGAC/04%20Estadisticas%202012/01%20Aviacion%20Mexicana/AMC_1992_2013.pdf . Mexico City.

Shane, J.N. (2006), *Air Transport Liberalization: The US Experience*. Speech delivered to the ICAO Global Symposium on Air Transport Liberalization, Dubai, September 18th. Online. Accessed November 24th 2015. Available from: http://www.icao.int/Meetings/LiberalizationSymposium/Documents/2006-Symposium-Dubai/Shane.pdf

Shepherd, W. G. (1984), "Contestability vs. Competition". *The American Economic Review*. Vol 74/4, pp. 572-587. American Economic Association, Nashville.

Slater, R.E. (2003), "How Antitrust Failed in America: The Sad Case of Predatory Pricing in the US Airline Industry". *Antitrust Law and Economic Review. V*ol 32/1 1, pp 83-94. Vero Beach.

Smith, F.L., Cox, B. (2008), "Airline Deregulation". *The Concise Encyclopaedia of Economics 2nd edition.* David R. Henderson, ed. Liberty Fund, Inc. 2008. Library of Economics and Liberty. Online. Available from: http://www.econlib.org/library/Enc/AirlineDeregulation.html

Staniland, M. (1999), *Transatlantic Air Transport: Routes to Liberalisation*. European Policy Paper No. 6. University of Pittsburgh, Graduate School of Public and International Affairs, Center for West European Studies, European Union Center, Pittsburgh.

Statistisches Bundesam (2015), *Record high: 81.6 million air passengers to foreign destinations 2014.* Online. Available from: https://www.destatis.de/EN/FactsFigures/EconomicSectors/TransportTraffic/PassengerTransport/PassengerTransportCurrent.html

Sundberg, J.W.F. (2000), "Airline Deregulation. Legal and Administrative Problems". *Scandinavian Studies in Law*. Vol 39, pp.439-479. Stockholm University, Faculty of Law, Stockholm Institute for Scandinavian Law, Stockholm.

Tan, A.K.-.J. (2010), "The ASEAN Multilateral Agreement on Air Services: En Route to Open Skies?" *Journal of Air Transport Management*. Vol. 16/6, pp.289–294. Elseveir

Tan, A.K.-.J (2013a), *Toward a Single Aviation Market in ASEAN: Regulatory Reform and Industry Challenges*. ERIA Discussion paper Series ERIA-DP-2013-22. The Economic Research Institute for ASEAN and East Asia, Jakarta.

Tan, A.K.-.J (2013b), "India's Evolving Policy on International Civil Aviation" *Air and Space Law.* Vol 38/6, pp. 439–462. Kluwer Law, Alphen aan den Rijn.

Tan, A.K.-.J (2014), *Assessing the Prospects for an E.U.-ASEAN Air Transport Agreement*. Discussion Paper No 2015-02. International Transport Forum / OECD, Paris.

Tretheway, M. (2005), "Canada-US Full Open Skies". *InterVISTAS Canadian Aviation Intelligence Report*, December, pp. 13-14. Online. Available from: http://issuu.com/intervistasconsulting/docs/12_dec2005?e=6192829/4447516

Topham, G. (2014), *Ryanair faces €8.3m penalty for breaching French labour laws*. The Guardian. October 28th. Online. Available from: http://www.theguardian.com/business/2014/oct/28/ryanair-penalty-breaching-french-labour-laws

Trafikstyrelsen (2014), *Report of the working group on "Social dumping" in aviation*. Online. Available from: https://www.eurocockpit.be/sites/default/files/social_dumping_rt_danish_transport_authority_2014.pdf

Trafikstyrelsen (2015), *Report on Social Dumping/Rule shopping in aviation Status Report.* Online. Available from: https://www.eurocockpit.be/sites/default/files/social_dumping_-_rapport_om_social_dumping_indenfor_luftfart_engelsk_version_2.pdf

Transport Canada (TC), 2006. *The Blue Sky Policy: Canada's New International Air Policy*.

Transport Canada (TC), 2014. Transportation in Canada 2013. Statistical Addendum Table A18

Tretheway, M.W. (2005), "Canada-US Full Open Skies". *InterVISTAS Canadian Aviation Intelligence Report*, December, pp. 13-14. Online. Available from: http://issuu.com/intervistasconsulting/docs/12_dec2005?e=6192829/4447516

Tretheway, M.W., and Kincaid, I.S. (2005), "The Effect of Market Structure on Airline Prices: A Review of Empirical Results". *Journal of Air Law and Commerce*. Vol. 70/3, pp. 466-498. Southern Methodist University, Dedman School of Law, Dallas.

Tretheway, M.W. and Andriulaitis, R. (2014), *What do we mean by a Level Playing Field in International Aviation?* Paper presented at the 18th ATRS World Conference, Bordeaux. ITF Discussion Paper No 2015-06. February.

Turkish Airlines (2015). *3Q15 Results Summary*. Online. Accessed on January 15th 2016. Available from http://investor.turkishairlines.com/documents/ThyInvestorRelations/download/sunumlar/IR_PRESENTATION_9M'15_vf1.pdf

Turkish Airlines (2016). *History.* Online. Accessed on January 15th 2016. Available from http://www.turkishairlines.com/en-fr/corporate/history

Turkish Statistical Institute (TUIK), 2016. *Total passenger and freight traffic at the airports*. Online. Accessed January 22nd 2016. Available from http://www.turkstat.gov.tr/PreIstatistikTablo.do?istab_id=1583.

Umweltbundesamt (2014), *Submission under the United Nations Framework Convention on Climate Change and the Kyoto Protocol 2014 National Inventory Report for the German Greenhouse Gas Inventory 1990 – 2012*. Dessau

United Continental Holdings (2014), *Annual Report 2013*. Chicago. Online. Available from: http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9NTM0OTM3fENoaWxkSUQ9MjIyODk3fFR5cGU9MQ==&t=1.

US Department of Justice (USDOJ) (2008), *Competition And Monopoly: Single-Firm Conduct Under Section 2 Of The Sherman Act.* Online. Available at http://www.justice.gov/atr/public/reports/236681.pdf

US Department of Transportation (DoT, 2000), *Transatlantic Deregulation: The Alliance Network Effect. International Aviation Developments. Second Report.* Washington.

US Department of Transportation (DoT,2016), *2016 US-Haneda Combination Services Allocation Proceedings – Order to show* cause Order 2016-7-14. July 20th Washington.

US General Accounting Office. (GAO). (1990), *Airline Competition: Higher Fares and Reduced Competition at Concentrated Airports*. Washington.

US General Accounting Office. (GAO). (2003), I*ssues Relating to Foreign Investment and Control of US Airlines*. Report GAO-04-34R. Online. Washington. Accessed April 24th 2015. Available from http://www.gpo.gov/fdsys/pkg/GAOREPORTS-GAO-04-34R/html/GAOREPORTS-GAO-04-34R.htm.

Vowles, T. M. (2006), "Airfare pricing determinants in hub-to-hub markets". *Journal of Transport Geography*. Vol 14/1 pp. 15–22. Elsevier in association with the Transport Geography Research Group of the Royal Geographical Society.

Waluilik, J. (2016), "At the core of airline foreign investment restrictions: A study of 121 countries". *Transport Policy,* Vol 49 pp. 234-251. Elsevier, Amsterdam.

Wee, V. (2013), *Impact of Air Services Liberalisation on Growth of Tourism in Asia*. Presented at the 6th UNWTO International Meeting on Silk Road Tourism, Dunhuang.

Wei, W and Hansen, M. (2007), "Airlines' competition in aircraft size and service frequency in duopoly markets". *Transportation Research Part E. Logistics and Transportation Review*. Vol.43/4, pp 409-424. Elsevier, Amsterdam.

Westjet. 2014. *Airline Partners.* Online. Accessed November 25th 2014. Available from: http://www.westjet.com/guest/en/about/airline-partners/index.shtml?null

Wojahn, O.W. (2012a), "Why does the airline industry over-invest?" *Journal of Air Transport Management*. Vol.19, pp.1–8. Elseveir, Amsterdam.

Wojahn, O.W. (2012b), *Key Policy Issue*. *Explaining over-capacity in the airline industry.* Key policy issue. International Air Transport Association, Geneva.

World Bank. (2012), *Mexico Policy Note 2: Towards a More Competitive Business Environment*. Online. Available from: www.worldbank.org/content/dam/Worldbank/document/Mexico%20Policy%20Note%202.%20Competition%20and%20business%20environment-July28.pdf. World Bank, Business Environment and Competition, Washington

World Tourism Organisation (UNWTO), (2015). *Tourism Highlights.* 2015 Edition. Madrid. Online. Accessed on January 14th 2016. Available from http://www.e-unwto.org/doi/pdf/10.18111/9789284416899

World Trade Organisation (WTO). (2003), *GATS. What Is It and To What Extent Does It Apply to Air Transport*. Presentation by Pierre Latrille to the ICAO Air Transport Conference 5. March. Montreal. Online. Available at www.icao.int/Meetings/ATConf5/Documents/Latrille.ppt

World Trade Organisation (WTO). (2006), *Second Review of the Air Transport Annex: Developments in the Air Transport Sector (Part Two) Quantitative Air services agreements Review (QUASAR), vols. I and II.* Note by the Secretariat, document S/C/W/270/Add.1. Geneva. Online. Available from: https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S006.aspx?Query=(%20@Symbol=%20s/c/w/270/add.1*)&Language=ENGLISH&Context=FomerScriptedSearch&languageUIChanged=true#

World Trade Organisation (WTO, 2008), Liberalization of Air Transport Services and Passenger Traffic. Staff Working Paper ERSD-2008-06. Online. Available from: http://www.wto.org/english/res_e/reser_e/ersd200806_e.pdf

World Trade Organisation (WTO), 2013. WTO sees gradual recovery in coming months despite cut in trade forecasts. Press Release 19 September. Online. Available from: http://www.wto.org/english/news_e/pres13_e/pr694_e.htm

World Travel & Tourism Council (WTTC) (2014), *Travel & Tourism. Economic Impact 2014.- Mexico*. London. Online. Available from: http://www.wttc.org/-/media/files/reports/economic%20impact%20research/country%20reports/mexico2014.pdf

Yamaguchi, K. (2013), *Evolution of Metropolitan Airports in Japan. Air Development in Tokyo and Osaka.* Discussion Paper 2013-03. International Transport Forum/ OECD, Paris. Online. Available at http://www.internationaltransportforum.org/jtrc/DiscussionPapers/DP201303.pdf

Yamauchi, H. (2000), *Towards a More Liberal Sky in Japan: An Evaluation of Policy Change*. University of Chicago Press, Chicago.

Yarrow, G. (199?), *Airline Deregulation and Privatization in the UK*. Hertford College, Regulatory Policy Research Centre, Oxford.

Zhang, A. (1996), "An analysis of fortress hubs in airline networks". *Journal of Transport Economics and Policy*. Vol 30/3 pp. 293-307. University of Bath, Bath.

Zhang, A and Zhang, Y. (2002a), "A model of Air Cargo Liberalization: Passenger vs. All Cargo Carriers". *Transportation Research Part E* Vol.38 pp 175-191. Elsevier, Amsterdam

Zhang, A, and Zhang, Y. (2002b), "Issues on Liberalization of Air Cargo Services in International Aviation". *Journal of Air Transport Management*. Vol.8, pp. 275-287. Elsevier, Amsterdam

Zhang, Y. and Findlay, C. (2014), "Air transport policy and its impacts on passenger traffic and tourist flows". *Journal of Air Transport Management*. Vol.34, pp. 42-48. Elsevier, Amsterdam

Zou,L., Oum, T.H., Yu,C. (2011) "Assessing the price effects of airline alliances on complemnetary routes". *Transportation Reasearch Part E*, Vol 47 (3) pp. 315-332

Zuidberg, J., 2013. *Benchmark luchthavengelden en overheidsheffingen voor de jaren 2003, 2008, 2011, 2012*. SEO Economic Research. Online. Available on: http://www.seo.nl/uploads/media/201409_Benchmark_luchthavengelden_en_overheidsheffingen__2_.pdf

Chapter 3
What do we mean by a level playing field in international aviation?

This chapter discusses the concept of level playing field in aviation, an argument that is often used to counter efforts at liberalisation.

Introduction

The issue of a "level playing field" has re-emerged as a major issue in international aviation. This issue has been around for decades but has been raised in recent policy debates. One policy forum in which this has been raised is the European Commission's proposed revision to Regulation 868/2004, which some view as a response to allegations by some legacy carriers to the rapid growth of the Middle East carriers such as Emirates, Etihad Airways and Qatar Airways. Another dimension to the concern over the level playing field is the evolution in foreign ownership rules, such as the type of treaty clauses being negotiated by the European Union. Could broader acceptance of service by carriers owned by third-party nationals create conditions for a flag of convenience regime of the kind that characterises parts of maritime liner shipping? The flag of convenience issue has been discussed in the US media with regard to Norwegian Air Shuttle. Norwegian's long-haul services are operated by subsidiaries Norwegian Long Haul AS and Norwegian International Ltd. The former is registered in Norway while the latter is registered in Ireland and operates flights for its parent. Some long-haul flights have operated with contract flight attendant labour based in Thailand.

On the flip side Findlay and Goldstein (2004), in looking at the aviation sector in Asia, point out that a more liberal foreign ownership approach would provide funding and management capacity to support the adjustment process of incumbent airlines dealing with key pressures to change, including demand side shocks and the rise of low-cost carriers (LCCs). They also note that a greater role for private investment, including foreign investment, will support the movement to regulatory reform.

The level playing field issue has received some, but limited attention in the literature. Some see the issue as one of a disguised attempt to seek protectionism (e.g., de Wit, 2013). Others see it in light of a post-mercantilist strategy (Dresner, 1989). Legacy carriers, and in particular their employees, view the issue as one of enhancing the aviation business environment and defending local jobs (ALPA, 2013).

In the debate thus far, there have been allegations of a lack of a level playing field in some markets. Some have tried to link aviation liberalisation in general with fair competition and level playing field issues, suggesting a desirability to halt or even reverse further liberalisation of air access. However, no one has precisely defined what constitutes a level playing field in aviation, or its converse, what constitutes a genuine unlevelled playing field. In fact, while the International Civil Aviation Organization (ICAO) has drafted a model level playing field clause, it has gone so far as to state in a March 2013 Working Paper that it "…is unlikely that consensus on a comprehensive definition can be achieved at this time, given the widely different circumstances of States and their aviation sectors…" (p.3). This is borne out by major differences in the level playing field clauses that the European Commission has negotiated with the United States versus Canada. This chapter is an initial step to fill this gap and address ICAO's

challenge to develop a comprehensive definition by articulating these issues and linking the level playing field with air transport liberalisation.

Historical context

The preamble of the *Convention on International Civil Aviation* (the "Chicago Convention") sets out its objective to ensure that "international civil aviation may be developed in a safe and orderly manner and that international air transport services may be established on the basis of equality of opportunity and operated soundly and economically".

Consistent with the Chicago Convention, the bilateral air services agreements (ASAs) that were negotiated between nations usually had some form of wording referring to the provision of "fair and equal opportunity to compete." In practice, however, governments hardly seemed willing to allow their carriers to really compete. Rather, they seemed to more heavily weigh the objectives of establishing operations that were relatively sound and economic (i.e., preventing service failures and destructive competition) than they were on actually providing equality of opportunity. This is not to say all services provided by flag carriers were economic. In the early days, and to some extent today, governments were willing to subsidise some services that were not commercially viable to achieve some other governmental purpose, such as access to low population regions. What they did not want, however, is for the carriers to actually compete with each other as that could mean even greater levels of subsidisation would be necessary.

What governments appeared to seek for their respective flag carrier(s) was an "equitable" split of a pool of revenues that were based on controlled (and high – above marginal cost) fares to achieve sound and economic operations. Routes and capacity were typically divided among carriers in such a manner as to ensure each carrier could operate profitably, hopefully without subsidy. Stability and sustainability were the goals, rather than competition and market growth. Essentially, governments actually sought equality of outcome rather than equality of opportunity.

In large part, the issue of the level playing field plays an inordinately larger role in aviation than in other sectors, due to the fact that aviation has been separated from general trade negotiations. In general trade theory, it is recognised that countries may have a comparative advantage in some factors of production and markets, and comparative disadvantages in others. Higher trade in areas where they have an advantage will be offset by lower trade in areas where they do not have an advantage. The focus is on overall benefits – not in trying to make every nation equal to others in all elements. By separating aviation from the rest of trade, comparative advantage/disadvantage is more difficult to achieve, and thus level playing field issues are brought into greater focus and the impact exacerbated.

An interesting example of aviation specific comparative advantage is that between Europe and the Gulf States. The Gulf States may have a comparative advantage in international hub operation between Europe and South Asia/East Africa that has enabled the growth of Gulf carriers. But these have purchased large numbers of A380 and other Airbus aircraft. In fact, without the purchases by the Gulf carriers it seems unlikely that the A380 would have been built at all. The exercise of Gulf carriers' comparative advantage in airline hub geography has enabled Europe to benefit from its comparative advantage in high tech manufacturing and skilled labour to engage in the production of very large aircraft. Without the first, the second would not have occurred.

In contrast, under the mercantilist approach, nations sought to boost their own economies by imposing high tariffs and imposing non-tariff barriers to protect domestic production, banning their colonies from

trading with other nations, and subsidising exports. Under such an approach, aggregate welfare is lower as comparative advantages are artificially negated.

Thus prior to the rise of open skies agreements between nations, international air transport operated under very restrictive conditions. The air service agreements between nations typically specified which city pairs could be served, and in some cases explicitly excluded certain airports. The number of carriers that could provide service was usually restricted (generally to a single carrier from each nation), as was the capacity they offered. In addition, all fares had to be approved by the civil aviation authorities of both nations party to the agreement so as to ensure proposed fares were not "unreasonably low" such that they might threaten the profitability of the carriers. This often was effected by governments allowing or requiring the carriers to agree on prices under the old tariff regime of the International Air Transport Association (IATA).

This approach began to change with the signing of the "International Air Transportation Negotiations Statement of U.S. Policy for the Conduct of the Negotiations" issued by President Carter. The statement noted:

> *"The guiding principle of U.S. aviation negotiation policy will be to trade competitive opportunities, rather than restrictions, with our negotiating partners. We will aggressively pursue our interests in expanded air transportation and reduced prices rather than accept the self-defeating accommodation of protectionism. Our concessions in negotiations will be given in return for progress toward competitive objectives, and these concessions themselves will be of a liberalising character."* (Carter 1978)

A key element of the US approach to open skies is that the objective of a level playing field is equality of opportunity, not equality of outcome. This is fully consistent with the objective articulated in the preamble to the Chicago Convention. Reliance on competition and reduction of the burden of regulation were the principles that would drive subsequent US negotiations.

In 1978, the US reached a partially liberalised ASA with the Netherlands, followed by liberal agreements with Israel and Belgium. After a lull in liberalisation efforts during the 1980s the US reached its first open skies agreement with the Netherlands in 1992. By the end of 1995, it also had open skies agreements with Belgium, Finland, Denmark, Norway, Sweden, Luxembourg, Austria, Iceland, Switzerland and the Czech Republic. Today it has open skies agreements with over 100 nations. The typical open skies agreements allows service between any point in one country to any point in the other, with no restrictions as to number of carriers or the capacity they offer. In addition to open third and fourth freedoms, they also provide for fifth and sixth freedom services, and sometimes seventh freedoms for all-cargo services. Sixth freedom services are an important part of open skies agreements as such hubbing services were often capacity restricted in traditional bilateral air service agreements. The profound economic advantages of operating hubs were effectively blocked by traditional agreements.

The concept of equality of opportunity also guided other liberalisation initiatives such as the EU Common Aviation Market, the Australia-New Zealand Single Aviation Market, and the Multilateral Agreement on the Liberalization of International Air Transportation (MALIAT) between Brunei Darussalam, Chile, Cook Islands, Mongolia, New Zealand, Samoa, Singapore, Tonga and the United States. The preamble to the MALIAT refers to the promotion of "an international aviation system based on competition among airlines in the marketplace with minimum interference and regulation". IATA's Agenda for Freedom initiative also supports the equality of opportunity concept.

There has been some backlash to this approach of late, and an apparent desire by some to return to a greater degree of government control over aviation services. Kahn (2002) noted that there were

inevitably issues stemming from deregulation/liberalisation, but that the lessons from the airline, telecommunications and electric utilities industries shows "the superiority of competition over comprehensive regulation". True, it requires a greater reliance on competition law, but a return to regulatory prescription is not the answer.

Gillen, Harris and Oum (2002) modelled the economic effects of bilateral liberalisation of air transport. They found in the case of Canada-Japan air services, the effects of removing regulations on price, frequency and entry would add service, lower prices and welfare gains to both Canada and Japan. InterVISTAS-ga[2] (2005) quantified the results of past and prospective air service liberalisation. They found that traffic growth typically averaged between 12% and 35%, with some cases reaching almost 100% of pre-liberalisation volumes. This has a significant stimulation effect: they found that liberalising 320 restrictive existing agreements could generate USD 490 billion in Gross Domestic Product(GDP) globally. The threat to continued liberalisation could have significant economic repercussions, and warrants examination of the current focus on levelling the playing field.

Factors affecting the level playing field that should not be considered an issue

Outside the classroom construct of "perfect competition" it is an anomaly to find a perfectly level playing field. For example, when Apple Computer launched its early computer products it was a fraction of the size of IBM. Many might have argued this was not a level playing field, as IBM had size and market domination that tilted the field in its favour. Yet as of early October 2014, Apple's market capitalisation of over USD 600 billion is significantly higher than IBM's market capitalisation of just under USD 190 billion (Bloomberg 2014). Perhaps the field was tilted in Apple's favour by virtue of flexibility and innovation. The key is what factors are legitimately issues in assessing a level playing field in aviation and which are not.

Wills-Johnson and Affleck (2006) address the issue of firms generating excess rents in their evaluation of Australian access to rail infrastructure. On the one hand, they note that Marshallian rents (market power rents) are inconsistent with economic efficiency, and are a legitimate concern for regulatory authorities. On the other hand, they note that Ricardian rents (resource rents, or rent that accrues to a firm due to the nature of the assets held by the firm) should not be a concern to regulators. This is because resource rents do not distort behaviour of the firm. The firm does enjoy rents, but as it does not have the ability to satisfy the entire market, it does not set the price. They also note that Schumpeterian rents (innovation rents) should not be a target for regulators. While Schumpeterian rents do in fact lead a firm to reduce output below, and raise price above, the economically efficient level as a monopolist would do; this is the price we pay to achieve innovation. They also note that these rents tend to be short-term in nature – the fact they exist spurs other firms to innovate as well.

We consider the various elements of a level playing field from this perspective.

Geography

Having a level playing field does NOT mean that we have to compensate for geographic advantages or disadvantages. In effect, geography is an asset – one that may generate Ricardian rents, but nothing that should be a target for regulators.

New Zealand based carriers do not have an inherent right to get special compensating advantages in bilateral air agreements because of the disadvantages inherent to that country's remote location. Nor should policy attempt to penalise countries such as Canada due to their favourable geographic location as an intermediary between major markets. The fact that flightpaths between Europe and the United States and between Asia and the United States go through Canadian airspace, making sixth freedom services by Canadian carriers through Canadian hubs attractive, should not result in limitations to such services.

The provision of capacity on a route to or from Canada to Europe (or Asia or the United States) greater than can be justified by purely Canadian-related origin and destination traffic due to the sixth freedom traffic the Canadian carrier can flow should not be a cause for concern and remediation through bilateral air service agreement restrictions. The same would be true for other geographies, such as South-east Asia, the Middle East or Turkey. As already stated, limiting sixth freedom rights is tantamount to suppressing the economic advantages of hub and spoke systems.

Geographic advantages are natural features (resources) that enable the provision of attractive economic services. Consumers should not be denied such services by a misguided effort to negate these advantages through punitive provisions in air service agreements.

Airline size

A level playing field does not mean that we compensate for airline size. Larger airlines might enjoy some types of economies. If so, airline size is a natural outcome of success and growth, and we should not penalise large carriers (e.g., restrict their access), nor should governments provide artificial support (i.e., subsidies) to smaller carriers in order to make large and small more equally competitive. Airline size might be an issue when evaluating mergers, but it should not be an issue when determining air access.

One might argue that if a carrier achieved its growth as a result of "unfair means" such as a government subsidy, would this not be grounds for assisting smaller carriers? Aside from the impracticality of determining the magnitude of all past unfair treatments of all carriers so as to know how much support should be given to other carriers, is it really necessary to address all "past sins" before moving forward? As Rose (2012) points out, regulating well (or in this case levelling the playing field for airline size) is difficult. Rose notes that regulation is information-intensive, it can give the wrong incentives, which can lead to behaviours that the regulators then need to address, and that the cost of regulation may be greater than the market flaws it seeks to address.

In our view, the successful growth of a carrier may give it a natural comparative advantage that does not constitute an unlevel playing field.

Factors of production

A level playing field also does not mean that we have to equalise factor of production advantages. For example, the United States should not and does not get special privileges vis à vis Canada because the latter has lower labour costs and/or provides a higher level of social services such as national health care.

The same applies for lower fuel costs. They are lower in some places than others due to location of sources and production and/or national taxation policies towards crude oil production (aviation fuel sales for international services are exempt oil product duties in all countries in line with ICAO's 1993

Resolution). As long as there is no discrimination of rates between domestic and foreign operators, this should not be an issue.

Airport charges vary among airports around the world. Much of the difference stems from government policy. In the case of Toronto Pearson relative to competing US hubs for services to Europe and Asia, the Canadian government requires the airport operator to cover all capital and operating costs and it charges in excess of CAD 100 million in annual rent even though it provides no services to the airport operator that are typical of a landlord. The policy of the United States, on the other hand, is to support the growth of aviation by the provision of the necessary infrastructure to foster growth. US airports enjoy tax-free bond financing, generally pay no rent for access to the land and no property taxes, and air travellers (and shippers) benefit from capital grants to aviation infrastructure that are funded in part through general tax revenues. Since 1971, the US Federal Aviation Administration (FAA) has received funding from the general fund (i.e. general taxes) in excess of USD 163 billion (expressed in 2013 dollars) to fund air traffic control and airport infrastructure. There could be a cause for redress if US airports discriminated against foreign-based airlines. However, since a given aircraft type pays the same airport fees whether the carrier is from Asia, the EU, the United States or a Gulf State, the low landing fees in the United States are not a valid basis for retaliatory actions. It should be noted that other nations support aviation infrastructure as well, including air traffic control services.

Cost of capital may vary across airlines, due to factors such as risk. Risk may vary across carriers based on geographic location, the quality of management, the soundness of the business plan and the degree of competition in the market. Again, it makes no economic sense to try to negate advantages lower risk airlines might have over higher risk carriers by equalising cost of capital. To the contrary, intervening in market risk to level the playing field could be very detrimental to economic efficiency.

Corporate and other taxes paid by a carrier to its home government are another element that is outside of the definition of level playing field. One interesting aspect of taxation is the view held by some that high-tax nations tilt the playing field to the disadvantage of their own home carriers. If a given government taxes aviation more heavily than other nations, that is its prerogative. It does not justify restricting access by carriers from nations with lower tax rates in order to offset the disadvantages it chooses to impose on its flag carrier(s). Of course, foreign carriers should face the same tax rates as domestic carriers, where applicable.

Any cost advantages a carrier enjoys based on its geographic location, quality of management, cost of capital, or level of taxation of its base country(ies) is not an element that should be addressed in trying to level the playing field. These elements are more akin to assets or resources that could potentially lead to Ricardian rents, but are not issues that should be targets of regulation via ASA restrictions.

Sixth freedom traffic

One claim that arises (e.g., especially concerning Gulf carriers) is that sixth freedom traffic creates an unlevel playing field. Proponents of this view maintain traffic rights should be confined only to third/fourth freedom traffic. Sometimes this is expressed as capacity should be limited to that needed to meet the needs of third/fourth freedom traffic between the city-pair market, and not for any connecting traffic to beyond points. This represents the mercantilist approach of capacity predetermination found in traditional bilateral ASAs.

First, restrictions on sixth freedom traffic are a violation of open skies principles. Open skies is explicit in allowing unrestricted sixth freedom traffic. After all, a carrier operating sixth freedom services is really

only combining fourth and third freedom traffic rights between markets it has a right to serve. Exploiting sixth freedom opportunities does not represent an unfair activity and thus does not constitute a playing field that is not level.

Second, restricting sixth freedom traffic is an attempt to suppress the economics of hub operation. This is akin to attempting to compensate for geography, an asset that is a natural element of comparative advantage.

Third, it is interesting to note that carriers making such a criticism often operate their own sixth freedom service or are in an alliance with another carrier operating sixth freedom flights. Criticisms that state that Gulf carriers should have their capacity limited only to what is justified by third/fourth freedom traffic often come from carriers operating their own major sixth freedom hubs, for example service traffic from the United States to Europe and/or Asia (and vice versa). These carriers may even point this out to investors as being part of its core strategy for success – the carrier emphasises its natural geographic advantage that allows it to operate an efficient hub for moving traffic between different regions. Sixth freedom is the very concept of international hubbing. The economics are the same for a domestic hub versus sixth freedom operation for international services. If a hub is located where it can serve many spokes, this is not evidence of a legitimate concern about the playing field – it is simply a natural comparative advantage.

This echoes an earlier point. Geographic advantages do not create an unlevel playing field, requiring correction. If we were to try to equalise the outcome, then Canada should be restricted in its bilateral to offset its natural geographic advantage between the large markets of the United States., Europe and Asia. The same would then have to be true for all countries with carriers that have successful international hubs, such as Heathrow, Schiphol, Frankfurt, Charles de Gaulle, Istanbul, the Gulf States, Singapore, Hong Kong, Atlanta and others. When governments venture into equalising geographic advantages via restrictions, we move from an equality of opportunity regime to one of equality of outcome. This is a move to mercantilism.

Airport slots

The level playing field concept does raise issues regarding access to scarce resources, especially slots. But we cannot expect to equalise slots between nations via bilateral ASAs. What policy should do, however, is give some preference to new entrants for slot access, while not completely holding back growth of the incumbents. The IATA slot guidelines and similar policies of United States, Canada, the United Kingdom etc. which makes some but not complete accommodation for new entrants when slots become available has merit in that it partially levels the playing field.

Some bilateral ASAs have provided some slots as the initial situation is severely distorted favouring one carrier. For example, when Canada and the United States. signed their first open skies treaty, the United States agreed to provide Canadian carriers with a small number of initial slots at New York LaGuardia airport. Multiple US carriers had access to this airport for years and could easily internally reallocate their slots to Canadian services. Canadian carriers would have been at a significant disadvantage for years until they were able to obtain slots as they came available through the normal process. Thus, the United States agreed to a small initial allocation of slots to Canadian carriers, after which they would have to obtain slots via the normal queuing process or by slot sales/exchanges.

But we can go further and suggest that a level playing field is enhanced if slot access has market elements. Carriers should be able to buy and sell slots, enabling carriers who place highest values on the

slots to get access. Scarcity is a consequence of not allowing proper pricing of scarce resources. There is competition law to address failures to allow access; bilateral ASAs are not the appropriate tool to address this issue.

Legitimate concerns raised by level playing field

Improper incentives and flags of convenience

The goal of a level playing field does raise issues of safety and proper incentives. It is appropriate for bilateral ASAs to require carriers to conform to both countries' safety regulations (i.e., it must obtain an operating certificate/licence from both countries). We do not want to create incentives for carriers to compete by adhering only to the lowest common denominator on safety. While this may occur in maritime freight shipping, protecting passengers outweighs cost savings. We want the opposite behaviour to occur: carriers adhering to the highest denominator of safety. Any cost advantage derived from exploitation of weak safety rules or inadequate compliance should not be allowed.

This also applies to labour regulations, though this issue is more complex. Carrier ground staff based within a given country must adhere to that country's labour laws. Again, we do not want to promote the development of flags of convenience which might exploit labour using sub-standard labour laws or lax enforcement of labour standards of a third country (e.g., that would directly or indirectly permit child labour). However, when it comes to flight crew labour that operates on routes to various countries, carriers should be free to choose their bases and be allowed to operate multiple bases within their route networks. The EU, in its communication addressing future challenges for its external aviation policy (COM (2102) 556 final) indicates that the practice of "using the least onerous social security systems irrespective of the crew member's home base can no longer be continued." (para 25). We would agree that crews based in a given country should not have social security systems applied that are to lower standards than that of the country in which the crew is based. However, we should not be dictating to foreign airlines which countries they should choose for crew bases in an attempt to make sure their costs are inflated to the benefit of the home carriers.

Bilateral ASAs should not prevent, for example, Qantas from establishing London based flight crews who may be UK, not Australian, citizens. Cathay Pacific found it economic to establish pilot and flight attendant bases in Canada in spite of lower general wages in Hong Kong. The hiring of these crews and the standards of their working conditions must adhere to local labour laws, including regulations on duty times, etc. the same as locally domiciled carriers must follow. Collective bargaining between a carrier and its unions might seek to prevent foreign hired and domiciled flight crews, but it is not the role of the bilateral ASA to address this by imposing restrictions on carriers that use foreign hired and domiciled crews. Equality of opportunity should prevail in ASAs. If Qantas finds it economic to base crews in London who adhere to the same labour rules as its competitors who are based in London, then the bilateral ASA should not prevent this. Again, collective bargaining may seek to limit carrier choices, but failure at collective bargain should not be allowed redress through the regulatory mechanism of bilateral ASAs. Bilateral ASAs should not be used to compensate home carriers for any failures they suffer in different fora. They should remain mechanisms for offering consumer choice and facilitating market growth rather than balancing outcomes between carriers.

Subsidies

The issue of subsidies is complex. The existence of wider economic benefits from aviation can justify some type of support to air transport in order to obtain economic efficiency. Many nations provide such support to infrastructure operators (airports and air navigation). For example, the US FAA is funded by both aviation-specific user fees and taxes as well as by allocations from general taxes (or government deficits) to cover airport capital costs and air traffic control costs. US airports in particular have access to tax free debt financing. In this form, since all carriers benefit from the lower cost of airport/air navigation services, this would not necessarily constitute an unlevel playing field. If the criterion for such support is that the benefits derived from the infrastructure investments outweigh their costs, then subsidy might be justified.

This type of support is different from subsidies to specific carriers. Carrier-specific subsidies distort allocative efficiency and create incentives for X-inefficiency (i.e., when firms do not have incentive to minimize costs and achieve technical efficiency). This has been an issue for some state-owned carriers prior to (and sometimes after) privatisation, although state ownership of an airline does not necessarily imply the existence of subsidisation.

There can be justification for support direct to carriers, such as in provisions of socially required services that are uneconomic (e.g. to remote airports). Europe has provided guidelines on state aid to carriers. It does not prohibit government ownership of carriers and airports (this means that governments can invest in carriers and airports), but government can no longer subsidise them to create an unfair cost advantage for a particular carrier. It allows governments to subsidise socially required air services, but the subsidies must be transparent and non-discriminatory. The US has government ownership of airports but this does not create an unlevel playing field. These facilities are used by all carriers and access/fees are non-discriminatory. Again, a key guiding principle of a level playing field is that access is non-discriminatory.

In the case where a subsidy is needed for a socially required air service, but the subsidy is available to any carrier and is awarded on the basis of an open competition, it could be argued that this does not violate the level playing field. Tendering ensures that the subsidised service outcome is as economically efficient as possible. In a situation where a carrier does receive a subsidy from government (other than for socially required services) and that this subsidy is not available to others, or is not awarded on the basis of a tender, this could constitute a legitimate concern about the playing field and would require further investigation.

This suggests that there are two main issues here. The first is whether certain carriers are subsidised or not, and the second is whether any subsidy that does in fact exist distorts the market.

Extent of subsidy. The most commonly cited claims of "subsidised" airlines concern the three growing airlines from the Gulf States: Emirates, Etihad Airways, and Qatar Airways. These accusations have never been convincingly substantiated. The heads of all three airlines have unequivocally and publicly stated that while they enjoy an environment where aviation growth is facilitated, they do not receive subsidies. Emirates acknowledges some financial support from the government at start-up in the form of an initial equity investment, but this is not an uncommon occurrence. Indeed most of the airlines making allegations of Gulf carrier subsidies started via government equity investment. Moreover, as Emirates points out, the USD 2.3 billion it has paid in dividends to the government of Dubai more than compensates for the USD 10 million in seed capital and USD 88 million in infrastructure investment. (Emirates, p.8) In this case, at least, the existence of subsidisation seems far from established.

Does any subsidy that might exist represent bad economics? The issue of subsidy in discussions of a level playing field needs to be treated carefully. Subsidies are not bad economics *per se*. As discussed, there can be sound economic rationale for the provision of subsidy in certain cases.

The World Trade Organization (WTO) notes that when the perfect market assumptions do not hold, then:

> *"…situations may arise where a government measure like a subsidy improves welfare. An efficient subsidy would correct a market failure, bringing social and private costs and benefits into alignment."* (WTO, p. 55)

The WTO goes on to describe two examples that would justify public subsidies. The first is increasing returns to scale particularly where there is a large fixed cost of entry, and the second is externalities. (WTO, pp. 58-62) Airports are generally characterised by economies of scale and large entry costs. Moreover, airline service has a positive form of externality as increased connectivity has a positive impact on a nation's productivity, although there are also negative externalities associated with noise and emissions. In these cases, support for the development of airports and for the operation of airlines would in fact be socially desirable.

Regarding state aid to carriers, the carriers of the European Union are subject to enforcement of a state aid regime, perhaps the only trading block in the world which has such a regime. Some claim that the WTO rules are loose and largely unenforceable, hence the European Commission's wish to amend Regulation 868/2004. This is not to say that there are no national rules in other countries which govern subsidies, but it is hard to compare a fully-fledged state aid regime and state aid control mechanism that Europe has developed with somewhat disparate national rules. The US for example has provided support to carriers for "essential air services" and for effects of traffic disruptions due to terrorism. It has provided support from the General Fund to airports and/or to air navigation services.

Thus the onus should be on those alleging "unfair" subsidisation to show that in fact this subsidisation does exist and that it lowers consumer welfare. There is no evidence to date that this is the case. General support of aviation and public investment in infrastructure are activities that forward looking and private sector growth oriented governments are pursuing. Simply because the EU has chosen to apply strict state aid controls that go beyond the WTO's anti-subsidy provisions does not mean that nations abiding by less restrictive WTO provisions are discriminating against European carriers. The fact that the EU made a policy choice to be more strictly prohibitive of state aid does not mean the rest of the world has to abide by EU rules and stop supporting aviation infrastructure when there are good economic reasons for such subsidy.

Beyond the potential economic rationale for subsidies, there are also legitimate social and national reasons why a government might wish to subsidise air transport. Lebanon and Israel both have social goals requiring a minimum level of service in times of national strife in order to remain connected to the rest of the world. This in turn may justify a degree of social support for their home based carriers in order to preserve that accessibility. The United States, for defence reasons, maintains the Civil Reserve Air Fleet to ensure it has sufficient airlift capacity in time of war or other national emergencies. In exchange for a commitment to provide aircraft when needed, airlines get access to the peacetime airlift business of the US military. There can be a number of reasons for support of airlines, beyond a strictly economic rationale.

Liberalisation and the level playing field

Some have argued that open skies, or extensive liberalisation of international air transport enables the tilting of the playing field in favour of one carrier or another. If what is meant by "tilting the playing field" is allowing certain carriers to take advantage of their geographic location, their size, possible advantages in the cost of factors of production, an ability to offer attractive sixth freedom operations, use of superior technology or legitimate access to scarce resources, then we should not view that such a playing field is "unlevel." To attempt to level all such comparative advantages to the logical conclusion, the way to achieve a truly "level" playing field would be by commoditising international air transport and locking it into the lowest common denominator status quo. After all, can it really be considered a "level" playing field if one competitor is better than another? Surely for those seeking equality of outcome, a playing field with competitors of different capability is by definition not level. Unfortunately, it is easier to bring carriers down to the lowest common denominator than it is to raise all carriers to the highest level. Creating a truly level playing field would inevitably result in a poorer level of service for travellers and shippers. A good example of such misguided levelling of the playing field is the past episode when the size of sandwiches on international flights was regulated. (Kahn 2000)

If, on the other hand, we take as a given, that carriers should be allowed to capitalise on their natural inherent advantages, then open skies or other such significant liberalisation, is a necessary condition for a level playing field. Under these conditions, carriers can actually compete on the playing field. The historical Bermuda II approach, naming available points for service, specifying capacity and tying capacity to origin/destination volumes may result in a "level playing field," but only in the sense that the rules restrict the players from actually playing. The field is level because the outcome is predetermined – there is no actual "game" being played on the playing field.

The purpose of a "fair competition clause" such as the EU is seeking in its bilateral ASAs, is to ensure this level playing field only really makes sense in an open skies environment, where competition is possible. Having a fair competition clause in a restrictive bilateral is an oxymoron – fair competition is not possible under a restrictive agreement where government decides what services and capacity are to be provided rather than the marketplace. Fair competition clauses could even cause some potential confusion. This could occur if there is a conflict between the wording used in the ASA and wording used in the two nations' competition or trade laws.

What is implicit in this argument is the existence of effective competition law that can address actual situations of abuse of market power. The proper application of effective competition law is sufficient to address predation, dumping and other unfair and anti-competitive practices. "Fair competition" clauses are not necessary. While a number of nations admittedly have some way to go in achieving effective competition law (given some nations do not have any laws, or exempt aviation from them), curtailing abuse of market power will be more likely in situations of open skies where competitive forces will act to prevent abuse. A return to more restrictive access, particularly in the absence of effective competition law will not be of benefit to passengers or shippers.

Alliances, antitrust immunity and the level playing field

One possible element of international air transport that could potentially tilt the playing field is the evolution and future actions of the global airline alliances. Alliance building (or deconstruction) may be affected by potential cross-border mergers or acquisitions if ownership rules are relaxed. The discussion

below focuses on alliances, but the same arguments would hold for global carriers created through mergers or acquisitions.

In the early days of alliances in the 1990s, there were a number of budding global alliances, some of which eventually evolved into the three branded global alliances: Star, oneWorld and Skyteam. These alliances formed as a means of establishing a global network in a regulatory environment which did not allow mergers or acquisitions of carriers across borders. Northwest, Continental and KLM (Wings) kick-started the process, and were soon joined by United/Lufthansa/Air Canada/SAS/Thai Airways (Star), as well as Delta/Swiss/Sabena/Austrian (Atlantic Excellence) and American/Canadian/British Airways/Cathay/Qantas (oneworld). The key members of Wings and Atlantic Excellence eventually combined into SkyTeam and Wings ceased to be (it was never actually a formal association though they did co-operate) as did Atlantic Excellence. We are now down to three global alliances.

Regulator acceptance of these alliances, especially those requiring the granting of antitrust immunity, has generally been tied to open skies. Giving large immunised alliances access to a market characterised by restrictive traffic rights could be a recipe for carrier exercise of market power. Open skies or a similar regime with access for potential new carriers is a necessary condition for antitrust immunity to be granted to an alliance. Dealing with actual, or potential, abuse of market power, however, should not be done through the mechanism of ASAs. This is better done by general competition law rather than by sector specific bilateral treaties.

It should be noted also that competition law is applied differently in different jurisdictions. The EU would prefer that competition authorities be independent. However, different states will apply competition law in different ways. For example, in the United States, while the various antitrust laws are generally administered by the Department of Justice, in the case of airline alliances/ mergers/ acquisitions, the Department of Transportation has jurisdiction. Moreover, many states will assess alliances or mergers/acquisitions from more than the perspective of economic efficiency that competition law generally adopts. In Canada, for example, the Minister of Transport has a role in these assessments in order to balance national interests with the economic efficiency focus the Canadian Competition Bureau adopts. In New Zealand, the Transport Minister is responsible for alliance authorisations in order to achieve this same balance between economic efficiency gains and national interests. A one-size-fits-all approach for application of competition law to aviation is not likely an achievable goal.

A final implication of having a level playing field

Finally, it should also be noted that the allegory of the “level playing field” can be misleading. Just because a playing field is level does not mean that every game will have teams that do equally well and end in a tie score – there is more likely to be a victor than a draw. Level playing fields can and do generate winners. Moreover, the sports analogy is a zero-sum game. The experience of LCCs clearly illustrates that aviation is not a zero-sum game. New entry by LCCs with low fares has brought new travellers into the market, increasing the size of the pie for which the carriers compete. In aviation, gains by one airline can actually benefit another by stimulating the overall market, enabling other carriers to gain incremental traffic, if not market share.

Conclusions

The concern about a level playing field has raised its profile in aviation in recent years, yet few have defined what constitutes a level playing field, or alternatively, what makes a playing field unlevel.

In this chapter we review elements that are often cited in arguments about whether access should or should not be granted, and on what terms. We find the following do not constitute legitimate factors that should be addressed in an ASA in order to make a playing field "level":

- geographic advantage/disadvantage
- size of carrier
- differences in the cost of factors of production
- sixth freedom traffic opportunities
- technological advantages, and
- airport slots.

Legitimate areas of concern include safety and general carrier-specific subsidies. The latter concern does not include transparent subsidies for specific air service obligations, especially if eligibility for such subsidy is competitive and non-discriminatory. It also does not exclude economically efficient subsidies to infrastructure.

There is a need to keep watch on developments in global alliances, or potential cross-border mergers and acquisitions, to ensure the resulting carrier combinations do not engage in activities that constitute an abuse of market power. The mechanism to deal with this, however, is through the application of competition law. It should not be addressed by bilateral ASAs.

Many of the complaints heard today are attempts to negate natural inherent competitive advantages. This effectively seeks to deny consumers the benefits of lower costs and/or better service that arise from geographic, management and other legitimate advantages inherent to a number of air carriers.

Future areas for consideration

This chapter represents an initial look at what does and does not constitute a legitimate concern regarding the level playing field. It also looks at the role of liberalisation of bilateral ASAs in preventing the market abuse some wish to address by restricting access through levelling the playing field.

The issues covered above are a first cut. There are other factors that could also be brought into the discussion. What about interventions in the market to maintain capacity that might be needed for national emergency response purposes? Does the provision of war risk insurance tilt the playing field? The US Chapter 11 bankruptcy protection and similar provisions elsewhere are potential issues. Variation in personal income tax (rather than corporate taxes discussed above) may be another issue. The role of foreign ownership restrictions is potentially a factor to be considered. The theory of comparative advantage in international trade does not require that citizens of one country can purchase assets in another country, but such ownership provisions can enable better exploitation of economies of scale (if they exist) and utilisation of comparative geographic advantages. These and other issues will be the focus of future work.

References

Air Line Pilots Association White Paper, "Leveling the Playing Field for U.S. Airlines and Their Employees", 2012.

Arab Civil Aviation Commission, "Agreement for the Liberalization of Air Transport Between the Arab States."

Bloomberg, 2014. According to Bloomberg's website summaries of the two companies on 9 October 2014, Apple's market cap was 608,127.77 million USD while IBM's was 187,736.87 million USD.

Carter, Jimmy, "International Air Transportation Negotiations Statement of U.S. Policy for the Conduct of the Negotiations", August 21, 1978.

De Wit, Jaap G., "Unlevel playing field? Ah yes, you mean protectionism", *Journal of Air Transport Management*, 2013.

Dresner, Martin E., "The International Regulation of Air Transport: Changing Regimes and Price Effects," PhD dissertation, University of British Columbia, 1989.

Emirates, "Airlines and subsidy: out position," 2014. Available at http://www.emirates.com/english/images/airlines%20and%20subsidy%20-%20our%20position%20new_tcm233-845771.pdf

Findlay, Christopher and Andrea Goldstein, "Liberalization and Foreign Direct Investment in Asian Transport Systems", *Asian Development Review*, January, 2004.

Gillen, David, Richard Harris and Tae Hoon Oum, "Measuring the economic effects of bilateral liberalization air transport", *Transportation Research Part # 38*, 2002.

International Civil Aviation Organization, "Convention on International Civil Aviation", signed at Chicago, on 7 December 1944.

International Civil Aviation Organization, "Fair Competition in International Air Transport", Working Paper, Worldwide Air Transport Conference (ATCONF), Sixth Meeting, Montréal, 18 to 22 March 2013.

InterVISTAS-ga[2], "The Economic Impact of Air Service Liberalization", 2005.

Kahn, Alfred E., "The Deregulatory Tar Baby: The Precarious Balance Between Regulation and Deregulation, 1970-2000 and Henceforth", *Journal of Regulatory Economics 21:*1, 2002.

Kahn, Alfred E, Interview in *The First Measured Century,* Public Broadcasting Services. Text of interview is available at http://www.pbs.org/fmc/interviews/kahn.htm. 2000.

Rose, Nancy L., "After Arline Deregulation and Alfred E. Kahn:, *American Economic Review: Papers and Proceedings*, 2012.

Wills-Johnson, Nick and Fred Affleck, "A problem looking for a solution or a solution looking for a problem? Economic regulation of railways in logistics chains", *29th Australasian Transport Research Forum*, 2006.

World Trade Organization, World Trade Report, 2006.

Chapter 4
European Union air transport liberalisation: process, impacts and future considerations

This chapter discusses the liberalisation of air transport within the European Union and discusses how the creation of a deregulated internal market has led to strong traffic growth throughout the EU.

Introduction

US deregulation and EU liberalisation

The stepwise liberalisation of the EU internal aviation market resulted in 1993 in an open internal market that generated a series of supply side responses, which are partly comparable with the changes demonstrated in the deregulated US domestic air transport market.

However, the starting point was quite different between these two markets. For example, until the deregulation in 1978, US legacy carriers operated a domestic crisscross network whereas the two flag carriers, Pan Am and TWA operated at various US gateways in stand-alone international networks based on bilateral air service agreements (ASAs) concluded between the United States and other states. After the deregulation, domestic major carriers transformed their crisscross domestic networks into radial hub and spoke networks (except the Delta hub at Atlanta that already existed before the deregulation). The domestic hubs in these networks also became the launching platforms for international operations when these domestic major carriers started to use their domestic feed for international operations. All in all, the former domestic major carriers became the new flag carriers in international markets, whereas the former two flag carriers went bankrupt due to the lack of domestic feed in order to adequately compete with these new internationally operating airlines.

In Europe, the liberalisation started under very different socio-economic and (aero)political circumstances. In each EU member state, a state-owned national airline already operated a starburst international and intercontinental network at its national home base. However, most of these networks were not hub-and-spoke networks in a strict sense as temporal coordination of the flight schedule was lacking at those home bases (Burghouwt & De Wit 2005). The national airline was the designated carrier for the bilateral ASAs concluded between that individual state and other states inside and outside Europe. The process of stepwise liberalisation of the internal market was simultaneously combined with an increasing number of bilateral open skies agreements and separately granted antitrust immunity on an ad hoc basis between individual EU member states and the United States. As a result, as Burghouwt & De Wit (2005) and Burghouwt (2007) showed, the national “flag carriers” developed their radial networks and national home bases in the 1990s into fully fledged hub-and-spoke systems with intensified wave-systems, leading to quickly rising hub connectivity levels. The rise of the hub-and-spoke systems in Europe also enabled the emergence of intercontinental multi-hub systems with alliance partners in the United States, leading to “dog-bone” networks, which strongly stimulated demand in the behind and beyond markets of these coupled hubs. An important difference remained between US major carriers and EU national airlines. National airlines in the EU continued to focus only on national

and international routes in a hub and spoke network from their national home base, without developing new hubs elsewhere in Europe. However, US carriers started to operate at various hubs covering the entire US domestic market after the deregulation.

Furthermore, in the European market another type of business model was applied successfully that hardly existed in the US market: the non-scheduled holiday charter operator providing total seat capacity of their aircraft to tour operators for resale to passengers either booking their flight under Advance Booking Charter (ABC) conditions in the North Atlantic market or Inclusive Tour Charter (ITC) conditions in the Mediterranean holiday market. The success of this business model in Europe was reflected in the expectations that unscheduled operations would equal the scheduled international traffic in Europe by 1975/76 (Doganis, 1973). The regulatory conditions within which non-scheduled carriers could operate varied from country to country, ranging from prior authorisation of incoming flights to special air service licences. After the liberalisation, inclusive tours continued to be offered by tour operators after the transformation of the charter carriers into so-called leisure airlines. This was due to the third package of liberalisation measures by which the distinction between scheduled and non-scheduled operations became superfluous after the introduction of the concept of a community air carrier (Council Regulation (EEC) No 2407/92) as well as the removal of restrictions on market entry, capacity, frequency and pricing (Council Regulation (EEC) No 2408/92 and No 2409/92). This enabled the former charter operators to convert their air services to the schedule mode and to transform into scheduled leisure airlines. The more or less comparable type of operation in the United States, the so-called supplemental carrier, only played a very limited role in the US market. However more recently the US low-cost carrier (LCC) Allegiant Air successfully started to sell an unbundled version of the traditional package tour product by a self-packaging formula for accommodation and air trips separately.

Taking into account the unique characteristics of the European air transport market, this chapter will provide an overview of the process and impact of European air transport liberalisation. We will start with a description of the creation and liberalisation of the internal aviation market. Then, we will shift our focus to the impact of intra-EU liberalisation during the period 1990-2014, will touch upon the external dimension of EU liberalisation and discuss the issue of merger control within the context of consolidation in the liberalised EU air transport industry. Finally, we conclude with a discussion of the future perspective for the liberalised EU air transport industry.

The creation of the internal market

Progressing liberalisation

Until the entry into force of the EU internal air transport market regulations on 1 January 1993, intra-EU routes were to a large extent monopolised by the EU flag carriers such as British Airways, Air France, Lufthansa, Alitalia, Iberia, KLM and so forth who were operating their intra-European network under bilateral ASAs concluded by their respective states. Hence, Air France was allowed to fly, by virtue of those agreements, from Paris, and other points in France, to bilaterally agreed points in the United Kingdom, but not from, for instance, Rome to Madrid. As a consequence, such carriers were, on the one hand, limited as to the choice of their operations because they were generally restricted to markets governed by bilateral regimes, that is, in the above case, the market consisting of points between France and the United Kingdom. On the other hand, they were also protected by their governments who decided which level of market freedom should be available for their carriers in order to survive the interplay of market forces. Thus, if need be, such bilateral arrangements were adjusted for the benefit of the designated carrier or carriers of either side. In short, bilateral ASAs regulated, and, in many cases,

restricted market entry, and market opportunities, for the benefit of these traditional flag carriers. As a result, the number of effective competitors at the route level was low in the early nineties and the share of single carrier routes even further increased until 1995 (see Figure 4.7).

Such a scheme was not in line with the EU principles proceeding from an "open market with free competition" (see Article 119 of the Treaty on the Functioning of the EU). That is why, at the end of the 1980s, the barriers for the operation of intra-EU flights were gradually removed, stimulated thereto by the United Kingdom and the Netherlands proclaiming liberal aviation policies in the then EEC.

However, for commercial reasons, the incumbent flag carriers did not, and have not made full use till today of the freedoms afforded to them: Iberia's operations are still limited to routes which start and end in Spain, and Lufthansa's network is based on points from and to Germany. Figure 4.8 shows that the use of the freedoms by flag carriers is limited. This is in sharp contrast with the segment of LCCs, which make extensive use of the opportunities that exist in the liberalised market (see the Emergence of LCCs in Europe Section).

Introduction of market principles into the air transport sector of the European Union

The above liberalisation measures did not only introduce the freedom for an EU air carrier as defined under relevant EU law to operate any route within the EU, but also removed restrictions as to capacity, that is, the equipment an EU air carrier so designated is allowed to use on the mentioned operations and the frequencies of such operations, as well as the freedom to set prices in accordance with the market rather than government dictated – as was the case in the aforementioned bilateral agreements – principles. At the same time, the distinction between scheduled and non-scheduled services has been largely removed so as to enable all types of air carriers holding EU operating licences, as explained in the next section, to provide services anywhere within the EU internal market, in accordance with demand.

The new freedoms were principally exploited by the newcomers in the second half of the 1990s such as EasyJet and Ryanair, as well as other (low-cost) carriers and former charter carriers. Their route network is principally different from that of the incumbent flag carriers (see the Emergence of LCCs in Europe section).

The internal dimension

A topical question concerns the definition of an EU air carrier as the above freedoms for the operation of intra-EU services are exclusively granted to them.

In short, an EU air carrier is a carrier which:

- is majority, that is, more than 50%, owned by EU states or their nationals, in terms of shareholding
- is effectively controlled by EU states or their nationals, that is, such persons must exercise a decisive influence on the management of the EU air carrier
- has its principal place of business in an EU state, which state has granted a valid operating licence to the air carrier in question.

The topicality of the above conditions is demonstrated by, among others, the investments made by the Arab carrier Etihad into airberlin, Alitalia and other European carriers. Consequently, the EU Commission

must examine whether these air carriers can still be qualified as EU air carriers in order to protect the values of the internal EU market, which values are reserved for EU air carriers only.

These examinations are all the more important as the external/international air transport market is not liberalised but still governed by bilateral ASAs, which can be very restrictive in terms of market access and market behaviour, but may also have a far more liberal character as exemplified by so called open skies agreements including the EU-US agreement on air transport (see the EU external aviation policy Section).

The external dimension

As a consequence of decisions made by the Court of Justice of the EU in 2002 in the so called open skies cases, the EU air carrier clause, also known as the "community air carrier clause", had, to be implemented in bilateral ASAs concluded between the EU states and third states in order to guarantee and implement the Freedom of Establishment in this sector. In practice, KLM should be entitled to fly not only between Amsterdam and points in Brazil, but also from, for instance, Madrid, if it has an establishment there. In the summer of 2014, over 1 000 out of about 3 000 of such bilateral agreements encompass the EU air carrier clause instead of the traditional air carrier clause based on the true nationality of the air carrier, hence, the Dutch nationality of, for instance, KLM.

Obviously, this EU air carrier clause helps to secure the operation of traffic rights by EU carriers whose nationality expressed in terms of ownership and control of the undertaking, that is, the air carrier, in question, is affected by a merger or takeover, such as KLM, Swiss or Austrian Airlines. On the other hand, it has not contributed to the provision of off-line air services by EU air carriers as such off-line operations, that is, operations carried out outside the principal hub and home country of the carrier, for instance, the operation of flights by Air France from Rome to New Delhi, are not lucrative undertakings.

The application of competition to the air transport market

The internal air transport market rules were supplemented by implementing rules for the air transport sector, including exemptions from the scope of the EU competition rules. As bilateral provisions governing the air services operated by the former national air carriers, which had now become EU air carriers were superseded in 1993 by the internal air transport regime, the newly acquired freedoms of the undertakings, that is, the EU air carriers came under the supervision of the EU competition authorities, that is, the EU Commission. This body has vigorously applied and enforced these rules, which principally address concerted actions conducted by EU air carriers, and abuses of dominant positions by them.

The EU competition rules also include rules on state aid, which have been, applied myriad times to EU air carriers in the 1990s and in the first decade of the 21st century, and which have contributed to, among others, the disappearance of former flag carriers such as the Belgium carrier Sabena and Swiss Air. The EU state aid rules are now applied to airports, which also have to behave as commercial undertakings and which are, hence, not allowed to favour certain carriers, as to which see the well know Charleroi-Ryanair case (see "Competition provisions as applied to the operation of an airport" section).

In the context of the enforcement of the EU competition regime, EU and non-EU air carriers whose operations affect the functioning of the EU internal market are also subject to the EU Merger Regulations. In the past ten years, the EU authorities, namely, the Commission and the Court of Justice of the EU have scrutinised mergers concerning, among others, Air France-KLM, Lufthansa-Swiss and Lufthansa-Austrian Airlines, and British Airways-Iberia, and subjected the approval of them to conditions

which are concisely addressed in the section on merger control. The envisaged merger between Ryanair and Aer Lingus has not been sanctioned as Ryanair is supposed to become too dominant on certain routes when it absorbs Aer Lingus, especially on the Dublin London route. The same happened to the Greek carriers Aegean and Olympic in the years 2012 and 2013 as the merged entity was also perceived to become too dominant on certain domestic and international routes. The last mentioned merger was eventually approved by the EU Commission on 9 October 2013. The Commission argued that the merged entity would create the conditions for the establishment of a sustainable and competitive Greek carrier, capable of supporting Greek tourism and the local economy.

Next to the application of competition rules, EU and other air carriers flying into and from EU airports, are also dependent on the availability of slots and must meet safety and environmental conditions. Congestion at airports as a consequence of the increase of air traffic, coupled with environmental concerns, has led to a shortage of slots. This phenomenon has sometimes impeded market access for new entrants as the traditional carriers, including former flag carriers, jealously kept their slots under "grandfather rights" regimes. The EU Commission is addressing this subject, which also raises competition related concerns. Slot trading could remedy current market entry problems.

The impact of liberalisation on the European market

Introduction and methodology

The creation and opening up of the EU internal market has had substantial impacts on the structure of the market, entry, competition, consolidation and rise of new business models. Yet, although the impact of European air transport liberalisation has received considerable attention during the early period of the internal, liberalised market (Button 2001; CAA 1995, 1998; Doganis 1994; Graham 1998; Morrell 1998; Reynolds-Feighan 1995; Williams 1994, 2002) as well as for separate geographical markets (Belén Rey 2003; Thompson 2002), its longer term overall impact has been studied much less intensively, except perhaps for Dobruszkes (2009) who analyses changes in competition levels and use of freedoms within the EU over the 1991-2005 period. In the following sections, we will contribute to the understanding of the long-term impact of EU liberalisation by providing an analysis of the supply side developments in the common EU aviation market since the beginning of liberalisation over a 24-year period.

Based on time series OAG airline schedules database covering the years 1990-2013 for a representative week in each year[1], this section will provide an overview of the development of a number of key indicators between 1990 and 2013 that together give insight into the longer term impacts of the creation and liberalisation of the internal European air transport market: airline output, number of carriers in the market, number of carriers at the route level, the use of the freedoms of the air, rise and impact of the low-cost carrier, the position of the (former) "flag" full service carrier and airline industry consolidation. As the year 2000 was lacking in our time series data, we have estimated the 2000 results by means of interpolation. Only unique, direct scheduled flights have been included in the analysis. Indirect connections, code-shared duplicating flight options and non-scheduled operations have not been taken into account.

The analysis in the following sections will focus on the direct liberalisation impacts on the air transport market itself. The well-known sequence of: liberalisation → new and better air services → air traffic growth → economic growth → new employment (Intervistas, 2006) is outside the scope of this chapter.

To make consistent comparisons over the various years, we have chosen a stable set of countries as the spatial base for our analysis: the EU15+2 area, which consists of the 15 countries that in May 1994

composed the European Union before the entry of the ten accession countries. To this region, we have added Switzerland and Norway. In addition, we have categorised the airlines operating within the EU15+2 areas into different business models: the (former) flag full service carriers (flag carriers), LCCs, leisure carriers, other carriers (regionals, hybrids, air taxi's etc.) and extra-EU15+2 carriers. Admittedly, such a categorisation, in particular over a prolonged period of time, always brings with it arbitrary choices as business models in the airline industry are dynamic and increasingly hybrid. These considerations should be born in mind when interpreting the results of our analysis. The categorisation of LCCs will be discussed in more detail in the "Which airlines belong to the low-cost carrier category" section.

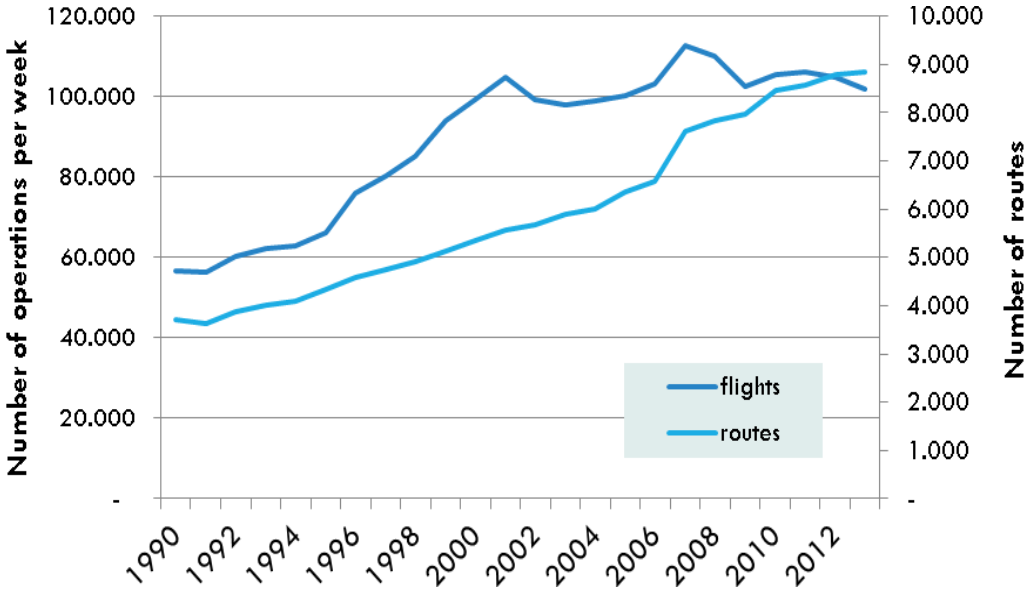
Expansion of the liberalised industry in three phases

One of the most noticeable impacts of liberalisation has been the expansion of the European airline industry. Not tied to the bilateral ASAs anymore, European carriers initiated new services including airlines' increased frequencies on existing routes, new routes opened and new operators entering the market. The resulting increase in service levels and lower air fares stimulated demand, leading to further output expansion. Between 1990 and 2013, the number of intra-EU15+2 flights increased by 80%, while the number of routes increased by 138% over the same period. Regarding the expansion of the market, we can roughly distinguish between three phases.

Phase 1: the early years

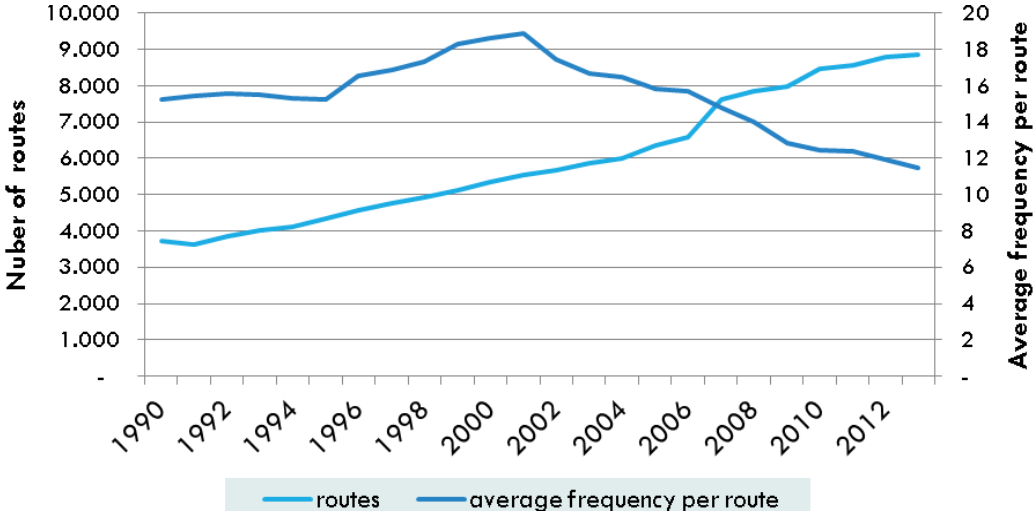
The first phase is the 1990-1993 period, starting with the second package of liberalisation measures in November 1990 until the third package of liberalisation measures took effect in 1993. The second package gave all EU carriers the opportunity to carry unlimited third and fourth freedom traffic, but still with substantial restrictions in terms of multiple designation, fifth and seventh freedoms, and cabotage[2.] Also influenced by the economic downturn in the early 1990s, this period is characterised by relatively low growth rates in frequencies and routes compared to the second half of the 1990s (Figure 4.3) Average route frequencies remained stable at 16 flights per week (Figures 4.1 and 4.2) and, at the route level, the number of effective carriers did not yet increase (Figure 4.6).

Figure 4.1 Number of routes and number of flights within EU15+2, 1990-2013



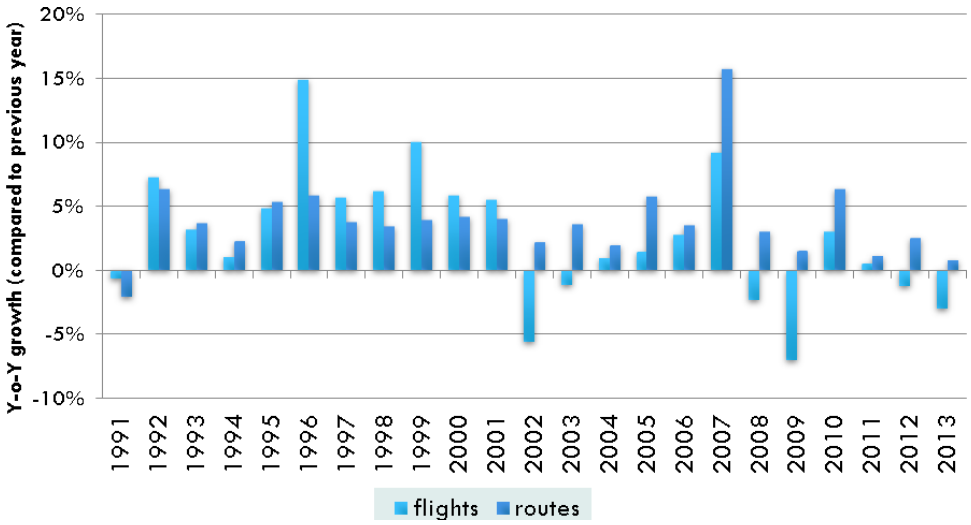
Source: OAG (2015); analysis by authors.

Figure 4.2. Number of routes and number of flights within EU15+2, 1990-2013



Source: OAG (2015); analysis by authors.

Figure 4.3. Year-on-year growth of number of intra-EU15+2 scheduled flights and number of scheduled routes (airport-pairs) compared to previous year, 1990-2013



Source: OAG (2015); analysis by authors.

Phase 2: growth of the flag carrier and hub-systems (1994-2000)

The second phase between 1994 and 2000 is characterised by a rapid growth in the number of flights relative to the increase in the number of routes, resulting in an increasing average weekly frequency per route (Figure 4.1 and 5.2).

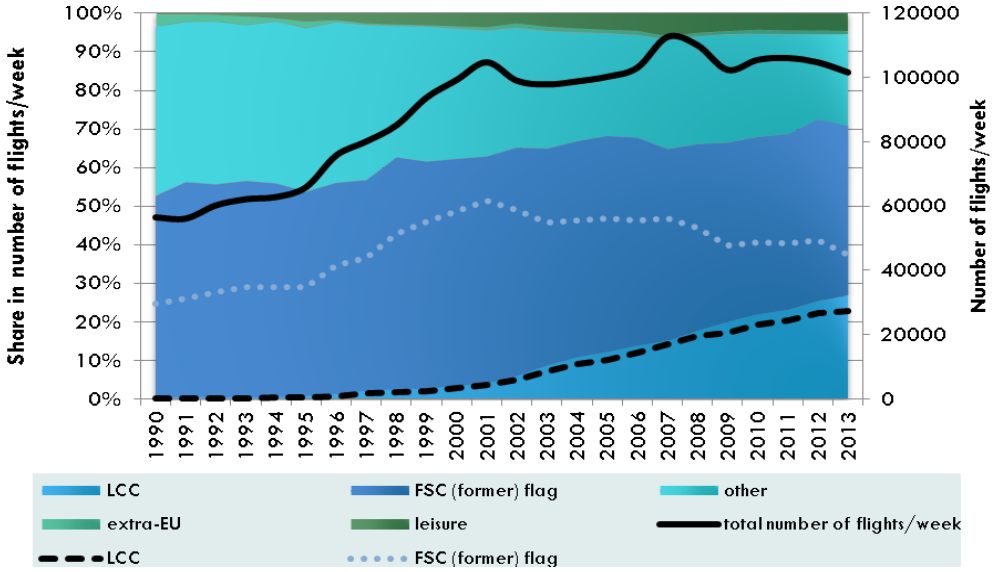
The higher average frequencies per route were partly the result of the intensification and adoption of hub-and-spoke networks by the (former) flag full-service carriers during the second half of the 1990s. Airlines such as Lufthansa, Swiss Air and KLM intensified the wave-systems at their hubs, while other flag carriers such as Iberia, Air France and Alitalia started to develop hub operations at their national airports by developing planned connection waves (see also the section on the rise of EU hubs). Both the intensification of the wave-systems of the flag carriers and the establishment of such systems led to higher frequencies at the feeder routes into the hub, benefitting from the advantageous economic conditions during the second half of the 1990s. The share of these carriers in the intra-EU15+2 markets increased substantially during the second phase (Figure 4.4).

Moreover, new carriers took advantage of the opportunities in the liberalised market to break the monopoly of the flag carriers. The share of monopoly and duopoly routes went down during the second phase, whereas the share of routes with three carriers or more increased (Figure 4.7). The increased effective competition at the route level is also demonstrated after weighting for the individual market shares of the competitors per route (Figure 4.6). Yet, as cabotage only became fully possible as of April 1997, domestic routes inside individual member states remained less sensitive to these increases in competition till 1997.

In sum, the second half of the 1990s offered favourable economic and regulatory conditions for the rise of the flag carriers in Europe, operating hub-and-spoke networks centred on their national airports. On the one hand, economic growth stimulated aviation demand, fuel prices were declining and many routes were still underserved. On the other hand, the third package gave them unlimited third, fourth, fifth, sixth and seventh freedom rights, and, as from 1 April 1997, also eighth and ninth (cabotage) freedom

rights (see Annex 4.A), which was exactly what they needed to build up their national hub operations. At the same time a few LCCs were testing the market and slowly took off.

Figure 4.4. Share of different carrier types in the total number of intra-EU15+2 flights



Note: the sharp 2006-2007 increase is –apart from network expansion by Ryanair- the result of leisure non-scheduled carriers such as First Choice Airways, MyTravel and Thomsonfly starting semi-scheduled operations to holiday destinations and as such included in the OAG-data. Hence, the capacity was already in the market but was not yet labeled as scheduled.

Source: OAG (2015); analysis by authors.

Phase 3: the era of the low-cost carrier (2001-2013)

After a continuous increase in average frequency per route during the second phase, in 2000 a third phase started, marking a continuous decline in the average frequency per flight until 2013, as well as a stabilisation of the total number of intra-EU15+2 flights (Figure 4.1), but a continuous expansion of the number of routes. As of 2006, the number of effective carriers at the route level starts to stabilise after a long period of continuous growth (Figure 4.1).

The full access to the EU aviation market (including unrestricted cabotage rights as of 1 April 1997) gave LCCs the opportunity to fully penetrate the European market, including the member states' domestic markets. They took advantage of the opportunity to establish an ever-increasing number of crew and aircraft bases all over Europe, whereas the flag carriers remained designated to their national home bases. This was for operational reasons of hubbing as well as aeropolitical reasons of nationally restricted traffic rights with regard to intercontinental routes. Facilitated by the introduction of direct Internet booking platforms, LCCs started to gain market share quickly at of the end of the 1990s (see also Figure 4.4). Yet, their business model is essentially different from that of the full-service network carriers: sufficient route density is not created through complex hub-and-spoke operations, but by serving an extended catchment area by using a low unit cost base to charge low fares, generate new market demand and serving routes at a lower frequency than the full service carriers. Hence, the growth of the LCC segment took place by means of quick expansion of the number of routes but at relatively low -and over time- declining average frequencies per route. The declining average frequencies at the route level may increasingly reflect the problem of starting new routes with a sufficient route density to at least

operate a once a week frequency. This may indicate a saturation of viable secondary routes, as argued by De Wit and Zuidberg (2012). We will get back to the growth limits of the LCC model in the liberalised EU market in the section on the emergernce of LCCs.

In addition, the growth in the number of flights and routes served by the flag carriers stagnated and became negative as of 2000, resulting in a substantially declining share in the number of intra-EU15+2 flights between 2000 and 2013 (Figure 4.4). First of all, the declining share and stagnation/negative absolute growth of the (former) flag carriers such as Lufthansa and Air France can be explained by the consolidation in the European airline industry, which from 2000 (with the bankruptcies of Sabena and Swiss Air) also started to affect the flag carriers (see Figure 4.21). Secondly, the flag carriers have been rationalising their networks since the beginning of the century in response to increasing competition from both inside the EU market (LCCs), outside the EU market (Turkey and the Gulf) and adverse economic conditions (rising fuel prices and economic downturns). Some airline bases have been de-hubbed by their respective home carriers, such as Milan Malpensa (Alitalia), Barcelona (Iberia) or have been drastically downsized (Copenhagen by SAS) (see also the "Development of full service network carriers" section). Thirdly, the stabilising number of frequencies served by the flag carriers may also indicate a certain saturation of the continental market of the EU hubs.

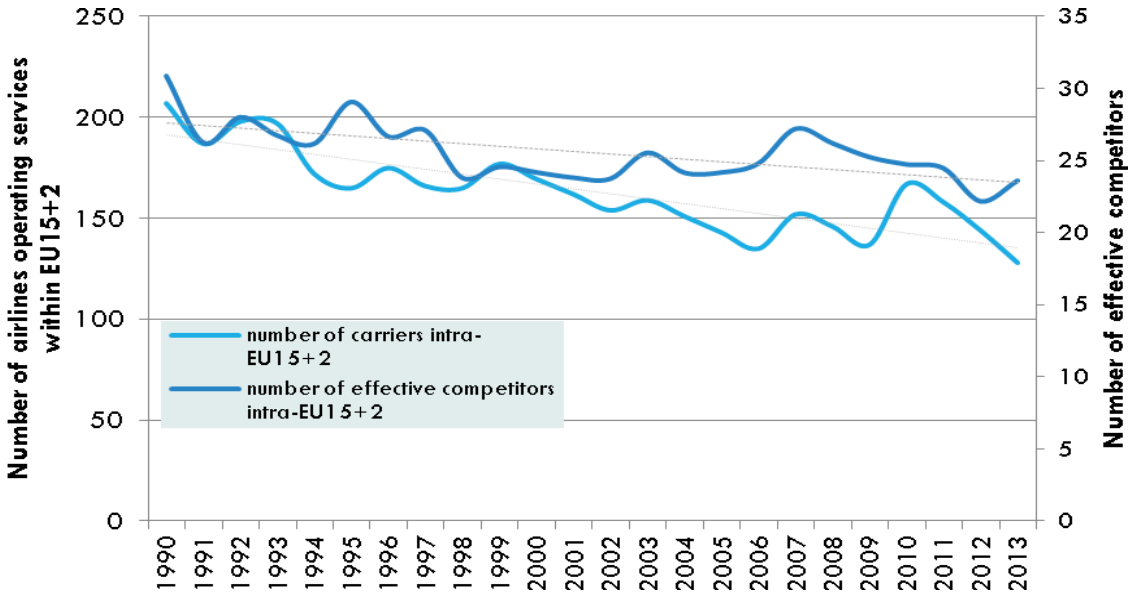
Hence, from 2000 on, the quickly growing LCC segment in combination with a decline of the (former) flag full-service carrier share resulted in further growth of the intra-EU route network but also in stagnating frequency growth and declining average route frequencies in this third post-liberalisation phase.

A consolidating industry with more players at the route level

After deregulation of the US domestic market, a first phase of new entry was followed by a phase of industry consolidation, characterized by take-overs, mergers and bankruptcies. Morrison & Winston (1995) showed that the number of effective competitors[3] in the US domestic airline industry increased rapidly after 1978, to fall substantially again after 1987 and reach a low, stable level. Do we see a similar pattern for the liberalised EU air transport market?

According to CAA (1995; 1998), the EU market saw a 40% increase in the number of carriers operating in the market between 1986 and 1990. From 1990 on, according to our OAG database on scheduled services, the number of effective carriers in the intra-EU15+2 market has – apart from some ups and downs- decreased from over 200 in 1990 to less than 130 in 2013. In other words, the European airline industry has been consolidating since the early 1990s, although this consolidation trend seems to have accelerated since the start of the economic crisis in 2003 (Figure 4.5). We expect the consolidation trend to be more severe in reality, as we have only looked at the number of operators with unique codes.

Figure 4.5. Number of scheduled and effectives carriers with services within EU15+2 and number of effective carriers, 1990-2013

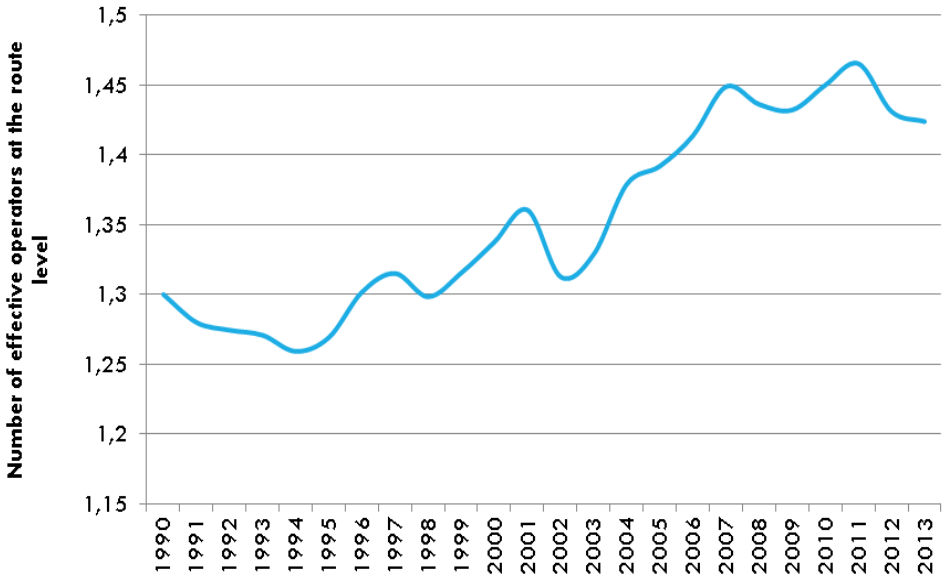


Note: Number of effective carriers: 1/hhi at industry level. Input to the HHI are total number of weekly flights

Source: OAG (2015); analysis by authors.

Fewer effective players at the EU market level do not necessarily result in decreased airline competition, for it is at the route level that airlines compete head to head according to the relevant market approach of the European Commission. In the EU15+2, the declining number of effective players at industry level has not resulted in a decrease in the number of effective players at route level. On the contrary, the number of carriers at the route level has been on the rise since 1994, when the third package of liberalisation measures came into force (Figure 4.6). Since 2007, the average number of effective carriers at the route level has stabilised around 1.45. The result for the EU-market is more or less in line with the developments following industry consolidation in the US domestic market: sharply rising concentration levels after 1987 did not result into more concentration at the route level (Morrison & Winston 1995) and concentration levels were still much lower than before deregulation.

Figure 4.6. Weighted number of effective carriers at the route level for intra-EU15+2 flights, 1990-2013

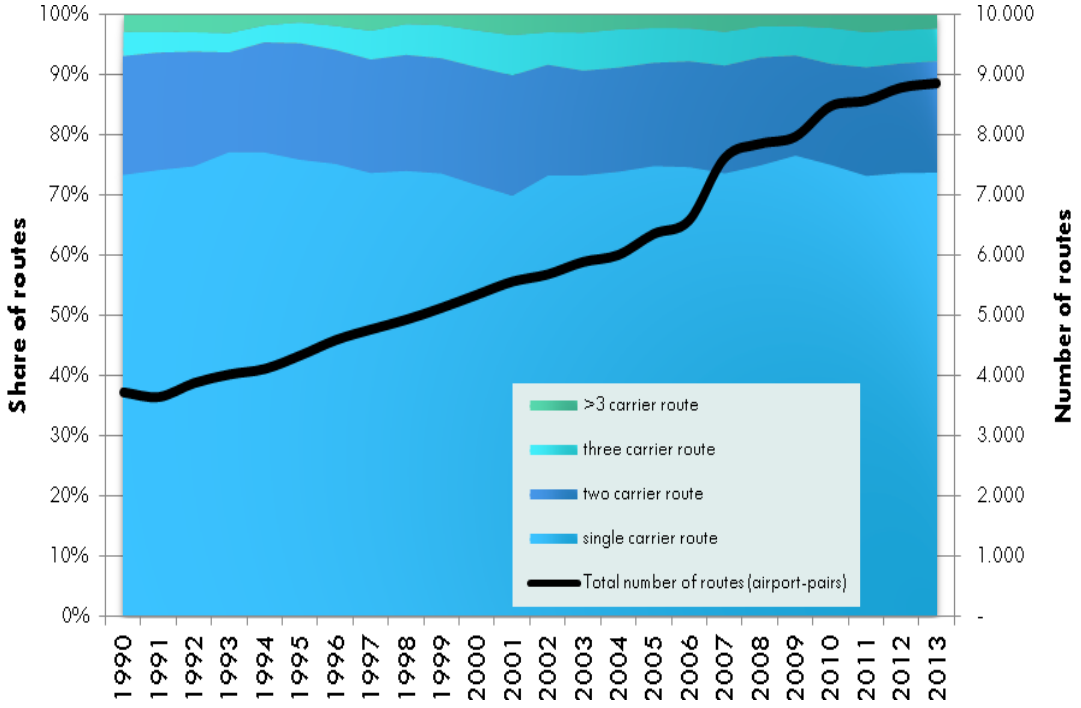


Note:The n umber of effective carriers: 1/HHI (Herfindahl–Hirschman Index) at the individual route level weighted by the share of the route in total number of flights in the EU15+2 market. Input to the HHI are number of weekly frequencies by a published carrier at the route level.

Source: OAG (2015); analysis by authors.

The increasing number of effective carriers at the route level is not fully mirrored by the development of the share of single carrier and multi-carrier routes (Figure 4.7): the share of single carrier routes within the EU15+2 decreased during the second phase (1993-2000) to increase again after 2000. Over the entire 24-year period of analysis, the share of single carrier routes has remained stable at 26%. In absolute terms, the number of single carrier and multi-carrier routes increased at an equal pace. However, such an analysis does not take into account the output of various carriers at the route level, nor does it take into account the relative weight of the routes[4] within the entire intra-EU15+2 aviation network. A weighted analysis using a concentration ratio is shown in Figure 4.6 which reveals the increase in the number of effective carriers at the route level.

Figure 4.7. Number of routes and number of carriers operating at the route level (intra-EU15+2), 1990-2013



Note: See Note for Figure 4.4.

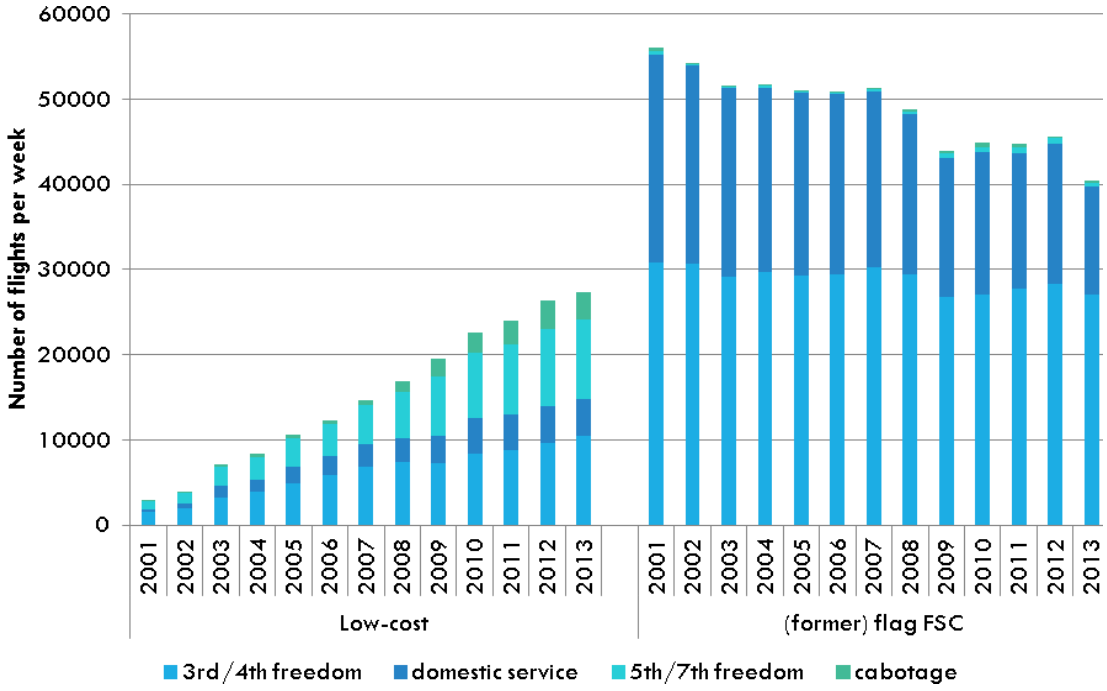
Source: OAG (2015); analysis by authors.

Use of freedoms

The extent to which carriers have actually made use of the extended Freedoms of the Air, in particular with respect to the use of the seventh to ninth freedom rights (Annex 4.A) is an important indication of the impact of the liberalisation and creation of a common EU aviation market.

For a selection of EU flag carriers and LCCs we have categorised their intra-EU operations according to type of freedom used. As already noted, we must conclude that full-service carriers mainly used the freedoms of the liberalised market to increase third/fourth freedom operations between their country of origin and other EU countries (Figure 4.8) (and combined them into sixth freedom in order to carry transfer traffic). By far the majority of their operations consists of domestic and third/fourth freedom operations. Exceptions were certainly there: e.g. Lufthansa operated for some time a mini-hub at Milan Malpensa after the de-hubbing of Malpensa by Alitalia. The business model of the flag carriers demands concentration of the network at one or a few central hubs in order to maximise network economies. Also setting up foreign hub operations is a costly and risky undertaking. Furthermore, ongoing bilateral regulation of extra-EU air services continued to pin them down on their national home bases.

Figure 4.8. Categorisation of intra-EU15+2 services by freedom of the air for selected European carriers



Note: Selection of EU carriers: (former) flag full-service carriers except SAS and the low-cost carriers as defined in this paper (see Annex 2)

Source: OAG (2015); analysis by authors.

The results for the flag full service carriers contrast sharply with the operations of the LCCs. Over 45% of LCC operations in 2013 were fifth to ninth freedom operations. This result is in line with the earlier findings of Dobruszkes (2009) for 2005. Their low-cost business model is fully focused on the current Common Aviation Area, avoiding complex hub-and-spoke operations. This allows for pan-European operations more easily than the flag full-service carriers, which have to combine their European operations with their long-haul network at their hubs under the bilateral air service regime (see above).

The emergence of low-cost carriers in Europe

Which airlines belong to the low-cost carrier category?

An important impact of the open aviation market in Europe is the emergence of the low-cost and low fare airline (LCC) business model.

However, the LCC model as such does not exist. A wide range of business models can be observed that more or less correspond with LCC characteristics. Budd et al. (2014) distinguish 1) diversified charter operators such as airberlin, Jet2 and Transavia, 2) Southwest copycats such as easyJet, Norwegian, Wizz Air and Ryanair and 3) Full-service carrier subsidiaries such as Vueling, germanwings.

The lists of airlines classified as LCCs in the literature strongly depend on the selection criteria applied in the various analyses. For example, Budd et al. (2014) require the application of eight out a larger set of

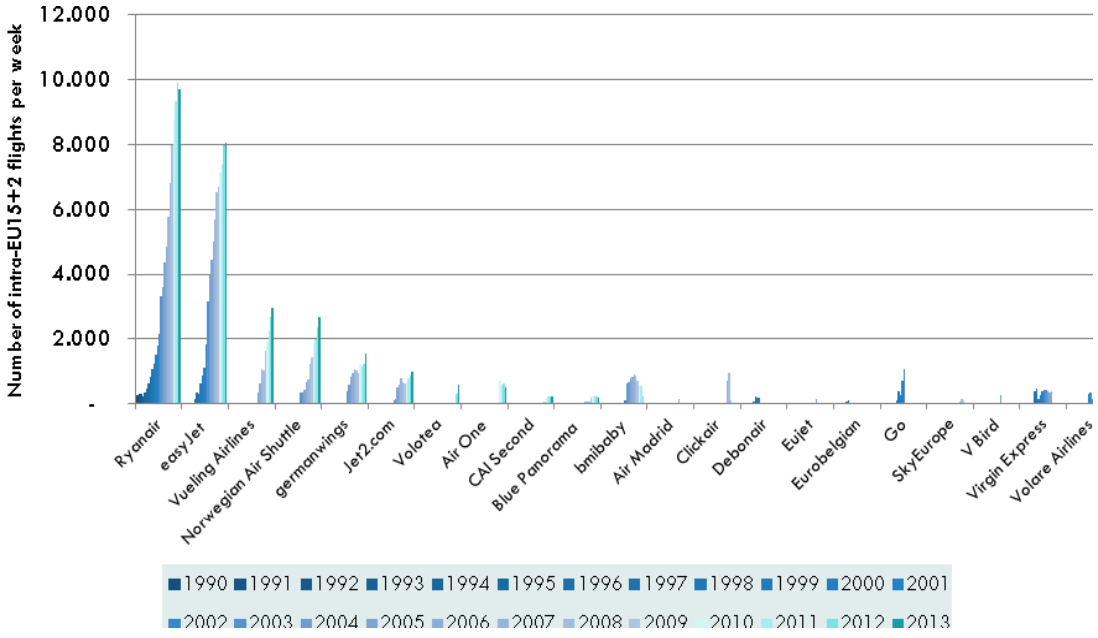
cost minimisation strategies for an airline to be qualified as an LCC, resulting in a set of 10 carriers still operating in the market of 2012. These criteria are partly comparable with the selection criteria used by Klophaus et al. (2012). But even then the resulting set of 20 selected airlines is remarkably different from the one Budd et al. (2014) selected. Dobruszkes (2013) also provides a substantially different set of 16 LCCs in 2012. He selects airlines which offer fares of around EUR 0.10 per seat-kilometer and/or half the price offered by the incumbent carriers.

Not only the selection criteria plays a role in the resulting set of LCCs. The geographical dimension is also important. It is obvious that the EU12 shows a different set of LCCs than the EU28 or the European Economic Area (EU12+3, namely, Norway, Iceland and Lichtenstein, also referred to as EEA). Budd et al. select airlines within the European Economic Area, whereas Dobruszkes (2013) makes selections from the whole current Common Aviation Area.

Thirdly, the time dimension contributes to the differentiation in LCC selection. Budd et al. (2014) report 43 LCC airlines in the European Economic Area that entered the market whereas 33 of them left the market between 1992 and 2012. So the timeframe or the year of the analysis also matters.

The LCC selection we use in this analysis is comparable with the selection of Budd et al. (2014). However we mainly focus on "Southwest copy cats". This resulting selection is summarised in Annex 2 that not only shows the market entry and exit (if applicable) in the period 1990-2013 but also the performance of each carrier in the years of operation for airlines in the EU15+2. Annex 4.C shows the different LCC selections found in the literature.

Figure 4.9. Categorisation of intra-EU15+2 services by freedom of the air for selected European carriers



Note: Selection of EU carriers: (former) flag full-service carriers except SAS and the LCCs as defined in this paper (see Annex 2)

Source: OAG (2015); analysis by author.

Figure 4.9 shows the rapidly growing market size of the individual LCCs included in our analysis. This clearly illustrates the dominant role of Ryanair and easyJet, followed by the second tier LCCs Vueling

Airlines, Norwegian Air Shuttle and Wizz Air. Note that the last one is missing here due to the consequence of only considering airlines operating services within the EU15+2 areas. Further, note that the continuous and rapid growth of Ryanair is interrupted in 2013.

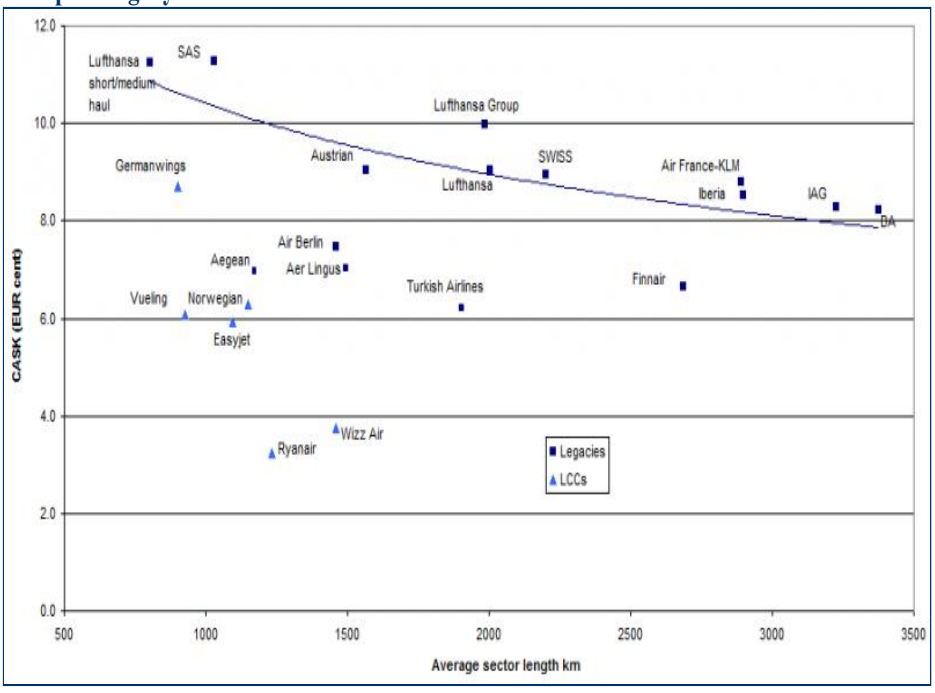
The LCC figures in this paper are based on the selection in Annex 2, unless indicated otherwise.

Market share of low-cost carriers in the intra-European market

The LCCs rapidly made substantial inroads in the intra-EU market after the liberalisation (Figure 4.4), partly by generating new demand on unique routes partly by cannibalising demand of full-service carriers in direct competition on the same routes and partly also indirectly on parallel or semi parallel routes. The low-cost market share in Europe grew in the period 2001-2013 from 3% to 27%[5]. The difference in air fares between full-service carriers and LCCs reflected in the structurally lower unit costs strongly contributed to this growth in market share by generating new low fare demand.

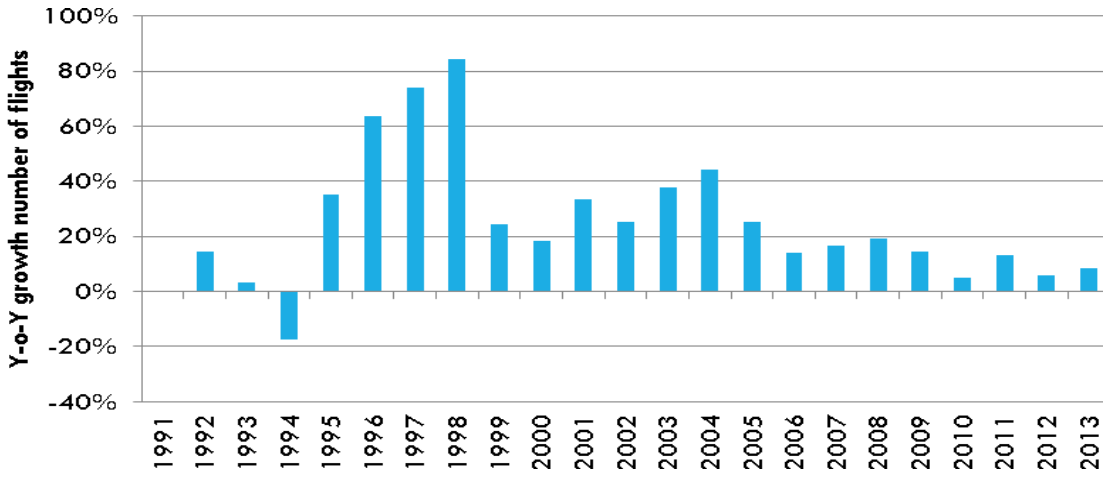
Figure 4.10. Unit cost differentials for selected European FSCs and LCCs in 2012

Unit costs (cost per available seat kilometre, EUR cent) and average sector length for selected European legacy and low-cost carriers: 2012*



*Financial year ends as follows: Germanwings Dec-11, Aegean Airlines, Air Berlin, Turkish Airlines, Lufthansa, Aer Lingus, IAG, Iberia, BA, Air France-KLM, Finnair, Norwegian, Vueling Dec-2012; SAS Oct-2012; easyJet Sep-2012; Wizz Air, Ryanair Mar-2012.
Source: CAPA analysis of company accounts and traffic data

Figure 4.11. Annual growth of the number of low-cost carrier intra-EU15+2 flights 1990-2013, compared to previous year



Source: OAG (2015); analysis by authors.

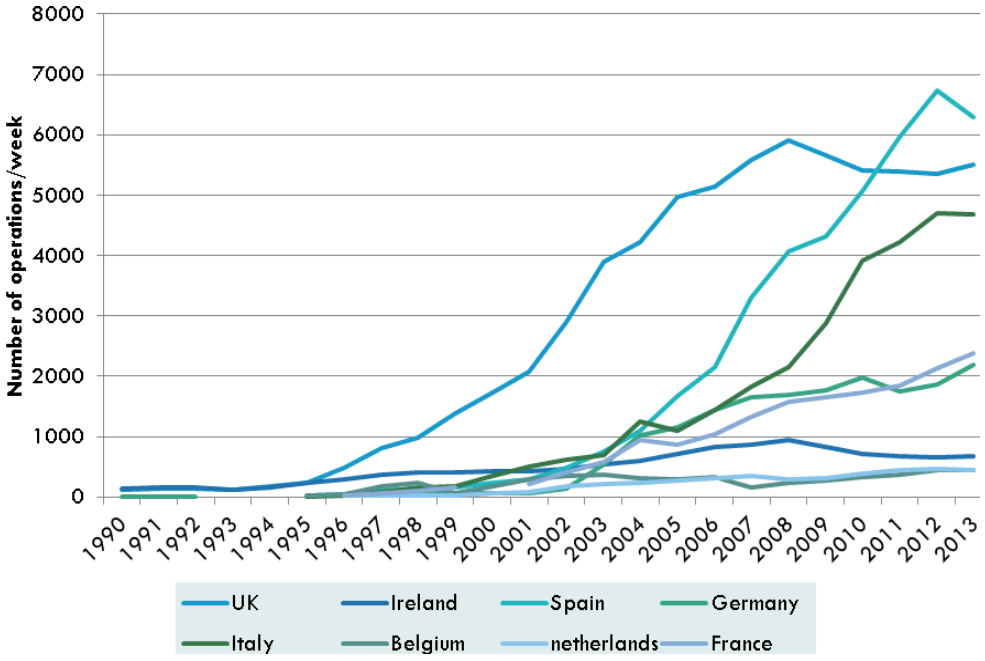
Saturation of the low-cost market?

There are symptoms of saturation involved in certain markets or in some versions of the low-cost business model. De Wit and Zuidberg (2012; 2014) observe that the so-called route density problem is becoming a growing obstacle for ultra LCCs such as Ryanair that primarily operate on low-density routes between secondary airports. Testing the viability of new low-density routes results in an increasing route churn and as a consequence the focus is shifting to more primary airports looking for new higher density, less seasonal and higher yield routes. This may result in more direct competition between the two biggest European LCCs, easyJet and Ryanair as well as more direct competition with the full-service carriers at their respective hubs. Note that this change in business model closely follows the same model change applied by Southwest in the US domestic market in 2007. Figure 4.11 provides further indications to sustain these saturation symptoms.

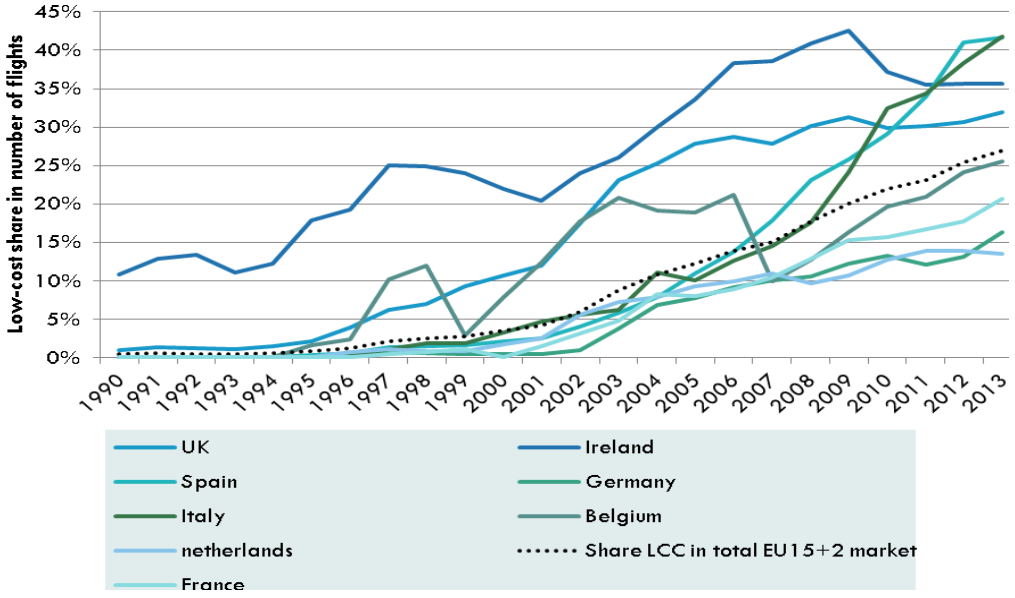
LCCs have returned to normal organic growth in certain EU countries. These symptoms of possible saturation are reflected in the large UK-continental Europe market (Figure 4.12). The substantial growth in market share of LCCs was abruptly disrupted in 2008. Leigh (2014) concludes that a new plateau has been reached. The high-growth period stimulated by cheap fares seems to take about 6-7 years before organic growth takes over (if any), driven by the state of the economy and disposable wealth as growth of all incumbents shows. Also, other countries in Figure 4.12 show the first symptoms of stagnation or even abrupt decline. However, it is not clear whether, in the aftermath, the financial crisis also plays a role in the demand for LCCs in countries such as Italy, Spain and Ireland.

All in all, it is not unlikely that a further increase in market share of LCCs will be more the result of an increasing cannibalisation of the full-service carrier market share at hubs instead of a more rapidly growing demand generated on new secondary routes.

Figure 4.12a Number and share of low-cost flights in total number of intra-EU15+2 flights



4.12b. Number and share of low-cost flights in a selection of originating countries, 1990-2013



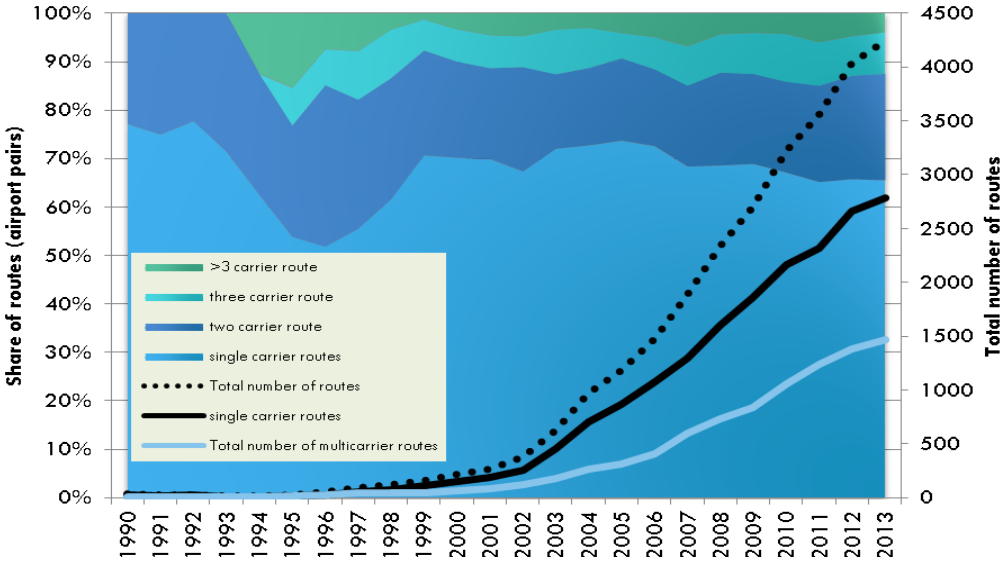
Source: OAG (2015); analysis by authors.

Exposure to low-cost competition

The next question is how these LCCs compete with each other in their (until recently) rapidly growing networks (see total number of routes in Figure 4.13 from a few hundred in 2000 to about 4250 in 2013). Surprisingly, Figure 4.13 reveals that the majority of the routes in these high growth networks (ca. 70%)

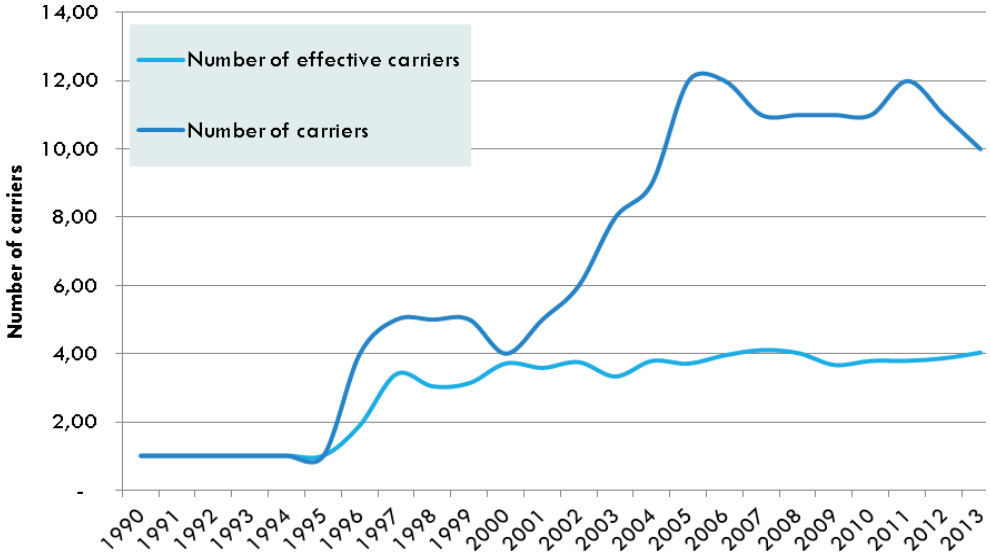
are lacking any direct head to head competition after the LCC business model started to take-off in the European market in in the early 2000s. Also in 2013 the share of multi-carrier LCC routes remains limited to 34% versus 33% in 2002, whereas in the intermediate period this share even decreased to 25% [6].

Figure 4.13. Total number of low-cost routes (intra-EU15+2) and share of route by number of operators, 1990-2013



Source: OAG (2015); analysis by authors.

Figure 4.14. Number of low-cost carriers and number of effective low-cost carriers (1/hhi) operating flights within EU15+2, 1990-2013



Source: OAG (2015); analysis by authors.

Especially in the first part of the 2000s the number of new LCC entrants in the market was substantial (Annex 4.B). However, the effective number of carriers hardly changed after 2000 (Figure 4.14). The main players in the market, primarily the first tier of Ryanair and easyJet, were already able to acquire a

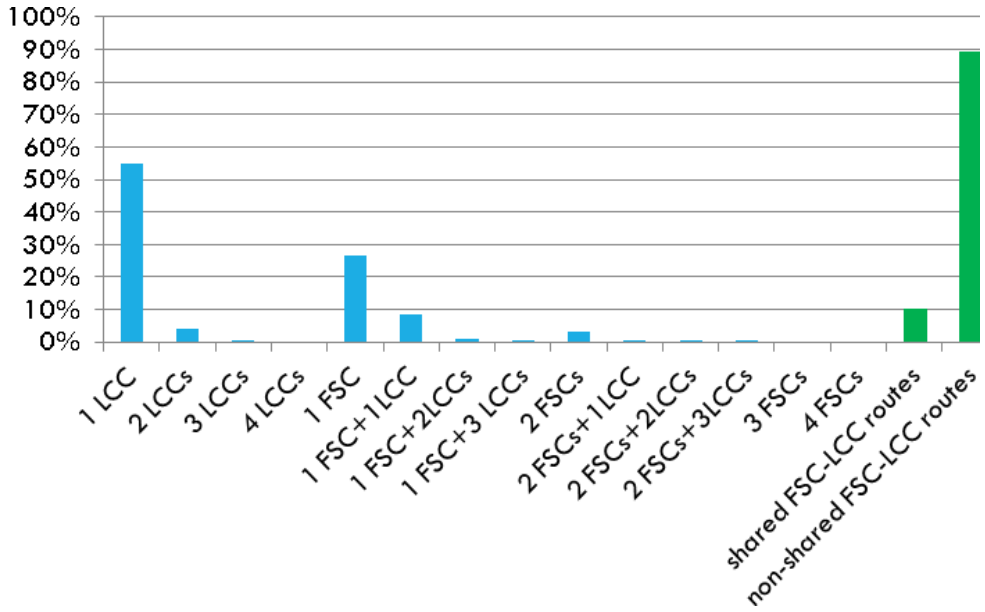
dominant role in the low-cost market. Even later market entrance of the second tier LCCs, such as Norwegian and Vueling (and Wizz Air) hardly affected the number of effective carriers. The impact of other new entrants in the third tier was too small to have any impact in the market anymore (see also Figure 4.14).

Direct and indirect competition of low-costs and full-service carriers

Since Dresner et al. (1996) indicated that the competitive impact of LCCs on fares of incumbent carriers is greater than on directly competed routes due to spillover effects - the so-called "Southwest effect" - it is likely that the competitive effect of LCCs on fares of the incumbents is not restricted to the routes where LCCs and full-service carriers directly compete directly but also on adjacent routes. Adjacent competition may concern semi-parallel routes such as Amsterdam-Rome Fiumicino (KLM) versus Amsterdam-Rome Ciampino (easyJet), and full parallel routes such as Eindhoven Rome-Ciampino (Ryanair) versus Amsterdam Rome Fiumicino (KLM).

Morrison (2001) even found substantial fare reduction effects of incumbents on routes of which only the origin airport and/or the destination airport is served by the LCC but not the route itself, the so-called potential competition. The presence of LCCs in the European market have a fare reduction effect on full-service carriers, which seems to be the strongest in case of direct competition but also in case of adjacent competition and even when potential competition is at issue. The various LCC sub-models manifest themselves differently in these three categories of competition. For example the easyJet model will cause fare reduction effects in all three categories of direct, adjacent and potential competition. The Ryanair and Wizz Air model will much more indirectly affect full-service fares on parallel routes as long as they focus on routes between secondary airports. The business model change announced by Ryanair in 2014 implies more competition with an increasing number of full-service carriers if their hubs started to be served by Ryanair as well. This does not only concern direct competition on full-service carrier feeder routes but also adjacent competition on semi-parallel routes from the hub and potential competition on European routes to and from the hub involved. First examples of this model change are Athens, Rome, Brussels, Madrid, Lisbon and new candidates of smaller hub airports with weaker full-service carriers will probably follow.

Figure 4.15. Percentage of routes shared by low-cost carriers and (former) flag full-service carriers



Source: OAG (2015); analysis by authors.

The development of direct competition between LCCs and full-service carriers can be derived from Figure 4.15 that reflects the share of routes commonly served by low-cost and full-service carriers in Europe in 2013. These relative shares hardly changed in the previous years. Hence, direct competition between the carriers of the two business models remains limited to around 10% of the routes. However, this percentage may increase due to the changing route strategy of the largest LCC, Ryanair, when it starts to focus more on primary airports rather than secondary airports. Until now, the direct, head to head competition between full-service and LCCs is limited. More remarkable is the absence of direct head to head competition for the majority of LCC routes. One should however bear in mind that route density is not reflected in Figure 4.14. This will probably imply that the number of low-cost single carrier routes often concerns low density and low frequency routes between secondary airports.

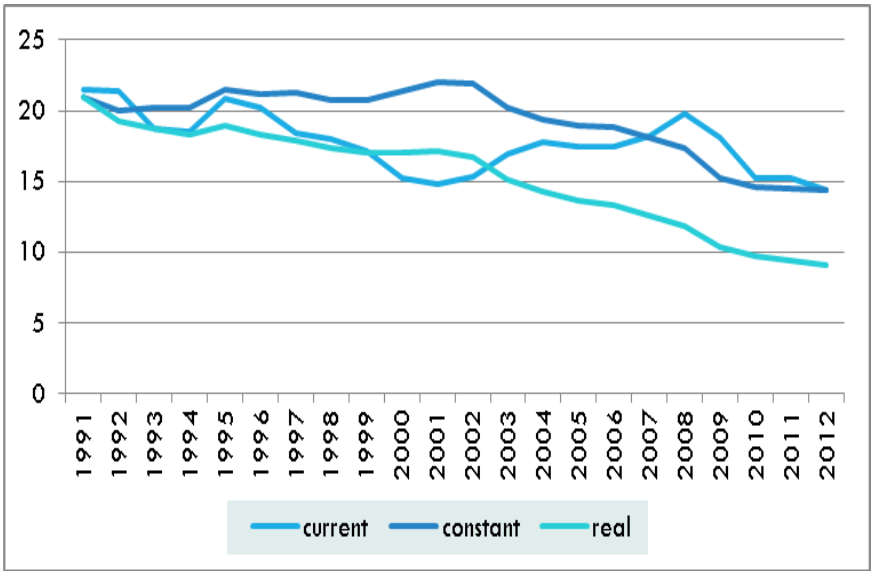
Effects of the second category i.e., potential LCC competition, manifest themselves in most of the full-service carrier European networks due to the presence of LCCs at their hubs. Exemptions are probably only BA at London Heathrow and Lufthansa at Frankfurt.

For a full picture of the impact of LCC competition on full-service carrier fares and yield the third category is that adjacent competition should also be taken into account. However this requires an extensive analysis of individual airline networks, which goes far beyond the scope of this paper. Such an approach, although relevant with regard to low-cost versus full-service carrier competition, also implies a wider concept of the relevant market than applied by the European Commission in its point of origin – point of destination approach.

The fare and yield development of full-service carriers has not only been affected by the competition with LCCs. The hub-and-spoke systems of the full-service carriers themselves also started to increasingly compete with each other as the number of spoke routes in Europe rapidly increased at the various hubs as well as the frequencies on these spoke routes enabling more daily connection waves at these hubs. Intra-European routes from the hubs encountered more and more competition from indirect European routes via competing hubs in Europe, especially in the non-business segment.

In sum, following the liberalisation of the internal air transport market, the effects of new competition have resulted in a very substantial real yield decrease in the European market for AEA airlines as seen in Figure 4.16: from 21¢ in 1990 to 9¢ in 2013. Whether this decrease is fully to the benefit of the consumer remains to be seen. To enable an answer requires an analysis of many other (social) costs and benefits, which is beyond the scope of this chapter.

Figure 4.16. Total Europe (incl. domestic) passenger yield, US¢/RPK



Source: AEA

Impact on the EU airport hierarchy

The rise of the LCC has not only affected output, competition levels and yields in the EU aviation market, but has also drastically altered the balance in seat capacity supply among the European airport population. In an analysis of seat capacity supply over the period 1990-2009, Sanchez et al. (2014) find that the growth of LCCs has fostered the spatial deconcentration of intra-EU traffic, as some LCCs allocate part of their seat capacity at secondary airports so as to avoid the high airport charges and costs associated with congestion. Thus, while LCC networks in themselves are still relatively concentrated because of the radial organisation around a number of home bases, overall these carriers have resulted in a more equal distribution of seat capacity over EU airports, with more opportunities for traffic growth at small airports.

However, looking at the potential signs of saturation of the low-cost market and, in response to this, altering network strategies of LCCs such as Ryanair, it is not unlikely that the deconcentration impact will be less strong in the future.

Development of full service network carriers in the liberalised market

The rise and consolidation of EU hubs

After the deregulation of the US domestic aviation market, the majors adopted temporally and spatially concentrated hub-and-spoke networks to benefit from cost and demand-side economies as well as to deter entry. The question is if the liberalisation and creation of the common EU aviation market provoked a similar network reaction from the EU states' flag carriers.

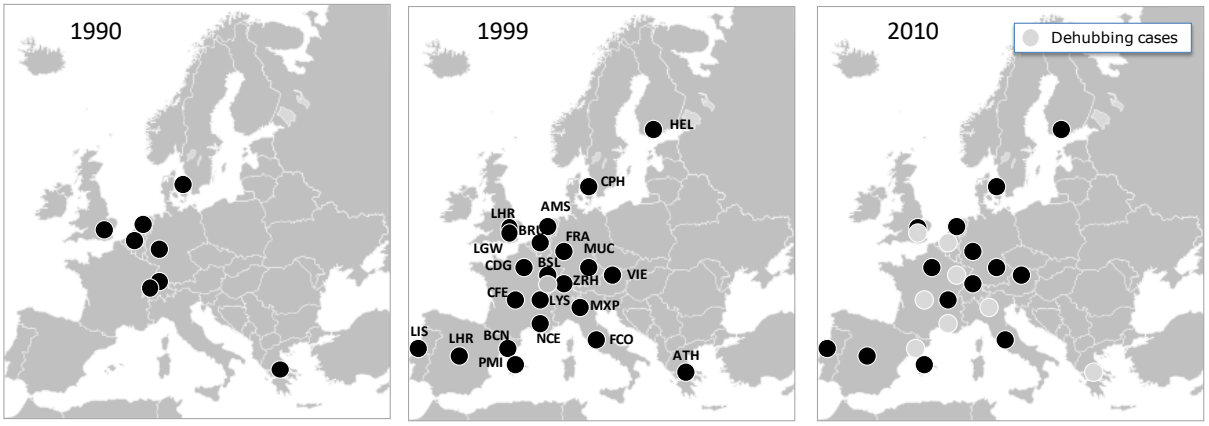
The rise

As explained earlier, EU liberalisation started from a different aeropolitical point than US deregulation in the sense that international air services from EU countries were pinnedto the national airports functioning as their principal hubs due to restrictions imposed on the operation of international air services by bilateral ASAs, focusing on the carriage of third and fourth freedom traffic (see section on progressing liberalisation). This resulted in radial, spatially concentrated networks operated by the European 'flag' carriers long before liberalisation took off. Thus, these networks were not hub-and-spoke networks in a strict sense but the result of the prevailing aeropolitical regime. In contrast, the networks of the US majors were spatially deconcentrated, crisscross networks before deregulation in 1978. Hence, it will be no surprise that spatial concentration as part of the formation of hub-and-spoke networks by EU carriers did not take place to any large extent (Burghouwt 2007), apart from intensification of these radial networks in terms of frequencies and number of routes.

However, EU liberalisation did trigger the rise of hubs in the second half of the 1990s through the temporal concentration of flights at the hubs by means of wave-system structures (Burghouwt and De Wit 2005; Burghouwt 2007). National carriers that already operated rudimentary wave systems in the early 1990s at some of their home bases intensified and optimised their wave structures, which entailed amongst other things a tighter schedule coordination of arriving and departing flights and an increase in the number of connection waves. Examples of intensified hubbing during the 1990s are KLM at Amsterdam, Lufthansa at Frankfurt, Sabena at Brussels, Swissair at Zurich and SAS at Copenhagen. In addition, a number of national carriers set up wave systems at their national airports almost from scratch. Air France implemented hub-operations with wave systems at both Paris CDG and Lyon. Iberia did the same at Madrid and Barcelona. Lufthansa developed a secondary hub at Munich, Alitalia at Rome Fiumicino and Milan Malpensa and British Airways at London Gatwick.

As a result, a considerable number of airline hubs was scattered over the EU at the end of the 1990s (Figure 4.17). Most of them were hinterland hubs, connecting continental European traffic with intercontinental destinations. Some of them merely had a regional function, such as Lyon (Air France), Basle (Crossair) and Clermont-Ferrand (Régional), while others used the hub concept to ease seasonality patterns in demand (airberlin at Palma de Mallorca). The build-up of hubs generated substantial growth in both connectivity to, from and via the hub as Burghouwt (2007) demonstrated.

Figure 4.17. The rise and consolidation of European hubs (EU15+2), 1990-2010



Note: hubs are airports that host hub-carrier operating a wave-system at the airport or a large airport with over 30% transfer traffic.

Source: adapted from Burghouwt (2007).

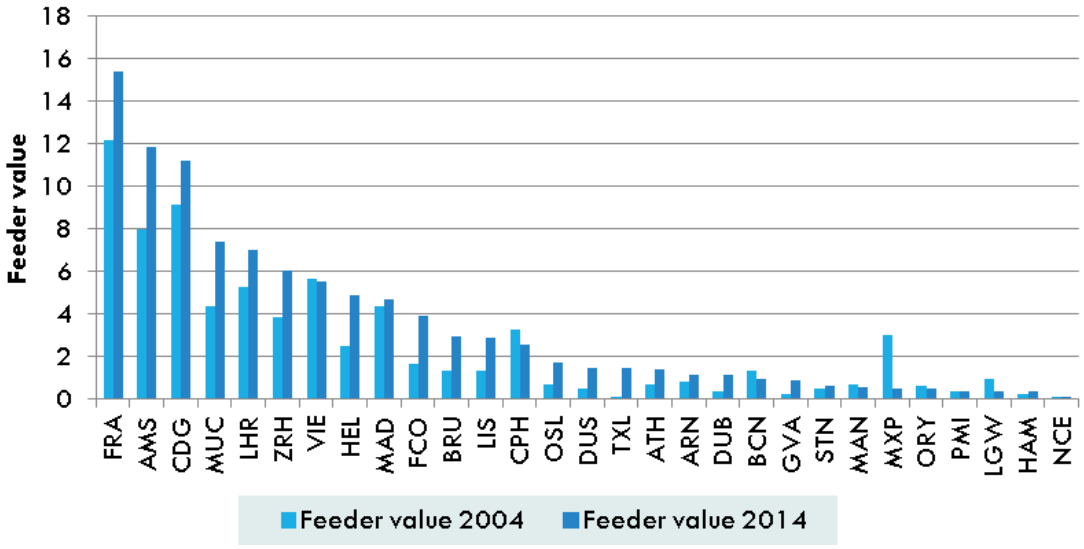
Consolidation

Since the start of the millennium, the hub build-up has come to an end and has been replaced by a phase of rationalisation and de-hubbing. First, this is the result of the bankruptcy of the carriers Sabena (Brussels), Swissair (Zurich), Air Littoral (Nice) and Spanair (Barcelona), which resulted in the demise of the respective hubs Brussels and Zurich as well. Only Zurich was able to recover its hub status with Crossair/Swiss continuing on the remains of bankrupt Swissair.

Secondly, (former) flag full service carriers have rationalised their networks in response to increasing competition, rising fuel costs and adverse economic conditions. In addition, additional network economies could be achieved by consolidating traffic at one hub instead of spreading the hub operation over two hubs in relative proximity to each other. Major de-hubbing cases include the de-hubbing of Milan Malpensa by Alitalia (and consolidation of the network at Rome, 2008), Barcelona by Iberia (consolidation at Madrid, 2006) and London Gatwick (consolidation at Heathrow, 2000). Figure 4.18 summarises the hub connectivity developments during the past decade in terms of the number of realistic connections offered via the hub, divided by the total number of direct connections, the so-called feeder value. It clearly shows the impact of de-hubbing at Barcelona, Malpensa and Gatwick on the airport's connectivity performance, as well as the rationalisation of hub operations at Copenhagen and Vienna.

The impact of de-hubbing on the respective airport is long lasting. Redondi et al. (2012) studied over 50 de-hubbing cases worldwide and found that de-hubbed airports do not recover their original traffic volumes within a 5-year time period. Furthermore, airports that lose their hub status generally do not regain that status, at least not in the short to medium-term.

Figure 4.18. Feeder value of major EU hubs in 2004 and 2014

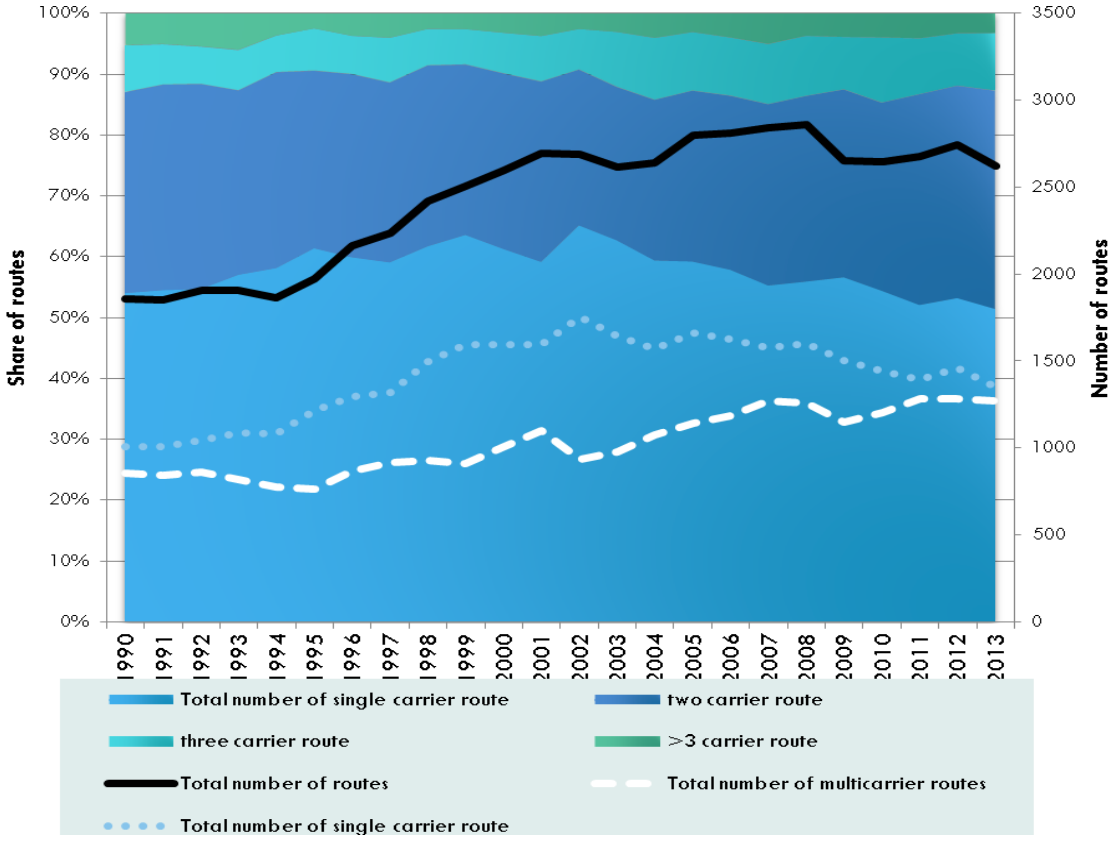


Source: ACI Europe (2014); SEO analysis; OAG. Note: number of hub connections with a transfer at the hub has been measured with the Netscan connectivity model. See Burghouwt and Redondi (2014).

EU flag carriers under pressure

The business model of the (former) flag full service carriers is under increasing pressure. Since 2000, the share of this carrier segment in the total supply of intra-EU flights has been decreasing (see Figure 4.4). Full-service carriers experience more competition on the route level and the share and number of monopolised airport-pairs is decreasing (Figure 4.19), while adjacent and potential competition from LCCs is on the rise. Furthermore, financial results of the EU flag carriers have been weak or negative – as reflected in IATA's Vision 2050.

Figure 4.19. Number of routes (airport-pairs) operated by (former) flag full-service carriers and share of type of routes by number of carriers, 1990-2013



Source: OAG (2015); analysis by authors.

The number and size of the (former) flag full service carriers in Europe was primarily determined by the political forces of having a flag carrier in each member state when market forces started to have their impact on the liberalised market. These market forces will continue to work towards a less fragmented European market through on-going consolidation. Expensive hub-and-spoke systems are increasingly exposed to LCC competition on short haul routes. A revival of long-haul, low-cost operations from and to Europe is also likely to increase, as well as the growth in competition of the Gulf carriers operating a cheaper long-haul network at their hourglass hubs in an unlevel playing field.

The intensifying competition will have more and more impact on European (former) flag full service carriers, which have to look not only for further cost-cutting opportunities but even more have to improve their hub connectivity to keep their networks as attractive as possible. These economic forces will continue to change the landscape of the former national carriers in Europe. Since Chapter 11 options are missing in the EU the likelihood of further market consolidation through bankruptcies, take-overs and mergers will remain substantial.

Consolidation of the European airline industry: mergers, take-overs, alliances and the impact on competition

In general terms causes of consolidation are usually mergers and take-overs, bankruptcies and horizontal cooperation. The main drivers in network industries are the network economies such as density

economies in existing networks and scope economies in extended networks. The coupling of continental hub and spoke systems of alliance partners in various continents clearly is an important alliance advantage. When after the liberalisation competition between hub-and-spoke systems of the new full-service carriers increased, and the often indirect competition with the new LCCs intensified, network size became an important competitive tool for full-service carriers. This was primarily effectuated by code sharing agreements and later by ever growing alliances (see the regulation of competition section).

Alliances refer to any kind of horizontal co-operation between airlines (excluding mergers), which may widely vary in scope, and strength. The reasons for entering into cross-border alliances instead of mergers partly have a legal background, i.e. trying to circumvent problems related to the nationality clause in the bilateral ASAs between the states involved (see further below), and partly an economic reason, i.e. the benefits of an increasingly global network can be realised through an increasing number of alliance members worldwide. The depth of alliances can widely differ, running from simple interlining agreements, via code-sharing agreements to merger-like metal-neutral joint ventures for which competitive issues such as prices, schedules, capacity and facilities are coordinated, costs revenues and/or profits are shared and a minority interest is acquired in allied partners. In the meantime diversification within alliances increases. Subsets of far-reaching joint ventures manifest themselves such as the transatlantic joint venture between Delta (including Northwest), Air France, KLM, Alitalia and CSA, as well as the oneWorld joint venture between American Airlines, British Airways, Finnair, Iberia and Royal Jordanian. Also LCCs are increasingly considered as potential alliance members. Skyteam and STAR each discuss the possibility of a platform for membership with selected LCCs. In the meantime the bilateral cooperation between individual alliance members and LCCs from other continents also increase.

Since domestic carriers in the US domestic market were not hampered by ownership and control clauses in bilateral ASAs with other countries, mergers and take-overs have been dominant in the consolidation of the US airline industry from the beginning of deregulation. In Europe this stage of domestic consolidation in the larger EU member states had already been effectuated before liberalisation. For example BCAL, in the United Kingdom and Air Inter in France had been taken over by the national carriers in an earlier stage. (Doganis 1994). In Europe it was only in 2003 that the first cross-border merger/take-over was realised between Air France and KLM. The merger model has been applied in various cross border mergers, i.e. the "umbrella model" as Gudmundsson (2014) characterised it. This implies a relative independence of the merging airlines under the same umbrella. This independence is maintained to safeguard the traffic rights designated to the respective merging candidates under the nationality clause included in the bilateral ASAs with third countries outside the CAA. These third states may dispute the nationality clause in bilateral ASAs if the ownership changes due to the merger. It should be emphasised however that the more the nationality clauses in bilateral ASAs of individual member states have been replaced by a Community air carrier clause the less is the chance of a dispute. This umbrella merger model has been adopted in more cross-border take-overs, equity stakes and mergers in Europe during the first decade of this century, such as the Lufthansa Group and IAG (see Figure 4.21). The question is however whether this umbrella model will be further compressed into full mergers if the competitive position of FSCs in Europe continues through increased competition from inside and outside the European market. (For details on merger control see relevant section).

Another category that contributed to market consolidation concerns bankruptcies. Some of the full service carriers fully disappeared from the market, such as Malev and Slovak Airlines. However most of them have risen from the ashes as new national carriers under a new name, such as SABENA and its successor Brussels Airlines, Swiss Air replaced by Swiss International via Crossair, Balkan Air which returned as Bulgaria Air and the remains of Olympic Airways, which have been taken over by Aegean as the new national carrier. With regard to LCCs the market access and network expansion of these carriers

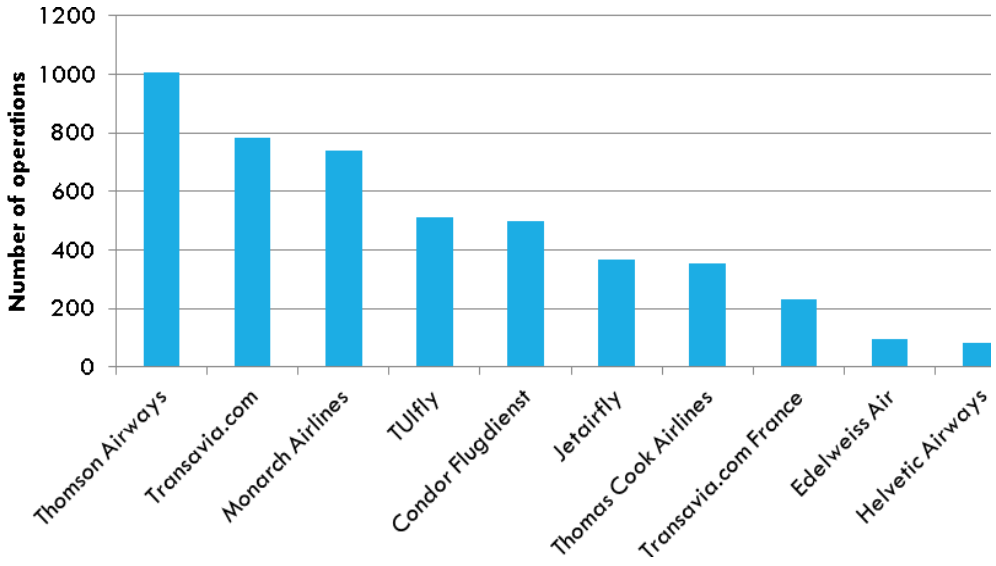
is often emphasised but Budd et al. (2014) analysed market entry and exit of LCCs in the European market between 1992 and 2012 and concluded that of the 43 LCCs identified in this period, 33 have left the market. Remarkably, the last two of the still existing ten carriers had already entered the market in 2004 (Wizz Air and Vueling). It is likely that further consolidation in this market segment will continue in the future. The reasons are not primarily related to network synergies and network economies, but more to the emergence of overcapacity and demand saturation if aircraft orders are also taken into account.

One market segment that is often neglected in airline consolidation studies concerns the former holiday charters and current leisure carriers. In contrast with FSCs, horizontal as well as vertical consolidation in the value chain is an issue here. As a consequence of the third package of liberalisation the regulatory distinction between scheduled services and unscheduled services ended in 1993. Although LCCs began competing in the holiday charter market, this was not the most important reason for consolidation in this market. Actually this consolidation was primarily a consequence of an ongoing consolidation downstream in the value chain, i.e. among the tour operators, which usually own most of these holiday charter airlines. Horizontal take-overs at an airline level are scarce, such as for example the LTU take-over by airberlin in 2007. Dominant is the consolidation in the tour operator business itself, including the charter airlines involved.

TUI Travel is a good example of the largest consolidated tourism group in Europe resulting from various mergers and take-overs and now owning several European airlines: 1. Arkefly (after the take-over of Arke Tours and HI), 2. Corsair International (after the take-over of Nouvelles Frontières), 3. Jetairfly, 4.Thomson Airways which resulted from an earlier merger between Thomsonfly (former charter Brittania Airways) and First choice Airways after the merger between TUI and First Choice Holidays in 2007, 5. TUIfly resulting from the former German airlines Hapag-Lloyd Flug and Hapag-Lloyd Express after the take-over of Hapag-Lloyd by TUI, 6. TUIfly Nordic (former Brittania Nordic and Transwede Airways).

The second largest tourism conglomerate in Europe today is Thomas Cook Group resulting from a merger with My Travel Group. Thomas Cook owns various airlines such as Condor, Thomas Cook Airlines United Kingdom (a merger between former Thomas Cook Airlines and My Travel Airways), Thomas Cook Belgium, and Thomas Cook Airlines Scandinavia. Note that the former Thomas Cook Airlines emanated from JMC Air that was the result of from the acquisitions of Flying Colours Airlines, Air World, Caledonian Airways and Peach Air by Thomas Cook in the 1990s.

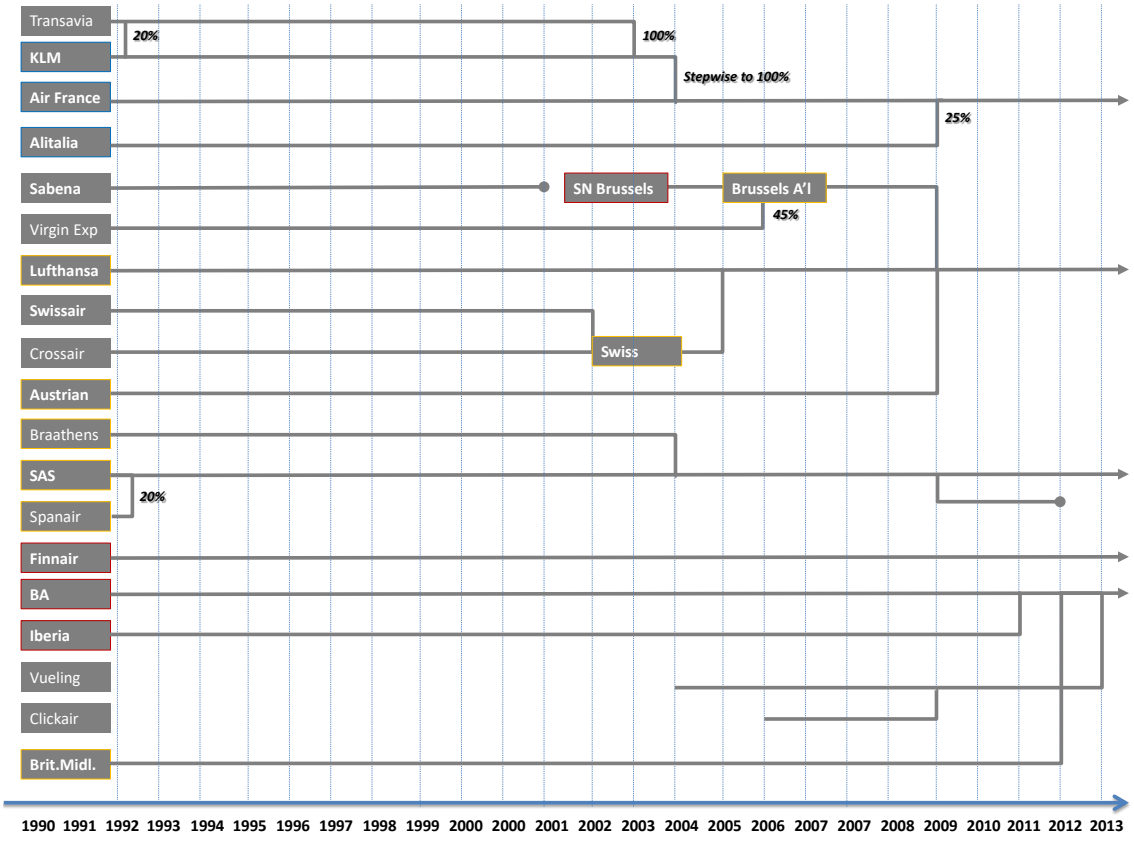
Figure 4.20. Total number of scheduled intra-EU15+2 operations per week of the ten largest leisure carriers



Source: OAG (2015); analysis by authors.

Hence, not only the European FSCs substantially consolidated in the last decade but former charter airlines even more. However, the consolidation of these leisure airlines resulted from the downstream consolidation in the tourism value chain, i.e. the tour operators, that were driven by scale economies derived from integration of the various components in their value chain, including air transport. Network economies were not the basic driver such as the case is in the FSC sector. The consolidation process in the tour operator business is however an already longer lasting process starting already in the 1970s. (Kerns et al. 2009). This process accelerated in the 2000s probably also due to the increasing competition of the LCCs in the Mediterranean holiday market. And as such this is a second order spin-off of liberalisation as well. In the meantime charter airlines mostly transformed into leisure airlines operating scheduled services to sun/sea/sand destinations from North-West Europe and combining the classic package tours with LCC-like seat-only products at competitive fares. For that reason it is obvious that many leisure airlines are also categorised as LCCs. (see CAPA list in Annex 3)

Figure 4.21. Selected mergers, take-overs and bankruptcies of legacy carriers



Airport competition and airport capacity as a competition barrier

Airport congestion in a liberalised market

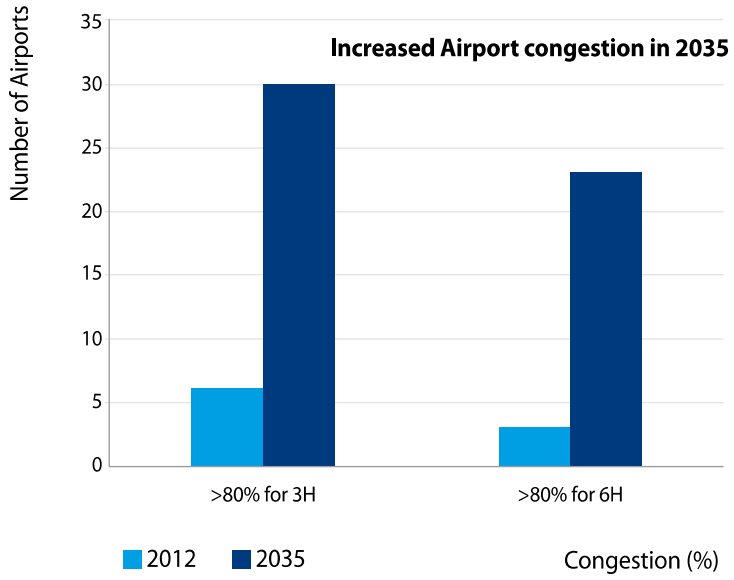
The liberalisation has resulted in a much better use of underused secondary airports thanks to the emergence of the LCC business model. It should be underlined however, that also new demand has been generated by the lower air fares offered by the new LCCs and by the lower fares of the full-service carriers resulting from continuous cost reductions in a more competitive environment (see Figure 4.16 which shows the decrease in yield development of Association of European Airlines [AEA] carriers). Furthermore, after the liberalisation full-service carriers intensified their hub-and-spoke systems and substantially increased the traffic at a number of primary airports. This process further intensified through the process of alliance building and the open skies agreements between the United States and EU member states enabling metal neutral joint ventures across the Atlantic.

All in all, increasing airport congestion in Europe seems to be here for the next few decades and will continue to affect the functioning of the liberalised air transport market. Congestion will continue to cause substantial unaccommodated demand and hamper the contestability of individual city-pair markets due to entry barriers for new competitors.

Eurocontrol (2013) estimates long-term traffic volumes for 2035 based on a demand scenario with moderate economic growth. Traffic levels in 2035 will be 1.5 times the 2012 volume, i.e. 14.4 million flights in Europe, of which 1.9 million flights cannot be accommodated.

Airport congestion will grow much faster due to the fact that the expected increase in total capacity has been scaled down substantially compared with earlier expectations for 2008-2030. Instead of 38% reported for that period, now calculations are based on a 17% increase in total capacity growth for the period 2013-2035. (Note the contrast with the rapidly expanding home bases of the Gulf carriers for example). According to Eurocontrol's definitions on congestion the number of structurally congested airports in Europe will increase from 3 to 23 (see Figure 4.22).

Figure 4.22. Airport congestion according to Eurocontrol's scenario C



Source: Eurocontrol (2013).

Besides a growing lack of airport capacity in Europe, also the consequence of operating at near capacity will be that the robustness of the total system is affected: primary delays will propagate through the European airline network via reactionary knock-on delays. Unusual events or disruptions in airport access may even more rapidly spread in the network.

Growing scarcity of airport capacity will therefore require new allocation mechanisms and new regulatory frameworks to not only optimally allocate the slots at individual airports but also to guarantee market access to new entrants and to remain a continuous stimulus for competition.

Competition provisions as applied to the operation of airports

As opposed to air traffic control agencies, which are regarded as state bodies, airports are considered as "undertakings" under EU law, designed to carry out an economic activity, and, hence, subject to EU competition law. The EU Commission has never applied the EU competition rules concerning concerted behaviour to dealings as between airports, probably as they have not occurred, whereas the EU

Commission holds that airport policy is a domestic affair. However, it has applied the EU rules on the abuse of a dominant position and state aid provisions to airports. In the 1990s, airports in Helsinki, Brussels and Lisbon have been condemned by the EU Commission for preferential treatment of their home carriers[7].

The question of state aid granted by airports to "home" or at least "most preferred" carriers in that such carriers are attractive for the commercial presence of the community in which the airport is located in relation to the broader domestic and European landscape, received attention during the first decade of the 21st century and is currently being examined by the EU Commission. A landmark decision leading to increased attention to this subject concerned the preferred treatment of Ryanair at the Belgium airport of Charleroi which is located about 80 kilometres south of Brussels. In this case, the EU Commission ruled that financial support and assistance given by the regional authorities in southern Belgium and the Charleroi airport authority to the Irish airline Ryanair constituted, in part, state aid and was unlawful. It ordered that part of the funds received by the airline should be repaid to the authorities concerned. On 17 December 2008, the European Court of Justice annulled the above Commission's decision, as the Commission had not correctly applied the above "market investor" principle. Among others, the court found that the Commission had wrongly decided that this principle could not be invoked as the aid had been granted by a public authority, namely, the Walloon Region, which did not act as an economic operator[8].

The topicality of the question of state aid placed in the context of airport-airline relations is illustrated by the establishment of the EU State Aid Guidelines which also focus on the financing of airports and start-up aid to airlines departing from regional airports[9] as well as case law which is emerging on the subject. European case law is built on the premise that the operation and construction of airport infrastructure cannot deemed to be "a task falling outside the ambit of State aid control"[10]. The guidelines of 2014 are designed to ensure viable connections between regions and the mobility of European citizens, while minimising distortions of competition in the internal air transport market[11].

EU external aviation policy: process and impacts

Establishment of the EU-US agreement on air transport

Introduction of a market approach towards the operation of the agreed international air services

As stated in the section above on the creation of the EU internal market, the traditional air transport regime which was, and still is, governed by bilateral ASAs (BASAs) concluded between states proceeds from the operation of the agreed international air services by the air carriers which are designated by the two states, parties to the bilateral agreement. Such an agreement regulates market entry and market behaviour of those designated air carriers, and the level of competition as between them.

Most bilateral air agreements, including the Bermuda-type ASAs, embraced the view that the designated airlines of the two sides should share the market created under the bilateral agreement, that is, the operation of the agreed international air services, and the capacity equally. In such cases, the designated airline of one side claiming more than 60% of the traffic and capacity in the market violated the "fair and equal" opportunities laid down in the bilateral agreement. The United Kingdom was known for being capable of defining "fair and equal" in Annex 2 of the Bermuda II Agreement of 1977: the 40/60 split of capacity and frequencies on a gateway to gateway basis was deemed to fall within the confines of "fair and equal".

As explained, the current liberalisation period has been marked by the deregulation process of the internal US market in the late 1970's, the completion of the internal EU air transport market in 1993, and, internationally, by the conclusion of an increasing number of open skies agreements, at present more than one hundred. Rules on market entry have been relaxed but not completely abolished. Carriers still have to meet nationality requirements, safety, security environmental and liability standards before they can start flying the agreed international air services. Those standards are intended to be as uniform as possible on a global level, as the Chicago Convention dictates in its Preamble that international air transport services should be stabilised "on the basis of equality of opportunity". However, jurisdictions in the world give different interpretations to the principle of "equality of opportunity" which is regarded as the principal tool for guaranteeing the maintenance of a level playing field internationally. The EU blacklisting regime, the EU Emissions Trade Scheme (ETS), the EU passenger protection rules and the application of strict US-based security standards, also outside the United Stats, are liable to affect the global objective of creating uniformity.

Having said that, domestic and international initiatives are designed to introduce a more market oriented approach towards the operation of domestic and international air services. The objective of liberalising the operation of air services is not only practiced in the United States, where it all started in 1978 with the deregulation process, and in the EU, with the creation of its internal air transport market (see above), but also in other parts of the world. Notable examples are the arrangements between Australia and New Zealand in the so-called *Tasman Pact*, regional initiatives undertaken in Africa, especially in the context of the Common Market for East and South Africa (COMESA), the South African Development Council (SADC) and the East African Community (EAC), the Association South East Nations (ASEAN) and in Latin America (*Mercosur and the Andean Pact)*. Next to these regional initiatives, and, as referred to above, countries all over of the world are concluding open skies agreements on a bilateral basis, liberalising market access but especially market behaviour for the designated air carriers.

However, as can be concluded from Annex 4 in which we compare the internal EU regime with a number of other regimes, the EU internal regime is the most advanced international regime in terms of liberalisation.

The EU-US agreement on air transport

A special if not unique agreement on air transport concerns the EU-US Agreement on air transport, which was signed in 2007, and updated in 2010. The EU-US Agreement, hereinafter also referred to as the Agreement, is essentially an open skies type of agreement as it provides for the operation of unlimited third and fourth freedom rights, that is, in short, the operation of air services between points in the EU and in the United States, and vice versa, and also fifth freedom rights on beyond routes, that is, in short, operations behind or beyond third and fourth freedom operations, for instance, the right of Air France to pick up traffic in Atlanta, the United States, with destination Mexico City, on a Paris-Atlanta-Mexico City service, for the airlines of each side, with freedom of pricing of the agreed international service. The expression "Freedoms of the Air" is explained in Annex 4.A.

The operation of seventh freedom rights, that is, the right for an EU airline to carry traffic between a point in the United States and a point in a third country, and the right for a US airline to operate between a point in the EU and a point in a third country, for instance, the right of United Airlines to carry traffic between Vienna, Austria, and Istanbul Turkey, is more restricted. EU airlines can operate combination passenger services between any point in the United States and any point in not only the EU but also the European Common Aviation Area, including Norway, Iceland, Albania and the states that were formerly part of Yugoslavia. Unrestricted seventh freedom rights for all-cargo services are given to EU airlines, but

to US airlines only in respect of services involving a point in one of eight named member states – the Czech Republic, France, Germany, Luxembourg, Malta, Poland, Portugal and Slovakia.

Most significantly, the United States has accepted the Community air carrier clause as it will allow any EU airline, and airlines from the European Economic Area (EEA), including Norway, Iceland and Lichtenstein, to operate between any point in the United States and any point in the EU/EEA. EU/EEA airlines are allowed to commence services, and have in fact done so, between points in the United States and points in a member state other than their own[12,] although the practical relevance of these opportunities has proven to be limited. For commercial reasons, EU air carriers prefer to stick to their traditional hubs, and do not operate "off line" services. Hence, Air France does not offer flights between Madrid and Miami, Florida, nor does BA offer flights between Helsinki and Boston. The acceptance of the Community clause facilitates cross-border mergers and acquisitions between Community airlines, as the United States will no longer be able to threaten to refuse or take away traffic rights on the basis that the carrier is not substantially owned and effectively controlled by the airline's home state and/or its nationals, as explained in the section "Internal and external dimensions of the EU carrier clause".

The availability and allocation of slots at congested airports will continue to be governed by the applicable local rules which is, in the case of the EU, EU Regulation 95/93 as variously amended, and currently (in 2014) under review. As a consequence, although US airlines will have in theory unlimited rights to operate air services from Heathrow, they will only be able to do so in practice if they can acquire slots there through the allocation process or trading.

The Agreement is different from typical BASAs, including open skies agreements, in its provisions for cooperation in a number of areas: security, safety, environment, competition law, state aid and questions of ownership and control, which cooperation is not provided for in traditional bilateral ASAs. Furthermore, a Joint Committee has been established to resolve questions relating to the interpretation and application of the Agreement, to review its implementation and to facilitate greater cooperation, particularly by consulting on issues dealt with in international organisations and in relations with third countries, including considering whether to adopt a joint approach.

The Agreement can be considered as the most important ASA in the world, allowing open market access for air services between the now 28 member states and the United States forming a market that together makes up almost 60% of global aviation. As said, it created an unprecedented regulatory platform to address all mutual concerns related to EU-US air services. However, differences remain with respect to questions on market access as the EU side wishes to further relax ownership and control conditions for airlines, and to reduce the impact of state aid on the operation of the agreed services. So far the US authorities have resisted these demands although EU carriers gained increased access to US government financed traffic, also referred to as Fly America.

The regulation of competition, including assessment of airline alliances

Airlines may work together in a less – for instance, in 'naked' code sharing arrangements or arrangements on the use of airport lounges – or more advanced manner. As to the latter, the next step with respect to cooperative arrangements between airlines regards the formation of airline alliances. The EU Commission has built a wealth of experience in this field.[13] It distinguishes between product and geographical markets and between business/time sensitive and leisure/price sensitive passengers in relation to the dominance on those markets.

Remedies offered by the parties and approved by the EU Commission may consist of freezing of frequencies on the appearance of a new entrant airline on a certain route, engagements with respect to

enter into intermodal arrangements with surface transport operators, for instance, the High Speed Train permitting interlining between air and rail, the granting of fifth freedom traffic rights to other EU air carriers flying to a destination outside the EU and the prohibition pricing on long-haul routes. An important measure concerns the rendering of slots. In the British Airways/Iberia/American Airlines case (2010) the EU Commission implicitly opened the door for slot trading, as parties are not prevented from requesting compensation for surrendering slots.[14] Generally speaking, the EU Commission supports consolidation, with due regard for global developments in this field. Under the regime set forth by EU Regulation 1/2003, the anti-competitive effects of such alliance agreements must now be (self) assessed by airlines.[15] [16].

Merger control

Merger control is a special issue in international air transport as it bears a close relationship with nationality requirements under which international air transport operates for the purpose of the operation of the agreed international air services under bilateral ASAs. Moreover, national laws frequently impose restrictions upon the licensing of air carriers on the basis of their nationality, for the EU.

Since the adoption of the Merger Regulation (139/2004), the European Commission has reviewed some 30 airline mergers. The first mergers were domestic mergers, followed by a number of international mergers, which have meanwhile been dissolved.

Significant intra-EU cross border merger activities took place in the 21st century with the merger between Air France and KLM. In Air France/KLM (2004)[17], the EU Commission found that the airlines' networks were basically complimentary. However, competition would be affected on fourteen European and intercontinental routes on which they currently compete actually or potentially. The parties offered remedies pertaining to the surrender of slots; the freezing of frequencies on the appearance of a new entrant on one of the above routes; the engagement into commitments with surface transport operators, for instance, the high-speed trains between Paris and Amsterdam permitting interlining between air and rail; the grant by Dutch and French governmental authorities of fifth freedom traffic rights to other EU air carriers flying via Amsterdam or Paris to a destination outside the EU, while keeping in mind that those authorities are not allowed to regulate pricing on long-haul routes. The US authorities approved the Air France/KLM merger on the same day as the European Commission that is, on 11 February 2004, allowing the combination to go forward. Apart from the EC Commission and USDOT, a number of countries, including but not limited to Brazil, Japan, Israel, South Africa, the Czech Republic, Poland and Romania have explicitly approved the deal.

In Lufthansa/Austrian Airlines[18], the EU Commission requested the parties to give up slots at specified airports in Germany and Austria, to engage into interline agreements and other arrangements on, for instance access to frequent flyer programmes (FFPs), with new entrants and into intermodal agreements with surface in carriers, in particular the operators of high speed trains.

On 14 July 2010, the EU Commission approved the merger between British Airways and Iberia[19]. The Commission opined that the merged entity would continue to face competition in the various markets, including those for short haul and long-haul services, and passenger, cargo and ground handling services.

Remedies used by the European Commission in competition cases include the slot divestiture at congested airports at one of the two or the two origin and destination (O&D) airports. As practice shows that slot divestiture has not always yielded the desired pro-competitive results, the European

Commission seems to be willing to adopt a more interventionist role with respect to the implementation of such remedies. Other remedies concern freezing of capacity by the airlines which are subject to competition review; price constraints so as to avoid predatory pricing; introduction of requirements on mandatory engagement into blocked space agreements and interlining with new entrant airlines; access to FFPs and Global Distribution Systems (GDS) by new entrant airlines or competitor airlines; relaxation of limitations with respect to the performance of fifth and sixth freedom rights on services from within the EU to points outside the EU and vice versa.

In short, the EU Commission is examining and developing its policy on remedies carefully while assessing their practical effects on the market forces. The approach adopted in merger cases is similar to that adopted in alliances cases.

Conclusions and future perspectives

In this chapter, we have described the process of the creation and liberalisation of the intra-EU aviation market. By means of a supply-side analysis over an extended period of time (24 years), we have provided – for the first time according to our knowledge – a descriptive analysis of the longer-term impacts of EU liberalisation.

In sum, we find that:

- During the second half of the 1990s most EU flag carriers were able to establish hub-and-spoke systems at the respective national airports and to increase their share in the intra-EU market. The second package gave them unlimited third and fourth freedom rights to build up their networks. Economic growth and low fuel prices, as well as the then still limited low-cost competition all contributed to favourable market conditions for the flag carriers. At the same time, the growth of hub-and-spoke networks during the 1990s, which was still rooted in the old national airport-national airline concept, also resulted in oversupply of hubs in the EU market. All in all, some of these flag carriers struggled with these network transformations and new competition, resulting in substantial state aid actions, until this was blocked by the Commission.
- Market conditions for the flag carriers became rapidly less favourable at the end of the 1990s, beginning of 2000s. Economic growth stalled, fuel prices were on the rise and LCC output was increasing rapidly. A very different competitive arena was the result:
    - High growth levels of LCCs, facilitated not only by liberalisation but also by Internet penetration, which allowed them to sell tickets through their online booking websites at a pan-European scale.
- Flag carriers are under pressure since we observe:
    - Declining intra-EU market shares of the flag carriers since 2000.
    - Rise in effective average number of operators at the route level, decrease in the percentage and number of intra-EU routes where flag carriers are the only operator. At the same time, it should be noted that on two-thirds of LCC routes, the LCC faces no direct competition. Hence, LCC growth has for a large part taken place on routes were they face no direct head-to-head competition. These are likely to be lower demand routes. As Dobruszkes (2009) puts it: “It [competition] has certainly increased, but much less rapidly than the number of routes operated by a single airline”.

  - Stagnating aircraft movement growth of the flag carriers.
  - Declining yields.
  - Accelerating industry consolidation through mergers, take-overs and bankruptcies among full-service carriers, stimulated by the new EU state aid policy towards the airlines and absence of US Chapter 11 options. Consolidation among LCCs still has to start.
  - Consolidation and network rationalisation resulted in the loss of hub status for a number of large EU airports during the 1990s.
  - It is not unlikely that a further increase in market share of LCCs will be more the result of an increasing cannibalisation of the full-service market share at the hubs instead of a more rapidly growing demand generated on new secondary routes.

- Although a consumer welfare impact study is outside the scope of our analysis, it is safe to conclude that the consumer has benefitted from EU liberalisation with the number of routes and frequencies increasing substantially since the early 1990s. The rise of hub-networks has improved connectivity both within Europe and between Europe and intercontinental destinations. In addition, there is more choice for the consumer at the route level as well as lower fares, in particular from 2000 onwards. The low-cost revolution created opportunities for smaller airports in the EU airport hierarchy, leading to a more balanced distribution of intra-EU supply over the EU airports and improved accessibility by air of many EU regions.

Future perspectives for the EU market

Based on our results, we foresee the following plausible developments in the EU air transport market:

- Further LCC growth in a number of EU countries (e.g. the Netherlands, France). In other EU countries such as the United Kingdom and Ireland, low-cost growth is stagnating and organic growth in line with the economic growth can be expected. Signs of saturation are not in line with fleet orders of the EU LCCs. A scenario of overcapacity in the EU air transport market is not an unlikely.
- In response to the saturating market, LCCs will have to alter their network strategies to further expand output and maintain their low unit cost levels. More hybridisation of the low-cost model is likely to take place. Network-wise, this may include the increased use of primary airports, more services on longer routes, more low frequent services and an increase in the cannibalisation of existing routes of flag and regional carriers;
- EU (former) flag carriers will be increasingly exposed to low-cost competition on short-haul markets and new hub carrier competition on long-haul markets (Gulf, Turkey). Hence, we may expect:
  - further industry consolidation through mergers and take-overs
  - bankruptcies of financially weak full-service carriers
  - rationalisation and optimisation of hub-networks, de-hubbing of secondary hubs
  - redefinition of hub-strategies, which may entail the integration of low-cost (subsidiary) carriers into the feeder networks of the full-service carriers in order to reach a lower cost level and to pre-empt competition; for example Vueling and Iberia Express started to contribute to better financial results of Iberia.

- Scarcity in large-scale airport capacity will be an increasingly important barrier to entry into Europe's congested airports, undermining the welfare benefits of the liberalised market. Stimulating a transparent secondary market for slots would help to make more efficient use of the existing scarce airport capacity;
- Competition in the ground handling market at a number of large EU airports remains limited, despite the new regulation on ground handling;
- LCC growth and commercialisation among airports has resulted in more departure airport choice for the consumer and, according to Copenhagen Economics (2012), more competition between airports in the origin-destination market. This trend is likely to be enforced with further growth of LCCs in Europe. Yet, the fact that many airports in Europe in the same geographical region share the same operator/owner limits the full potential for effective airport competition. Breaking-up of airport groups under common ownership in the same geographical region (cf. BAA) may create additional competitive constraints to the airports and deliver benefits both to the passenger as well as the airlines;
- Unfair competition/level playing field debates are likely to intensify when business models and worldwide aviation markets further develop, such as the long-haul hub and spoke systems operated by the Gulf carriers (De Wit, 2013).

Scenarios and challenges regarding market access and competition

The following scenarios and challenge in terms of market access and competition between airlines may lie ahead of us.

- Subject to the remark below on fair competition, the EU will continue to export its "open market with free competition" agenda to third states and to adjacent states. The Mediterranean states, and states located in South East Europe, and Eastern Europe will be encouraged to align their aviation policies with those conducted by the EU. In this process the EU Commission has a leading role as it must prepare that alignment and carry out the negotiations. This trend has resulted in the conclusion of Association Agreements between the EU and those states, in which "regulatory convergence", that is, the approximation of the regulatory approach towards the operation of the agreed international air services coming under those agreements, is a principal target. In practice, alignment means that the non-EU states had to adjust their policies and regulations with those of the EU, not only in the field of market access and the interplay of market forces by competition but also in the areas of safety, security, the environment and consumer protection.
- While those surrounding states are willing and prepared to align their policies and laws to those of the EU as their designated air carriers receive access to the attractive EU internal market in return, whereas they can also count on financial and technical assistance from the EU, states in other areas of the world wish to decide their own pace of liberalisation, for domestic policy and commercial reality reasons. One of the principal reasons why the EU-Brazil agreement on air transport, liberalising the market between the two parties along the lines of the EU-US agreement on air transport previously discussed, has not yet been ratified is that Brazilian carriers do not want to lose market share for the benefit of the EU air carriers. The same may be true for the reluctance, so far, of China to sign an air transport agreement with the EU and its member states. Russia also has political motives for refraining from promoting ties with the EU and the EU Commission.

- Absent a global understanding of core principles defining it under the WTO/GATS regime (see below), or any other international regime, the scope of liberalisation of international air transport has yet to be determined. In this process, the introduction of fair competition principles which are concisely addressed in the next point plays a principal role. Based on the Resolutions of the 38th General Assembly of ICAO of 2013, the following ideas on liberalisation are put forward:
  - discussion of fair competition principles in the context of competition law regimes (below);
  - avoidance of conflict between competition law regimes and bilateral air agreements
  - ICAO's engagement with the gathering and analysis of competition laws and enforcement actions worldwide
  - cooperation between competition authorities on a bilateral, regional or multilateral level.

Hence, ICAO appears to support liberalisation by drawing up core principles affecting fair competition. It adopts a more reserved stance with respect to the question of state aid. Although it does not apply to the operation of air transport services, the WTO regime offers an interesting model in terms of procedures, provisions and measures for liberalisation. The air transport sector takes a special place in trade law as trade in air services are governed by bilateral or plurilateral (e.g., EU-US) agreements in which questions of fair competition and especially state aid have not, not yet or only partially found a place.

- A special point on the current and future international air transport agenda concerns the question of fair competition as a result of the invasion of Gulf carriers into markets which were so far dominated by EU and US carriers. Chinese, Indian and South East Asian carriers are also affected by the articulated presence of these Gulf carriers in their respective markets. While the United States and the EU, especially the EU states, try to resolve this perceived imbalance in bilateral relationships, the EU Commission, ICAO and other states are working together to promoting standards for fair competition internationally. Various mechanisms are being proposed in order to address this question. They include but are not limited to:
  - addressing state aid, which is perceived to be a driver behind the operations of the Gulf carriers, in a bilateral, interregional or global context
  - including fair competition clauses as formulated by the EU Commission, EU states or ICAO in bilateral ASAs, or, more generally, international agreements on air transport
  - requesting more transparency on the financial accounts of the carriers in question before granting traffic rights.
- Finally, we believe that regionalism, and regional players, such as the EU, ASEAN, COMESA and other organisations will influence the way in which air services are operated not only on a regional basis but also internationally. Apart from the EU, most regional organisations have a limited mandate only and are commencing their activities in the field of air transport. Moreover, the EU is unique as it has an institutional and constitutional backing giving it its supra-national status under international law, which other regional organisations, which have a more intergovernmental character under international law, lack. Its experience in air transport, trade and competition affairs has greatly helped to shape its policies. However, other organisations are learning their lessons from the EU experiences and will no doubt also inspire the global aviation policy agendas of the next decades.

Notes

1 Third week of July of each year.

2 See Annex A for an overview of traffic rights

3 1/hhi

4 In terms of the share of the route in total number of intra-EU15+2 flights

5 Note that the low-cost share only includes the share of low-cost carriers in intra-EU15+2 flights by EU15+2 carriers. Within EU-28, this share is likely to be higher.

6 It should be noted however that this relatively stable percentage concerns a rapidly growing absolute number of routes with head to head competition to almost 1 500 in 2013.

7 See Commission Decision 1999/198 of 10 February 1999 regarding airport charges at Finnish airports; Commission Decision 95/364/EC of 28 June 1995 regarding landing fees at Brussels airport; Commission Decision 1999/199/EC of 10 February 1999 on landing charges in use at Portuguese airports.

8 See, Ryanair v. Commission, Case T-196/04

9 See: http://www.eipa.nl/UserFiles/File/state_aid/State_Aid_in_the_Transport_Sector.pdf. These Guidelines have been repealed and replaced by a new, substantially different, version, adopted in April 2014 (OJ C 99/3, 04.04.2014).

10 See, Communication from the EU Commission (2013), EU Guidelines on State aid to airports and airlines

11 See, Press Release of 20 February 2014, at: http://europa.eu/rapid/press-release_IP-14-172_en.htm

12 One of the examples are the services of the BA subsidiary open skies between the Netherlands (cancelled) and the United States and France and the United States

13 See, for instance, Lufthansa/SAS/United Airlines, COMP/D-2/36.201, 36.076 and 36.078 - IP/02/1569 of 29 October 2002; KLM/NorthWest, COMP. 36.111 IP/02/1569 of 29 October 2002

14 British Airways/Iberia/American Airlines – COMP/39569, decision of 14 July 2010

15 The application of EU competition rules in an international context is explained in the Air Freight Cartel cases, as to which see Annex 5

16 The Air Cargo Fuel Charges cases have been the first international competition cases in the field of air transport, requiring the application of the provisions prohibiting concerted actions by undertakings (see Article 1010 TFEU). See Annex 5

17 See prior notification of a proposed concentration which the Commission received on 18 December 2003 pursuant to Art. 4 of Council Regulation 4064/89 (as amended and corrected), OJ C 317/15 (2003). Case No. COMP/M.3280 – Air France/KLM, decision of 11 February 2004, available at: http://europa.eu.int/comm/competition/mergers/cases/decisions/m3280_en.pdf

18 Case M.5440; Decision of 28 August 2009

19 Case M. 5747; Decision of 14 July 2010; see: http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=2_M_5747

References

Belén Rey, M. (2003). Structural changes in the Spanish scheduled flights market as a result of air transport deregulation in Europe. Journal of Air Transport Management 9(3), 195-200.

Budd, L., G. Francis , Humphreys, I. and S. Ison (2014). Grounded: characterizing the market exit of European low cost airlines. Journal of Air Transport Management 34, 78-85.

Burghouwt, G. and J.G. de Wit (2005). Temporal configurations of European airline networks. Journal of Air Transport Management 11(3), 185-198.

Burghouwt, G. (2007). Airline network development in Europe and its implications for airport planning. Aldershot: Ashgate.

Button, K. (2001). Deregulation and liberalisation of European air transport markets. Innovation: the European Journal of Social Science Research 14(3), 255-275.

CAA (1998). The single European aviation market: the first five years. London: Civil Aviation Authority.

CAA (1995). The single European aviation market: the progress so far. London: Civil Aviation Authority.

De Wit, J.G. and J. Zuidberg (2012). The growth limits of the low cost carrier model. Journal of Air Transport Management 21, 17-23.

De Wit, J.G. (2013). An Unlevel Playing Field? Ah yes, you mean protectionism. Journal of Air Transport Management, dx.doi.org/j.airtraman.2013.11.012

Dobruszkes, F. (2009). Does liberalisation of air transport imply increasing competition? Lessons from the European case. Transport Policy 29-39.

Dobruzskes, F. (2013). The geography of European low-cost airline networks: a contemporary analysis. Journal of Transport Geography, 75-88.

Doganis, R. (1973). Air Transport: A Case Study in International Regulation. Journal of Transport Economics and Policy, May 1973.

Doganis, R. (1994). The impact of liberalisation on European airline strategies and operations. Journal of Air Transport Management 1(1), 15-25.

Eurocontrol (2013). Challenges for growth. Task 6: the effect of air traffic network congestion in 2035.

Graham, B. (1998). Liberalisation, regional economic development and the geography for air transport in the European Union. Journal of Transport Geography 6(2), 87-104.

Gudmundson, S.V. (2014). Mergers vs alliances. The Air France-KLM story. Available at SSRN: http://ssrn.com/abstract=2142915 or http://dx.doi.org/10.2139/ssrn.2142915

Kerns, C., D. Paukova and F. Schlapbach (2009). The battle for the European leisure traveler. Can the charter airline business model survive. Available at: http://www.ottimo.ch/fd/files/charters.pdf

Klophaus, R., R. Conrady and F. Fichert (2012). Low cost carriers going hybrid: evidence from Europe. Journal of Air Transport Management 23, 54-58.

Leigh, R. (2014). Stimulation effects wear off. Available at http://www.aviationeconomics.com/NewsItem.aspx?title=Low-cost-airlines:-Stimulation-effects-wear-

off&utm_source=AVEC-Mailing-List-20-Jun&utm_medium=email&utm_campaign=AVEC-Mailing-List, 20 June 2014

Morrell, P. (1998). Air transport liberalisation in Europe: the progress so far. Journal of Air Transportation World-wide 3(1), 42-61.

Morrison, S.A. & C. Winston (1995). The evolution of the airline industry. Washington: The Brookings Institution.

Morrison, S.A. (2001). Actual, adjacent and potential competition: estimating the full effect of Southwest Airlines. Journal of Transport Economics and Policy 35(2), 239-356.

OAG (Official Airline Guide) (2015) Airline Schedules Database.

Redondi, R., P. Malighetti and S. Paleari (2012). De-hubbing of airports and their recovery patterns. Journal of Air Transport Management 18(1), 1-4.

Burghouwt, G. and R. Redondi (2013). Connectivity in air transport networks: an assessment of models and applications. Journal of Transport Economics and Policy 47(1), 35-53.

Reynolds-Feighan, A.J. (1995). European and American approaches to air transport liberalisation: some implications for small communities. Transportation Research Part A: Policy and Practice 29(6), 467-483.

Thompson, I.B. (2002). Air transport liberalisation and the development of third level airports in France. Journal of Transport Geography 10(4), 273-285.

Williams, G. (1994). The airline industry and the impact of deregulation. Aldershot: Ashgate.

Williams, G. (2002). Airline competition: deregulation's mixed legacy. Aldershot: Ashgate.

Annex 4.A

Box 4.A.1 Freedoms of the air

First freedom:

To overfly one country en-route to another

Ex.: Aerolinas Argentinas flies over Brazil from Buenos Aires to Chicago (US)

Second freedom:

To make a technical stop in another country

Ex.: Aeroflot makes a stop for fuelling purposes in Warsaw (Poland) on a flight between Moscow and London

Third freedom:

The carriage of traffic (passengers and cargo) from the home country of the airline to another country

Ex.: Air France carries traffic from Paris to Minneapolis (US)

Fourth freedom:

The carriage of traffic to the home country from another country

Ex.: Garuda (Indonesia) carries traffic from New Delhi to Jakarta

Fifth freedom:

The carriage of traffic between two foreign countries by an airline of a third country, which carriage is linked with third and fourth freedom traffic rights of the airline.

Ex.: Japan Airlines operates a service originating in Tokyo to Mexico City, and then on to New York, picking up traffic in Mexico City with destination New York

Sixth freedom:

The carriage of fifth freedom traffic between two foreign countries via the home country of the airline

Ex.: Emirates (UAE) carries traffic originating in Katmandu (Nepal) via Dubai (UAE) to Nairobi

Seventh freedom:

The carriage of traffic between two foreign countries by an airline of a third country, which carriage is not linked with third and fourth freedom traffic rights of the airline.

Ex.: South African Airways carries traffic between Cairo (Egypt) and Rome (Italy) on a service, which is unrelated to a point in South Africa

Eighth freedom:

The carriage of passengers and cargo between two points in a foreign country on a route with origin and/or destination in the home country of the airline.

Ex.: TAP (Portugal) carries traffic between Sao Paolo and Brasilia (both in Brazil), on a flight Lisbon - Sao

Paolo - Brasilia

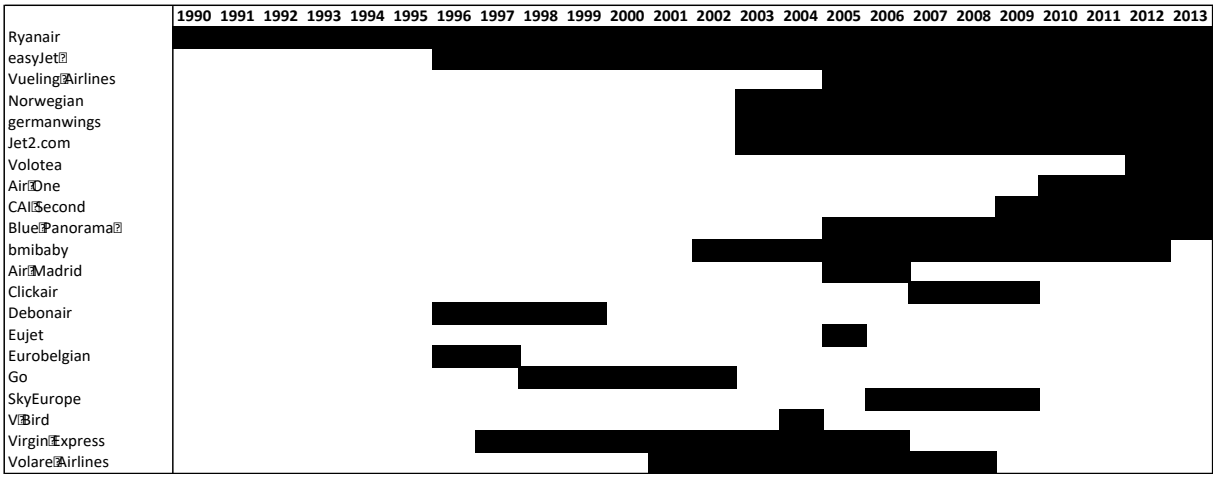
Ninth freedom:

The carriage of passengers and cargo between two points in a foreign country on a route, which is unrelated to the home country of the airline.

Ex.: SAS (Scandinavia) carries traffic between Madrid and Barcelona (both in Spain) on a service which is unrelated to a point in Scandinavia.

Annex 4.B

Figure 4.B.1 Low-cost airlines and years of operation
as applied in this chapter



Annex 4.C

Table 4.C.1. Low-cost carriers in different studies

European Airline	CAPA	Budd et al.	Klophaus	Dobruszkes	Burghouwt et al
Intersky		X			X
Germanwings	X	X	X	X	X
Flybe	X		X	X	
Dba		X		X	
Norwegian	X	X	X	X	X
Alpi Eagles				X	
Aer Lingus			X	X	
Ryanair	X	X	X	X	X
Wind Jet		X	X	X	
Jet2.com	X	X	X	X	X
Sterling		X		X	
Sky Europe		X		X	X
Air Finland				X	
Skynet Airlines				X	
Germania (Express)		X		X	
Transavia.com France	X			X	
Virgin Express		X		X	X
easyJet	X	X	X	X	X
Volare Airlines	X	X		X	X
Vueling Airlines	X	X	X	X	X
MyTravelLite		X		X	
Wizz Air*	X	X	X	X	*
Wizz air Ukraine	X			X	
Wizz air Bulgaria	X				
Bmibaby		X	X	X	X
Hapa-Lloyd Express				X	
Monarch Airlines	X			X	
airberlin		X	X		
Meridiana fly			X		
Air Baltic	X		X		
Transavia	X	X	X		
NIKI	X		X		
Blu Express	X		X		
Corendon			X		
Blue Air	X		X		
Air Italy			X		

Note: *Wizz Air not considered because no intra-EU15+2 flights were reported during the period of analysis.

European Airline	CAPA	Budd et al.	Klophaus	Dobruszkes	Burghouwt et al
Arkefly	X				
EasyJet Switzerland	X				
Feel Air	X				
Iberia Express	X				
Islas Afortunadas Air	X				
Jetairfly	X				
Smart Wings	X				
Sun Express Germany	X				
TUIfly	X				
Volotea	X				X
Air One				X	
CAI Second					X
Blue Panorama				X	
Air Madrid					X
Eurobelgian					X
WOW air	X	X			
Air Polonia		X			
Air Scotland		X			
Air Turquoise		X			
Basiq Air		X			
Buzz		X			
Central Wings		X			
Click Air		X			X
Color Air		X			
Debonair		X			X
EU Jet		X			X
Fly Globespan		X			
Flying Finn		X			
FlyMe		X			
FlyNordic		X			
Get Fly		X			
Go		X			X
Goodjet		X			
HLX		X			
My Air		X			
Snowflake		X			
Star 1		X			
Thomsonfly.com		X			
V Bird		X			X
Zoom UK		X			

Annex 4.D
Comparison between bilateral and plurilateral arrangements governing the operation of international air services

The table below compares provisions of bilateral ASAs on the economic operation of international air services bilateral air services with those laid down in regional arrangements, and open skies agreements. The table illustrates these provisions in a birds-eye view only as the freedoms listed there are conditioned in the relevant arrangements whereas the relationship between regional arrangements and the underlying bilateral air services concluded between the members of the regional organisations must be assessed on a case by case basis. The Freedoms of the Air, identifying the degree of market access granted to the eligible air carriers, are explained in Annex 4.A. The higher the freedom number (IX), and the greater the number of freedoms granted to the relevant air carriers, the higher the degree of liberalisation.

Table 4.D.1 Comparison of the degree of liberalisation of selected air policy regimes

	Traditional bilateral agreements	Andean Pact	ASEAN	COMESA	Open Skies	EU internal market
Nationality requirements for airlines (O&C)	Applicable	Principal place of business in a member state	ASEAN nationals and principal place of business in ASEAN State (cf. EU)	Applicable	Applicable	EU requirements
Designation*	Single or dual	Multiple	Multiple	Multiple	Multiple	Unlimited*
Traffic rights**	I-IV	I-V, subject to conditions	I-VI, subject to conditions, other Freedoms to be implemented	I – IV, V subject to conditions	I-VI (passengers) or I-VII (cargo)	I-IX
Pricing***	Subject to conditions	Country of origin approval	Free	Progressive liberalisation	Free	Free
Capacity	Subject to conditions	No restrictions	No restrictions	No restrictions	No restrictions	No restrictions
Frequencies	Subject to conditions	No restrictions	No restrictions	Pax services restricted; No restrictions for cargo and charter	No restrictions	No restrictions
Applicability of competition law regime	Not relevant: *ex ante* economic regulation	No reference to competition law regime	No reference to competition law regime	COMESA regime	US regime; application of positive comity	EU regime

Notes: *The term "designation" does not apply to the regime set forth by the EU; access to intra-Community routes is free for Community airlines if the conditions drawn up by EU Regulation 1008/2008 are satisfied.** In terms of Freedoms of the Air; see Annex 4.A. *** Free pricing is subject to government interventions in cases of predatory or discriminatory pricing, and, in the case of intra-EU traffic, to the EU Commission's supervisory tasks under Regulation 1008/2008.

Box 4.D.1 Explanation of terms

Nationality requirements for airlines: For airlines to access an international air transport market they must have a nationality which is expressed in terms of ownership (nationality of the shareholders) and control (nationality of the members of the airline's executive board), in short, O&C. Most bilateral ASAs provide that airlines operating the agreed international air services must be "substantially owned and effectively controlled" by the state or nationals of the state designating (as to which see the next term) the airline for the operation of the agreed international air services.

Designation: States party to a bilateral agreement can agree to designate one, two or multiple airlines – complying with the agreed nationality requirements as to which see the previous term – for the operation of the (agreed) international air services.

Traffic rights: Traditional bilateral ASAs tend to focus on the operation of third and fourth freedoms providing basic market access opportunities for the designated airlines; see also Annex 4A of this report.

Pricing: Encompasses pricing of the agreed international air services. Fares refer to passenger services whereas rates are related to cargo services. Variations exist as to the freedom of air carriers to set fares. Traditional bilateral ASAs regulate pricing quite strictly, giving governments, often represented by Civil Aviation Authorities, the authority to control pricing of the agreed international air services.

Capacity: The volume of traffic in terms of passenger seats or cargo space that is available for the operation of the agreed international air services.

Frequencies: Refers to the number of air services per week which a designated airline is allowed to operate under the terms of the bilateral ASA.

Applicability of competition law regimes: As governments through traditional bilateral ASAs regulate and control international air transport markets *ex ante* as exemplified by the above provisions, there is no room for the application of competition regimes. However, open skies agreements liberalise international air transport markets facilitating the introduction of competition regimes.

The EU applies, or at least has a regulatory framework in place for applying, its competition law regime to the operation of international air services, and is the only jurisdiction regulating, and in applicable cases, forbidding state aid, and applying the freedom of establishment to the air transport sector, while allowing the operation of external services from any establishment, or hub, in the EU to points outside the EU. For instance, when Lufthansa has an establishment in Rome, it is entitled, pursuant to EU law, to operate air services from there to Jakarta in Indonesia. Whether the Indonesian authorities would agree with such operations is another question.

Annex 4.E
The air cargo fuel charge cases

The *Air Cargo Fuel Charges* cases have been the first international competition cases in the field of air transport, requiring the application of the provisions prohibiting concerted actions by undertakings (see Article 1010 TFEU). The investigation started in 2006 with dawn raids, also involving non-EU airlines. On 9 November 2010, the EU Commission imposed fines of almost EUR 800 million on eleven airlines for operating a cartel on cargo fuel and security charges. For further information see the Airfreight cartel case COMP/39.258, Decision of 9 November 2010. Hence, concerted behaviour by way of price fixing has been punished severely; pricing must be made in an independent fashion. The EU Commission warned that "the existence of an alliance agreement cannot give a blank cheque for naked price coordination among the members." On the other hand, the Commission showed comprehension for the existence of the regulatory regime prevailing in international air transport encouraging in some cases airlines to behave in an anti-competitive manner because of government dictated trade in air services as illustrated by the mentioned bilateral ASAs; this comprehension resulted in some cases in a 15 % reduction of fines. All airlines apart from Qantas airlines appealed the decision. Moreover, airline managers who have been involved with these cases have undergone imprisonment, especially in the United States and the United Kingdom which apply criminal sanctions to natural persons committing cartel offenses.

Also, the US Department of Justice has conducted criminal price fixing investigations of certain airlines. The investigation resulted in 17 guilty pleas and over USD 1.6 billion in fines to date, the largest fines ever imposed in a single criminal antitrust investigation.

Chapter 5
Assessing the prospects for an EU-ASEAN air transport agreement

This chapter discusses the possible air service agreement (ASA) between the EU and the ASEAN countries and the impact it may have on carriers based in ASEAN countries as well as how it could favour more direct services between the two country blocs.

Introduction

In February 2014, transport officials from the European Union (EU) and the Association of Southeast Asian Nations (ASEAN) met on the sidelines of the Singapore Airshow to discuss a possible comprehensive air transport agreement between both sides. At the meeting's conclusion, the ASEAN states invited the European Commission to launch the internal processes necessary to secure a mandate to commence negotiations on an agreement. In particular, ASEAN welcomed the Vice President of the European Commission and Commissioner for Transport, Siim Kallas' statement that he would propose to the Commission seeking authorisation from the Council of the European Union to start negotiations (E.U.-ASEAN Joint Declaration, 2014).

The economic potential of a "bloc-to-bloc" agreement is obvious: it would be the first accord to lay out an "open skies" or "open aviation area" arrangement between two major regional trading blocs. This could significantly liberalise traffic rights and market access for both regions' airlines in each other's respective territories, along with numerous other potential benefits. Indeed, with 28 and 10 countries respectively and a massive combined population of 1.1 billion, the EU and ASEAN economies stand to benefit greatly from an ambitiously-crafted agreement.

Air traffic between the two regions has nearly doubled in the last 15 years to more than 10 million passengers in 2012 (EU-ASEAN Joint Declaration, 2014). At the same time, a significant amount of traffic in the EU-ASEAN market has been captured by airlines from third countries, particularly the "sixth freedom" carriers like Emirates, Etihad, Qatar Airways and Turkish Airlines. Thus, a major impetus for the proposed EU-ASEAN agreement is the desire on both sides to stem this loss of traffic to the sixth freedom carriers.

This chapter assesses if the proposed agreement can realistically counter the sixth freedom carriers' market power. At the same time, the asymmetries between the EU's common aviation market and the incomplete ASEAN Single Aviation Market (ASAM) will be analysed to illustrate both sides' unequal bargaining positions.

Envisioning the EU - ASEAN open skies market

Unlimited third and fourth freedom rights?

While actual negotiations have not started, it is possible to predict the features of any meaningful accord. One critical liberalising feature would be the complete relaxation of third and fourth freedom rights on a bloc-to-bloc basis. Hence, market access in the form of direct, non-stop flights between the two regions operated by airlines designated by both sides could become unlimited in capacity, frequency

and aircraft type. This is basic philosophy behind all modern open skies aviation agreements and should form the backbone of the proposed EU-ASEAN agreement. An open skies regime with unlimited third and fourth freedom rights and capacity for both regions' airlines could contribute to winning back some of the traffic lost to sixth freedom rivals. Hence, major hub-to-hub operations between Singapore, Bangkok and Kuala Lumpur (on the ASEAN side) and London, Paris, Frankfurt, Amsterdam and Rome (on the EU side) will likely benefit from increased operations and market competition.

Here, it should be noted that currently, not all the bilateral agreements between the EU and ASEAN states have been fully liberalised. The proposed comprehensive agreement will undoubtedly seek to overcome this problem – indeed, with full relaxations, the ASEAN carriers will enjoy unlimited rights and capacity into all the EU countries, including those such as France, Greece and Italy that still maintain capacity restrictions bilaterally. The EU carriers will similarly enjoy reciprocal unlimited access into ASEAN points. To date, the European Commission has concluded "horizontal" agreements with only four out of the ten ASEAN states (Indonesia, Malaysia, Singapore and Viet Nam) to allow for the automatic designation of all EU carriers to enjoy the traffic rights between individual EU states and these ASEAN states (European Commission, 2013). Four other ASEAN member states - Brunei, Cambodia, the Philippines and Thailand - have agreed to EU designation in a more limited way, i.e. through amendments of bilateral agreements with individual EU states. The two remaining ASEAN states, Laos and Myanmar, have not yet entered into any agreement for EU designation. The table below shows the status of such agreements:

Table 5.1. Status of EU designation agreements with ASEAN member states

EU designation agreed under a horizontal agreement		EU designation agreed bilaterally with EU Member State	
	Total no. of bilateral agreements amended		No. of bilateral agreements amended
Singapore	22	Thailand	7
Malaysia	19	Philippines	4
Indonesia	19	Brunei	2
Viet Nam	17	Cambodia	1

Source: European Commission, Bilateral Air Services Agreements brought into legal conformity since the Court of Justice of the EU judgments of 5 November 2002, http://ec.europa.eu/transport/modes/air/international_aviation/external_aviation_policy/doc/table_-_asa_brought_into_legal_conformity_since_ecj_judgments-_january_2013.pdf

In essence, EU designation allows carriers such as Lufthansa (and for that matter, all EU airlines) to be designated to fly between, say, Paris and Singapore even though they are not French carriers. However, actual traffic capacity remains governed by the relevant bilateral agreements. If these have finite entitlements (e.g. the France-Singapore agreement), the EU carriers will have to share that limited capacity between themselves following EU Regulation 847/2004. Of course, a comprehensive EU-ASEAN agreement will overcome this problem and eliminate capacity constraints altogether.

Table 5.2. Direct operations by EU and ASEAN carriers between the two regions

Carrier (Region)	Originating Points/Hubs	Destination Points	Total Weekly Seats	% of Total Capacity
Thai Airways (ASEAN)	Bangkok	Brussels, Copenhagen, Frankfurt, London Heathrow, Madrid, Milan, Munich, Oslo, Paris, Rome, Stockholm, Zurich	64 410	26.1
Singapore Airlines (ASEAN)	Singapore	Amsterdam, Athens, Barcelona, Copenhagen, Frankfurt, London Heathrow, Manchester (via Munich), Milan, Munich, Paris, Rome, Zurich	61 792	25.0
Malaysia Airlines (ASEAN)	Kuala Lumpur	London Heathrow, Frankfurt Paris, Amsterdam	27 516	11.2
KLM (EU)	Amsterdam	Bali (via Singapore), Bangkok, Kuala Lumpur, Jakarta (via Kuala Lumpur), Manila (via Taipei), Singapore	15 620	6.3
Viet Nam Airlines (ASEAN)	Hanoi, Ho Chi Minh City	London Heathrow, Frankfurt, Paris	13 508	5.5
Air France (EU)	Paris	Bangkok, Ho Chi Minh City, Kuala Lumpur, Singapore	13 394	5.4
Lufthansa (EU)	Frankfurt	Bangkok, Jakarta (via Kuala Lumpur), Kuala Lumpur, Singapore	11 648	4.7
British Airways (EU)	London Heathrow	Bangkok, Singapore	11 284	4.6
Finnair (EU)	Helsinki	Bangkok, Singapore, Hanoi, Krabi, Phuket	9 992	4.0
SWISS (EU)	Zurich	Bangkok, Singapore	6 132	2.5
Austrian (EU)	Vienna	Bangkok	4 312	1.7
Norwegian (EU)	Stockholm, Oslo	Bangkok	3 492	1.4
Garuda Indonesia (ASEAN)	Jakarta	Amsterdam	3 140	1.3
Condor (EU)	Frankfurt	Bangkok, Phuket	498	0.2
		TOTAL	**246 738**	**100.0**

Note: Weekly capacity is for week of 4-10 November 2013. The figures reflect direct flights on the respective airlines' own metal (aircraft) only; code-share operations on other carriers are excluded. Fifth freedom operations by non-EU and non-ASEAN carriers are excluded; SWISS and Norwegian taken as EU carriers.

Source: Airline websites and Centre for Aviation (CAPA) and Innovata, at http://centreforaviation.com/analysis/emirates-etihad--qatar-continue-to-pursue-rapid-expansion-in-southeast-asia-western-europe-market-120471

Table 5.3 illustrates the points serviced in both regions by the Middle Eastern and Turkish sixth freedom carriers, while Table 5.4 sets out these carriers' weekly capacity into ASEAN.

Table 5.3. One-stop operations by sixth freedom carriers between the EU and ASEAN

Carrier	Originating Hub	Destination Points		
		EU		ASEAN
Emirates	Dubai	Amsterdam Athens Barcelona Birmingham Brussels Copenhagen Dublin Dusseldorf Frankfurt Geneva Glasgow Hamburg Larnaca Lisbon London Lyon	Madrid Malta Manchester Milan Munich Newcastle Nice Oslo Paris Prague Rome Stockholm Venice Vienna Warsaw Zurich **Total: 32**	Bangkok Ho Chi Minh City Jakarta Kuala Lumpur Manila Phuket Singapore **Total: 7**
Qatar	Doha	Athens Barcelona Berlin Brussels Bucharest (via Sofia) Budapest (via Zagreb) Copenhagen Edinburgh Frankfurt Geneva Larnaca London Madrid	Manchester Milan Munich Oslo Paris Rome Sofia Stockholm Venice Vienna Warsaw Zagreb Zurich **Total: 26**	Bali (via Singapore) Bangkok Clark, Manila Hanoi (via Bangkok) Ho Chi Minh City Kuala Lumpur Jakarta Manila Phnom Penh (via Ho Chi Minh) Phuket (via Kuala Lumpur) Singapore Yangon **Total: 12**
Etihad	Abu Dhabi	Amsterdam Brussels Athens Berlin Dublin Dusseldorf Larnaca London	Frankfurt Geneva Manchester Milan Munich Paris Rome Zurich **Total: 16**	Bangkok Ho Chi Minh City Jakarta Kuala Lumpur Phuket Manila Singapore **Total: 7**
Turkish Airlines	Istanbul	A total of **74** points in the EU		Bangkok Ho Chi Minh City (via Bangkok) Jakarta (via Singapore) Kuala Lumpur Singapore **Total: 5**

Note: EU points include those in Norway and Switzerland. Own elaboration of Ministry of Transport Statistics, 2014.

Source: Respective airlines' websites.

Table 5.4. Middle Eastern and Turkish carriers' capacity into ASEAN, by weekly seats

Carrier	November 2011	November 2012	November 2013	% growth over Nov 2011	No. of ASEAN destinations
Emirates	72 982	80 588	112 028	54	7
Qatar Airways	46 372	47 720	68 374	47	12
Etihad	29 202	38 812	48 314	65	7
Turkish	N.A.	N.A.	approx. 10 000	N.A.	5

Note: Seat capacity is for the first week in November 2011, November 2012 and November 2013.

Source: Centre for Aviation (CAPA) and Innovata, at http://centreforaviation.com/analysis/emirates-etihad--qatar-continue-to-pursue-rapid-expansion-in-southeast-asia-western-europe-market-120471 and http://centreforaviation.com/analysis/http://centreforaviation.com/analysis/turkish-airlines-narrowing-the-strategic-gulf-part-2-112353

It can be seen that the Middle Eastern and Turkish carriers' penetration into both regions, particularly in the EU, is hugely impressive. Hence, they have tremendous capacity to compete for traffic in the EU-ASEAN market. Turkish Airlines alone has more than 70 destinations in the EU, although its seat capacity into ASEAN lags behind that of Middle Eastern carriers. Of course, these sixth freedom carriers collect passenger "feed" from other regions such as Northeast Asia, North America and Africa as well. As such, their operations benefit from greater economies of scale in being able to funnel passengers from a variety of markets through their mid-point hubs. This is particularly important for filling up aircraft on the thinner routes involving smaller cities.

What this means is that an unlimited open skies regime between the EU and ASEAN may not help to justify their respective carriers' direct, non-stop flights between ASEAN and smaller non-hub EU cities such as Bordeaux, Oslo, Glasgow, Prague or Zagreb. The problem for these operations is not the lack of traffic rights but the absence of a sizeable market to fill up the aircraft. The same applies to direct flights between the EU and ASEAN cities such as Bali, Phuket, Manila, Ho Chi Minh City or Yangon. Due to superior geography and operating economics, the Middle Eastern and Turkish sixth-freedom carriers are better-positioned to exploit their "hub-and-spokes" advantage. Indeed, all the above cities are connected by one or more of the sixth freedom carriers through their respective hubs.

Consequently, an EU-ASEAN comprehensive agreement with unlimited third and fourth freedom rights is likely to boost, if at all, only the hub-to-hub operations between the two regions. The thinner routes will remain difficult to fill. Even for the hub or trunk routes, there is unlikely to be a significant increase in actual traffic carried. With some exceptions, most direct EU-ASEAN routes already enjoy unlimited or near-unlimited capacity under the existing bilateral agreements. For instance, Singapore carriers have had unlimited rights into London Heathrow and all points in the United Kingdom since 2007; the real problem here is the lack of slots at Heathrow Airport which an EU-ASEAN agreement does not cure.

Elsewhere, unlimited or generous rights for ASEAN carriers to fly to the likes of Berlin, Brussels or Barcelona already exist, but are largely unutilised due to the lack of a market for regular and profitable operations. Similarly, the EU carriers have more than enough rights into points such as Kuala Lumpur, Hanoi, Phnom Penh and Jakarta but these have also proven to be unprofitable. Overall, unlimited capacity into points such as Paris and Manila that are still limited by the relevant bilateral agreements might be welcomed, but unlimited traffic rights alone will not help the EU and ASEAN carriers fill up their flights, particularly on the thinner routes.

A more significant strategy to grow the market would be to facilitate agreements between airlines from both sides that are immunised for joint venture, "metal-neutral" operations. These will allow hitherto competing players on a particular route to co-operate and engage in joint marketing and revenue-sharing. To illustrate, KLM and Garuda Indonesia could conceivably launch daily flights between Amsterdam and Jakarta that see both carriers jointly marketing and operating those flights beyond simple code-sharing. Each carrier could take one of two daily flights, for instance, or half of the number of weekly flights. In this manner, the co-operating carriers would be metal-neutral, in that they become indifferent to which between them operates a particular segment, as long as both work toward marketing all seats that are cumulatively on offer. Overall, this represents a more viable strategy against rival sixth freedom carriers.

Naturally, such close co-operation (presumably along alliance lines) will invite competition or antitrust law scrutiny from regulators. Such metal-neutral operations have already received the blessings of regulators in the United States, Japan, Korea and Singapore (for trans-Pacific flights, e.g. by Japan Airlines and All-Nippon Airways) and the US and EU regulators for operations across the Atlantic. A comprehensive EU-ASEAN agreement could conceivably seek to facilitate such operations between the two regions and to lay down the necessary safeguards for protecting competition. It follows that in each case, regulators will still have to conduct robust economic analyses to determine the effect on competition. However, to the extent that strong competition is posed by the sixth freedom carriers in the EU-ASEAN market, approving such co-operation by airlines from both ends appears to be straightforward.

Fifth freedom rights and ownership and control rules?

The proposed EU - ASEAN agreement should also go beyond liberalising third and fourth freedom flights (i.e. direct, non-stop flights) to relax fifth freedom operations as well. Thus, EU carriers could gain from having mid-point stops with traffic rights in the Middle East or India as well as beyond-ASEAN rights to Australia, New Zealand and the Pacific. For instance, EU carriers could stop over in Mumbai, India on an EU-Singapore-EU flight with unconstrained traffic pick-up rights in Mumbai in both directions, as well as similar rights in Singapore for an onward segment to Sydney, Australia and back. Conversely, ASEAN carriers could secure similar rights in Mumbai en route to the EU as well as beyond EU rights to the Americas (e.g. Thai Airways on a Bangkok-Mumbai-Frankfurt-New York operation).

Such fifth freedom rights already exist in many of the current bilateral agreements, although their daily or weekly capacity may be restricted. Singapore Airlines, for instance, utilises beyond-EU fifth freedom rights for its Singapore-Frankfurt-New York and Singapore-Barcelona-Sao Paolo operations. The EU carriers have similar traffic pick-up rights in ASEAN points for onward segments to Australia (e.g. British Airways' London-Singapore-Sydney operations). The EU-ASEAN agreement's aim should be to relax such operations to a greater or unlimited degree in order for its liberalising impact to be meaningful. Of course, such operations must also be permitted by the respective agreements with the third countries concerned (i.e. India, Australia, the United States and Brazil in the above examples).

The exchange of full intra-regional fifth freedom rights within the EU and ASEAN should also be considered. Again, the bilateral agreements already provide for such operations, albeit with limited capacity on some routes. Hence, EU carriers like KLM have been operating to Bali via Singapore and Jakarta via Kuala Lumpur, in both cases with traffic pick-up rights in the mid-point ASEAN cities. Conversely, Singapore Airlines offers a Singapore-Munich-Manchester routing. Such fifth freedom operations should be freed up completely with capacity and pricing left to the market to dictate. Indeed, under the EU's Regulation 1008/2008, EU carriers and, on the basis of reciprocity, air carriers of third

countries, can freely set air fares and rates for intra-EU services. That said, given the fierce competition from the LCCs, few airlines from outside the EU have actually found it profitable to mount intra-EU operations.

The beyond-EU fifth freedom rights are likely to be more contentious, particularly because the lucrative trans-Atlantic market to the United States would be affected. The EU airlines and their member states have tended to guard this market jealously, and ASEAN would conceivably have to offer a suitable quid pro quo or exchange. Here, the logical beyond-ASEAN market to barter would be Australia and New Zealand. Yet, the EU carriers that have attempted this route in the past have mostly pulled out due to the high operating costs and severe competition. In fact, British Airways remains the only EU carrier still operating a fifth freedom flight to Australia (Sydney) via Singapore and even then, competition is stiff due to overcapacity in this sector. A bargain in some other form will likely have to be found in order to make fifth freedom liberalisation work.

One possible avenue would be to negotiate a "package deal" involving more liberal investment opportunities in both sides' airlines. This would be similar to what the EU had negotiated with the United States and Canada, only that the United States still insisted on restricting foreign ownership of voting shares in US airlines to no more than 25%. Here, the EU agreement with Canada would be more instructive – the liberalisation of traffic rights is explicitly conditioned upon ownership limits in each side's airlines being progressively relaxed (EU-Canada Air Transport Agreement, 2009). Hence, when the national laws of both parties permit nationals of the other party to own and control up to 25% of the voting interests of its airlines, unlimited third and fourth freedom rights for both sides' airlines shall be granted. When the relaxation on ownership and control goes up to 49%, relaxations on fifth freedom rights shall apply.

Following this approach, the EU and ASEAN could phase in provisions allowing for either side to own up to 49% of shareholding in the other's carriers, with ownership allowed to be held region- or Community-wide. The relaxation of traffic rights could then be explicitly tied to such progressive relaxation on ownership. Practically, this will allow a consortium of EU airlines (possibly from within the same airline alliance group, e.g. Star, Oneworld or Skyteam) to hold 49% of interests in an allied ASEAN carrier. With the EU generally having more investment capital, the deal is likely to see more EU airlines and interests buying stakes in ASEAN airlines than the other way around.

What is notable about the EU-Canada agreement, though, is the fact that Canada previously limited foreign ownership of its airlines to 25% of voting shares and prohibited foreign control. As such, a progressive relaxation up to 49% could be traded in negotiations with the EU In the case of ASEAN, the complication is that the various member states have different ownership and control rules. Most already allow foreign ownership of local airlines up to 49%, in which case there would be nothing new to barter with the EU There is then the exceptional case of the Philippines, which maintains a lower threshold (40%) for foreign ownership of local airlines. This simply means that the ASEAN states will have to craft a consistent internal policy on airline ownership stakes first before they can negotiate effectively with the EU.

Assuming ASEAN can agree on a common 49% cap for foreign ownership, this could conceivably be offered to the EU along the lines of the EU-Canada agreement. Alternatively, the EU-ASEAN agreement could simply provide for a 49% relaxation and leave it to the individual ASEAN states if they wish to adopt it. This could be a more realistic avenue as the relevant legal restriction in the Philippines is actually found in its constitution and may be very difficult to amend.

Table 5.5. Points offered for the ASEAN-China Agreement's Draft Protocol 2 on Fifth Freedom Rights

	"External" Fifth Freedom (e.g. ASEAN – China – Third Country *or* China – ASEAN – Third Country) Example: Malaysian carrier operating Kota Kinabalu - Kunming – Delhi; Chinese carrier operating Xian – Chiang Mai - Sydney **[Weekly limit of 14 per country]**	**"Internal" Fifth Freedom (e.g. ASEAN – ASEAN – China *or* ASEAN – China – ASEAN *or* China – ASEAN - ASEAN)** Example: Malaysian carrier operating Kota Kinabalu - Chiang Mai - Kunming *or* Kota Kinabalu - Haikou - Chiang Mai; Chinese carrier operating Xian – Chiang Mai - Singapore **[No weekly limit]**
Brunei	Bandar Seri Begawan	
Cambodia	Preah Sihanouk (Sihanoukville)	
Indonesia	Mataram (Lombok)	
Lao PDR	Luang Phabang	
Malaysia	Kota Kinabalu	
Myanmar	Any point except Yangon	
Philippines	Any point except Manila	
Singapore	Singapore	
Thailand	Chiang Mai	
Viet Nam	Any point except Hanoi and Ho Chi Minh City	
China	Nanning, Guilin, Kunming, Chengdu, Chongqing, Urumqi, Xian, Changsha, Zhengzhou, *either* Xiamen *or* Fuzhou **Total: 10**	Nanning, Guilin, Kunming, Chengdu, Chongqing, Urumqi, Xian, Changsha, Zhengzhou, Xiamen, Fuzhou, Xishuangbanna, Wuhan, Shenyang, Dalian, Haikou, Sanya, Guiyang, Lanzhou, Xining, Yinchuan, Lhasa, Kashgar, Hohhot, Harbin, Changchun, Ningbo, Yanji **Total: 28**

For now, the EU and ASEAN should perhaps attempt to replicate what the EU has concluded with Canada, particularly in tying the relaxation of traffic rights (including eventually fifth freedom rights) to the progressive relaxation of ownership restrictions in the other party's airlines. Another model, albeit hugely imperfect, would be the draft fifth freedom deal that ASEAN has struck with China. While agreeing to trade unlimited third and fourth freedom rights, the Chinese were wary of giving up beyond-China fifth freedom rights to ASEAN airlines. China thus excluded its three major cities of Beijing, Shanghai and Guangzhou from the fifth freedom deal. Further, it offered a finite list of 10 points (mostly secondary cities) through which "beyond" fifth freedom rights could be exercised by ASEAN carriers. No "linkage" between traffic rights and ownership rules was made, which was probably wise given the complexities in doing so. However, capacity is limited to 14 weekly flights for each contracting state.

As for "internal" or "behind" fifth freedom rights (e.g. a Singapore carrier's Singapore-Bangkok-Shanghai operation, i.e. an ASEAN-ASEAN-China routing), the Chinese offered a list of 28 cities through which such operations can be mounted. Again, these are mainly secondary cities and the three major points of Beijing, Shanghai and Guangzhou are excluded. For both "internal" and "external" fifth freedom, the ASEAN states each offered a secondary point through which the Chinese carriers' operations can be routed. The result is a fifth freedom deal that is limited to secondary cities on both the Chinese and ASEAN sides.

Table 5.5 below reproduces the list of cities that are implicated in the deal. It is obvious that there are few realistic fifth freedom operations that can be mounted. A likely candidate route could be Singapore-Chongqing-Los Angeles, given Chongqing's size and huge catchment population. However, its geographical position in the interior of China means that the route will be circuitous and lengthy. Filling up the Chongqing-Los Angeles sector could thus turn out to be difficult.

The lesson here for the EU and ASEAN is that if a finite city "list" approach were to be taken, it must be ensured that the possible routings are commercially feasible, lest the agreement ends up being practicably worthless. If limits to fifth freedom have to be imposed at all, the better way would be to limit capacity only (e.g. no more than a maximum number of weekly flights or seats), rather than to add a further limitation on the cities through which the rights can be exercised.

ASEAN skies: not yet truly open

At this point, one should note the reality that the ASEAN states do not yet have a true single market among themselves comparable to the EU. Hence, ASEAN is nothing like the EU, let alone a fully unified market like Canada or the United States. For one thing, the ASEAN carriers do not enjoy the seventh freedom that would allow them to fly between two points outside their home state (not even two points within ASEAN).

As a result, a Singapore carrier cannot set up a base in Indonesia to fly to Thailand or to operate between domestic points in Indonesia, unless it adopts the traditional method of incorporating a subsidiary in Indonesia that is majority-owned and effectively controlled by Indonesians. Of course, such restrictions have been abolished in the EU, where any EU airline can freely connect any number of EU points (even domestic ones) and can establish itself in any other EU member state without having to ensure that majority ownership and effective control reside in that state.

As for the more modest third, fourth and fifth freedom rights, the ASEAN Single Aviation Market (ASAM) project does attempt to liberalise these completely by way of several multilateral agreements. However, for these rights to take effect in an individual ASEAN member state, that state must explicitly accept the relevant multilateral agreements that spell them out. This is totally unlike the EU where the common market has automatic community-wide application by force of law.

In ASEAN, the largest member state, Indonesia, has only recently on 30 May 2014 accepted the agreements that free up third, fourth and fifth freedom rights (and even then for its slot-constrained capital, Jakarta, only). For now, the other ASEAN states must still rely on their bilateral ASAs with Indonesia that contain finite capacity entitlements to enable their airlines' operations into other Indonesian points.

The crux is that ASEAN's regional integration is not as developed as the EU's. Critically, there is no supranational organ like the European Commission that can compel member states to place the regional interest above individual, national interests. The fact that the Commission can bring EU member states before the European Court of Justice (notably in the open skies cases) to extract compliance with a single market ambition is the precise reason why the EU common aviation market is relatively successful. Of course, aviation is only part of the larger EU project for regional integration, and that gives the common aviation market additional momentum. In ASEAN, the SAM project is wholly voluntary in that individual member states can accept liberalisation commitments as and when they feel ready. As such, reluctant states can hold up the entire project if they do not see it as in their or their airlines' interests to accept.

As for ownership and control, ASAM takes a leaf out of the EU's book to provide for the possibility of a "Community Carrier". Hence, ASAM makes it possible for an airline set up in Cambodia, for instance, to

be majority-owned by ASEAN interests taken together (e.g. 20% Singapore, 20% Thai and 11% Cambodian stakes). In theory, there is no need for a Cambodian majority interest as long as effective regulatory control over the airline resides with the Cambodian authorities. While this provision exists on paper, no airline to date has actually been set up as a Community carrier. This is because the ASEAN agreements provide that each individual member state retains the discretion to reject applications by such a carrier to fly to its points.

Not surprisingly, new airlines set up in ASEAN in recent years have continued to employ the traditional model with local (i.e. national) interests owning more than 50% of shareholding (the foreign investor typically holds 49%). This is still seen to be the preferred and more sustainable model. The recent examples of joint venture airlines of this type are low-cost carriers (LCCs) bearing a foreign parent's brand – Thai Lion Air, Malindo, Thai VietJet Air and Nok Scoot. These now join the more established LCCs like Thai AirAsia, Indonesia AirAsia and Jetstar Asia, all of which are joint ventures featuring majority local/national ownership but using the foreign parents' brands.

Consequently, there is adherence in ASEAN to the "substantial ownership" requirement in that the foreign partner does not enjoy majority shareholding. That said, the related requirement of local "effective control" has taken on a much looser meaning. Most ASEAN member states gloss over the requirement and appear satisfied when their national is appointed as CEO. Whether effective control truly resides locally could be questionable since many of the joint venture airlines are run as integrated operations alongside their parent foreign carriers, using established common brands or identities as well as combined internet booking platforms. Relevant examples include the AirAsia, Jetstar, Tigerair and Lion Air operations.

In this regard, the ASEAN governments' relatively lenient attitude toward control has to be contrasted with the increasing attention that EU regulators are paying to airlines allegedly controlled by foreign minority shareholders, e.g. the Etihad equity stakes in various smaller European airlines. Even in liberal Hong Kong, the proposed establishment of Jetstar Hong Kong has elicited huge opposition from incumbent carriers such as Cathay Pacific and Hong Kong Airlines over the proposed new LCC's alleged control by the Jetstar/Qantas group in Australia. The more relaxed attitude toward control in ASEAN has actually allowed liberalisation to grow roots, despite the governments' formal attitude toward foreign ownership stakes.

As a result of its unfinished single aviation market project, what is interesting about ASEAN's aviation relations is that it readily negotiates with third countries and blocs even if its own internal market is not yet truly "single". Consequently, an EU-ASEAN comprehensive agreement will practically mean that an ASEAN airline can fly to EU points only from its home national territory. Conversely, all EU-designated airlines will be able to connect any EU point to any ASEAN point, for the simple reason that the EU "backyard" is a unified one. This presents a significant market imbalance that disadvantages the ASEAN airlines in the long-term. Moreover, EU airlines can now merge among themselves (the way Air France-KLM, British Airways-Iberia and Lufthansa-SWISS have done), but this is still impossible for the ASEAN airlines. Of course, all these market imbalances can only be corrected if the ASEAN states start to treat their own backyard as a true single market but this will take years to realise.

In this regard, it is clear that for the immediate future, an EU-ASEAN comprehensive agreement with open or unlimited capacity stands to benefit the EU airlines more in terms of market networks and penetration. Yet, the pragmatic ASEAN position is that it is unrealistic to wait for its own internal market to be forged first. This is why ASEAN went ahead and adopted an air transport agreement with China in 2010, despite all the market imbalance drawbacks described above. Hence, Chinese airlines can fly from

all of China to all of ASEAN, while ASEAN airlines can fly to all of China only from points in their home states (Tan, 2010).

Fundamentally, apart from lacking a supranational mechanism to overcome national sovereignty and to prioritise the regional interest, the problem with ASEAN is that the individual member states' interests and levels of development are too disparate. The lack of a united negotiating stand is also partly why ASEAN could not convince the Chinese to allow fifth freedom rights through the major cities of Beijing, Shanghai and Guangzhou (as explained above). As a result, ASEAN's negotiations with the EU will likely be characterized by aero-political dynamics and asymmetries that are broadly similar to those encountered with China. Like with China, third and fourth freedom liberalisation can probably be attained with minimal problems. However, fifth freedom rights and ownership and control issues will be much more complicated.

The challenge then is to make the proposed EU-ASEAN comprehensive agreement as meaningful as possible, despite the aero-political realities. Beyond third and fourth freedom relaxations, the negotiators should attempt to negotiate a package deal entailing liberalisation for fifth freedom operations, joint venture and alliance arrangements as well as mutual investments in and control over their airlines. Both sides should also seek to promote deeper co-operation in other challenging issues such as harmonisation of safety and security standards and even regulatory oversight over passenger rights, competition law and carbon emissions.

Conclusion

Ultimately, even if all these goals were progressively met in the proposed EU-ASEAN comprehensive agreement, there is probably not too much that the agreement alone can do to stem the loss of traffic to sixth freedom carriers. Overall, the two blocs should not allow their proposed comprehensive agreement to be defined only by the desire to neutralise the sixth freedom carriers. Other liberalising steps and areas of co-operation that promise mutual benefit should be pursued in order to bring two dynamic regions that are separated by the tyranny of distance a whole lot closer, particularly in terms of market philosophy, trading relations and people-to-people exchanges.

References

EU-ASEAN, Joint Declaration on EU-ASEAN Aviation Cooperation adopted at the first EU-ASEAN Aviation Summit, Singapore, at http://ec.europa.eu/transport/modes/air/events/doc/eu-asean/joint-declaration.pdf

EU-Canada, Agreement on Air Transport between Canada and the European Community and its Member States, 2009, at

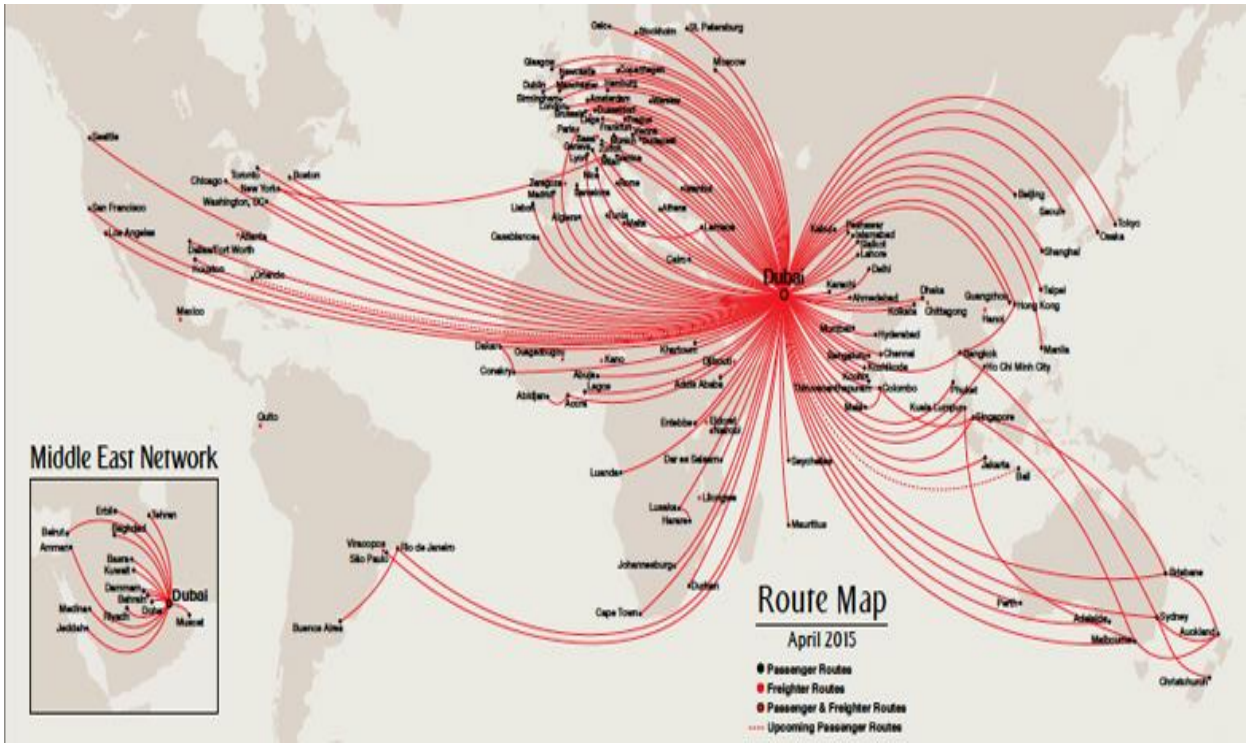
http://ec.europa.eu/transport/modes/air/international_aviation/country_index/doc/canada_final_text_agreement.pdf

European Commission, Bilateral ASAs brought into legal conformity since the Court of Justice of the EU judgments of 5 November 2002, updated as at 30 January 2013, at http://ec.europa.eu/transport/modes/air/international_aviation/external_aviation_policy/doc/table_-_asa_brought_into_legal_conformity_since_ecj_judgments-_january_2013.pdf

Tan, Alan Khee-Jin, "The 2010 ASEAN-China Air Transport Agreement: Placing the Cart before the Horse?" Vol. 37, Air and Space Law 35 (2012) (Netherlands)

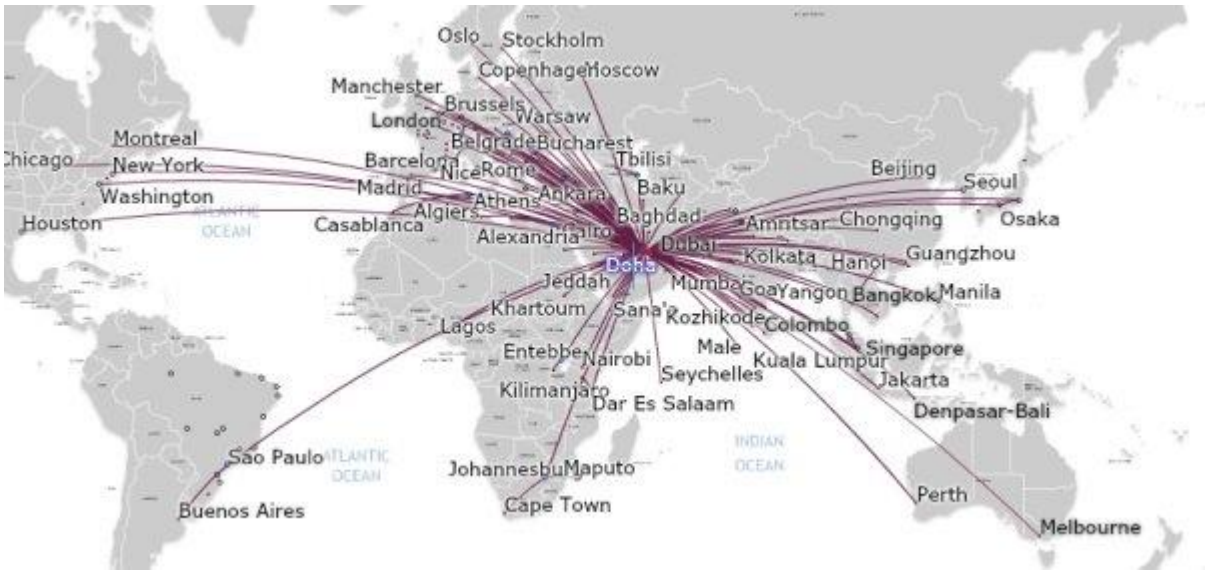
Annex 5.A
Network maps of leading sixth freedom carriers in the Middle East and Asia

Figure 5.A.1. Emirates



Source: https://www.businesstraveller.com/files/News-images/Emirates/Route-map.jpg

Figure 5.A.1. Qatar airways

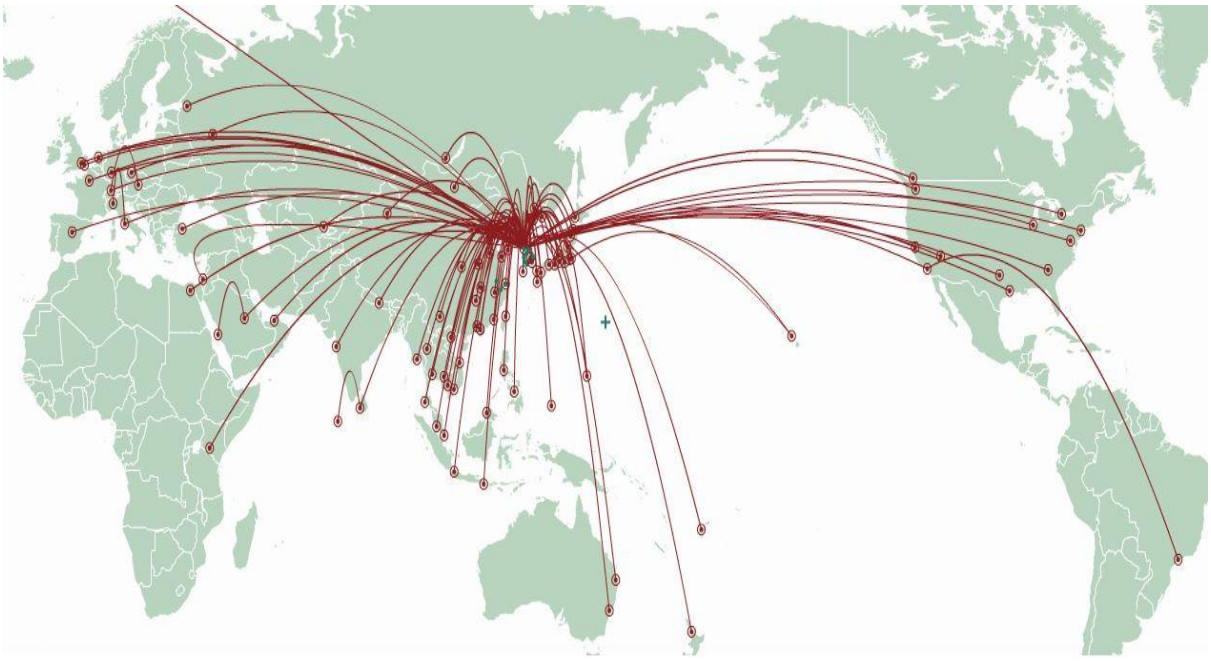


Source: http://cdn1.loyaltylobby.com/wp-content/gallery/october-2012/xqatar-airways-worldwide-map.jpg.pagespeed.ic.U_4IY0_iRz.jpg

Figure 5.A.3. Turkish airlines

Source: http://www.uberti.eu/informazioni/compagnie-aeree/turkish-airlines/destinazioni-turkish-airlines-route-map.html

Figure 5.A.4. Korean Air

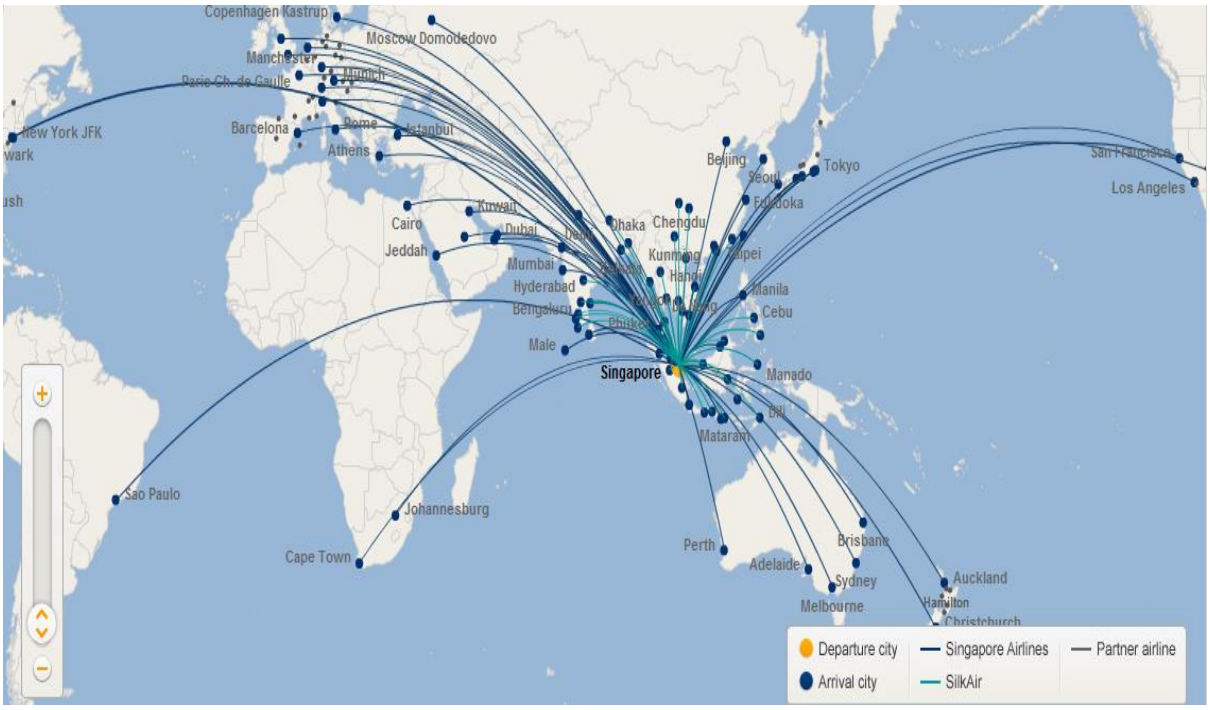


Source: https://www.alternativeairlines.com/korean-air

Figure 5.A.5. Thai Airways

Source: http://www.thaiairwaysau.com.au/thai_our_network.asp

Figure 5.A.6. Singapore airlines



Source: http://www.singaporeair.com/en_UK/promotions/fly-through-singapore-to-europe/

Chapter 6
Dominant carrier performance and international liberalisation: The case of North East Asia

This chapter discusses aviation liberalisation in Northeast Asia with particular attention to China, how its aviation industry is organised and the role of dominant carriers in the country. It also discusses how liberalisation could lead to more low cost carriers present on the Chinese market.

Introduction

Numerous studies on the aviation industry have confirmed that significant benefits can be brought by liberalising the international market. After a comprehensive review of the recent studies on this issue, Fu and Oum (2014) concluded that there is strong evidence that liberalisation introduces substantial economic benefits to the countries involved. In the airline industry, liberalisation has led to increased airline competition, decreased average fares, increased frequency, improved load factor and airline productivity, increased traffic volumes and new route services. These changes not only lead to higher employment and economic output in the aviation industry, but also provide better inputs to other related sectors such as tourism, trade and logistics. Yet despite such well recognised benefits, it is mainly developed countries that have liberalised their air service agreements (ASAs), notably the United States followed by the EU. As of 2003, 57 liberalisation agreements out of 87 involved the United States. As of October 2012, over 400 liberalised agreements were reached among 145 economies, among which more than 100 were US open skies agreements (ICAO 2013). In most other markets, air liberalisation has made limited progress over recent decades, even in regions characterised with strong economic and international trade growth.

Some limited progress in aviation liberalisation has been achieved in the North East Asia (NEA) region. In 2006, an open skies agreement was endorsed between Korea and the Shandong province in China. In 2007, Korea and Japan achieved bilateral open skies agreements with the exception of Japanese metropolitan airports that suffer from capacity constraints. An agreement to liberalise the services between Tokyo Narita International Airport and Incheon International Airport was subsequently reached in 2010, after the airport capacity was expanded in Tokyo. All these achievements have led to substantial growth in aviation traffic and service frequency. However, compared to the market potential of this region, which comprises of the world's second, third and fifteenth economies in terms of GDP (i.e. China, Japan and Korea[1]) and a total population of more than 1.5 billion, it is clear that the international aviation market in NEA could have been much larger if more liberalised bilateral service agreements had been reached. Therefore, there is a need to investigate why governments in this region have not been able to achieve more and whether a clear roadmap can be designed in order to push liberalisation forward on a fast track in the years to come.

Despite an increasing body of literature on air transport liberalisation in recent years, limited attention has been devoted to dominant airlines' performance changes throughout the liberalisation process, and how the competitiveness of a country's aviation sector influences its government's policy on international transport. This is justified in theory since national policy such as air transport liberalisation

should be based on the overall national interests instead of individual firms' well-being. In practice, however, dominant airlines often exert significant influences throughout the liberalisation process. This is not a new issue; it dates back to the time when the current international system was first introduced. The United States urged for liberal international markets after World War II. However, most other countries had reservations over full liberalisation, partly due to concerns that their airlines could not compete with those in the United States on almost every aspect including fleet development, availability of qualified pilots, management expertise and financial resources.

The preamble to the 1944 Chicago Conference aimed to promote international aviation "in a safe and orderly manner" on the basis of equality of opportunity. In 1946 the Bermuda Agreement was reached between the United States and Great Britain subsequently, and bilateral service agreements (BSAs) were formed. This generally led to compromises which allowed liberalisation of the international markets without jeopardising the well-being of “flag carriers”. Such practices and philosophies prevailed until governments of the United States and Western European countries began to liberalise their skies in the early 1990s. At that time the concept of “flag carrier” was phasing out and governments had no or little direct interests in their airlines. This is not the case in the NEA region. Other than a few niche players such as Spring Airlines and Juneyao Airlines, most airlines in China are majority owned by either central or local governments. Although the Chinese government recognised the decisive role to be played by markets in allocating resources[2], there is still no clear separation between its dual-role as the owner of airlines and as a regulator. Influences from the dominant airlines in China on various aviation policies will not fade away quickly.

In addition, investigating major airlines’ performance, both overall and in domestic market development, will help predict their performance in international markets, enabling their strategy in developing international markets, and their attitude toward alternative liberalisation policies to be examined. Many studies have discussed the relationship between domestic market structure and export services. With some simplification, the literature on this could be divided into two streams. On one hand, the national-champion theory argues that with suppressed competition in domestic markets, firms can achieve large scales which enable them to obtain large market shares and profits in export markets (see for example Pagoulatos and Sorensen, 1976; Marvel, 1980; Krugman, 1984; Chou, 1986). Another group of studies support the competition theory in that tight competition in domestic markets forces firms to improve and innovate enabling them to achieve global competitiveness in the export market (see for example Audretsch and Yamawaki 1988; Porter 1990; Clark et al. 1992; Kim & Marion, 1997; Sakakibara and Porter, 2001). Clougherty and Zhang (2009) examined the case of airline markets and found that if an airline can improve its performance in the domestic market, it is more likely to win competition in the overseas markets.

This chapter aims to investigate the linkage between domestic market regulation/deregulation, airline performance and liberalisation of international markets in the NEA region, with a focus on the Chinese market. China is the world’s second largest aviation market after the United States, and thus, its liberalisation policy will have a significant impact on the NEA region as well as on the global aviation market. Japan and Korea have made major progress in opening up their markets to each other and a few other states. In comparison, the Chinese government has been more conservative towards liberalisation after some opening-up efforts in 2007, when the bilateral service agreement between China and United States allowed more flight frequency designations.

Airlines in Korea and Japan have been privatised for quite some time, yet dominant carriers in China are still majority owned by state. Such close linkages with the government may allow Chinese carriers to exert greater influence over national policies. Despite some deregulation policies implemented over the

years, legacy regulations are still present in the Chinese domestic markets. If such regulations limit airline competition and cannot be phased out in domestic markets, they are unlikely to be removed from the international market any time soon. In summary, an examination of development in the Chinese domestic market, in particular the performance of major airlines, will contribute to a better understanding of the Chinese regulator's aims and priorities. Such a study helps outsiders to predict regulators' policy preferences in the years to come. For the reasons mentioned above, this study will focus on the aviation market in China whereas the case of Korea and Japan will be briefly discussed only if it is necessary to benchmark across all three countries.

This chapter is organised as follows: It begins with a review of the development path and current status of aviation markets in the NEA region, including domestic deregulation, international liberalisation efforts and major airlines' performance. Then it discusses possible concerns of the Chinese government if a "national champion" philosophy is adopted to help major carriers achieve a large scale and global competitiveness. It then goes on to review the development of low-cost carriers (LCCs) in the region, and whether they can promote aviation liberalisation in the NEA region without generating substantial market disruptions.

Domestic market development and status of major airlines

In the past few decades, the Chinese aviation sector has achieved tremendous growth thanks to the country's fast-expanding economy and huge investments in transport infrastructure including airports and air traffic control systems. In terms of market size, the number of air passengers grew at an annualised rate of 14.9% between 1990 and 2010.

It is not straightforward to measure the performance and competitiveness of Chinese airlines. In 2010 the total earnings of Chinese carriers reached RMB 35.1 billion (USD 5.18 billion), about 60% of the industry's global profit that year. On the other hand, China Eastern Airlines, the second largest carrier in the country, received a government capital injection of 10 billion RMB (USD 1.45 bn) in 2009, and another injection of more than 3 billion RMB (USD 0.44 billion) in 2012 to reduce its exceedingly high debt ratio. The other two largest airlines, China Southern and Air China, received capital injections of 2 billion RMB (USD 0.29 billion) and 1 billion RMB (USD 0.15 billion) respectively in 2012 as an urgent measure to boost capital and reduce debt. During this period, there were no major disruptive events such as SARS or terrorist attacks in China. Although Chinese airlines have been growing rapidly in terms of scale, their performances can be two-sided and need to be examined. This section reviews the market structure and development path in the Chinese aviation market, thus that the performance of Chinese carriers can be interpreted and their attitude towards deregulation and liberalisation can be evaluated.

The development path of Chinese domestic market

The Chinese aviation industry was operated as a quasi-military unit before 1978. Commercialisation of airlines started in March 1978, when management/regulatory authority was transferred from the air force to the State Council. However, airlines were only corporatised in 1987, when six major state-owned airlines were formed based on six regional bureaus: Air China, China Southern, China Eastern, China Southwest, China Northwest, and China Northern. Since 2002, some major restructuring policies were introduced in the aviation sector:

- The Chinese government initiated market consolidation among major carriers. In 2002, China Eastern airlines merged with China Northwest and Yunnan airlines; China Southern merged with

China Northern and Xinjiang airlines; and Air China merged with China Southwest and CNAC airlines. In 2010, the market was further consolidated, when China Eastern acquired Shanghai airlines and Air China acquired Shenzhen airlines. In addition, consolidated airlines also established many subsidiary carriers, often jointly with local governments, which serve as niche players in regional markets. For example, Air China holds shares in Shandong Airlines, Tibet Airlines, Dalian Airlines, Air China Inner Mongolia and Air Macau. The same strategy has been adopted by other major airlines such as China Southern, China Eastern and Hainan Airlines. In summary, the Chinese government has allowed coordinated mergers and consolidation in the airline market. Competition or antitrust issues have not been a serious concern to the regulator.

- The preference for scale and government control in China is also reflected in the input supply market. The China National Aviation Fuel (CNAF), a fortune 500 company, is the *de facto* monopoly supplier of aviation fuel in China although some airlines have limited control of fuel supply in a few domestic airports. The China Aviation Supplies Holding Company, another state-owned company, has a significant market share in aircrafts purchase and leasing. The China Travel Sky Holding Company provides the IT backbone for domestic ticket sales and reservations, and has been providing airport passenger systems for over 100 airports. Since 2002, the six groups (i.e. Air China, China Eastern and China Southern airline groups, CNAF, China Aviation Supply and China Travel Sky) have been "detached" from the Civil Aviation Administration of China (CAAC) and are now under the control of the state-owned Assets Supervision and Administration Commission of the State Council. Still, ties between CAAC and these state-controlled groups remain strong. Many senior officials at CAAC actually served as top executives at these six groups.
- Provincial and municipal governments play significant roles in the aviation industry. Other than the Beijing Capital Airport and airports in Tibet, all airports had been transferred to local governments by 2004. Local governments are responsible for airport investments, although airport operation and pricing are regulated by the central government. Airports are classified into different "categories" Each category is under a set of pricing schemes as defined by CAAC. In addition, many second-tier airlines (in terms of size) are founded/co-founded by local governments, mainly to promote aviation services to the province or the city. Therefore, local governments' interests and objectives are usually consistent with their own airports, but not always consistent with those of the other airlines That is, airlines care more about their own revenues and profits, while local governments care more about traffic volume and service quality in their regions since better aviation services contribute to the well-being of local airports and economies.

Compared to aviation markets in developed economies, the commercialisation process of Chinese aviation markets started much later. Currently, all major carriers are majority owned and managed by either central or local governments. Many inputs and supporting services are also controlled by state-owned companies that have significant market power. The central government owns the largest three airline groups and dominant/monopoly companies that provide fuelling services, ticketing and airport IT services, fleet purchasing services. The regulator has little concern over market consolidation and reduction of competition. Only a few private airlines have been allowed to enter the market and they are still much smaller than their state-owned peers. Most airports are under the control of local governments, which are responsible for these airports' financial performance and infrastructure investments. Therefore, these local governments may have different objectives than the dominant carriers as local governments care for better aviation services in their respective regions, which benefit local airports and increase social welfare.

Airline route entry, network development and airline competition

Route and network planning is very important since they directly affect airlines' cost and revenue. Piermartini and Rousova (2008) reviewed ASAs in international markets and found that although 60% of the ASAs allow multiple designations, 40% only permit single designation thus there are at most two airlines competing in the international routes involved. Fu et al. (2010) and Fu and Oum (2014) concluded that liberalisation allows airlines to optimise their networks for various objectives: to improve cost efficiency by exploiting "economies of traffic density", to enhance service quality by initiating direct flights and/or by increasing flight frequency, to price more aggressively or to compete more strategically. Regulation on route entry has been removed in most mature markets in North America and Europe, as well as Asia-Pacific countries such as Japan, Korea, Australia, New Zealand etc.

In the Chinese domestic markets, route entry and airport slot allocations are monitored and/or regulated depending on whether hub airports are involved. The detailed regulation rules have evolved over the years. Currently, when airlines plan to enter a new market defined as an airport-pair, they need to either apply for approval or simply register/report in advance. The following three types of route entry need to be approved: (I) when the entry involves an airport that is slot controlled or capacity constrained as defined by the regulator, or (II) when the entry involves busy airports or routes with large traffic volume, or (III) airports that have special arrangements related to safety of flight operations. For the following three types of route entry an airline only needs to register/report in advance without seeking an approval: (1) airport pairs not included in I-III as outlined above, or (2) cargo flights, or (3) airport pairs defined by CAAC or regional bureaus.

Before 2010, approval for route entry was required for most large airports in provincial capital cities and metropolitan areas. Under the current rules, entries involving the four airports in Beijing, Shanghai and Guangzhou (i.e. Beijing Capital Airport, Shanghai Hongqiao Airport, Shanghai Pudong Airport and Guangzhou Baiyun Airport) need to be approved. However, for airlines which have their hubs located in these four airports, there is no need to seek approval for flights from their hub to other destinations not involving the four regulated airports. For example, since Air China has its hub at Beijing, there is no need to seek approval for flights between Beijing – Xi'an, but the carrier needs to apply for adding frequency between Beijing – Shanghai. As of December 2013, 88% of the entry rights to 3 353 domestic routes are by registration only without the need to seek formal approval. This ratio has been increasing over the years.

In addition to route entry regulation, there are also slot controls at congested airports. Airport slot allocation and coordination are under the control of the central government (i.e. CAAC) as well as regional bureaus. Regional bureaus are responsible for domestic airlines' flights at the airports, whereas CAAC coordinates slots for international flights. Since traffic volumes have outpaced airport capacity growth to many destinations, more and more airports needed slot coordination in recent years as reported in Table 6.1:

Table 6.1. Airport slot control and coordination of Chinese airports

Airport	Peak-hour movement limit (per hour)	Coordinated time period	Effective since
Beijing	88	06:00—02:00	2011.12.15
Shanghai Pudong	65	06:00—02:00	2010.5.1
Guangzhou	58	06:00—02:00	2010.3.28
Xi'an	45	06:00—02:00	2012.5.7
Shanghai Hongqiao	43	06:00—02:00	2010.5.1
Chongqing	42	06:00—02:00	2012.5.25
Shenzhen	34	06:00—02:00	2011.2.9
Chengdu	34	06:00—02:00	2012.3.25
Wuhan	33	06:00—02:00	2012.3.25
Hangzhou	31	06:00—02:00	2012.3.25
Nanjing	28	06:00—02:00	2012.3.25
Qingdao	28	06:00—02:00	2012.3.25
Xiamen	28	06:00—02:00	2011.2.9
Dalian	27	06:00—02:00	2012.5.25
Changsha	27	06:00—02:00	2011.2.9
Haikou	27	06:00—02:00	2011.2.9
Urumqi	25	08:00—04:00	2011.8.15
Tianjin	24	06:00—02:00	2011.1.13
Fuzhou	23	06:00—02:00	2011.2.9
Sanya	20	06:00—02:00	2011.2.9

When a regional bureau manages airport slots, an allocation committee is formed by representatives from the regional bureau, regional air traffic control, airlines and the airport. One key responsibility of this committee is to suggest the slot allocation ratio between hub carriers vs. airlines based in other airports. For major decisions, a vote will be conducted among committee members, who have a total of 1 000 voting rights. Based on the shares of allocated slots in the previous year, a total of 600 votes are distributed among airlines. The rest of the voting rights are shared among regional bureaus, airports and air traffic control agencies. Through routine operation and management, airport slots are allocated among the following services with a decreasing priority:

- Existing flights (i.e. grandfather rights)
- Entrant airlines initiating services at the airport
- Hub carriers having priority over non-hub carriers
- New routes by airlines currently serving the airport
- Airlines that achieved high use rates of current slots.

In view of the current practice in the global aviation industry, the airport slot allocation regulations in China are not totally unreasonable. In mature markets such as Europe and North America, the first step of slot allocation is to give priorities to incumbent airlines with existing slots to obtain the same slots in the next period (grandfather rights). If the existing slots are to be protected for the next period, the slots have to be used at least 80% of the time in the current period ("use it or lose it" rule). Once the grandfather rights are confirmed, the remaining slots together with newly created slots (through improved air control technology, voluntary relinquishment, insufficient use or added capacity) are grouped in a "slot pool", up to 50% of which are set aside for new entrants ("new entrant" rule). The rest is allocated free of charge to incumbents. The current slot allocation approach adopted in many countries, characterised by "grandfather rights", "use it or lose it" rule and "new entrant" rule, however, has long been criticised for inefficient allocation, and is recognised as a source of congestion both in the academic literature and by the aviation industry (Matthews and Menaz, 2003). For example, an incumbent airline may deter entrant airlines by scheduling small aircrafts over non-core routes or to lease slots to alliance members for a short period, thus that incumbent airlines can continue to hold to slots that are under-utilised. With this kind of "slot baby-sitting" strategy, incumbent airlines may deter entrant airlines by pre-empting the markets via airport slot hoarding. Many studies, including these commissioned by governments, have investigated using slot auction or other possible market-based instruments (e.g., congestion pricing, slot sales and slot trading), so that slots are allocated to carriers that attach the highest economic value to them (DotEcon 2001, 2006; Sentence 2003; Maldoom 2003; National Economic Research Associates 2004, Madas and Zografos, 2006, 2008, 2010, Brueckner 2009, Verhoef 2010). However, these proposals have largely remained on paper due to various practical challenges and political concerns. For example, the US Department of Transportation (USDOT) planned to auction slots for airports in New York, but was eventually forced to postpone the plan indefinitely due to resistance from airlines and the Port Authority of New York and New Jersey which manages the airports involved.

Still, the regulations on route entry and airport slot allocation in China jointly are much more restrictive than the regulations adopted in mature markets such as Europe and North America (e.g. London Heathrow airport, JFK, Chicago O'Hare etc.). In these deregulated markets there is only slot control in congested airports. Once a slot is secured and used by an airline, it can be used for any route without seeking approval. In contrast, Chinese airlines often need to secure approvals for both route entry and airport slots when they enter or add frequencies in routes linking to hubs in metropolitan areas (i.e. Beijing, Shanghai and Guangzhou). In addition, whereas it has been a common practice in mature markets to give priorities to entrant airlines and new services, in the Chinese domestic markets hub carriers receive preferential treatments: other than the four regulated airports, there is no need for hub carriers to seek route entry approval for initiating services to their own hub airports. In addition, these carriers also have higher priority in securing airport slots at their hubs. It has been claimed by the regulator that these policies are aimed at achieving two objectives: to promote competition and to facilitate dominant airlines developing their hubs. However, the preferential treatments given to hub carriers make it difficult for other airlines to compete in major hubs. This is in sharp contrast to the policies adopted by USDOT, which has tried to introduce competition in hub airports and to discipline hub carriers' market power[3].

Performance of aviation markets and major airlines

There is a two-way relationship between government policy and market performance in China. On one hand, aviation policies have been revised over the years to reflect the changing market conditions and to achieve evolving policy objectives. On the other hand, these policies have brought significant influences

to the market equilibrium and thus airlines' performances. For example, large airports in China account for a significant proportion of the national markets, so special arrangements have been made with respect to route entry and slot allocation at these airports. Because government policies have given preferential consideration to hub carriers, they have been able to further strengthen their market positions at major hubs as well as in the national market. The market share of the top 10 major airports are reported in the table below for the 1998-2009 period. Over the years, the top 10 airports have accounted for more than half of the national passenger market and more than 70% of the national cargo markets. As a result, it is of critical importance for airlines to secure their market share at major airports.

Table 6.2. Market share of the top-ten Chinese airports

Market share by passenger volume (Unit %)						
Year	09 Rank	2009	2008	2005	2002	1998
Beijing	1	13.45	13.79	14.42	15.85	15.23
Guangzhou	2	7.62	8.24	8.28	9.34	10.92
Shanghai / Pudong	3	6.57	6.7	8.32	6.45	N/A
Shanghai / Hongqiao	4	5.16	5.64	6.26	7.98	12.05
Shenzhen	5	5.04	5.27	5.73	5.46	4.53
Chengdu	6	4.66	4.25	4.89	4.40	3.86
Kunming	7	3.90	3.91	4.16	4.14	4.33
Xi'an	8	3.15	2.94	2.79	2.59	2.52
Hangzhou	9	3.07	3.12	2.85	2.26	2.00
Chongqing	10	2.89	2.75	2.33	2.26	2.07
Total		55.51	56.61	60.03	60.73	57.51
Market share by cargo volume (Unit %)						
Year	09 Rank	2009	2008	2005	2002	1998
Shanghai / Pudong	1	26.9	29.5	29.3	15.8	N/A
Beijing	2	15.6	15.5	12.4	15.7	17.7
Guangzhou	3	10.1	7.8	9.5	12.4	14.1
Shenzhen	4	6.4	6.8	7.4	7.2	4.0
Shanghai / Hongqiao	5	4.6	4.7	5.7	10.9	19.8
Chengdu	6	4.0	4.2	4.0	4.0	3.8
Kunming	7	2.7	2.7	3.1	3.0	3.5
Hangzhou	8	2.4	2.4	2.6	2.2	1.9
Nanjing	9	2.1	2.1	2.2	1.3	1.1
Xiamen	10	2.1	2.2	2.5	2.7	3.3
Total		76.92	77.9	78.70	75.20	69.20

Note: Shanghai Pudong International Airport was in service on 1 Oct 1999

Source: Fu et al. (2012).

The overall effects of route entry and slot allocation have been unclear. As shown in the following tables, the increases in flight frequency have been substantial although significant variations exist among airports of different sizes. However, average aircraft size for flights linking the largest airports actually

decreased from 2002 to 2008. This might indicate the progress of Chinese carriers in constructing hub-and-spoke networks (which requires extensive feeder operations using small aircrafts), or increased airline service quality with reduced schedule delay. On the other hand, it may be an indication that precious airport slots could have been better utilised by larger aircrafts, or the current slot allocation scheme is not optimal from the perspective of social welfare. In addition, Wang et al. (2014) noted that Chinese carriers' yields at the largest routes are slightly higher than the average yield in the United States. Considering the lower per capita income and input prices in China, airline competition in China is certainly not at the level it should have been.

Table 6.3. Average aircraft size on routes between different sized airports

2002			
	Top 10 airports	Airports ranked 11-50	Other airports
Top 10 airports	182 (33.14)	148 (35.92)	113 (49.30)
Airports ranked 11-50		123 (48.69)	91 (55.66)
Other airports			155 (50.28)
2008			
	Top 10 airports	Airports ranked 11-50	Other airports
Top 10 airports	166 (32.05)	146 (21.48)	115 (43.82)
Airports ranked 11-50		134 (38.44)	100 (51.40)
Other airports			85 (55.26)

Note: Numbers in parentheses are standard deviations.

Source: Wang et al. (2014).

Table 6.4. Weekly average flight frequency on routes between different-sized airports

2002			
	Top 10 airports	Airports ranked 11-50	Other airports
Top 10 airports	78.5 (61.67)	26.8 (27.62)	6.6 (8.30)
Airports ranked 11-50		9.1 (9.20)	7.9 (9.68)
Other airports			3.5 (2.03)
2008			
	Top 10 airports	Airports ranked 11-50	Other airports
Top 10 airports	168.6 (104.41)	50.2 (48.71)	10.6 (14.31)
Airports ranked 11-50		14.8 (16.10)	8.6 (12.73)
Other airports			10.9 (16.59)

Note: Numbers in parentheses are standard deviations.

Source: Wang et al. (2014).

Dominant airlines in China have been able to take advantage of many favourable factors in recent decades: the Chinese economy has been growing at a fast pace, leading to very strong demands for air travel. Such demand growth has been particularly high in major airports, where hub carriers enjoy substantial competitive advantage under the regulatory regimes of route entry and airport slot allocation. The Chinese government has encouraged major airlines to further consolidate, enabling leading carriers to increase their scale at remarkable speeds. As shown in Table 6.5, Chinese airlines have

been growing much faster than their peers in the NEA region. During the period of 2001 to 2012, the "big three" Chinese carriers (i.e., Air China, China Southern and China Eastern) recorded about 700% growth in revenue. In comparison, Korean carriers increased revenues by less than 300%, whereas Japanese carriers' revenues increased by less than 50%. In terms of the number of passengers carried and the number of aircraft, Chinese carriers were much smaller than their Japanese and Korean competitors in 2001. But in 2012, they were almost twice large as the largest followers in the other two countries. It is clear that Chinese airlines have achieved remarkable growth in size.

Table 6.5. Benchmark major airlines' performance in NEA

2001	China Southern	China Eastern	Air China	Korean Air	Asiana	Japan Air	ANA
Total revenue (million USD current price)	2 039	1 468	2 747	4 393	1 718	12 095	NA
Total profit (million USD current price)	169	69	115	718	344	-276	NA
Revenue passenger (1 000)	19 121	10 371	15 600	21 638	11 931	37 183	NA
Number of aircraft	111	70	114	127	59	173	NA
% of cargo revenue	8%	17.20%	15%	27.81%	28.24%	14.90%	NA
% of international RPK	22.40%	NA	46%	88.67%	84.21%	77.23%	NA
2006	**China Southern**	**China Eastern**	**Air China**	**Korean Air**	**Asiana**	**Japan Air**	**ANA**
Total revenue (million USD current price)	5 797	4 842	5 636	8 455	3 613	19 499	11 769
Total profit (million USD current price)	26	-433	415	1 856	706	-138	230
Revenue passenger (1 000)	49 206	35 040	33 971	22 353	12 767	57 452	49 609
Number of aircraft	309	205	225	116	65	NA	NA
% of cargo revenue	7.70%	15%	9%	31.36%	27.68%	9.50%	6.21%
% of international RPK	17%	37.80%	48.00%	92.85%	91.50%	65.35%	32.10%
2012	**China Southern**	**China Eastern**	**Air China**	**Korean Air**	**Asiana**	**Japan Air**	**ANA**
Total revenue (million USD current price)	15 771	13 511	15 981	10 883	5 003	14 509	16 998
Total profit (million USD current price)	808	445	781	1 238	598	2 247	339
Revenue passenger (1 000)	86 485	73 077	72 416	24 283	15 514	37 564	44 903
Number of aircraft	491	428	461	142	71	216	230
% of cargo revenue	6.60%	10.10%	8.40%	25.27%	25.73%	6.54%	8.59%
% of international RPK	20.80%	30.20%	33.30%	96.19%	94.94%	89.64%	42.30%

Source: Company's annual reports and industry sources

Meanwhile, Chinese airlines were able to increase their profits significantly, albeit slightly slower than the growth in scale. As shown in Table 6.5, the Chinese "big three" improved their profits by more than 500% from 2001 to 2012. However, they were not able to improve their competitiveness in global markets as predicted by the "national champion" theory – the share of international traffic in terms of revenue per passenger-kilometre (RPK) actually decreased between 2001 and 2012, lagging far behind

other major network carriers in NEA. Domestic success has not enabled Chinese airlines to bridge the gap of competitiveness with other airlines. Wang et al. (2014) benchmarked Chinese airlines' Total Factor Productivity (TFP) against major network carriers in Europe, Asia and North America. They concluded that although Chinese airlines were able to improve their efficiency significantly, the efficiency differences with North American carriers actually grew, as reported in Table 6.6.

Table 6.6. Gross Total Factor Productivity (TFP) Index of major airlines: Normalised at American Airlines 2005=1

Year	China Eastern	China Southern	Air China	Chinese A.V.G (3)	Thai Airways	Singapore	Cathay	American	Delta	United(1)	Continental (1l	Air Canada	North American A.V.G (3)	Lufthansa	Air France (2)	KLM (2)
2001	0.49	0.51	0.50	0.50	0.68	1.12	1.04	0.72	0.77	0.79	0.88	0.76	0.78	0.64		0.85
2002	0.50	0.54	0.53	0.52	0.73	1.01	1.17	0.74	0.81	0.92	0.86	0.79	0.82	0.67	0.71	0.83
2003	0.49	0.50	0.54	0.51	0.66	1.01	1.11	0.85	0.89	0.99	0.98	0.80	0.91	0.65	0.75	0.82
2004	0.60	0.56	0.63	0.60	0.70	1.01	1.10	0.94	0.86	1.07	0.96	0.95	0.95	0.70	0.77	0.94
2005	0.56	0.57	0.68	0.61	0.70	1.10	1.10	1.00	1.01	1.11	0.99	0.91	1.01	0.72	0.89	0.89
2006	0.59	0.61	0.75	0.65	0.74	1.29	1.05	1.04	1.06	1.15	1.03	0.92	1.05	0.71	0.88	0.88
2007	0.63	0.66	0.76	0.69	0.78	1.32	1.03	1.05	1.01	1.14	1.06	0.94	1.05	0.74	0.90	0.90
2008	0.60	0.67	0.64	0.64	0.68	1.32	1.02	0.98	0.75	0.98	1.05	0.95	0.93	0.74	0.92	0.92
2009	0.62	0.68	0.75	0.69	0.74	1.33	1.10	1.02	1.03	1.12	1.09	0.91	1.04	0.71	0.95	0.95
2010	0.71	0.72	0.77	0.74	0.86	1.30	1.11	1.06	1.09	1.09	1.09	1.00	1.07	0.74	0.95	0.95

Notes: 1. United Airlines and Continental Airlines merged in 2010. Thus the TFP for the two airlines in 2010 is for the new merged airline. 2. Air France and KLM merged in 2005. Thus the TFP for the two airlines from 2005 to 2010 is for the new merged airline. 3. The weight used to calculate the Chinese and North American average TFP is the airlines' revenue share.
Source: Wang et al. (2014).

In summary, major airports are of critical importance to Chinese airlines due to their large market potential. However, traffic growth has outpaced capacity in these markets, making government regulation on route entry and slot allocation in these markets a critical factor in determining airlines' performances. Whereas route entry regulation has been phased out in all but four major airports in the metropolitan areas, an increasing number of airports are under slot control. The route entry and airport slot allocation mechanisms jointly favour hub carriers' network development, but put other airlines in a significantly disadvantaged position. Overall, flight frequencies have been increasing quickly among all airports, leading to increased service quality and reduced schedule delay to travellers. However, average aircraft size has actually decreased slightly for flights among the largest 10 airports. This may reflect airlines' efforts to build up hub-and-spoke networks, but may also suggest that precious slots are not utilised in an optimal way. Chinese airlines were able to achieve very high yield in dense routes due to insufficient competition in the domestic markets, especially routes linking hub airports.

Thanks to the phenomenal growth in the domestic markets, Chinese carriers were able to grow their scale and profit. However, success in domestic markets did not increase their competitiveness in international markets substantially. Chinese airline efficiency is still worse than that of the industry leaders, and Chinese airlines' share of international revenue has decreased recent decades and remained far below their NEA peers. In summary, Chinese airlines are now better positioned to compete globally in terms of scale, but they have not identified a good strategy to fully leverage the favourable management conditions they have been enjoying. The following section will discuss their readiness for global competition, and their attitude towards international aviation policy.

Implications of liberalisation to dominant airlines

Many studies have examined the effects of liberalisation using observed industry data. These ex-post studies found strong evidence that if travellers' well-being and social welfare are considered in addition to airline profits, liberalisation generally brings significant benefits to all the countries involved. In addition, empirical investigations on various sectors including the airline industry have provided convincing evidence that the "national championship" model rarely works and that it is competition that brings innovation and improvements in the long-term. Even if the Chinese government still favours such a strategy in the years to come, Chinese airlines should be encouraged to compete in a more deregulated market since they are now among the largest airlines in the world (as shown in Table 6.5). Few industries, including the airline sector, can become globally competitive through government protection. The Japanese government had for decades given its national carriers direct and indirect assistance. However, such a policy did not prevent JAL from filing for bankruptcy protection in 2009. Since then, more competition has been introduced in the Japanese domestic and international markets, yet JAL has recently emerged as a stronger airline. Therefore, it is our belief that all three countries in the NEA region should liberalise their skies to maximise the benefits to the overall economy instead of protecting their airlines.

However, due to policy/political considerations beyond economic considerations, NEA governments may stick to their current policy and major airlines may continue to exert significant influences over liberalisation policy. Therefore, in this section we will identify the opportunities and challenges of liberalisation to major airlines in the region in order to identify airlines' preferences and strategies. This will allow us to predict the likely liberalisation process in the short term if public policies are still heavily influenced by major airlines in the years to come. Obviously, such an outcome is likely to be sub-optimal compared to full liberalisation as explained above.

Priority markets and airline performances

The three countries in NEA have experienced different periods of strong growth of their economies and international trade. Japan's economy and export was quite strong by the early 1960s. Priority was given to the development of North American routes. Both Japanese carriers and US carriers established good networks and high frequency services to the United States. The Korean economy and aviation industry developed in a similar pattern, with major liberalisation agreements signed between Korea and the United States after the Asian financial crisis. In comparison, although trade and passenger volumes between China and the United States have been growing at extremely high rates since the early 1990s, Chinese airline networks to North America was much slower than that of their Japanese and Korean peers. As shown in Table 6.7, in 2001, three Chinese carriers served a total of three North American destinations with 23 weekly flights. During the same period, Japanese (and Korean) airlines served 10 (11) destinations with 198 (92) weekly flights. Over the years, Chinese carriers have improved their network developments. As of the first week of July 2014, the numbers of North American destinations and weekly frequency are finally comparable to their competitors in Japan and Korea. Still, since there are more carriers from China than from Japan and Korea (2 airlines each) that serve this market, individual Chinese airline services are still likely to be inferior to their competitors in the NEA region.

Table 6.7. NEA Airline service to North American destinations

2001	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of airports	3	10	11
Weekly frequency	23	198	92
Weekly seats	8 008	69 771	31 809
Number of airlines	3	3	2
2006	**Chinese Carriers**	**Japanese Carriers**	**Korean Carriers**
Number of airports	4	9	11
Weekly frequency	47	145	100
Weekly seats	14 252	47 104	34 410
Number of airlines	3	4	2
2012	**Chinese Carriers**	**Japanese Carriers**	**Korean Carriers**
Number of airports	7	8	12
Weekly frequency	87	147	140
Weekly seats	24 981	39 186	45 049
Number of airlines	5	3	2
2014	**Chinese Carriers**	**Japanese Carriers**	**Korean Carriers**
Number of airports	11	11	13
Weekly frequency	154	189	152
Weekly seats	42 412	41 446	47 455
Number of airlines	5	2	2

Notes: The number of airports refers to the number of airports served with direct flights. The first week of July in the sample year is referred to for weekly statistics.

Source: OAG database for scheduled flights

Geographic location and airport capacity also play important roles in determining the competition among NEA carriers for services to North America. Without an open skies agreement between China and the United States, a regional NEA open skies agreement would enable Japanese and Korean carriers to use Tokyo and Incheon as gateway hubs to North America. Indeed, a lot of Chinese passengers are now using connecting flights at Seoul.

As reported in Table 6.8, Chinese carriers' network connectivity to European destinations fared better than other NEA airlines in terms of airports served, weekly frequency and number of seats offered most of the time within our sample period from 2001 to 2014. In addition, in terms of geographic location and market potential, major Chinese airports such as Guangzhou, Chengdu and Xi'an can serve as Asian gateway hubs to Europe. In fact, China Southern has been making good progress in developing the "Canton route" via Guangzhou airport, which could potentially feed traffic from Southeast Asia, Australia and New Zealand to its European destinations. Since Guangzhou airport has a large capacity and a rapidly increasing local market, it is well positioned to compete with other Asian hubs such as Bangkok, Singapore or even Dubai in the long-term. China Southern may also be able to capture a share of the traffic originally served by the "Kangaroo routes" linking Australia and New Zealand to Europe.

Table 6.8. NEA Airline service to European destinations

2001	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of airports	9	9	6
Weekly frequency	39	78	24
Weekly seats	11 426	26 919	8 904
Number of airlines	3	2	2
2006	**Chinese Carriers**	**Japanese Carriers**	**Korean Carriers**
Number of airports	12	8	10
Weekly frequency	96	79	53
Weekly seats	28 234	25 261	18 040
Number of airlines	4	2	2
2012	**Chinese Carriers**	**Japanese Carriers**	**Korean Carriers**
Number of airports	19	5	12
Weekly frequency	181	66	72
Weekly seats	44 823	21 232	23 859
Number of airlines	4	2	2
2014	**Chinese Carriers**	**Japanese Carriers**	**Korean Carriers**
Number of airports	20	7	12
Weekly frequency	219	88	82
Weekly seats	54 801	18 151	23 778
Number of airlines	4	2	2

Note: The number of airports refers to the number of airports served with direct flights. The first week of July in the sample year is referred to for weekly statistics.

Source: OAG database for scheduled flights

For international network development in Asia and Oceania, Chinese and Korean airlines performed better than Japanese airlines. As shown in Table 6.8, as of 2012 and 2014, Korean carriers served more destinations, whereas Chinese airlines provided more frequent services and more scheduled seats. Japanese carriers consistently lagged behind other NEA airlines. This is probably due to their high costs, which make them less competitive when serving relatively price-sensitive consumers. In addition, Japanese carriers serve a fewer number of cities in China compared to their Korean competitors. More investigations are needed to identify the key causes for Japanese carriers' limited network coverage in Asia and Oceania.

Table 6.9. NEA airline services to destinations in Asia and Oceania (International markets only)

2001	Chinese Carriers	Japanese Carriers	Korean Carriers
Number of airports	43	25	55
Weekly frequency	735	471	454
Weekly seats	145 694	140 318	118 803
Number of airlines	11	6	2
2006	**Chinese Carriers**	**Japanese Carriers**	**Korean Carriers**
Number of airports	55	28	83
Weekly frequency	1 277	638	826
Weekly seats	235 298	166 689	214 628
Number of airlines	8	5	2
2012	**Chinese Carriers**	**Japanese Carriers**	**Korean Carriers**
Number of airports	78	30	97
Weekly frequency	2 036	669	1 526
Weekly seats	353 838	133,473	338 856
Number of airlines	12	3	7
2014	**Chinese Carriers**	**Japanese Carriers**	**Korean Carriers**
Number of airports	84	31	101
Weekly frequency	2 479	771	1 637
Weekly seats	436 846	165 452	356 215
Number of airlines	14	4	7

Note: The number of airports refers to the number of airports served with direct flights. The first week of July in the sample year is referred to for weekly statistics.

Source: OAG database for scheduled flights.

In summary, Japanese and Korean carriers have better network coverage to destinations in North America, whereas Chinese airlines are better positioned for services to Europe. For aviation services to Asia and Oceania, Japanese airlines lag behind Chinese and Korean carriers. Therefore, Chinese airlines are likely to have the following preferences concerning aviation policy:

- Chinese airlines will be less resistant towards bilateral liberalisation with ASEAN countries, Australia and New Zealand for several considerations: a more liberal regional market will help Chinese airlines to develop their hubs, notably Guangzhou and in the long term Chengdu, as gateways to Europe. Meanwhile, other than Singapore Airlines and Qantas, few network carriers can compete with Chinese airlines for European destinations. Therefore, bilateral liberalisation with these countries will not introduce significant competitive pressure to Chinese airlines, while helping significantly for developing connecting passenger markets between these countries and Europe.
- In the absence of open skies agreements with the United States and Canada, Chinese airlines may have some concerns in creating a single aviation market with Korea and Japan: Japanese and Korean carriers have good network coverage to North American destinations, which allows them to feed traffic from China and the rest of Asia to their gateway hubs in Incheon and Tokyo.

In addition, since there are many more airports in China than Japan and Korea, liberalisation will bring some network benefits to airlines in Japan and Korea, as they will be able to connect many more spoke markets to their hubs. Similar observations have been made by Lau et al. (2012). Their study found that when direct air services were allowed across the Chinese Taipai Straits, airlines in Chinese Taipai were able to improve their networks more than carriers in mainland China.

Performance of major airports and effects on hub airlines

In addition to airlines, major airports can exercise considerable influence over national policy on liberalisation. The connectivity and competitiveness of a major hub also has positive effects on its hub carrier's development. The performances of major hubs in the NEA region are reported in Table 6.10. Unlike analysis in the above section on airlines, in this table all airlines' services, including both domestic and foreign carriers at an airport are reported.

Table 6.10. Hub airport performance benchmarking

2001	Shanghai Pudong (PVG)	Shanghai Hongqiao (SHA)	Beijing (PEK)	Guangzhou (CAN)	Seoul (ICN)	Tokyo (NRT)
Number of Asia-Oceania destinations and weekly frequency	6 / 37	19 / 268	17 / 247	14 / 94	63 / 697	33 / 529
Number of European destinations and weekly frequency	5 / 27	-	15 / 80	-	8 / 46	13 / 151
Number of North American destinations and weekly frequency	4 / 30	-	4 / 24	1 / 4	11 / 116	18 / 345
Other	-	-	2 / 3	-	1 / 2	1 / 1
2006	**Shanghai Pudong (PVG)**	**Shanghai Hongqiao (SHA)**	**Beijing (PEK)**	**Guangzhou (CAN)**	**Seoul (ICN)**	**Tokyo (NRT)**
Number of Asia-Oceania destinations and weekly frequency	38 / 750	-	29 / 448	20 / 221	87 / 1126	43 / 880
Number of European destinations and weekly frequency	12 / 111	-	16 / 147	3 / 16	10 / 81	13 / 168
Number of North American destinations and weekly frequency	5 / 45	-	7 / 61	1 / 7	11 / 130	19 / 341
Other (Intl)	-	-	4 / 15	1 / 3	2 / 11	1 / 3
2012	**Shanghai Pudong (PVG)**	**Shanghai Hongqiao (SHA)**	**Beijing (PEK)**	**Guangzhou (CAN)**	**Seoul (ICN)**	**Tokyo (NRT)**
Number of Asia-Oceania destinations and weekly frequency	48 / 985	5 / 139	41 / 656	34 / 423	101 / 1775	48 / 935
Number of European destinations and weekly frequency	16 / 190	-	25 / 210	11 / 66	23 / 185	26 / 271
Number of North American destinations and weekly frequency	9 / 90	-	10 / 106	2 / 12	13 / 175	18 / 320
Other (Intl)	4 / 30	-	11 / 58	5 / 36	5 / 32	4 / 17
2014	**Shanghai Pudong (PVG)**	**Shanghai Hongqiao (SHA)**	**Beijing (PEK)**	**Guangzhou (CAN)**	**Seoul (ICN)**	**Tokyo (NRT)**
Number of Asia-Oceania destinations and weekly frequency	56 / 1168	6 / 136	48 / 660	39 / 449	102 / 2009	49 / 962
Number of European destinations and weekly frequency	12 / 161	-	24 / 210	5 / 45	14 / 145	16 / 136
Number of North American destinations and weekly frequency	11 / 130	-	13 / 148	2 / 14	14 / 203	20 / 338
Other (Intl)	7 / 46	-	11 / 56	8 / 41	6 / 34	4 / 25

Source: OAG database for scheduled flights.

Note: Weekly data are the data of first week in July for each selected year.

As evidenced in Table 6.10, for comparisons related to hub airports connectivity:

- Although Japanese carriers' network connectivity in Asia and Oceania lagged behind its NEA competitors, thanks to foreign carriers' frequent services Narita has a comparable connectivity to most NEA hubs as Incheon. Several factors have contributed to Incheon's superior network connectivity: the Korean government has actively promoted aviation liberalisation in recent years. In addition, Korean government's hub policy restricts international services to Seoul Gimpo airport. In the long-term, such a policy should be relaxed to allow more international LCC services at Gimpo.
- For European destinations, Beijing is far ahead of other hubs with 24 airports connected via direct flights, followed by Narita (16), Incheon (14), Shanghai Pudong (12) and Guangzhou (5). Given Beijing's large market potential and national capital status, such an advantage is likely to persist in the years to come. However, geographically Guangzhou Baiyun airport is better positioned to serve as a European gateway. Although China Southern has made good progress in developing its "Canton routes" in recent years, Guangzhou airport still has a long way to go. This implies that this airport may be more supportive to liberalisation policies, which allows more frequencies and destinations to be added by both domestic and foreign carriers.
- When foreign carrier services are taken into account, airport development analyses will be very different from those carried out for major airlines at a national level. All three international hubs in China (i.e. Beijing capital airport, Shanghai Pudong airport and Guangzhou Baiyun airport) have superior connections to North America compared to Incheon and Narita in terms of number of destinations and weekly frequency. This probably explains why US carriers have hoped for bilateral liberalisation with China, which could allow more destinations and frequencies to be added. There are significant demands for passenger and cargo flow between the world's two largest economies. Protecting home carriers in this market will not only prevent consumers from enjoying better services, but also prevent NEA airlines from optimising their networks in the region.

Liberalisation policy preference of Chinese airlines and hub airports

As discussed in the introduction, in the NEA region airlines have significant influence over their nations' aviation policies. With the ongoing process of airport privatisation, commercialisation and localisation, major hubs are also gaining more attention from local/central governments. As a result, the strategy and preference of major airlines and hub airports will be taken into consideration when regulators design national aviation policy. Of course, other factors such as political relationships among countries, trade negotiations and pacts may all change the liberalisation process dramatically. Yet, a good understanding of the strategies by airlines and airport (vested interests) will help us predict the likely aviation policies that governments will adopt.

In terms of home carriers' performance and network connectivity, Chinese airline services to North America still lag slightly behind other NEA carriers. In addition, the geographic locations of Incheon and Narita airports make them ideal gateways for traffic between Asia and North America. Regional liberalisation among NEA countries will allow Japanese and Korean carriers to compete in the China – United States routes by feeding traffic to their own hubs. Therefore, major Chinese airlines are unlikely to be passionate about such a liberalisation policy. Instead, they may be less resistant to liberalisation packages with EU and the rest of Asia and Oceania. Chinese airline services are relatively well established

for European destinations, and they may develop major airports at Guangzhou and Chengdu as gateways to Europe by adding more feeder routes from Asia and Oceania. In addition, other than Singapore Airlines and Qantas, there are no other strong network carriers in the region. Therefore, if the Chinese government continues its policy support to major state-owned carriers such as the "big three", liberalisation with ASEAN countries, Oceania and Europe countries will have a higher priority than creating a single aviation market in the NEA region.

When foreign carrier services are also considered, however, hub airports in Chinese metropolitan areas are better positioned to become gateways to both Europe and Oceania than Incheon and Narita, and their competitiveness to North America will also be strengthened significantly. Recent studies suggest that dominant airline development and vertical arrangements with airports will affect market equilibrium in the aviation markets, and thus, there are interactive dynamics between hub carrier performance and airport development (see for example Barbot 2009; Fu and Zhang 2010, Zhang et al. 2010, Fu et al. 2011 and Homsombat et al. 2011). This implies that Chinese carriers have not fully leveraged the market potential and domestic dominance at their hubs to develop international services. This has prevented these hub airports from achieving their full potential too. In comparison, Incheon airport has quickly established itself as an important international gateway thanks to Korea's liberalisation policies in recent years and its hub airlines' international expansions. Although there are positive dynamics between major airports and their hub carriers' policies protecting home airlines may actually constrain rather than strengthen the competitiveness of airports. Although Chinese hub airports currently have less influence on international aviation policy, in the long term they may become more empowered supporters of liberalisation.

In the short term, there is a high chance that major airlines in the NEA region, especially those in China, will continue to exercise the most significant influence over their nation's liberalisation policies. While it is our belief that governments should put higher priority over consumer wellbeing and national interests in the long run, one immediate strategy for making progress on liberalisation is to promote LCC services in the region. The following section evaluates the possible effects of such a policy option.

Liberalisation by facilitating low-cost carrier services

A few LCCs have been long established in the NEA region but the majority have been established in the last few years. In Korea and Japan, many new entrants are affiliated with incumbent network carriers. In certain markets, such ownership structures may help LCCs to secure approval for route entry and airport slots. In addition, the study by Homsombat et al. (2014) on the Australian domestic market reveals that a "dual-brand" strategy of jointly offering network carrier services and LCC services may bring competitive advantage to an airline group. However, such ownership/affiliation arrangements could lead to complications in the future, as network carriers may block the entry of foreign LCCs to undercut the LCC's parent airline. So far, many LCCs have chosen to form local joint ventures when expanding their businesses in another country. Such a strategy has been adopted by AirAsia and Jetstar when they entered markets such as Thailand, Philippines and Japan. Another more direct strategy of overseas expansion is to serve foreign destinations under rules set by bilateral service agreements.

Promoting LCC services in the NEA region could be a good alternative for full liberalisation in the medium-term. In order to cut costs, LCCs usually provide no-frills point-to-point services in short/medium distance markets. Connection services are normally not offered since they will significantly increase baggage handling costs and turnaround times at airports. As a result, improved LCC services will not significantly change the competition among network carriers in inter-continental routes.

In addition, whereas route entry and slot allocation at hub airports are closely monitored, regulators and major carriers are usually not concerned with LCCs' expansion at regional airports. In fact, local governments welcome new services which improve their airports' connectivity and contribute to the regional economy. Since LCCs' low-cost bases allow them to serve thin markets which would otherwise be unfeasible for network carriers, there will be relatively moderate disruption of the current market equilibrium. Promoting LCC entry can be a feasible and useful first-step toward full liberalisation.

The profiles of NEA LCCs are summarised in Table 6.11. As of June 2014, most LCCs had less than 20 aircrafts in service and consequently small market shares. In addition, as reported in Table 6.12, NEA LCCs have mostly focused on the domestic markets. Although some LCCs serve a good number of international destinations (e.g. Spring Airlines in China, Air Busan, Jin Air in Korea), the low total frequencies reveal that they offer rather limited services to most overseas destinations. This would not help LCCs to reduce costs by exploiting economies of traffic density. In addition to constraints in bilateral service agreements, regulations are imposed by individual government. For example, although Seoul Gimpo airport has excess capacity and is located closer to the city than Incheon, foreign LCC services are only allowed at Incheon airport. The traffic rights allocation by the Korean Ministry of Land, Infrastructure and Transport (MOLIT) is *ad hoc* without clearly defined rules, making it difficult for LCCs to optimise and plan their service offerings.

Table 6.11. NEA low-cost carrier profile

Country	Airlines (code)	Fleet size	Service starting date	Key share-holder and /or parent airline	Main hub
China	Spring Airline (9C)	41	18-Jul-05	Shanghai Spring International Travel Service	Shanghai Hongqiao Airport
	Lucky Air (8L)	26	Jul-04	Hainan Airlines Group (HNA)	Kunming Airport
	West Air (PN)	14	14-Jul-10	Hainan Airlines Group (HNA)	Chongqing Airport
	Juneyao Airlines (HO)	34	Jun-05	Juneyao Group	Shanghai Hongqiao Airport
Japan	Air Do	13	Oct-12	ANA, DBJ (Development Bank of Japan)	Tokyo Haneda Airport
	Jetstar Japan (GK)	18	3-Jul-12	Qantas, Japan Airlines	Tokyo Narita Airport
	Peach (MM)	13	Mar-12	ANA,First Eastern Investment Group and INCJ	Osaka Kansai Airport
	Skymark Airlines (BC)	32	19-Sep-98	Shinichi Nishikubo	Tokyo Haneda Airport
	Solaseed Air (6J)	13	Jul-11	Miyakoh Holding	Tokyo Haneda Airport
	StarFlyer (7G)	10	16-Mar-06	Star Flyer Inc.	Tokyo Haneda Airport
	Vanilla Air (JW)	6	20-Dec-13	ANA	Tokyo Narita Airport
Korea	Air Busan (BX)	12	Oct-08	Asiana Airlines	Busan Gimhae Airport
	Eastar Jet (ZE)	8	7-Jan-09	Privately owned, not listed	Jeju Airport
	Jeju Air (7C)	15	2-Jun-06	Aekyung Group	Jeju Airport
	Jin Air (LJ)	11	Jul-08	Korean Air	Jeju Airport
	t'way (TW)	7	Sep-10	KDIC, YeaRimDang Publishing	Seoul Gimpo Airport

Note: Fleet statistics as of June 2014. Service starting date refers to the date when the airline began to offer services under the current name.

Source: Company's official website and annual reports.

Table 6.12. NEA LCC service overview as of July 2014

Airline	Country	Number of domestic destinations	Domestic weekly frequency	Number of international destination	International weekly frequency
Lucky Air	China	44	1 112	2	2
Ruili Airlines	China	7	98	-	-
Spring Airlines	China	38	1 162	24	184
West Air	China	35	576	-	-
HK Express	Hong Kong	-	-	17	164
Air Do	Japan	14	517	-	-
AirAsia Japan Co Ltd	Japan	3	126	4	56
Jetstar Japan	Japan	10	586	-	-
Peach	Japan	10	346	9	140
Skymark Airlines	Japan	14	1 144	-	-
StarFlyer	Japan	5	420	-	-
Vanilla Air	Japan	3	126	4	56
Air Busan	Korea	3	432	20	162
Eastar Jet	Korea	-	-	15	90
Jeju Air	Korea	5	400	19	240
Jin Air	Korea	2	170	36	152
t'way	Korea	3	250	10	56

Source: Compiled with OAG airline schedule data for the first week of July 2014.

There are signs that China is progressively allowing foreign LCCs into both major and medium-sized airports. As reported in Table 6.13, foreign LCCs served 36 Chinese airports as of July 2014. Guangzhou, Hangzhou, Shenzhen and Shanghai Pudong airport had the highest weekly LCC flights. Qingdao has 20 LCC flights a week, mainly due to the provincial open skies agreement signed between Korea and the Shandong province, which allowed Korean carriers to offer 14 weekly flights to the city. Otherwise Korean LCCs have quite limited services to China despite direct flights to 22 airports. For example, eight airports were served with one LCC flight per week only as of July 2014. A closer look at the data revealed that these services were all recently initiated by Jin Air, an LCC owned by Korean Air. Therefore, more flights may be added in the near future, and the LCC could have been assisted by its affiliated network carrier (i.e. Korean Air) in entering these routes. No Japanese LCC services were present at Chinese airports, although Chinese LCCs served four medium-sized Japanese airports (i.e. Hiroshima, Ibaraki, Saga, Takamatsu) with a total of 18 weekly flights as of July 2014.

Table 6.13. LCC entry to NEA countries as of the first week of July 2014

Foreign LCC Entry to China (First week of July, 2014)						
Chinese airports	Number of Foreign LCCs	Number of Japanese LCCs	Number of Korean LCCs	Frequency of Foreign LCCs	Frequency of Japanese LCCs	Frequency of Korean LCCs
Guangzhou	4	0	0	54	0	0
Hangzhou	5	0	1	42	0	2
Shenzhen	3	0	0	33	0	0
Shanghai Pudong	4	0	1	31	0	7
Qingdao	4	0	2	20	0	14
Xi'an	5	0	2	20	0	6
Wuhan	2	0	1	15	0	1
Chongqing	1	0	0	14	0	0
Kunming	2	0	0	14	0	0
Beijing	3	0	0	12	0	0
Nanjing	2	0	0	11	0	0
Chengdu	2	0	1	9	0	2
Jinan	2	0	2	9	0	9
Haikou	2	0	0	8	0	0
Ningbo	2	0	0	8	0	0
Changsha	1	0	0	7	0	0
Nanning	1	0	0	7	0	0
Shenyang	2	0	1	5	0	3
Tianjin	2	0	1	5	0	2
Guilin	1	0	0	4	0	0
Shantou	1	0	0	4	0	0
Xiamen	2	0	1	4	0	2
Yantai	1	0	1	4	0	4
Quanzhou	1	0	0	3	0	0
Changchun	1	0	1	2	0	2
Hohhot	1	0	1	2	0	2
Lijiang	1	0	0	2	0	0
Taiyuan	1	0	1	2	0	2
Yinchuan	1	0	1	2	0	2
Dalian	1	0	1	1	0	1
Harbin	1	0	1	1	0	1
Hefei	1	0	1	1	0	1
Nanchang	1	0	1	1	0	1
Shijiazhuang	1	0	1	1	0	1
Yanji	1	0	1	1	0	1
Zhengzhou	1	0	1	1	0	1
Foreign LCC Entry to Japan (First week of July, 2014)						
Japanese Airports	Number of Foreign LCCs	Number of Chinese LCCs	Number of Korean LCCs	Frequency of Foreign LCCs	Frequency of Chinese LCCs	Frequency of Korean LCCs
Osaka Kansai International	8	0	3	78	0	35
Tokyo Narita Intl	6	0	3	58	0	28
Fukuoka	5	0	3	42	0	28
Nagoya Chubu Centrair	3	0	1	22	0	14
Tokyo Intl (Haneda)	2	0	0	14	0	0
Sapporo New Chitose Apt	2	0	2	11	0	11
Okinawa Naha Apt	1	0	1	7	0	7
Hiroshima	1	1	0	6	6	0

Ibaraki	1	1	0	6	6	0
Saga	2	1	1	6	3	3
Nagasaki	1	0	1	3	0	3
Takamatsu	1	1	0	3	3	0
Foreign LCC Entry to Korea (First week of July, 2014)						
Korean Airports	Number of Foreign LCCs	Number of Chinese LCCs	Number of Japanese LCCs	Frequency of Foreign LCCs	Frequency of Chinese LCCs	Frequency of Japanese LCCs
Busan	4	0	1	21	0	7
Jeju International	1	1	0	7	7	0
Seoul Incheon	8	0	2	126	0	35

Note: Summary statistics for China do not include LCCs in Hong Kong and Taiwan due to the special arrangements between these two regions with mainland China.

Source: Compiled with OAG airline schedule data for the first week of July 2014.

Overall, there are signs that China is progressively opening up its skies to foreign LCCs. Quite a few airports are now accessible, although services are still concentrated around a few airports. Several factors could have contributed to such progress. As discussed previously, LCCs usually do not provide connection services, resulting in less of a competitive advantage to the parent airline (if any). Major Chinese network carriers will be less concerned about increased competition. Meanwhile, the lower average costs and smaller aircraft used by LCCs imply that they are better positioned to serve medium-sized airports in China, which are not congested and of secondary importance to Chinese network carriers. Provincial/municipal governments will also welcome foreign LCC services as they can benefit local airport, business and welfare. Therefore, foreign LCCs should be able to grow their services in non-hub Chinese airports significantly in the coming years.

Thanks to the open skies agreement between Korea and Japan, these two countries' LCCs now have reasonably good network coverage in each other's territory. For example, Japanese LCCs have five daily flights (35 weekly flights) to Incheon and one daily flight to Busan. Korean LCCs not only have frequent services to major airports such as Kansai, Narita, Fukuoka and Nagoya, but also to five other regional airports. Compared to China, international and domestic LCC services are better developed in Japan and Korea, although LCC penetration rates in these two countries are still lower than in other Asian markets such as Malaysia, Singapore and Australia. Some constraints are still present and should be removed.

For example, the Seoul Gimpo airport is close to the city centre and has convenient ground transport systems. In 2001, all international services were relocated to Incheon airport, causing a 40% reduction in passenger volume almost overnight. Other than a few routes such as Seoul – Jeju Island, domestic aviation markets have achieved little growth over the years due to competition from high-speed rail services. To revive its business, Gimpo has been reducing operational costs and trying to improve its non-aeronautical services. Some regional flights to Japan, China and Taiwan have also been re-introduced together with Customs, Immigration and Quarantine (CIQ) services. Therefore, this airport is ideal for all types of international service. However, currently the Korean government has not allocated any traffic rights to foreign LCCs at Gimpo even though there is no congestion nor slot constraint. The Ministry's misguided policy to promote Seoul-Incheon airport as the only hub airport is preventing Seoul-Gimpo airport from fully realising its market potential. It is our view that this type of government regulation and intervention should be removed, allowing airlines to optimise their operations in a deregulated environment.

Summary, conclusion, and further thought

The benefits of air transport liberalisation have been confirmed by many studies. However, much of the NEA market remains regulated despite strong growth in economy and international trade in the region, and the trans-border open skies agreements that have been reached. Therefore, there is a need to investigate why governments in this region have not been able to achieve more, and whether a clear roadmap can be designed enabling liberalisation to speed up in the years to come. Although governments should aim to improve the overall social welfare of their nations and their economy as a whole rather than helping the vested interest, i.e., the aviation industry only, in practice dominant airlines in the region have been exerting significant political and practical influence against liberalisation. Therefore, investigationing the performance of major airlines, both overall and in the domestic market, will help predict their performances in international markets, and their strategies in developing international routes and attitudes toward alternative liberalisation policies. In addition, an examination of legacy regulations in the domestic markets also sheds light on the policy priorities and philosophies of the regulators in international markets. The intuition is clear: if certain regulations have been persistent in the domestic markets, they are unlikely to be removed for foreign carriers in the near future.

Our investigation of the NEA aviation market, in particular that of China, reveals that substantial legacy regulations are still present in the Chinese aviation market despite rapid growth in recent decades. In particular, our investigation has lead us to the following conclusions:

- In the Chinese aviation market, dominant carriers are majority-owned and managed by either central or local governments. Many inputs and supporting services are also controlled by state-owned companies that have significant market power. The central government owns the largest three airline groups and dominant/monopoly companies that provide fuelling services, ticketing and airport IT services, fleet purchasing and leasing services. The regulator has little concern over market consolidation and competition. Only a few private airlines have been allowed to enter the market, and they are still much smaller than their state-owned peers.
- The regulations on route entry and airport slot allocation in China jointly provide dominant hub carriers preferential treatments, making it difficult for other airlines to compete in major hubs which account for a significant share of the Chinese markets. Although there is evidence that dominant airlines have improved their hub-and-spoke networks, there are also signs that precious airport slots have not been allocated in an efficient manner.

In summary, the Chinese government has tried to help major airlines to grow in size, instead of forcing them to improve and innovate via increased competition so that these dominant players can achieve global competitiveness. Chinese airlines have not bridged the efficiency gap between global leaders, and the Chinese hub airports could have better aviation services and network connectivity if more liberalisation policies had been introduced.

Compared to services to North American destinations, Chinese airlines are currently more competitive in providing services to Europe, Asia and Oceania destinations. Therefore, Chinese airlines will be more open to liberalisation agreements with these countries, facilitating development of their hubs into Asia's gateways to Europe. In general, however, there is no sign that these dominant airlines will welcome full liberalisation. As an intermediate compromise (instead of an optimal policy in the long-term), promoting LCC services in the NEA region is a sensible policy. LCCs usually provide no-frills point-to-point services for short/medium distance markets. Liberalising LCC services will not significantly influence competition among network carriers on inter-continental routes. In addition, whereas route entry and slot allocation at hub airports are closely monitored, regulators and major carriers are usually not that concerned with

LCCs' expansion at regional airports. Local governments also welcome new services which improve their airports' connectivity and contribute to the regional economy. Therefore, promoting LCC entry can be a feasible and useful first-step towards full liberalisation.

In the long run, however, there is a need to fully liberalise the aviation markets in the region. After all, the top priority of the governments is to maximise the welfare of the whole nation instead of protecting airlines only. In addition, studies in the airline sector, together with lessons learnt in other industries have shown that a "national-champion" strategy rarely works. It is increased competition that forces airlines to improve and innovate, achieving global competitiveness and sustaining long-term growth.

As discussed in this chapter, the Korean and Japanese governments overall, and, to some extent their transport ministry officials, now realise that opening up the air transport market in Northeast Asian region is an important economic issue. However, the current dominant players in China's air transport sector, somewhat helped by CAAC's regulations, have restricted domestic competition and foreign carrier entries. This holds true especially for services to major airports in metropolitan areas in Beijing, Shanghai and Guangzhou. This policy is likely to continue until one or more of the following situations occurs:

- China's three major carriers are now among the largest carriers in Asia, and are on their way to becoming the largest carriers in the world within this decade. Policies aimed at protecting the major carriers at this stage are akin to "treating giants as babies" which, as a transport policy could harm China's economy and be to the detriment of China's own citizens.
- In the years to come Korea and/or Japan may put the air transport issue on China-Korea, China-Japan and/or tripartite Economic Summit meetings agendas so that proper trade-offs among trade, investment and air transport opportunities can be made. Instead of postponing industry reform and restructuring as long as possible, it is better for the transport ministry and CAAC officials to proactively design deregulation/liberalisation policies with a clear road map. With informed policy changes down the road, the Chinese aviation sector can innovate and improve to achieve international competitiveness.
- Over time, other central government agencies together with local governments and airports will see the opportunities that foreign carrier entries can provide in achieving important politico-economic objectives. Private airlines will request more freedom to operate and compete with state-owned carriers on an equal basis. There will be increased pressure for deregulation and liberalisation.

Aside from these possible events that may trigger liberalisation policies, CAAC and major carriers in China may want to open up markets to their Asian neighbours even for their own benefit. Our reasoning on this goes as follows:

- As examined already, China's major airlines and airports are well positioned to route Euro-bound Asian traffic including connecting traffic originating in or destined to Korea and Japan via their major hubs in China (Beijing, Shanghai, Guangzhou, Chengdu etc.);
- With higher frequencies of services that China's hub carriers can offer from their current and future super-hubs to intercontinental destinations (including North America and Europe) in the future, Chinese airlines can increasingly attract more overseas travellers originating in Japan and Korea to travel via Chinese hub airports. When China's air travel propensity increases to 0.75 per capita, its air transport market will exceed that of the United States. By then China's super-hub airports are likely to assume similar roles in Asia as those of Chicago, Atlanta and

Dallas in the United States, offering high frequency of services to major intercontinental destinations in Europe and North America.

The benefits of air transport liberalisation have been confirmed by many studies on mature markets. More investigation focused on the NEA aviation market is needed so that the governments and regulators in the region can make informed decisions and commit to a clear road-map for liberalisation. If regulators and major carriers in the region fully recognise such opportunities which may be realised within this decade, there may be a rational move by these power brokers to proactively push for liberalisation instead of trying to kick the can down the road as long as possible.

Notes

1 At 2012 current price in US dollars, based on the estimates by the United Nations Statistics Division.

2 Decision made at the third plenary session of the 18th Communist Party of China Central Committee, held in Nov 2013.

3 Many studies on the US aviation markets have found that dominance at an airport allows a carrier to achieve substantially higher mark-up above cost, a benefit known as the "hub premium" in the literature (Borenstein 1989; GAO 1989, 1990). The U.S. Department of Transportation (DOT, 2001) believes that it was the lack of price competition, not other rationales, that explained high prices at hub markets. Therefore, it is required that each of the large airports with a "dominant" carrier must submit to the USDOT a plan on how they intend to promote airport access, entry and competition (FAA, 1999). The requirement of submitting a competition plan was incorporated into the "Wendell H. Ford Aviation Investment and Reform Act for the 21st Century" legislated in 2000. According to this Act, large and medium airports that exceed a certain threshold of concentration are required to submit competition plans.

References

Audretsch, D. B., Yamawaki, H. (1988), "R&D Rivalry, Industrial Policy, and U.S.-Japanese Trade", *Review of Economics and Statistics*,70(3), 438-447.

Barbot, C. (2009) "Airport and airline competition: Incentives for vertical collusion", *Transportation Research*, Part B 43(10), 952–965.

Borenstein, S. (1989), "Hubs and High Fares: Dominance and Market Power in the U.S. Airline Industry", *RAND Journal of Economics,* 20, 344-365

Brueckner, J.K. (2009), "Price vs. quantity-based approaches to airport congestion management", *Journal of Public Economics*, 93(5), 681-690.

Chou, T.-C. (1986), "Concentration, Profitability and Trade in a Simultaneous Equation Analysis: The Case of Taiwan", *The Journal of Industrial Economics* 34(4), 429-443.

Clark, D. P., Kaserman, D. J., Melese, F. (1992), "Domestic Market Structure and International Trade in an Open Economy", *Quarterly Review of Economics and Finance* 32(3), 3-15.

Clougherty, J., Zhang, A. (2009), "Domestic Rivalry and Export Performance: Theory and Evidence from International Airline Markets", *Canadian Journal of Economics* 42, 440-468.

DOT (U.S. Department of Transportation) (2001), *Dominated Hub Fares*, Domestic Aviation Competition Series.

DotEcon Ltd. (2001), "Auctioning airports slots", London, UK.

DotEcon Ltd. (2006), "Alternative allocation mechanisms for slots created by new airport capacity", London, UK.

FAA (U.S. Federal Aviation Administration) (1999), "Airport Business Practices and Their Impact on Airline Competition", FAA / OST Taskforce Study.

Fu X., Homsombat, W., Oum, T.H. (2011), "Airport-airline vertical relationships, their effects and regulatory policy implications", *Journal of Air Transport Management* 17, 347-353.

Fu, X., Zhang, A., Lei, Z. (2012), "Will China's airline industry survive the entry of high-speed rail?", *Research in Transportation Economics* 35, 13-25.

Fu X., Oum, T.H. (2014), "Air Transport Liberalisation and its Effects on Airline Competition and Traffic Growth – An Overview", *Advances in Airline Economics* 4, Editor: James H. Peoples, Jr.

Fu X., Oum, T.H., Zhang, A. (2010), "Air transport liberalisation and its impacts on airline competition and air passenger traffic", *Transportation Journal* 49(4), 24-41.

GAO (U.S. General Accounting Office) (1989), *Barriers to Competition in the Airline Industry*.

GAO (U.S. General Accounting Office) (1990), *Airline Competition: Industry Operating and Marketing Practices limit market entry*.

Homsombat W., Lei, Z., Fu, X. (2011), « Development Status and Prospects For Aviation Hubs – A Comparative Study of the Major Airports in South-east Asia", *Singapore Economic Review* 56(4), 573–591.

Homsombat, W., Lei, Z., Fu, X. (2014), "Competitive Effects of the Airlines-within-Airlines Strategy - Pricing and route entry patterns", *Transportation Research* - Part E 63, 1-16.

Kim, D., Marion, B.W. (1997), "Domestic Market Structure and Performance in Global Markets: Theory and Empirical Evidence from U.S. Food Manufacturing Industries", *Review of Industrial Organization* 12, 335-354.

Krugman, P. R. (1984), "Import Protection as Export Promotion: International Competition in the Presence of Oligopoly and Economies of Scale" in Kierzkowski, H. (ed.), *Monopolistic Competition and International Trade*, Oxford University Press, Oxford.

Lau, Y.Y., Lei, Z., Fu, X., Ng, A. (2012), "The Implications of the Re-establishment of direct links across the Taiwan Strait on the aviation industries in Greater China", *Research In Transportation Economics* 35, 3-12.

Madas, M.A., Zografos ,K.G. (2006), "Airport slot allocation: from instruments to strategies", *Journal of Air Transport Management* 12(2), 53-62.

Madas, M.A., Zografos, K.G. (2008), "Airport capacity vs. demand: Mismatch or mismanagement?", *Transportation Research Part A: Policy and Practice* 42(1), 203-226.

Madas, M.A., and Zografos, K.G. (2010), "Airport slot allocation: a time for change?", *Transport Policy* 17(4), 274-285.

Maldoom, D. (2003), "Auctioning capacity at airports", *Utilities policy* 11(1), 47-51.

Marvel, H. P. (1980), "Foreign Trade and Domestic Competition", *Economic Inquiry* 18(1), 103-122.

Matthews, B., Menaz, B. (2003), *Airport capacity: the problem of slot allocation*, Institute for Transport Studies.

National Economic Research Associates (NERA) (2004), *Study to assess the effects of different slot allocation schemes*. Technical Report prepared for the European Commission (DG TREN), London, UK.

Piermartini R., Rousova, L. (2008), "Liberalisation of air transport services and passenger traffic", World Trade Organization - Economic Research and Statistics Division, Staff Working Paper ERSD-2008-06.

Pagoulatos, E., Sorensen, R. (1976), "Domestic Market Structure and International Trade: An Empirical Analysis", *Quarterly Review of Economics and Business* 16(1), 45-59.

Porter, M. E. (1990), *The Competitive Advantage of Nations*. The Free Press, New York.

Sakakibara, M., Porter, M. E. (2001), "Competing at Home to Win Abroad: Evidence from Japanese Industry", *Review of Economics and Statistics* 83(2), 310-322.

Sentance, A. (2003), "Airport slot auctions: desirable or feasible?" *Utilities policy* 11(1), 53-57.

Verhoef, E.T. (2010), "Congestion pricing, slot sales and slot trading in aviation", *Transportation Research Part B: Methodological* 44(3), 320-329.

Wang K., Fan X., Fu X., Zhou Y. (2014), "Benchmarking the Performance of Chinese Airlines: An investigation of productivity, yield, and cost competitiveness", *Journal of Air Transport Management* 38, 3-14.

Wang K., Gong Q., Fu X., Fan X. (2014), *Frequency and Aircraft Size Dynamics in a Concentrated Growth Market: The Case of the Chinese Domestic Market*

Liberalisation of Air Transport

Aviation is one of the most regulated industries in the world. Much of this regulation is safety-related, to mitigate the inherent risks tied with air transport. But aviation is also subject to economic regulation that influences which airline flies which route, at which frequency, capacity and price. It even stipulates the nationality of its owners and decision makers. Aviation has freed itself from some restrictions over the past three decades, with many benefits to society. Yet liberalisation has also raised issues with regard to maintaining fair competition, high labour standards and mitigating aviation's growing environmental impact.

International Transport Forum
2 rue André Pascal
F-75775 Paris Cedex 16
+33 (0)1 73 31 25 00
contact@itf-oecd.org
www.itf-oecd.org

OECD

Published: 05/2019 | Photo credit: muratart/shutterstock