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The Impacts of Globalisation on International Air Transport Activity

Past trends and future perspectives

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NOTE FROM THE SECRETARIAT

This paper was prepared by Prof. Ken Button of School of George Mason University, USA, as a contribution to the OECD/ITF *Global Forum on Transport and Environment in a Globalising World* that will be held 10-12 November 2008 in Guadalajara, Mexico. The paper discusses the impacts of increased globalisation on international air traffic activity – past trends and future perspectives.

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THE IMPACT OF GLOBALIZATION ON INTERNATIONAL AIR TRANSPORT ACTIVITY - PAST TRENDS AND FUTURE PERSPECTIVE

1. Introduction

1. Air transportation is a major industry in its own right and it also provides important inputs into wider economic, political, and social processes. The demand for its services, as with most transport, is a derived one that is driven by the needs and desires to attain some other, final objective. Air transport can facilitate, for example, in the economic development of a region or of a particular industry such as tourism, but there has to be a latent demand for the goods and services offered by a region or by an industry. Lack of air transport, as with any other input into the economic system, can stymie efficient growth, but equally inappropriateness or excesses in supply are wasteful.

2. Economies, and the interactions between them, are in a continual state of flux, and although economists' notions of equilibrium have some very useful intellectual content, and also validity in the very short-run, in reality the world is dynamic. This dynamism, of which the particular thrust of globalization is the concern here, has implications for industries such as air transport that service it. But there are also feedback loops, because, developments in air transport can shape the form and the speed at which globalization and related processes take place. In effect, while the demand for air transport is a derived, the institutional context in which air transport services are delivered have knock-on effects on the economic system. These feedback loops may entail direct economic, political, and social effects that, for example, accompany enhanced trade and personal mobility, but they may also be indirect, as for example through the impacts of air transport on the environment.

3. The analysis here is, by necessity, excessively simplistic given the multi-dimensional and dynamic nature of globalization, and focuses on one small sector, international commercial aviation, and on only one direction of causality, the implications of globalization for this sector. Some related considerations are embraced where particularly important. For example, there is an increasing blurring of international and domestic air transport as airlines form alliances and invest in each other to form global networks; indeed, the domestic and international air transport market within the European Union (EU) is *de facto* one market. Also, not all feedback loops are ignored, particularly when changes in air transport facilitate global trends that then, in turn, feed back on the air transport industries; migration of labor is one example of this.

2. Globalization and internationalization

4. Globalization, in its most literal sense, is the process of making, transformation of things or phenomena into global ones. It can be described abstractly as a process by which the people of the world are unified into a single society and function together. This process is a combination of economic, technological, socio-cultural, and political forces. The idea of globalization is, however, also often used to refer in the narrower sense of economic globalization involving integration of national economies into the

international economy through trade, foreign direct investment, capital flows, migration, and the spread of technology.¹ Here much, but not all, of the focus is on the narrower perspective, although clearly the increase in mobility and personal interchanges that air transport facilitates has broader socio-cultural and political implications.

5. The reasons for the contemporary globalization processes from the latter part of the 20th century, and their larger implications, are much debated. Thomas Friedman (2005) for example, suggests the world is "flat" in the sense that globalization has leveled the competitive playing fields between industrial and emerging market countries. The globalization of trade, outsourcing, supply-chaining, and political forces have changed the world permanently, for both better and worse. He also argues that the pace of globalization is quickening and will continue to have a growing impact on business organization and practice. This flattening is seen as a product of a convergence of the emergence of the personal computer and the fiber-optic micro cable, combined with the rise of work-flow software. He calls this Globalization 3.0, which is different to Globalization 1.0 (when countries and governments were the main protagonists in globalization) and the Globalization 2.0 (in which multinational companies led the way in driving global integration). Cairncross (1997) looks at it from only a slightly different perspective. The growing ease and speed of communication is seen as creating a world where miles have little to do with abilities to work or interact together. Much work that can be done on a computer may be done from anywhere; workers can code software in one part of the world and pass it to a company thousands of miles away that will assemble the code for marketing. With workers able to earn a living anywhere, countries will find themselves competing for citizens as individuals relocate for reasons ranging from lower taxes to nicer weather.

6. Much of these processes have been technology-driven, although facilitated by broad political shifts, such as the demise of the Soviet system, the gradual emergence of international free trade bodies, such as the EU and World Trade Organization, and reductions in global political tensions. Many of these technical changes have been in transport. In particular, there have been massive developments in the technologies that we use to transport information. While traditional transport analysts often see the "telecommunications revolution" as somehow different and outside their field of study, it is, in fact, the first major transport-change since the widespread adoption of mechanized transport in mid-19th century. Air transport, although still a child of the mechanized age, has been closely linked with globalization and the telecommunications revolution. It has been important in the opening up of labor markets, along the lines indicated by Frances Cairncross, and in its role of role as a facilitator for the development of industry allowing the production and maintenance of cheap telecommunications hardware. It has also, in turn, benefited from the communications revolution in terms of air traffic control, navigation, and safety enhancement, but also in making possible the airline logistics of bringing the elements required in moving millions of people and tons of cargo across complex networks practical.

3. The Basic Features of International Air Transportation

3.1 *Historical perspective*

7. Air transport has always been seen to have an inherently strategic role. It has obvious direct military applications, but it is also highly visible and, for a period, and in some countries still, was seen as

1 Strictly, there are differences between globalization and internationalization. Internationalization refers to the importance of international trade, relations, treaties etc.; it refers to actions between or among nations. Globalization means erasure of national boundaries for economic purposes; international trade (governed by comparative advantage) becomes inter-regional trade (governed by absolute advantage). In practical terms, internationalization is technically what has largely been occurring in the World with the development of agencies such as the World Trade Organization. Perversely, globalization has been more narrowly geographically concentrated, for example within the EU area. We use the term 'globalization' here in its broader sense.

a “flag carrier”, a symbol of international commercial presence. From its earliest days, airlines were seen as having potential for providing high-speed mail services, and subsequently medium and long-term passenger transport. Technology now allows the carriage of much larger cargo pay-loads in a more reliable way. These strategic functions were used to pursue internal national policies of social, political, and economic integration within large countries such as Canada, the US, and Australia, but also took on international significance from the 1930s within the Imperial geopolitical systems centered mainly on the UK, France, Germany, and other European countries when technology allowed for intercontinental services to be developed.

8. Air transport was highly regulated and protected in this environment with the intention of it being used as a lever for larger political and economic objectives. But even in these roles, its importance, largely because of the technology until after World War II, was small. British Imperial Airways, for example, only carried about 50,000 passengers to the colonies in the 1930s; a figure hidden in the public media coverage given to the importance of colonial air networks. Technology shifts as an offshoot of military developments in World War II changed this with the introduction of planes with far longer ranges, faster speeds, enhanced lift, and the increasingly ability to cope with adverse weather conditions. Air traffic control, navigation, communications, and airport facilities have also improved considerably, and more recently the underlying management structure of the supplying industries has enhanced efficiency.

9. The Chicago Convention of 1944 confronted the new international potentials of civil aviation and initiated an institutional structure that laid common ground rules for bilateral air service agreements (ASAs) between nationals. The result, however, while providing a formal basis for negotiation, was essentially one of protectionism with pairs of countries agreeing on which airlines could offer services between them, the fares to be charged and, often, how the revenues could be shared. Added to this, with the major exception of the US, most international airlines were state owned flag-carriers that operated to fulfill, often vague, national objectives of prestige, as well as linking colonies. Internal markets within countries were regulated in similar fashions, and it was not uncommon for wealthier countries to have an airline to provide primarily domestic and short haul services, and one for long-haul, international markets.

10. The breakdown of the domestic regulatory structure within the US from the late 1970s (Morrison, and Winston, 1995) provided both a demonstration for other countries to follow in deregulating their own domestic regimes, but also the US's, initially unsuccessful, initiatives from 1979 to liberalize international services on a bilateral basis based on a common “Open Skies” recipe began to bring about pressures to wider reforms. This was coupled with more generic moves towards a withdrawal of government in market-oriented countries such as New Zealand and the UK that saw airports and air traffic control being privatized, or at least operated on a more commercial footing. The move to a Single European Market within the EU from 1992 represented a broader trend, both in terms of the sectors and the geography involved, towards market liberalization of air transport infrastructure, as did the collapse of the Soviet economic system. Not all countries moved completely in this direction, the US for example, rather perversely, continued with its traditional, strongly socialist policy of air traffic control being a state owned, tax financed monopoly and airports, with few exceptions, being owned by local governments (Button and McDougall, 2006).

11. Where there have been almost universal tightening of regulations that run counter to the market liberalizations, have been in what the US calls “social regulation” and Europe calls, “quality regulation”. This concerns such matters as the environment, safety, security, and consumer and labor protection. These are areas that have been traditionally dealt with at the international level by the International Civil Aviation Organisation (ICAO) set up under the Chicago Convention, and in accord with some peculiar international accords such as the Warsaw Convention that dates back to 1929 and deals with liabilities in the case of

accidents². More recently, regional or national actions have also taken international significance; e.g. the extension of carbon trading within the EU to embrace all air transport, and the US's introduction of stricter security measures, such as the provision on passenger information, for all flights into the country.

3.2 *The modern industry*

12. The modern air transport industry is thus one that increasingly operates within a liberal market context. While government controls over fares, market entry, and capacity continue in many smaller countries, they are gradually and almost universally being removed or relaxed. International controls under the bilateral ASA structure are increasingly moving towards broad Open Skies formulations, allowing free provision of services between the countries involved, although progress on open market, whereby nationality of ownership of airlines is unrestricted, is coming more slowly. The EU area³ has effectively been the largest international free market in air transport services in the world since 1997, and this has grown as the Union has expanded geographically. The supply and operation of air transport infrastructure is also becoming more market driven with on-going privatizations of airports and air traffic control systems, or the use of franchising mechanisms to involve private capital and expertise (Button, 2008). It is also becoming more coordinated.⁴

13. The air transport industry is now large – it accounts for about 1% of the GDP of both the EU and the US – and is vital in many industries such as tourism, exotics, and hi-technology⁵. It is an important transporter of high-value, low-bulk cargoes. International aviation moves about 40% of world trade by value, although far less in physical terms. The market is served by a diversity of carriers, some specializing in long-haul international routes and others in short-haul markets⁶. Table 1 offers some indication of the scale of larger airlines involved. To handle the interface between land and air transport the world's major airports have grown to handle millions of international passengers (Table 2) and tonnes of cargo⁷ each year, and many have been significant catalyst facilitating, in particular, the growth of modern hi-technology industries and tourism about them. In 2008, passenger air services globally link around 15,500 airports; with the fastest growth in air services over the past two decades being in the Europe-Asian Pacific markets.

2 The air transport industry itself has established international bodies to both interact with national governments and institutions such as the ICAO; e.g. the International Air Transport Association (IATA) was established to assist airline companies to achieve lawful competition and uniformity in prices

3 Norway and Switzerland are also included in most of these agreements.

4 E.g. in October 2001, the European Commission also adopted proposals for a Single European Sky, to create a Community regulator for air traffic management within the EU, Norway and Switzerland

5 One US survey has shown that hi-technology personnel fly about 60% more than their counterparts in traditional industries. A broader econometric analysis indicates that the location of a city with a hub airport in the US in the 1990s enjoyed some 12000 more high technology jobs than a comparable city without a hub (Button et al., 1999Source). Analysis of transatlantic routes shows that enhanced numbers of links and service frequencies lead, albeit at a declining rate, to more hi-technology employment (Button and Taylor, 2002).

6 In terms of total passengers, because length of trips not included the ranking of airlines is somewhat different; e.g. according to IATA, Ryanair carried 40,532 thousand passengers in 2006; Lufthansa, 38,236; Air France, 30,417; British Airways, 29,498; and KLM, 22,322

7 For example, Airports Council International data shows Memphis International Airport handled 3,840,491 metric tonnes of cargo in 2007; Hong Kong International Airport New Territories, 3,773,964 tonnes; Ted Stevens Anchorage International Airport, Shanghai Pudong International Airport, 2,559,310 tonnes; Incheon International Airport, 2,555,580 tonnes.

Table 1. The ten largest international airlines by scheduled passenger-kilometres

Airline	Scheduled passenger-kilometres (million)
Air France	112,689
British Airways	111,336
Lufthansa	109,384
Singapore Airlines	87,646
American Airlines	81,129
United Airlines	74,578
Emirates Airline	74,578
KLM	71,761
Cathay Pacific	71,124
Japan Airlines	59,913

Source: International Air Transport Association

Table 2. The 20 largest international airports by passengers

Airport	International passengers
London Heathrow Airport	62,099,530
Charles de Gaulle International Airport	54,901,564
Amsterdam Airport Schiphol	47,677,570
Frankfurt Airport	47,087,699
Hong Kong International Airport	46,281,000
Singapore Changi Airport	35,221,203
Narita International Airport	34,289,064
Dubai International Airport	33,481,257
Suvarnabhumi Airport	31,632,716
London Gatwick Airport	31,139,116
Incheon International Airport	30,753,225
Madrid Barajas International Airport	29,339,784
Kuala Lumpur International Airport	26,938,970
Chatrapati Shivaji International Airport	25,360,860
Munich Airport	23,988,612
Dublin Airport	22,339,673
John F. Kennedy International Airport	21,521,711
London Stansted Airport	21,201,543
Taiwan Taoyuan International Airport	20,855,186
Malpensa International Airport	20,627,846

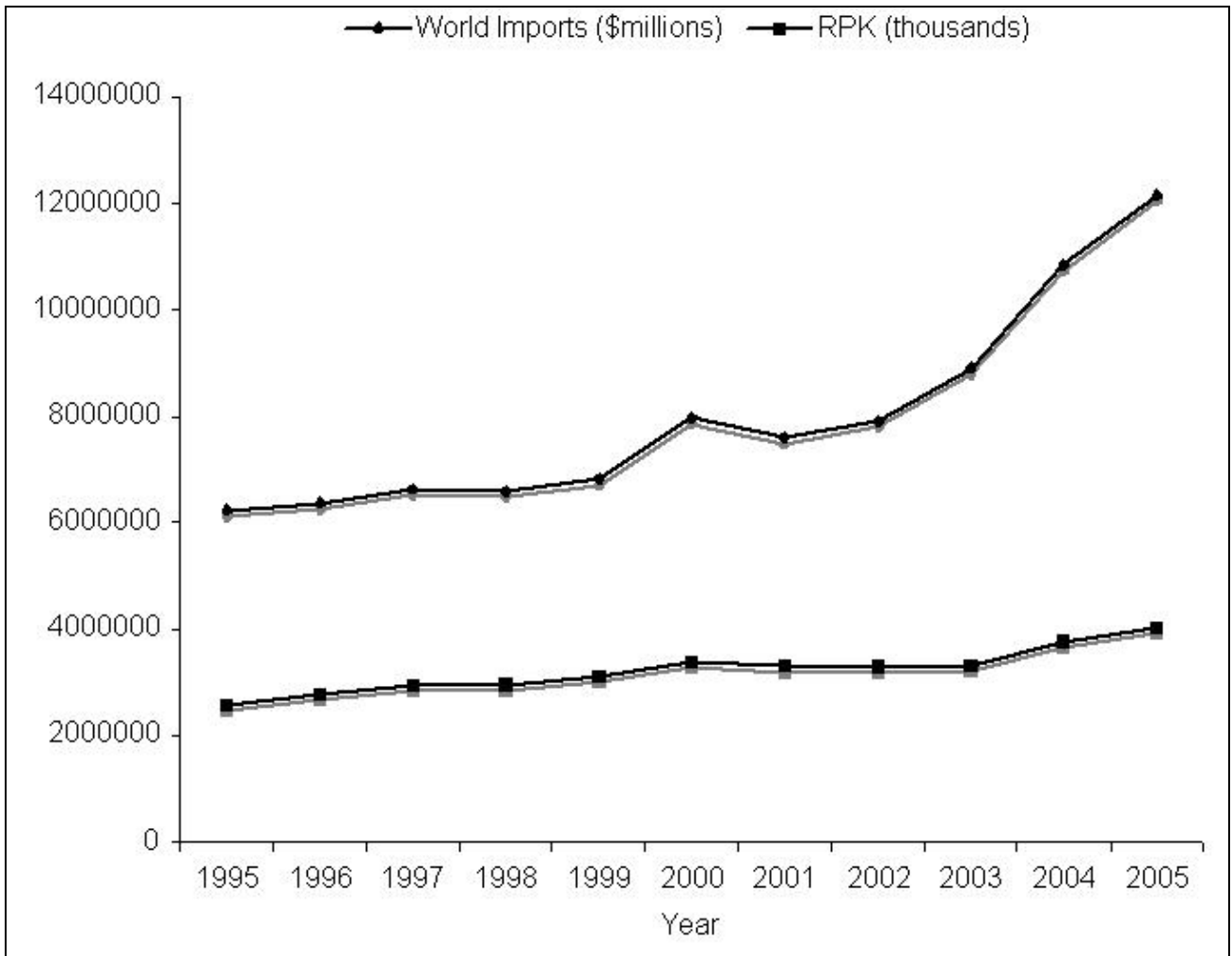
Source: Airports Council International

14. If one looks at the basic aggregate data there is clear general link, although causality is another matter, between the growth in global GDP and international trade and air transport. Figure 1 provides aggregate information on the trends in world trade, and international air transport from the mid-1990s. A similar picture emerges if one plots world GDP against air traffic. In each cases air volumes have risen albeit it slightly less rapidly than GDP. Figure 2 gives detail of the shorter-run trends in growth in world trade and air freight traffic volumes, and shows the common cyclical effects. While the ups and downs broadly coincide, little by way of a consistent lag structure emerges.

4. The effect of globalization on airline markets

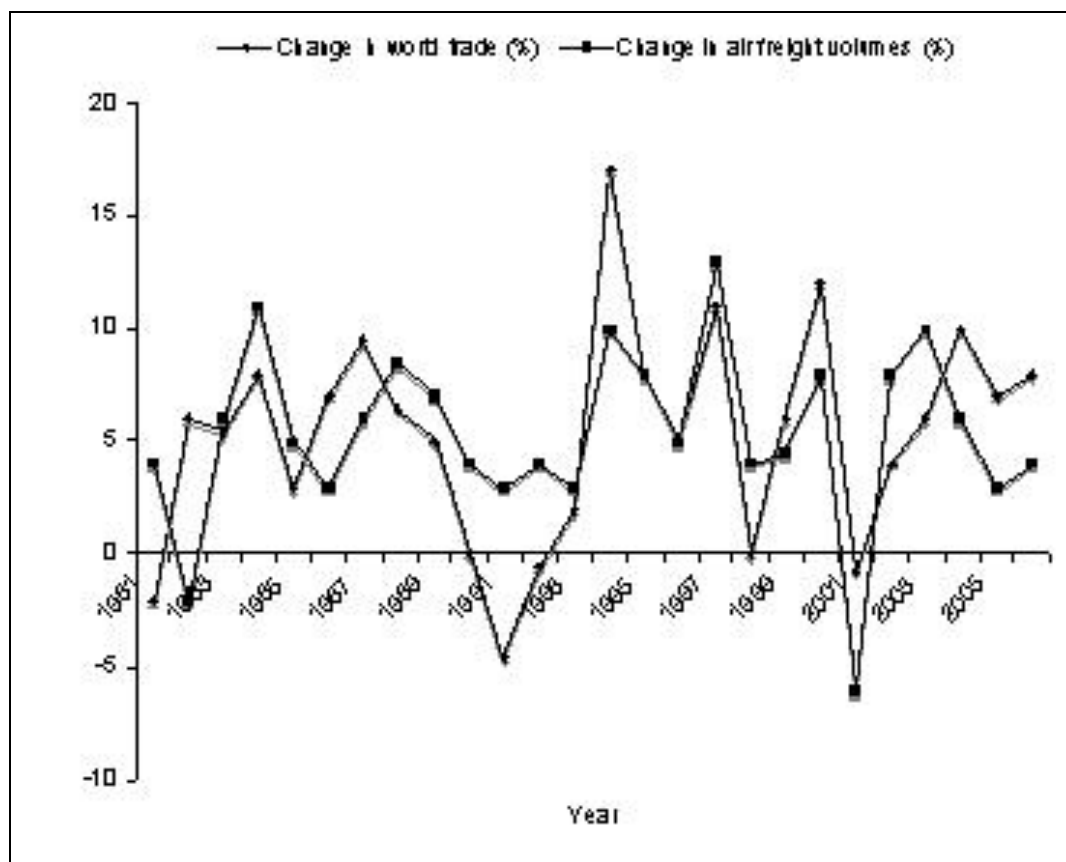
15. The implications of globalization in its many manifestations have been profound for the international air transport industry, not just on the demand side, where the scale, nature, and geography of demand in global markets has led to significant shifts, but also on the supply side, where implicit and explicit international coordination of policies by governments (e.g. regarding safety, security, and the environment) and the private sector (e.g. the internationalization of airframe and aero-engine production) have affected the institutional and technological environment in which air transport services are delivered. We address some of most important of these interactions.

Figure 1. Trends in World international trade, and airlines' revenue passenger kilometres



Note: RPK are revenue passenger kilometres

Figure 2. Short-term links between World-trade in manufactures and air freight volumes



Source: Boeing Commercial Airplane

5. Implications of global air transport institutional changes in airline regulation

5.1 Fares

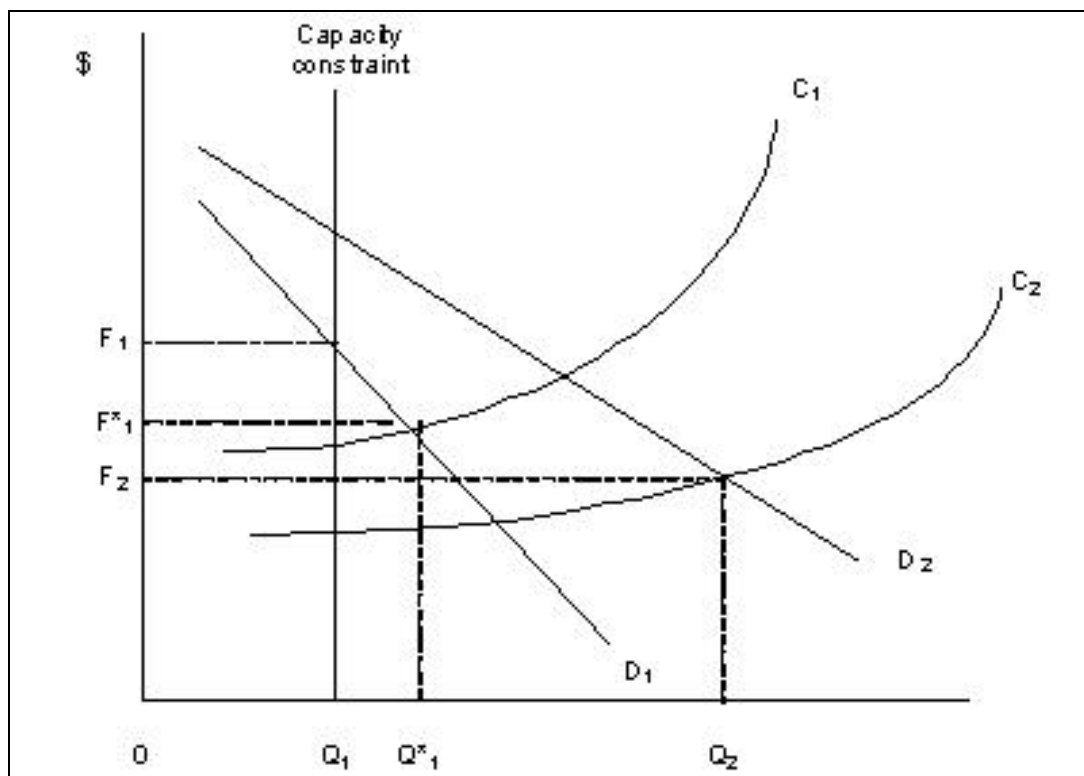
16. The restrictive bilateral ASAs that typified the institutional structure of international airline markets before the advent of Open Skies manifestly had a number of adverse effects on the efficiency of supply and, specifically, on the levels of benefits society could reap from air travel. These effects are not easy to isolate and to completely quantify in a simple way, but Figure 3 offers a general representation of the issues that are involved. In particular, it highlights the potential fare- and output-implications of the various types of regulatory regimes that have been common in the past and are gradually emerging as globalization is taking place⁸.

17. The initial position of the demand curve for international services between two countries, **A** and **B**, under the pre-1980s regulatory regimes that typified international trade in air services is assumed linear and shown as D_1 in the figure, and the average cost curve per passenger, which for simplicity is assumed to

8 The treatments of elements in the figure are static in the sense that technology is held constant. Modern economic theory holds that at least part of technical change is endogenous and thus a function of market and institutional structures.

rise more than linearly with quantity, as C_1 .⁹ Market forces, however, because of the institutional interventions in place, did not determine fares and capacity in these regulated markets. Capacity under this system was limited (seen as the “capacity constraint” in the figure) and fares were regulated. If we assume that the terms reached under the bilateral agreement between **A** and **B** regarding fares allowed for at least cost recovery by the partners’ airlines, this implies a fare level up to F_1 .¹⁰ The removal of both this capacity constraint and of negotiated pricing, as happens under a typical Open Skies arrangement, results in competition for air services, and a move toward cost-recovery pricing strategies by the carriers. This would reduce fares to F^*_1 .

Figure 3. The simple economics of Open Skies policies



18. Open Skies policies, coupled with the permitting of strategic alliances, not only remove the capacity constraint but also affects both the demand and supply curves for international air travel between

9 This particular approach to examining the implications of international deregulation of air transport markets was developed in the specific context of transatlantic routes, but the arguments are general (Button, 2009a). That paper also assesses the quantitative analysis that has been done on the implications of a US-EU Open Skies agreement.

10 In practice, fares tended to reflect the bargaining power of the parties and the objectives of the countries’ overall approaches to the airlines market. Continental European countries have had a long tradition of supporting their flag-carriers for a variety of reasons that are linked to their perceptions of their national interest. In some cases, the fares may have been below the level required for cost recovery, whilst in others it may have been higher if, for example, one partner sought to cross-subsidize domestic services.

A and **B**. The ability of airlines to more effectively feed their transatlantic routes and coordinate their activities, through the restructuring of their business and networks, will reduce the average cost of carriage to C_2 in the figure. The effect is often reinforced due to downward pressures on costs because, although not strictly part of the Open Skies framework, the wider competitive environment within Europe, and the privatization of many carriers, by heightening commercial pressures, reduces the amount of static and dynamic X-inefficiency in the airline industry. In other words, there is the combined pressure of both free airline markets across the Atlantic and within the two feeder markets at either end.

19. The Open Skies policy also has stimulation effects on the demand side. By allowing more effective feed to the long-haul stage of transatlantic services through the concentration of traffic at international hub airports, it increases the geographical market being serviced and also generates economies of scope and scale. The larger physical market demand, combined usually with the improved quality of the “product” that accompanies more integrated services, such as code sharing, interchangeable frequent flier programs, common lounges, and through baggage checking, pushes out the demand for international air services to D_2 in Figure 3.

20. The outcome of the lowering of costs and the outward shift in demand is that the number of passengers traveling increases to Q_2 and, because Open Skies allow price flexibility, the fare falls to F_2 in the way our example is drawn. It should be noted that fares might not actually fall; indeed, they may rise as the result of the freer market conditions. The reason for this is that the outward shift in demand reflects a better “quality” of service – e.g., more convenient flights, transferability of frequent flier miles, and seamless ticketing – and that, on average, potential travelers are willing to pay more for this than the generic portfolio of features that were found under the old bilateral ASA structure. (In Figure 3, the shift out in demand may counteract the fall in costs resulting in $F^*_1 < F_2$.)¹¹

21. What does become pertinent, however, is the extent to which the fare structure is influenced by the market power of the airlines. The analysis presented in Figure 3 assumes that, in the Open Skies environment, fares are set to recover costs; in other words, competition and mergers policy can effectively fulfill the role of regulation. This raises issues as to the nature of markets that are generally served by a relatively small number of large network carriers, often involving alliances between them. A degree of competition exists between the various alliances for the trunk hauls market, and there is also competition at either end of routes with many other, including low cost, carriers competing for passengers in overlapping feeder and origin-destination traffic to international hub airports. There are also theoretical reasons derived from game theory suggesting that the outcome in a market with three players approaches that of competition. Nevertheless, each alliance by dint of product differentiation (e.g., they serve different airports) inevitably enjoys some degree of monopoly power. This could lead to fares higher than F_2 and a smaller output than Q_2 , with consequential reductions in consumer surplus.¹²

22. The effects of a full Open Aviation Area – a genuine open market involving capital mobility as well as simply the ability to sell final airline services in both **A** and **B**'s markets - can be seen as an extension of this framework. Free capital markets, together with the ability to have more flexible feeder networks owned by the truck carrier at both ends of transatlantic services, would further lower costs and may generate additional economies of market presence, although this latter effect is unlikely to be large. The ability to invest across national boundaries provides for short-term support in situations of local market fluctuations and more integrated long-term planning of infrastructure; it would in effect produce air

11 If there are economies of scope or density from offering air services in this market, as is often the case, the cost curve would be downward sloping and in this case the outward shift in demand reinforces the cost curve more and fares will always fall.

12 If there are declining costs, however, this monopoly power may be needed to allow for the recovery of the fixed costs of providing a scheduled service.

networks akin to those enjoyed by US railroads that can move investment funds across states rather than have separate rail companies each with limited intra-state operations. In terms of Figure 3, it would mean lower fares and larger air traffic volumes with concomitant increases in society benefits.

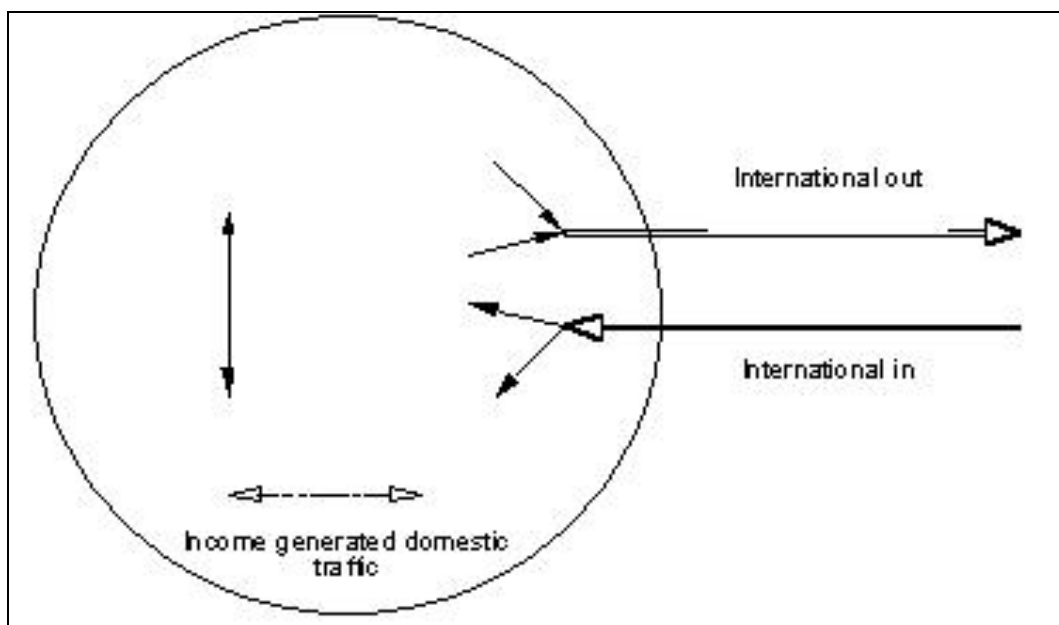
5.2 *Linkages between domestic and international air services*

23. There is a further aspect to liberalizing international services stemming from the interaction of domestic air transport with international markets. The growth of international trade in general that accompanies globalization, obviously leads to more demands for international air services, and changes in the air transport regulatory environment has added to this effect, but trade also increases demands for domestic transport, including air services, and especially so within larger countries. The economic structures required to produce the additional exports, and to distribute additional imports, also needs supplementation by further layers of domestic economic structures to satisfy the new internal demands that come from a more prosperous economy. Figure 4 offers a stylized representation of the types of airlines markets affected by an increase in globalization.

- **International markets.**

24. Globalization inevitably means higher demands for the movement of people and goods between countries which, given the largely commercial orientation of modern air transport, will bring forth additional supply. Given the economies in air transport, most notably the decreasing costs involved in infrastructure use, this in turn can bring about further fare reductions. In addition, international trade increases global income that results in more international tourist travel and shipment of higher value goods, such as exotics, in which air transport often has a comparative advantage. Finally, globalization entails greater factor mobility, with an increase in both temporary and permanent migration. Over longer distances, international air transport is normally the cheapest mode for this.

Figure 4. The implications of globalization on the various air transport markets



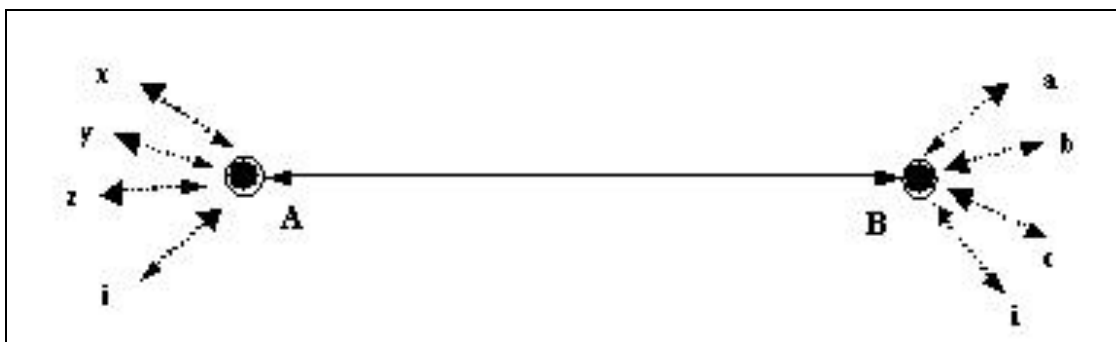
- **Domestic feeder services.**

25. International air transport enjoys significant economies of scale, scope and density and the main international airports, and their associated long haul carriers, benefit from feeder services that take domestic traffic to and from more distant locations within a country. Increasingly, major international airlines operate ‘dog-bone’ networks (Figure 5) with their trunk haul operations between international city hubs in countries **A** and **B** supplemented by local services at each main hub that the international carriers either provided for themselves or (and mainly in the non-home country) by partners of various kinds.¹³ Increases in international air transport inevitably have implications on the demands for feeder air services as well as for the main international service. In some countries, these feeder services may involve collecting and distributing passengers from nearby countries as well as domestically.

- **Trade-generated domestic air services.**

26. Globalization involved increased economic activity, and this in turn leads to the need for more domestic transport as part of the enlarge value chain. In countries with a small land mass much of this additional transport is provided by surface modes that enjoy a comparative advantage over shorter distances, although adverse terrain may give a comparative advantage to air transport in some contexts. In larger countries, however, personnel and freight movements where speed is important will require more air transport as the globalization process takes place. This is a purely domestic implication of increased globalization, and may be quite remote from the international air transport market.

Figure 5. A ‘dog-bone’ or ‘dumb-bell’ international air transport network



- **Income-generated domestic air services.**

27. Globalization also, as a result of the increased overall economic activity, leads to higher income and consumption in each country (see again Figure 4), although the affluence is not spread evenly. Air transport facilitates some of this consumption. Again, in larger countries, as incomes rise, people spend more on domestic vacations and make more frequent visits to family and friends. Again, as with trade-generated domestic air movement, this internal activity may be remote economically and institutionally from international movements, but it is nevertheless a result of it.

28. From an analytical perspective, it is convenient to isolate these four distinct types of air transport influenced by globalization trends, but from an empirical basis it is virtually impossible to isolate their relative magnitudes from available data. There are two major problems. First, the air transport sector provides network services, and any shock to one link or node has implications throughout, at least, other

¹³ In some cases, these feeder flights may actually be by another mode. For example, Lufthansa has rail feeder services and most feeder movements for cargo to Heathrow in London are, despite having a flight number associated with them, carried out by truck.

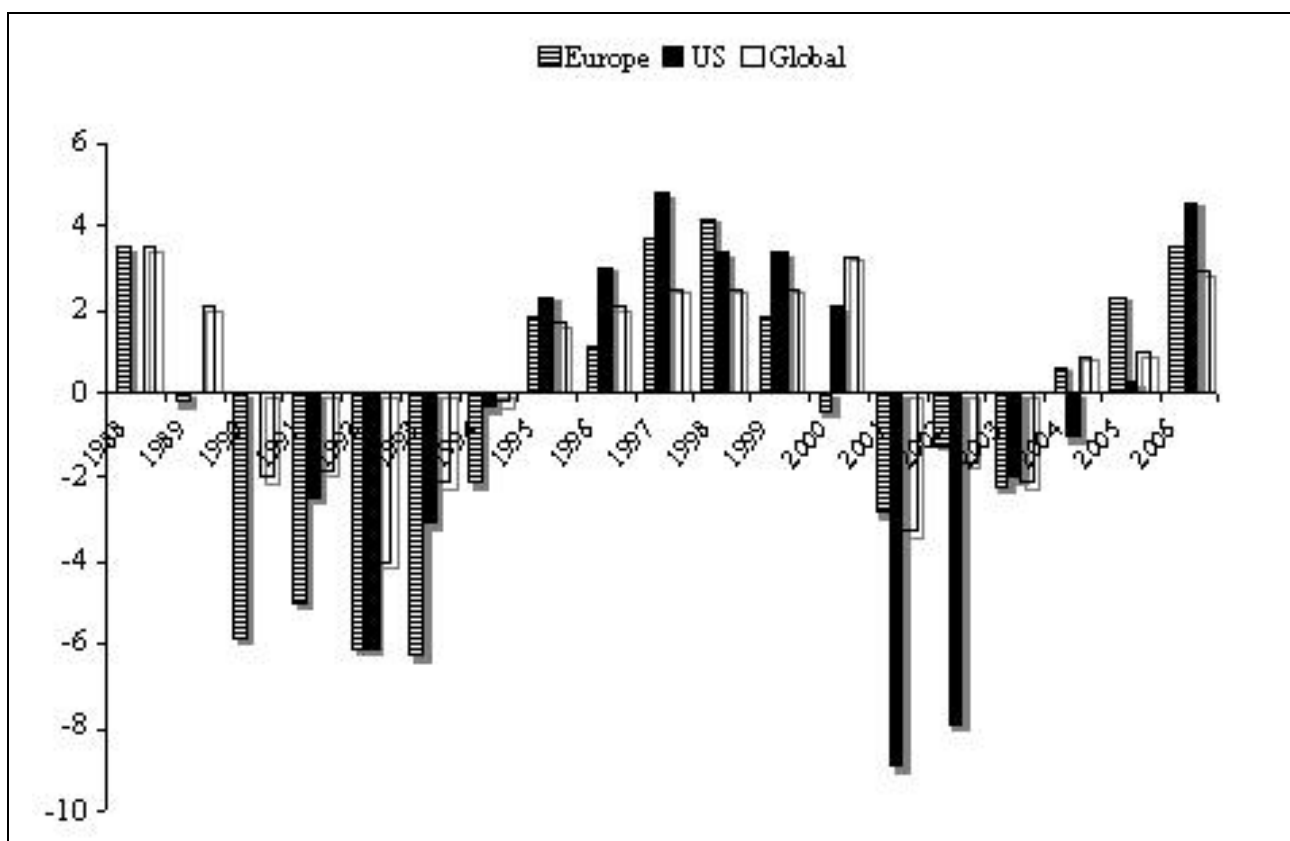
parts of the network. This is not simply a matter of additional demands on an international route affecting the domestic feeder services of that airline, but rather it has ripple effects across the networks of all carriers in the domestic market because aircraft carrying feed traffic also carry purely domestic traffic. Thus, a change in international demand affects the basis of competition between all domestic services. Disentangling these effects even for a marginal change in the international market affecting one airline and one route is empirically impossible at present, let alone larger changes involving numerous international routes.

29. Second, there are the problems in defining the counterfactual. At the simplest intellectual, although not necessarily practical, level there is the challenge of saying what would have happened if the new trades with their associated demands on air transport had not arisen; in other words, if past trends had continued or alternative background variables had changed. Technically one could compare a simple extrapolation of the past with actual events. Predicting economic growth is, however, a treacherous task. Where there have been partial attempts to look at the wider implications of growth in international air traffic as the result of some external change, the ripple effects through the network were frequently large. For example, the Brattle Group (2002) study of the effects of relaxing entry to the North Atlantic air traffic market suggested significant implications for demand on the internal European market, and this did not allow for any trade or income induced effects.

5.3 *Airline profits*

30. That the financial conditions of airlines are strongly influenced by international economic trade-cycle effects is clearly seen in Figure 6, which shows net operating margins, although other financial measures exhibit similar patterns. There have been demonstrable downturns in the past coinciding with international financial crises (the early 1990s) and major international incidents (the terrorist attacks on New York and Washington and the SARS epidemic). The figure illustrates the consistency with which these types of factors affect all air transportation markets, albeit with different intensities. But, in addition, even during relatively good times, the returns earned do not compensate for the bad, even assuming a zero operating margin is viable, which is unlikely.

Figure 6. Operating margins of airlines
1988-2006

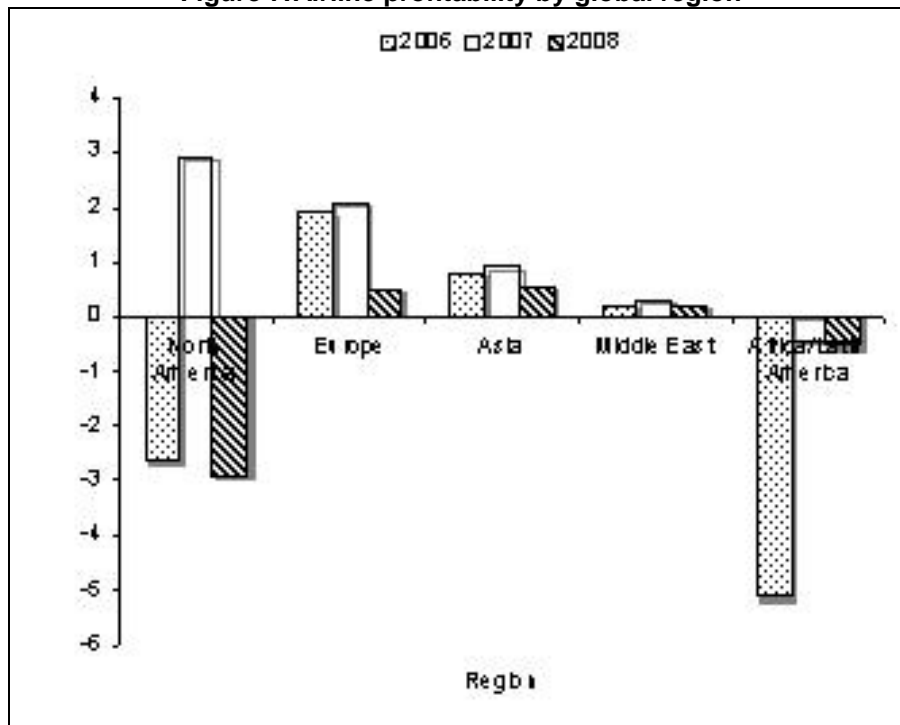


Notes: (i) A lack of a bar indicates a missing observation and not a zero operating margin, (ii) The data refers to members of the various associations that provide financial details of associated airlines. Memberships of the various reporting bodies vary over time and thus the reported margins reflect the associated carriers at the time of reporting. Sources: Boeing Commercial Airplane, Association of European Airlines, Air Transport Association of America, International Air Transport Association.

31. The financial situation of airlines at the time of writing, with serious macro-economic problems in the US economy and slowing of many other economies, has led to forecast by the IATA of potential global losses of \$6.1 billion for the airline industry in 2008 due to higher input prices and a down-turn in the business cycle.¹⁴ Within these global trends, however, there have also been significant variations in profitability across macro-regional markets (Figure 7), which in part reflect the maturity of markets, but also the extent to which individual countries within them have liberalized their international ASAs.

14 While airlines have, as a whole, found it difficult to recover their full economic costs, other actors in the air transport value chain have generally earned a reasonable return. International airlines can be seen as “till” at the end of this chain and as collectors of the revenues that finance the chain (Button, 2004)

Figure 7. Airline profitability by global region



Note: 2008 data are from the IATA June2008 provisional forecasts

32. Elementary economic theory tells us that, when there are no fixed costs, then bargaining between suppliers and customers will ensure that prices are kept to a minimal level that allows suppliers to recover all costs over the long term. When there are no fixed costs, the marginal cost of meeting customer demand represents the entire costs of production. The problems come when there are fixed costs.

33. The traditional view of fixed costs was developed when the bricks, steel, and mortar of industrial plants had to be paid for. The world has changed, and with service industries, and especially those involving scheduled services, the fixed costs are somewhat different. While airlines do use expensive hardware, this is not their underlying fixed cost problem. Indeed, the largest costs of airlines has traditionally been their labor, although rising fuel prices from 2007 have changed this somewhat.¹⁵ These in the traditional sense are variable costs. Even aircraft are now seldom owned by the carriers, but are leased, sometimes (it is illegal in the US) on a wet-lease that includes crew. The result is that airlines are increasingly becoming “virtual carriers” that act to bring together packages of services owned by others and thus are encumbered with few fixed costs themselves in the traditional economic sense.

34. Fixed costs in a modern service industry, therefore, can take an entirely form. An airline is committed to a particular scheduled service some 6 months or so before the flight – it is committed to have a plane, crew, fuel, gates, landing and take-off slots, etc., available at a scheduled time and designated place. This does have the advantage that fares are often collected before the airlines has to provide the service, but in a highly competitive market, this is generally more than offset, by the limited amount of revenue that is ultimately collected.

15 There have been unprecedented rapid rises in costs of aviation fuel (kerosene) since 2001. Jet fuel rose from \$30.5 a barrel in 2001 to \$81.9 in 2006, to \$113.4 in December 2007 and is over \$140 at the time of writing (July, 2008). The result is that for international airlines, fuel costs that constituted 13% of operating costs rose to 26% by 2006 and has climbed since to account for between 30% and 50% of costs in the US.

35. Airlines in deregulated markets engage in price discrimination and charge passengers different fares to try to extract as much revenue as possible. In generally, this means that lower fares are offered initially when a flight is some way off, because leisure travelers are willing to pay less for a seat and are more flexible in their scheduling and will seek lower fares if available. They are caught early by the airline. Towards the time of take-off, fares rise as last minute travelers, often business travelers, seek seats. These people are less sensitive to fares, meeting a last minute business deadline can make or break a deal, and tax deductions are normally allowed for the offsetting of higher fares. The problem is that with a fixed schedule in a competitive market, the various airlines set take-off times for each destination at about the same time. These leads to intense competition to fill seats and forces fares down to levels that do not allow all the costs of individual's services to be met.¹⁶ It is worth filing a seat once it is there with anyone willing to pay for the additional costs of handling.

36. The problem is exacerbated when taken over a business cycle, and when there is new entry to markets. In the longer-term, it leads to instability in the market as airlines enter and leave. It also leads to sub-optimal levels of investment, despite excess capacity during peaks in the cycle. When full costs are not recovered, and an airline ultimately withdraws a service or goes out of business, is known as the "empty core problem" in economic analysis. It is neither a new concept, it was developed in the 1880s by a largely forgotten Oxford economist, Francis Edgeworth (1881), nor is it one that has limited application. In the long-term, as potential investors become aware of this problem, they will reduce or cease to put new capital into the industry. However, the complexity of the underlying economic model has hindered the communication of the issue to decision makers.¹⁷ This situation also runs counter to some traditional, often ideological, views of competition policy that hold that there can "never be too much competition". The idea that there can be 'too much competition' is something of an anathema in such circles.

37. The current situation, with large parts of airline industry hemorrhaging cash, while widespread, has impacted individual markets differently. The domestic US market, which is possibly the most competitive in the world, has been the hardest hit to date, and although low-cost domestic carriers, such as Southwest, has been adding some routes, the vast majority of airlines have been retracting, pulling services, and some, such as ATA Airlines and Skybus, and the legacy airline, Aloha, have simply vanished from the market. European airlines, although some like Ryanair, British Airways and Air France are recording profits, are also being badly hit financially by a rise in fuel cost, as are carriers elsewhere, such as Qantas, that, after predictions in June 2007 of a \$1.3 billion profit for 2008, in June 2008 anticipated a loss of \$1 billion.

38. The airlines have historically reacted to the situation in a number of ways, essentially trying to glean a degree of short-term monopoly power wherever and whenever the opportunity has arisen. Many of the initiatives have been extensions or modifications to existing strategies that have been used in previous market downturns, but which, as has been seen, have not prevented long-term financial problems for the airlines. The measures that have been taken, and in turn influenced the international air transport market include:

16 Even where there is not actual competition, potential market entry for at least a period prior to take-off is possible. This is weak-competition due to contestability (Button, 2006).

17 For a largely accessible general survey of the theory, see Telser (1987). The academic literature applying the theory to airlines is thin, but includes Button et al. (2007) and Button (1996).

- **Loyalty payments**

39. Major international partners operate frequent flier programs that reward regular customers with free flights and bonuses, such as up-grades to higher classes of service and access to airport lounges. The ‘miles’ earned on carriers within airline alliances are normally interchangeable, albeit not perfectly, providing passengers with an extensive range of services for redemption. More recently, it has been possible in many programs to obtain miles with non-airline purchases such as credit card use, car rentals, and dining. The airlines effectively sell their miles to other industries that then give them as rewards to their own customers – the value of this business to the airlines in 2005 was about \$3 billion. The long-term problem is that there is an inherent tendency for the ‘currency’ to be debased, with ever increasing numbers of miles being required to buy flights and the number of flights for sale shrinking. The impact has been that loyalty-incentives have been weakened, reducing the incentive to make multiple trips by one carrier.

- **Cost cutting**

40. To gain an advantage over competitors, many airlines have sought to reduce costs. If other carriers cannot match the lower costs, then either fares remain at the competitive level of the higher-cost airlines, allowing the low-cost carrier to earn a margin towards fixed costs, or the higher-cost airlines leave the market. This has been the strategy of low-cost international airlines like Ryanair in Europe. The low-cost carrier business model, with numerous variants, centers on the ability of an airline to undercut its rivals, and thus obtain market power. This generally entails standardization in its operations (the use of a common family of aircraft and a homogeneous network of services), maximising the use of its labor force, serving less congested airports, providing a ‘no-frills’ service on the plane and at the airport, limiting methods of booking to the Internet, charging for non-core services (such as refreshment) and offering only one class of service. Such measures can reduce costs by 30% or so compared to those of traditional airlines. Low-cost carriers have thus trimmed their costs considerably and the traditional carriers have been forced to follow (Morrison, 2001) often going through bankruptcy, by re-negotiating labor contracts, replacing older aircraft with fuel-efficient planes, increasing automation, and unbundling some services. There are technical limits, however, to which viable and safe services can be offered and, in many cases, airlines may well be approaching these.

41. There are also more fundamental issues. The successful low-cost carriers have tended to be the first in the market and to enjoy a “first mover advantage”. The list of failed low-cost airlines in the Europe (Table 3) and elsewhere, however, is long. One problem is that as low-cost carriers have expanded, they have moved into increasingly thin and less suitable markets for their style of operations. Additionally, as more carriers have emerged, so competition between low-cost airlines has grown, hitting their bottom lines (Button and Vega, 2007). The traditional airlines have also become leaner and also more skilled at resisting the challenges associated with low-cost carriers trying to enter their routes. While the low-cost model may continue to throw up winners, it does not solve the problem of market stability. Even if all airlines were low-cost, competition between them would erode their revenue streams.

- **Subsidies**

42. Subsidies have long been used to recover capital costs. One argument is that once an investment has been made, it becomes economically efficient to maximize its use subject to the willingness of users to pay their incremental costs. The current trend to unbundle attributes of an airline service – such as charging for food and second checked bags by some airlines – attempts to separate the activities in which the fixed costs are concentrated and to charge explicitly for the incremental costs. The fixed costs in this sense can then be isolated, and the other attributes – the food and bag service – are sold in the market at competitive prices. Direct subsidies are then used to cover the fixed costs that cannot be recovered from customers. In

the airlines case, however, where the fixed cost is that of a commitment to a schedule, it is difficult to isolate the fixed cost in the traditional sense. Further, there is the generic problem that subsidies reduce the incentive toward efficient production. If the recipient knows that losses are going to be covered by external sources, there is less incentive to restrain costs – a moral hazard issue. Further, there is less incentive to provide the goods and products that customers seek. These problems have led to considerable reductions in subsidies for international airlines services.

Table 3. European low cost carriers that ceased to exist (2003 to 2005)*

Aeris	BuzzAway	Hellas Jet
Agent	Dream Air	Hop
Air Bosnia	Duo	Jet Magic
Air Andalucia	Europe DutchBird	Jetgreen
Air Catalunya	EastJet	JetsSky
Europe Air Exel	EU Jet	JetX
Air Freedom	Europe Exel Aviation Group	Low Fare Jet
Europe Air	Fairline Austria	Maersk Air
Air Littoral	Fly Eco	Now
Air Luxor	Fly West	Silesian Air
Air Madrid	Flying Finn	Skynet Airlines
Air Polonia	Free Airways	Spirit Of Balkan
Air Wales	Fresh Aer	Swedline Express
Airlib Express	Germania Express	V Bird
BasiqAir	GetJet Poland	VolareWeb
BerlinJet	Go Fly	White Eagle
Bexx Air	Goodjet	Windjet

* Most of these airlines operated for a period and then went into bankruptcy. Some, such as Go Fly and BuzzAway, merged with successful low-cost airlines. In a few cases, the airline was registered but never offered actual services. Source: www.discountairfares.com/costgra.htm.

- **Institutional market power**

43. Institutional monopoly power is engendered either by government actions (as with the ASA that exist in non-Open Skies markets) or by suppliers erecting barriers to competition. Market power may also arise naturally when suppliers merge or a dominant player exists. In the context of airlines, the domination of certain hub airports by network carriers, such as Delta at Atlanta and Northwest at Detroit and Minneapolis airports, in the US has given them some degree of market power (US Department of Transportation, 2001). Airlines have sought to grow by mergers and through the formation of cartels – strategic alliances. While there are many alliances, often involving a single route and a pair of carriers, the major international traffics, about 60% of all passengers, are increasingly being carried by members of three global alliances; Oneworld, SkyTeam, and the Star Alliance (Table 4). Similar cartels are found in international air cargo; e.g. the WOW Alliance and SkyTeam Cargo.

44. Monopoly power associated with airlines' own actions have traditionally been a concern of government, and, in particular, mergers and competition agencies. Regulation has been used to prevent an institutional monopoly from exerting excessive market power, e.g. by controlling fares as under the traditional ASA regimes, or by preventing mergers or cartelization. At the extreme there has been state ownership. Given the state of the finances of many major international carriers, however, the amount of market power enjoyed as a result of alliances and mergers seems rather limited, and is unlikely to increase significantly within liberalized markets.

- **Long-term contracts between supplier and customer**

45. Negotiating a long-term cost recovery contract with a major customer, at the time capacity is introduced, can help ensure an airline a guaranteed revenue flow that will cover most of its capital outlay. Such arrangements, while relatively common in other industries, are not often pursued by passenger airlines, although they are more common in the freight sector. Scheduled passenger airlines find it difficult to do because they guarantee a service ahead of time and then effectively become common carriers of the traffic willing to pay for flights. In some US cities, groups of businessmen have, however, tried to ensure regular air services with guarantees of adequate patronage for an initial period – ‘travel banks’. In Wichita, Kansas, some 400 businesses raised \$7.2 million to attract carriers. Air Tran started operations in May 2002 with services to Atlanta and Chicago’s Midway airport. The agreement included up to \$3.0 million to cover losses in its first year and \$1.5 million in the second. Similarly, Pensacola, Florida raised \$2.1 million from 319 businesses to attract Air Tran while companies and individuals in Stockton, California bought \$800,000 of prepaid tickets to attract American West (Nolan et al, 2005).¹⁸ In a different context, the US’s Civil Reserve Air Fleet program may be seen as a long-term contract to buy military support from commercial airlines.

Table 4. Strategic Airline Alliances¹⁹

	Star Alliance	SkyTeam	Oneworld
Passengers per year	455.5 million	428 million	319.7 million
Destinations	975	841	692
Global market share	25.1%	20.8%	14.9%
Participants	Adria Airways Air Canada Air China Air New Zealand ANA Asiana Airlines Austrian Airlines Blue1 BMI Croatia Airlines EgyptAir LOT Polish Airlines Lufthansa SAS Shanghai Airlines Singapore Airlines South African Airways Spanair Swiss International Air Lines TAP Portugal Thai Airways International Turkish Airlines United Airlines US Airways American Airlines	Aeroflot Aeroméxico Air Europa Air France Alitalia China Southern Continental Copa Airlines Czech Airlines Delta Kenya Airways KLM Korean Air Northwest	American Airlines British Airways Cathay Pacific Finnair Iberia Japan Airlines LAN Malév Qantas Royal Jordanian

¹⁸ In the EU, efforts by Ryanair to pursue similar strategies for inter-European international services fell foul of legislation covering the use of any public funds to support services.

¹⁹ Alliances are flexible and this represents the alignments at the time of writing (July 2008). *Airline Business* provides an annual survey of alliances.

- **Vertical integration**

46. If one link in the overall air transportation value chain fails to recover its full long-run costs, but the chain in its entirety is viable, then one option is for the loss-making element to vertically integrate with profitable links, or to in some way be subsidized by them. Historically, airlines such as American initiated the computer reservation systems (CRS), Sabre, that were subsequently separated but provided a revenue flow to the airline. There were historically, strong ties between Boeing and Pan American and between Lockheed and TWA in terms of aircraft development and use. Outside of the US, airlines have a major stake in the UK's public-private air traffic control system – NATS – and airlines like Lufthansa have invested in catering and in railway services. While in some cases these activities produce direct revenue flows – American Airlines enjoyed considerable incomes from when it owned a CRS system – such involvements up and down the chain offered an assurance of stable cost and other controls over inputs, that potentially give a carrier a cost advantage over competitors. The problem is that airline management is often not adept at managing non-airline activities; United Airline's ownership of Hertz rental cars in the 1980s is a classic case of the problems encountered. This inevitably limits the extent to which airlines should become too integrated with other elements in the supply chain.

- **Discriminate pricing**

47. The US domestic air transport market developed and refined price discrimination (the charging of customers different fares according to their willingness-to-pay) that has now become almost universal. There are several forms of price discrimination deployed by airlines, but 'yield management' – essentially dynamic temporal pricing – is the most potent (Dana, 1998). An airline revises the fare charged as seats are filled. The advent of sophisticated information systems allows an airline to offer seats at various prices, and to continue to vary these offers, as seats are purchased. Generally, leisure travellers are relatively sensitive to fares, but know in advance when they wish to travel and thus lower fares are offered well before a particular flight. As the departure date is approached, fewer cheap seats become available, as the focus is on attracting less price-sensitive business traffic that requires flexibility in its travel planning. The conditions pertaining to a 'seat' can also differ; for example, the ticket may be refundable, it may be upgradeable, or it may be at a particular location on a plane (e.g. a seat at an emergency exit row) and prices are adjusted according to these quality factors.

48. Yield management is designed to extract as much revenue from customers as possible by levying prices that reflect the willingness of customers to pay. Consequently, customers who are less sensitive to price pay more, and contribute to the capital cost of the service, while those who are less willing to pay are charged lower prices that at least cover their marginal costs. While it can be used to generate large profits, and this has been done in many industries, its main purpose in air transport is to generate sufficient revenue to earn an acceptable return after all costs, (including those of capital) have been covered.

49. However, to be able to practice discriminatory pricing, an airline has to enjoy a degree of monopoly power.²⁰ While the international airlines sold many of their tickets through their own retail outlets, and subsequently when they developed their own CRS systems used by travel agents, they enjoyed control over fares, it was time-consuming for potential customers to search for the cheapest ticket. Travel agents are, though, now a dying breed in the US (National Commission to Ensure Consumer Information and Choice in the Airline Industry, 2002) and in many other countries, and on-line booking on global

20 Levine (2002) argues that you can have price discrimination without market power and that this is a natural way to recover costs. However, while price discrimination, as practiced by airlines in the form of yield management, may be needed for cost recovery, it seems difficult to see how its use is possible without an airline having some market power. The issue is more the extent to which market power is necessary for optimal price discrimination for cost recovery and when this changes to become a tool of rent seeking.

distribution systems has largely removed the asymmetric information advantage that the airlines enjoyed – customers can easily get details of fares and the associated services and restrictions that go with them from sites such as Priceline, Orbitz, Opado, and Travelocity. This makes it much harder for any airline to differentiate between customers and to extract the highest possible fares from them.

6. The Shifting Situation

50. Looking into the future is never easy, and although usually some random individual comes up with a reasonable forecast (but seldom repeats the feat), the history of previous seers has largely been one of failure. The difficulty with trying to look into the future of international air transport is that it is, as with most things, going to be influenced not only by on-going trends, but also by trend breaks and by new trends. The awful truth is that while current trends can be generally extrapolated, economists and others sink when it comes to projecting trend breaks or the implications of new trends. Thus caution is adhered to here, and we look mainly at emerging trends and the way they are affecting the shaping of the international air transport as globalization takes place, and is assumed to continue. Initially we simply reproduce some forecasts in the public arena. In doing, so we omit one very important factor, the role of public policy, and in particular that which relates to environment policy. This is emerging as a key area of global concern, particularly with regard to global warming gases, even though air transport is responsible for only about 2% worldwide CO₂ emissions. Related to these environmental concerns, albeit at a local level, is the provision of infrastructure, and particularly airports. Additional capacity will be needed to cope with growing demands for international air transport services, but providing this generally meets with considerable local opposition. The discussion of environmental topics is left to others.

6.1 The traffic forecasts that we have

51. For a variety of reasons, those involved in air transport require forecast; e.g. airlines have to plan their commercial strategies, suppliers of hardware, such as airframe and aero engine manufacturers need to plan investment and production schedules, those responsible for stationary hardware such as airports and air traffic control need to develop their capacity, and surface land-use/transport planners need to construct roads and railroads to service airports. Government policy makers need forecasts to allow for the development of overall institutional and regulatory structures. International forecasts are largely based on trends in economic drivers, most notable growth in world GDP and emerging patterns of trade and tourism. Their accuracy in the short term, because of the effects of unexpected shocks to the aviation market, is not high, but the main concern many of the users of forecasts is the longer-term magnitude and pattern of air travel. Like much transport forecasting, there is often little attempt to embrace feedback effects, such as capacity constraints or changing input prices, making them *de facto* extrapolations of previous experiences.²¹

52. What the current forecasts, which normally have a 20-year time horizon, suggest is that air travel will continue to grow, albeit at different rates in different geographical markets, and for different types of service (e.g. for passengers and cargo). We provide examples of recent forecasts.

53. Boeing Commercial Airplane (2007) up-dates its forecasts annually. The predictions from Boeing are that passenger traffic (RPK) will grow over the next 20 years at 5.0% and cargo at 6.1% per year. (This contrasts, for example, with the 4.8% average annual passenger traffic growth of the previous two decades, although the prediction for cargo broadly follows the historic pattern.) Since it is forecast by Boeing that

21 From the mid-1990s, there was some effort to adopt scenario-driven analysis for forecasting, although standard statistical methods still dominate – e.g. see British Airways (1995). One attempt to look at the future of international air travel using a softer approach is to be found in Organisation for Economic Co-operation and Development (1997).

passenger numbers will increase by 4% per annum, this implies a large increase longer-distance traffic. In terms of the global commercial aircraft fleet, Boeing predicts an increase from 18,230 in 2007 to 36,420 airplanes in 2026. In terms of geographical markets, on a regional basis, Boeing predicts Europe's passenger demand will grow at 4.2%, North America at 4.0% and Asia-Pacific, at 6.7% a year (including China's at 8.0%).

54. The aggregate Airbus (2007) forecasts are similar. World passenger traffic is expected to traffic grow at 4.9% per annum for the period 2007 to 2026 with service frequencies doubling. This would imply the world's commercial aircraft fleet, including passenger (from 100 seats to very large aircraft) and freighter aircraft, will grow from 14,980 at the end of 2006 to nearly 33,000 by 2026.²² While passenger traffic demand will nearly triple, airlines will more than double their fleets of passenger aircraft (with more than 100 seats) from 13,284 in 2006 to 28,534 in 2026. In terms of geographical markets, on a regional basis, airbus predicts Europe will receive 24% of new aircraft, with North America and Asia-Pacific taking 27% and 31% respectively.

55. Regarding infrastructure, Airbus estimates 93 major airports around the world are stretched to capacity, representing 63% of passenger traffic. A key airport on the list is London's Heathrow Airport, which is operating at about 99% of its permitted runway capacity. Its forecasts implicitly assume capacity expansion, either through physical construction or making better use of what is already available.

56. IATA's short-term forecasts made in 2007, based upon a survey of the airline industry, suggest that passenger and freight demand growth will continue to provide a positive boost to airline revenues over the five years to 2011, although the profile of growth will differ. Compared to 2006, international passenger growth is expected to slow slightly, domestic passenger growth to improve slightly and international freight growth to remain at a similar level. International passenger volume growth will remain strong and passenger numbers are expected to grow at an average annual growth rate of 5.1% between 2007 and 2011, lower than the average rate of 7.4% seen between 2002 and 2006. Demand will be weakened by slightly slower global economic growth, but will also be boosted by the liberalization of markets and the emergence of new routes and services. Domestic passenger growth is expected to pick-up slightly, growing at an annual rate of 5.3% between 2007 and 2011, led by strong growth in the Chinese and Indian domestic markets. International air-freight traffic is forecast to increase at 4.8% a year, lower than that seen between 2002 and 2006, but similar to its 2006 growth level of 5.0%.

6.2 Globalized labor markets, migration and international air transport

57. The role of international air transport has continually been changing since the early days when it was seen as a sort of "pony express of the skies" for the carriage of express mail. It then became a mode for the wealthy and as a way for governments to reach the extremes of their spheres of influence. It subsequently became the mode of choice for long distance business travel as trade expanded after World War II, and then as a mass mode for leisure and personal travel as technology advances and regulatory reform reduced its costs, and increased leisure time and disposable income stimulated tourism. While all these demands for international air services remain, there has been an added one that may be at least important in the immediate future, namely the demand for air transport to facilitate labor migration (Button and Vega, 2008).

58. Labor migration is growing, and about 3% of the World's population has been living outside of their country of birth for one year. People are largely economic animals and respond to the stimuli offered

22 The differing futures seen by Boeing and Airbus are in part due to the former believing that the growth in long-haul traffic will be catered for by point-to-point services, whereas Airbus believes there will be a significant demand for its A380 super jumbo plane to link up large hub airports.

at various locations when deciding where to locate. The role of transport in carrying these migrants depends on a variety of factors, but given the nature of the mode, distance and the income of the migrants are critical factors. Much of the migration today involves developing countries – the World Bank estimates are that in 2005, two in every five migrants reside in a developing country, and most have come from developing countries.²³ Most of this is relatively short distance and between countries with contiguous borders. It, therefore, seems that air transport places an insignificant role for this large group. In cases of movement between developing and higher income countries there may be more scope for migration by air. While the two largest single corridors for migration – Mexico to the US and Bangladesh to India – are mainly served by surface modes, geography means that the next three largest corridors – Turkey to Germany, India to the United Arab Emirates, and the Philippines to the US – have significant flows by airlines.

59. The pattern of labor migration has also varied over time and can differ between corridors. Migration of workers from Asian countries, for example, shifted from a predominantly Middle East bound flow to an intra-Asian flow in the 1990s. Labor migration in Asia is mostly on fixed-term contracts representing temporary migration, although permanent or settled migration still takes place on a limited scale to Australia and New Zealand. Most Asian migrant workers are unskilled or semi-skilled such as construction workers and female domestic workers.

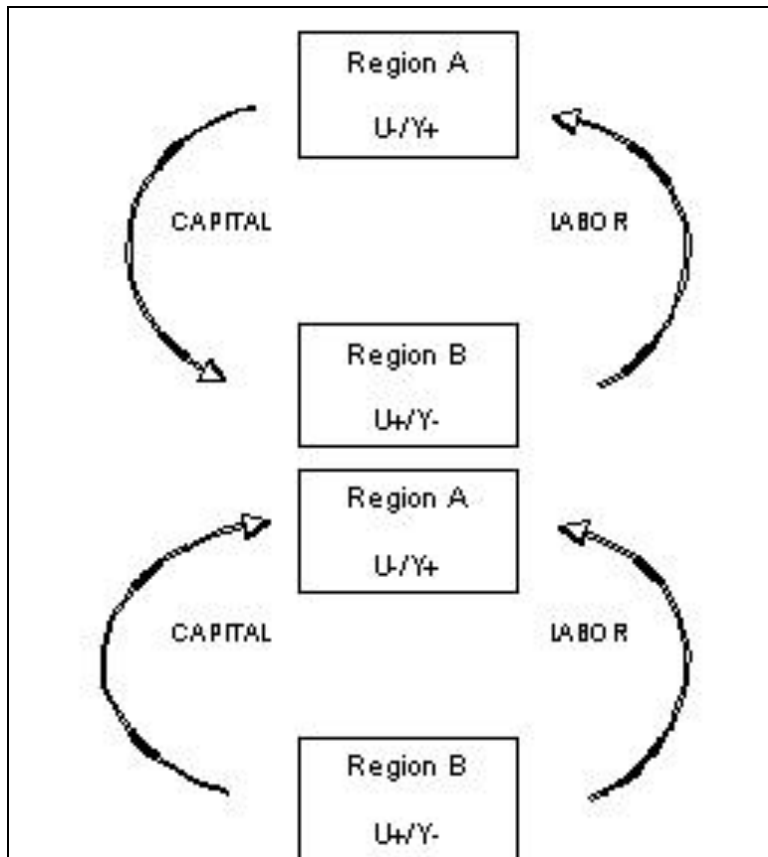
60. There are two broad theories of migration illustrated in Figure 8 (Hart, 1975a; b)²⁴. We assume two regions, **A** and **B**. **A** has high income and low unemployment whilst **B** is the mirror image of this. The classical model assumes that with zero costs of migration, labor will move from **B** to **A** seeking work and higher pay, and that capital will move from **A** to **B**, where it can be combined with abundant, cheap labor to maximize returns. The process continues until labor costs and employment levels are equalized.²⁵

23 This is often called “South-South migration” as opposed to “South-North migration” that traditionally describes movements from developing to developed countries. Of the South-South migration, 80% is between countries with contiguous borders and 65% of the remainder is between countries with the 40th percentile of countries ranked by distance.

24 These theories only relate to the narrow economic motivations for migration and do not include socio-political theories covering such things as military disruptions and forced migration.

25 Strictly with full market clearing, there is no unemployment in this type of model, labor movements being determined by real relative wages. The unemployment effect is added to indicate possible imperfections in the short-term labor markets in the two regions.

Figure 8. The alternative views of the implications of migration



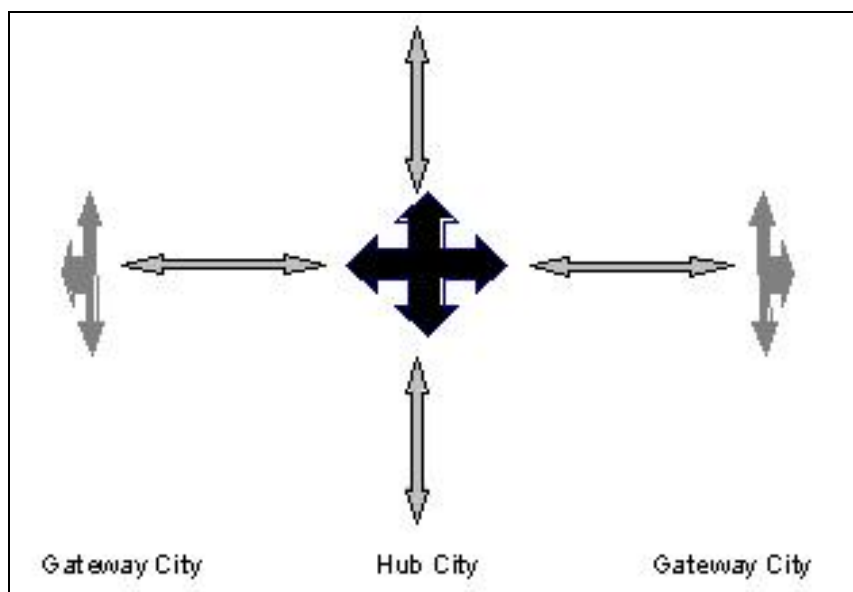
61. The alternative approach is essentially Keynesian in its orientation, and in its modern form is linked to the New Growth Theory. Taking the initial starting positions for our two regions, this approach argues that not only will equalization of real wages and employment levels not be attained, but that there may be cases where they diverge further. Labor mobility may be impeded by the various costs of migration – embracing social and search costs, as well as simple financial costs – and heterogeneity in the labor market – the jobs available in region **A** not being compatible with the skills of labor in region **B**. Equally, capital does not move from region **A** to **B** because of the higher returns that are to be found in regions that already have a high level of prosperity. The original formulation of this type of model in the 1960s put emphasis on the scale economies enjoyed by prosperous regions with a larger capital base, but, as the nature of industry has evolved, it switched the ability of advanced, knowledge-based economies to continually push forward the technology envelope and forge ahead of other regions (Button, 2009b)

62. The role of transport in these models is different. In the classic framework it is considered, as in classic trade theory, to be ubiquitous and free. In the Keynesian style model, it is seen as a major transactions cost that affects clearing in the labor markets; transport costs are considered important in the labor mobility decision but the labor market *per se* is largely seen as clearing in most other respects. There is an underlying assumption that in the short-term, there are potential mismatches between available pools of labor skills and the demand for different types of labor but in the long-term, this is resolved both through migration and natural adjustments to the endogenous labor bases of each labor market.

63. Traditionally, migrants may do three things: stay in the same host country forever (permanent settlers), go somewhere else (remigration) or go back to their country of origin after a period.²⁶ But these definitions raise some problems in a more globalized world and one where mobility is easier. In the past migrants to countries had little choice but to become permanent settlers; besides those sent to penal colonies, where returning was simply not tolerated, transportation was extremely expensive. More recently many “migrants” have been seen as guest workers and, as for example in Germany in the 1970s, were often not very highly-skilled workers were sought on short-term contracts. This has now changed in many places.²⁷ Globally, there has also been some attempt to liberalize the temporary movement of service workers under the General Agreement on Trade and Services, but implementation has been piecemeal, although it has focused largely on high-level personnel that are more likely to use air transportation if they become temporary migrants.

64. Until the mid-1900s, the traditional flow of migrants passed through some form of geographical “gateway” or institution such as Ellis Island in the US (Button, 2007). These gateways have gradually moved farther apart, as it has become easier for migrants to both pass-through them and, as transportation systems have evolved, to transverse the distance between them. Figure 9 represents the traditional view of gateways (Burghardt, 1971). In the US context, for example, the two traditional gateway cities of the mid-1880s may be seen as New York on one coast and San Francisco on the other. Once into the country, migrants would move into the hinterland, often through a hub such as Chicago. Railroads largely facilitated this movement. The nature of maritime transportation at the time, as well as institutional controls, led to this pattern of behavior. The gateways proved challenging barriers to cross and, while migration was extensive, it was not easy and reverse migration, or visits to family left behind, proved almost impossible for the vast majority of individuals even if they did succeed in their new land.

Figure 9. The notion of gateways

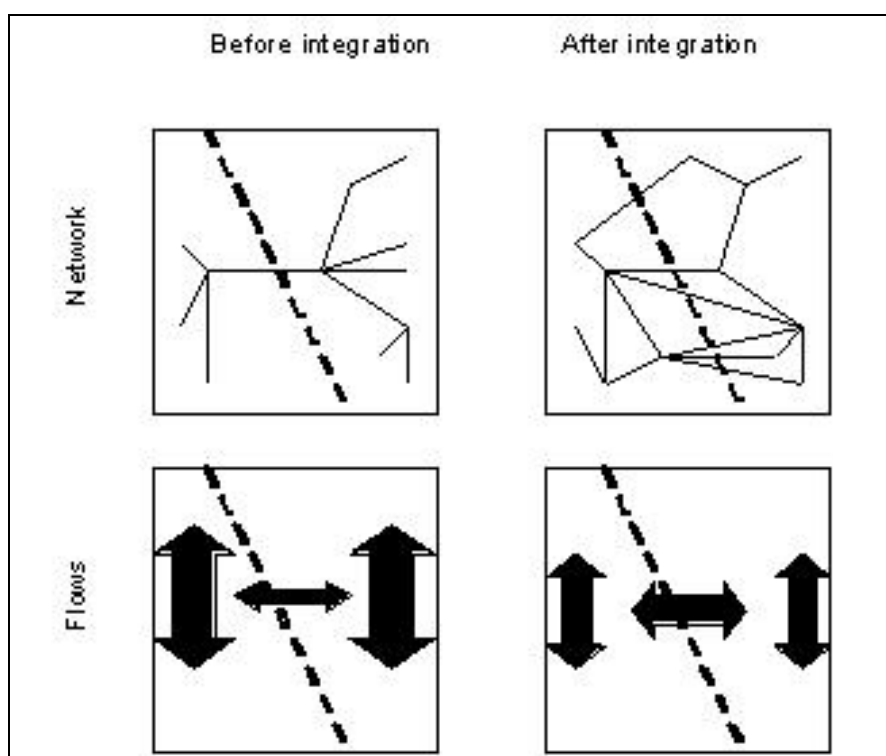


26 These are often “target workers”, who return home once a certain amount of money has been saved or skills attained.

27 There are still significant flows of unskilled temporary migrants that have become institutionalized in some cases. Canada, for example has the Seasonal Agricultural Worker Program that in 2006 allowed 13,000 workers to come from Mexico. These workers all had to travel by air transportation.

65. The institutional and technical changes that have taken place, particularly over the past three decades, have changed this picture dramatically (Rodrigue, J.-P., 2006). The speed and flexibility of air transportation have both effectively shortened the “distance” between recipient countries, such as the US and those sending immigrants, and between settling locations within the recipient country. Open Skies has also provided more gateways into the country. Figure 10 offers a simplified picture of the types of effects that this has had on air traffic flows. The left side of the diagram shows the limited gateways between countries **A** and **B** (the line crossing the “dashed” international border) that existed previous to the emergence of more air transportation services and the types of internal movements that took place. The upper part of this side of the figure shows that the bulk of labor migration was internal to the countries involved, with only limited international mobility.

Figure 10. Impacts of opening more gateways on international and domestic air transport networks and flows



66. The advent of domestic aviation reforms in both **A** and **B** stimulated more domestic labor mobility of various types, including long-distance commuting, as air-fares fell with the advent of low-cost carriers and more services came on-line. Internationally, labor movements crossed more border points that, in turn, further affected the nature and pattern of internal migration. These cross-border flows have themselves also changed in nature, with more movement of temporary migrants and also more back-and-forth movements, as migrants take advantage of low fares to revisit their homelands. The result of these interacting forces has been a relative growth in international migration (conceptualized in the lower elements of Figure 10.)

67. In many cases, including large parts of the EU, freer global labor markets have allowed workers to select their place of work. Even where labor mobility is still restricted, the high demands for particular types of labor have led to governments opening gateways to those with the required skills. The result is that the nature of labor migration has changed in recent decades, including a shift from longer-term to more temporary migration, sequential migration, and cycles of migration. There has also been an increase in long-distance commuting, involving regular return trips home, whether weekly or at some longer interval.

Air transportation seems to be in many cases a facilitator of these changes. Labor migration, both in its volume of flows, and its changing composition, including greater emphasis on circulation and temporary migration, has in many cases been shaped by changes in the availability, frequency and costs of air travel. It makes the initial migration itself more viable and, by facilitating cheap return trips, reduces the longer-term social costs of being away from kith and kin.²⁸

68. The reforms in air transportation regulation have overcome many of the previous limitations of air transportation as a significant form of mass mobility; costs were a significant barrier to air travel as were the frequency and convenience attributes. Low-cost airlines, and their knock-on effects on the legacy carriers, have changed this. As a result, they have impacted on labor markets in several ways, but mainly through reducing travel costs and increasing accessibility. Effectively, they reduce the transaction costs of international labor migration and, all else being equal, by shifting the balance between the costs and returns of migration, have contributed to the increase in factor mobility. For individuals, the cost of being away from home is high (mental and physical stress, the cost of separation, etc.), for others, the cost of traveling may be more important. For all, air transportation lowers migration costs. Some can visit relatives more often. Others can at least afford getting to their destination. There is also the induced demand for migration that is made possible by lower air transportation costs.

69. Airlines have changed to meet the challenges of the new demands posed by freer international labor markets. Low-fare services from a local airport seem to be changing consumers' perceptions about flying generally and consequently are having an effect on travel patterns. In many cases, as with Ryanair in Europe that serves numerous small airports with radial structures of routes, it is not simply about vacations and visiting a second home, but also seems to stimulate people to apply for jobs abroad and may facilitate working far from home. Wizz Air, the Hungarian air carrier, is a leader among several low-cost airlines transporting planeloads of Poles, Hungarians and others to Western Europe with one-way fares starting at less than €20, including taxes. Nearly one million East Europeans have moved to Britain, Ireland, Sweden, Germany and other countries since the EU expanded from 15 to 25 nations in 2004.

70. Figure 11 provides an indication of the increased air traffic between several of the countries with significant migrant flows into the UK on routes where there have been expansions of low-cost carrier activity; not only Wizz but also Centralwings (a subsidiary of Lot Polish Airlines), the Slovenian carrier SkyEurope Airways and others. Just taking Poland, as an example, in 2000 there were five scheduled services between Poland and the UK; by 2006 this had grown to 27 scheduled services linking 12 Polish cities and 12 UK airports (UK Civil Aviation Authority, 2006).

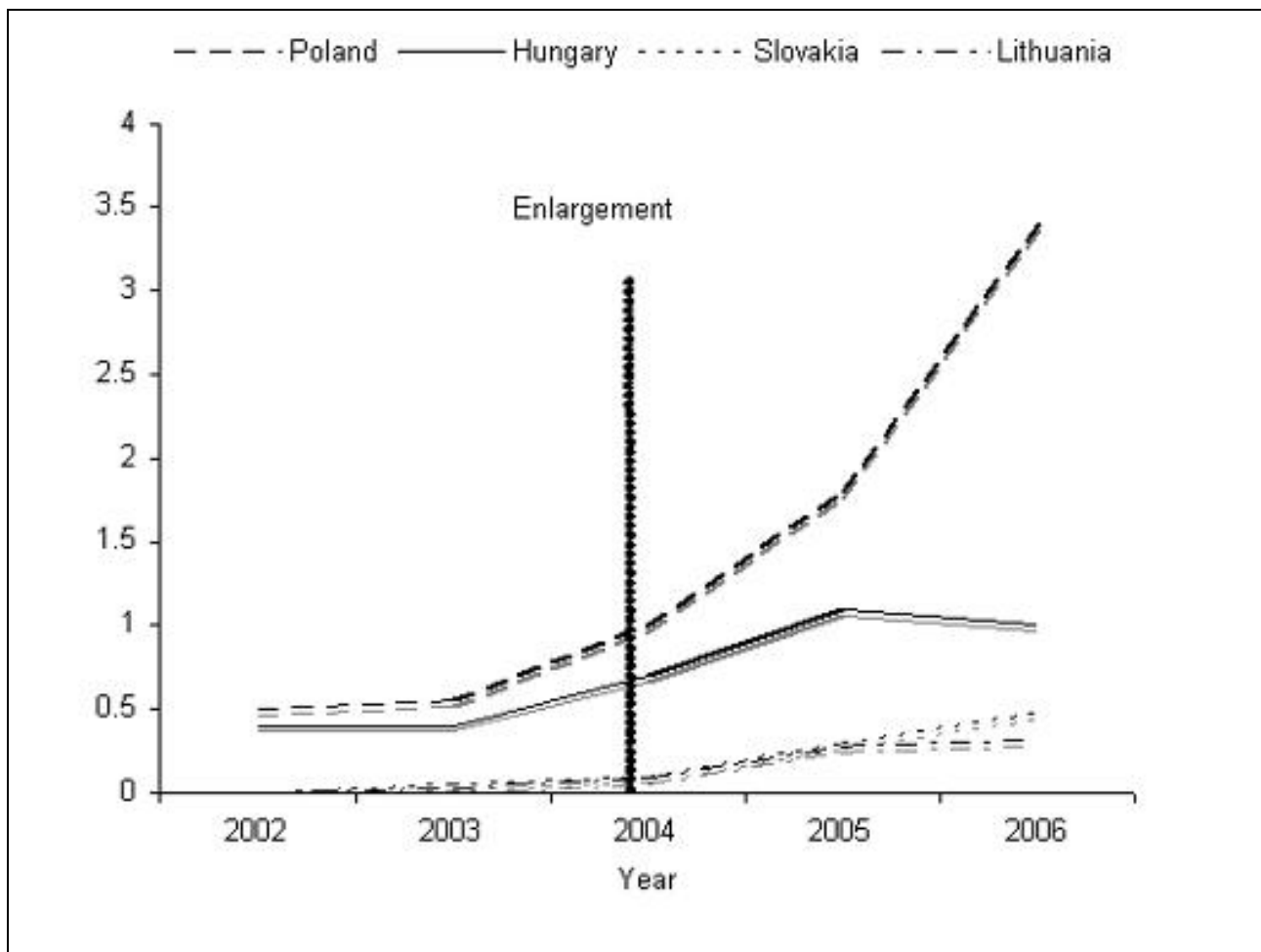
71. The causality between changes in the airline market and labor migration patterns is not all unidirectional. Workers are increasingly participating in labor markets far from home and airlines have responded by creating an informal new travel category alongside the traditional business, leisure, and "visiting friends and relatives" traffic breakdown. Airlines often call this "ethnic traffic" to reflect the cultural diversity of this type of traffic. Many carriers have even adapted their business models to cater for these ethnic travelers because of the relative reliability and predictability pattern of their demands that offset the relatively cheap fares paid. "Ethnic travelers" are for instance highly regarded by low-cost airlines like Wizz and SkyEurope Airways.

72. While official statistics do not capture this particular sub-class of traveler, one can glean some indication of the growth in this ethnic traffic, at least in Europe, by looking at the conventional "visiting friends and relatives" (VFR); most of the growth being migrants making visits to their homeland. Comparing the number of inbound passengers for 2000 and 2005 at the two primarily low-cost UK

28 Improvements in telecommunications have added to the ability to retain close ties with the "homeland" and are closely linked to the effects of air transportation.

airports, Stansted and Luton, VFR traffic grew by 198% over the period to become the largest single component of inbound traffic. At the national, UK, level a similar picture emerges with VFR traffic growing from less than 2.5% of EU passengers in 1997 (when there were 15 member countries) to about 15% by 2005 (albeit with 25 members).

Figure 11. Air travel between the UK and selected transition economies



Source: UK Civil Aviation Authority (2006)

6.3 *The business models of airlines*

73. There are considerable economies of scale, density, and scale on the cost-side, and of market presence on the demand-side in the provision of airlines services. These features have led many of the major airlines to adopt hub-and-spoke styles of operations, and particularly when there is a focus on long-haul operations. In the short-haul market, the growth of low cost, or “no-frills” carriers, such as Southwest Airlines in the US and Ryanair in Europe, operating either point-to-point services akin to a bus service (with scope and scale economies coming from generating high load-factors by combining a series of short segments) or radial services (with the airline operating a set of routes from an airport but not providing on-line connections) has impacted adversely on the viability of hub-and-spoke operators.

74. While the airline industry has, as a whole, proved itself remarkably robust and flexible over previous decades, there would seem to be a need to redefine the existing models further as globalization progresses. There is already some indication that airlines are feeling their way to deploy different business

models. What the exact outcome will be over the next decades is difficult to say, but some indications may be found in current trends.

75. There has been a demonstrable switch by the traditional network carriers away from short-haul markets to long-haul international routes, and as the forecasts of Boeing, Airbus, and others suggest, this is likely to be on-going in the future. For US airlines, for example, even in the short term international passenger traffic grew between January/May 2007 and January/May 2008 by 5.7% compared to a decline of 1.9% in domestic passengers.²⁹ The issue, alluded to in the context of the traffic forecasts of the main airframe manufacturers, is the actual form this will take. Figure 10 can be used as a reference point for this. One possibility is that as traffic grows, the patterns of routes will remain unaltered (as in the top left quadrant) with increasing volumes of traffic being pushed through the existing major hubs. Congestion being handled through the use of very much larger aircraft, improved operations, and ground investments at these hubs, and with short-haul feeder services providing egress and access for “domestic” traffic. The alternative view, essentially that of Boeing, is that there will be more long-haul routes developed to carry traffic between **A** and **B** ground capacity coming from the utilization of smaller airports and the air service being provided by large, but not super-jumbo, fuel efficient planes. Which will prove the correct prediction has yet to emerge.

76. A second modification of the business model is a further, and clearer, demarcation of service quality. The initiation of low-cost services effectively moved away from passengers seeking on-board service attributes to a separation of those seeking low fares. More recent premium services, initiated by Lufthansa on the North Atlantic, have been introduced to separate passengers where the on-plane environment is important. The aim is to segregate the business market niche where long-distance travelers want to arrive to work and where in many cases, there is a principle-agent distinction (the employer pays the fare and the employee selects the flight). To date, this has not proved a successful model and some of the early actors such as MAXjet, Silverjet, and EOS has left the market. The basic problems are that the traditional carriers competed heavily by reducing the business-class fares on their multi-class planes, and the all-business airlines could not provide the level of frequency that business travelers seek. Whether large carriers, such as British Airways that are now moving into this market, will be more successful is to be seen, but they do have the advantages of substantial financial reserves, good airport access, capacity to offer a high service frequency, and having control over the fares they offer on their own competing multi-configuration services.

77. At the other extreme, long-haul low-cost services are only just beginning to be developed. The availability of longer-range, smaller aircraft is one technical factor for this, but also the increased movement of labor and growing levels of long-distance tourism had provided an impetus on the demand side. Progress to-date has been slow, but the economics of the industry may change with the advent of the Airbus A-380 superjumbo.

78. Historically, Freddie Laker's, Laker Airways that operated its "Skytrain" service between London and New York City during the late 1970s was a pioneer in this type of travel, but failed financially. In 2004 Aer Lingus started offering no-frills transatlantic flights for just over €100, and the Canadian airline Zoom Airlines also started selling transatlantic flights between Glasgow, UK; Manchester, UK; and Canada for £89. On 26 October 2006, Oasis Hong Kong Airlines started flying from Hong Kong to London Gatwick Airport (delayed by one day because Russia suspended fly-over rights for that flight an hour before the flight's scheduled departure). Economy tickets for flights between Hong Kong to London could be as low as £75 per leg excluding taxes and other charges and business class £470 per leg. The company stopped its flights in 2008, after running-up HK\$1 billions of losses. In 2007, AirAsia X, a subsidiary of AirAsia and

29 For a more detailed assessment of this type of strategy in the context of TAP, the Portuguese airline, see Button *et al.* (2005).

Virgin Group initiated services from Kuala Lumpur to the Gold Coast, Australia claiming it is the first true low-cost long-haul carrier of the modern era.

79. Developing a viable low-cost business model is difficult because of the need to have sufficient feeder traffic. While connecting flights can generate this, this adds significantly to operating costs and means that a mixed fleet of aircraft is needed. Additionally, low costs on sort-haul routes come, in part, from rapid turnaround time for hardware and crew, but this is not relevant for long-distance flights that also often encounter problems of coordination across time zones and in meeting the scheduling limitations imposed by airport curfews. Additionally, very long flights are fuel intensive – basically the plane has to carry additional fuel to carry the extra fuel needed. This makes costs saving difficult.

6.4 Changing industrial needs

80. The demand for air cargo movement has historically been correlated with economic growth, but is also influenced by the types of consignment to be moved and the logistics needs of the associated supply-chain. The move to higher value manufacturers, demands for exotics, and the need to replace damaged or worn-out industrial components has been instrument in increasing the demands for international freight transport.³⁰ In addition, with the growth of such activities as “teleshopping”, with its associated physical supply chain, there have additional demands for fast and reliable movement of goods across borders where there are free trade agreements – such as the EU. Air cargo also has an advantage of needing less fixed infrastructure than surface transport, making it a viable mode in many geographical locations where there are major physical constraints to trucking or sea transport, and thus it has found an increasing role in developing countries with poor infrastructure and difficult terrain to export and import capital equipment (Vega, 2009).

81. According to the ICAO, aircraft, while only carrying around 2% of international trade by volume, carry about 40% by value. Air cargo, because road and rail offer alternatives over short distances, is also predominantly an international activity; about 85% of freight tonne-kilometres (FTK) done are intercontinental. A large part of the global market for airfreight services is provided by a limited number of large carriers (Table 5) that often, and particularly for wealthier countries with large land-masses, provide seamless domestic and international collection and delivery; about 59% of the worlds FTKs involve the US. Further, much of the longer-distance air freight is carried in the belly-holds of scheduled passenger aircraft because of the costs savings from economies of scale that this can create.³¹ Short-distance movements, because there are less synergies between passenger and freight traffic, are usually done on dedicated aircraft. Not only does the carriage of freight slow the turn-round times of passenger planes, the peak times for its movement often do not coincide with passenger schedules and freight hubs, such as Memphis for FedEx, are not large passenger airports.

82. Air freight transport has also become an integrated part of the modern supply chain. In some sectors, such as the movement of exotics (largely flowers and fruits with a short market life) this is essential because a lack of durability in the product, while in others it is because of the need for reliable and rapid delivery (industrial components and legal documents). Unlike passenger transport, where the passengers deliver themselves to airports and then disperse themselves to final destinations, a single commercial carrier often handles air cargo, from origin to destination. The integrated carriers that provide these services, such as FedEx, DHL, UPS, etc. are multimodal companies that, for example, also have extensive fleets of trucks for pick-up and delivery, and flow a large part of their business through one or

30 About 19% of FTKs involve capital equipment, 13.5% computers, 12.4% intermediate materials, and 7.4% perishables.

31 In terms of purely international freight tonne-kilometres done, Korean Air Cargo did 8,680 in 2006; Lufthansa Cargo, 8,077; Singapore Airlines Cargo, 7,991; Cathay Pacific; 6,914; and FedEx Express, 6,136.

more major hubs. In addition, packages and cargo are insensitive to the quality of the “on-board” service that they receive, other than temperature control in some cases, and routing is unimportant to them. This offers more opportunity for flexibility in the supply-chain and for the air transport component to avoid some of the constraints on passenger movements. It is, therefore, easier to develop mega-hubs away from environmentally sensitive locations.

Table 5. Scheduled freight tonne-kilometres flown

Airline	2006 (millions)	2005 (millions)
FedEx Express	15,145	14,408
UPS Airlines	9,341	9,075
Korean Air Cargo	8,764	8,072
Lufthansa Cargo	8,091	7,680
Singapore Airlines Cargo	7,991	7,603
Cathay Pacific	6,914	6,458
China Airlines	6,099	6,037
Air France	5,868	5,532
Cargolux	5,237	5,149
EVA Air	5,160	5,285

Source: International Air Transport Association

83. In the past, the growth in international air cargo has been heavily influenced by the availability of suitable aeroplanes. The advent of the wide-bodied jet in the late 1960s offered belly-hold capacity and the lift required to take significant amounts of freight. Later these planes were converted into dedicated freighters. These freighters have both a significant carrying capacity and range: *e.g.* a Boeing 747-400ERF freighter aircraft has a payload of 112,760 kg and a range of some 18,000 km. Technology does allow for larger planes, although Airbus is not immediately planning to produce a freighter version of its A380 plane,³² although limits on wing technology, airport capacity issues and other factors may result in short-term constraints.

6.5 Developments in emerging markets

84. There are a number of markets that seem likely candidates to replace the lead of more traditional ones of North America and Western Europe as these reach full maturity. Some regions, such as Africa, seem unlikely to develop significant air traffic flows over the next 20 years, in part because the base incomes levels are low, but also because their economic growth rate seems uncertain and spasmodic. Some South American international air transport markets have been growing, and if political stability is maintained, these may grow at an accelerated rate; the uncertainty, however, is high. We, therefore, focus on two types of emerging markets, those associated with the European transition countries and those with the mega developing economies.

6.5.1 The transition economies

85. The collapse of the Soviet bloc from the late 1980s has resulted in large increases of trade between the resultant transition economies³³ and the more traditional market economies to the extent that some have joined the European Union. Figure 11 has provided some indication of the growth of air transport in one segment of the European air transport market as transition economies have become integrated within the EU.

32 Originally a freighter version was planned but was abandoned after only one order was received.

33 “Transition economies” is now a somewhat dated term, but it is useful shorthand for this group of countries.

86. The former communist states had relatively undeveloped international air transport networks prior to 1989, often served by poor-quality hardware and not managed to maximize either social or commercial efficiency. Since that time, many of the countries have up-graded their fleets and restructured their route networks to integrate into the western European short-haul markets. A number of successful low-cost carriers have emerged to carry migrant workers and to offer leisure services as incomes rises. In the short term, there is a clear shortage of capacity due to limited investment availability which has been a constraint on expansion, and in the longer-term with the liberalized EU market, the industry will confront competition from low-cost and traditional carriers from western European states. How many of the carriers from the transition economies will survive in this type environment, despite higher traffic levels, is uncertain.

6.5.2 The emerging mega-economies China and India

87. China and India are large exporters and importers. They both have large and growing domestic airline markets to facilitate their production of goods to sell in the international market, and also have rapidly growing flows of international air traffic. Certainly, from the projections of the main airframe manufacturers, there is a feel that they will continue to provide continuing and expanding markets for their products.

88. China has the second largest economy in the World and grew at an average rate of 10% per year during the period 1990 to 2004. Its international trade in 2006 surpassed \$1.76 trillion, making it the world's third-largest trading nation. Accessibility to air transport improved significantly over the past 20 years as has China expanded its air transport system and, in particular, its airport capacity (Table 6) to meet growing economic demands. The dominance of major airports has declined as the system has expanded to medium and small cities. The centroid of passenger traffic migrated southeast, consistent with the expansion of economic growth in that region's coastal areas. Distance decay in air traffic became more pronounced in China after 1998 as the country's air transport system became more commercially driven. The east region has a high proportion of air passengers given its population and GDP, followed by the west and the central regions, reflecting a "flyover" effect. By 1998, a hub-and-spoke air transport system was clearly in place in China.

Table 6. Selected indices of China's Civil Air Transport System
1980-2005

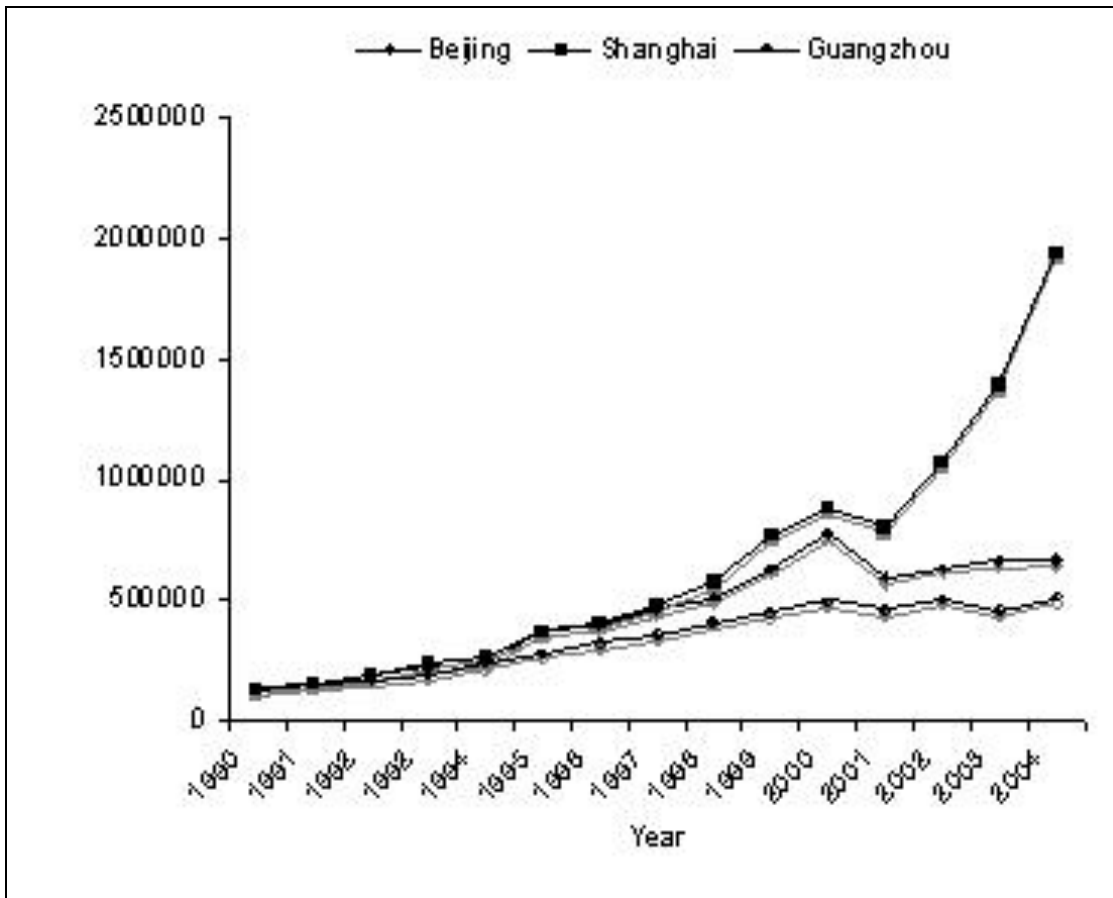
	1980	1985	1990	1995	2000	2005
Number of airports	77	80	92	116	139	142
Passenger traffic (million persons)	3.4	7.5	16.6	51.2	67.2	138.3
Passenger traffic turnover (million person-km)	39.6	116.7	230.5	681.3	970.5	2,044.9
Freight traffic (thousand tonnes)	90	200	370	1010	1970	3070
Freight traffic turnover (million tonne-km)	140.6	415.1	818.2	2,229.8	5,026.8	7,889.5

Source : Wang and Jin (2007).

89. China's rapid industrialization, and in particular the development of its manufacturing industries, has also led to a massive growth in its use of air cargo but to export commodities, but also bring into the countries components etc. that are needed to keep its factories working (see again Table 6)³⁴. Much of this traffic has come in through three major gateways, Shanghai, Beijing, and Guangzhou (Figure 12). The airports at these cities have become focal points in the countries interactive domestic and international freight network. Beijing, for example, offered 57 freight connection cities in 1990, of which 13 were international; by 2003 this had grown to 126 connections with 65 destinations. The comparable figures for international connections for Shanghai were 13 in 1990 rising to 65 in 1990.

34 In terms of tonnage, this has risen from some 157 thousand in 1980 to 4.5 million in 2003.

Figure 12. Throughput of freight at major Chinese cargo hub airports



Source: *Statistical Data on civil Aviation of China* (various years)

90. China's international air transport has, until recently been, been heavily protected, and many, both hard (largely infrastructure) and soft (institutional protection) barriers remain. This protection has been exercised through a number of channels, including protecting uncompetitive carriers, restrictions on its citizen's traveling abroad, limited infrastructure, particularly airport, capacity, and a lack of skilled manpower and management. (Zhang and Chen, 2003). In the context of cargo traffic, these have not only limited market access, but made the development of fully integrated logistics system difficult (Fung et al, 2005). These constraints have begun to be less binding and many bilateral ASAs have been signed, although Open Skies in major markets remains some away. It seems inevitable that China's international air markets will continue to be liberalized, stimulating traffic. Discussions with the EU, for example, began in 2005.

91. The geography and size of the domestic market in China suggests that its air transport sector will gradually move to a structure akin to the US. Its domestic airline industry, while initially very fragmented after deregulations of the late 1980s, is now consolidating and alliances are being formed to provide seamless international services; for example China Southern Airlines became a member of SkyTeam in 2007. The perceived strategic nature of the air cargo market, however, suggests that government involvement will remain a feature. Given the institutional structure within China, which is largely modal based with no single agency covering freight transport, this government involvement is likely to impair the growth of multi-modal logistics. This is despite the fact that China's accession to the World Trade Organisation allows part or full ownership of air-cargo related companies.

92. Although its economic growth has not been so pronounced as China's, the Indian economy has expanded considerably – its growth rate in 2006/7 was 9.6%, compared to China's 11.4% - and with this has come an expansion of its domestic and international air transport networks. The Indian air transport market was traditionally highly regulated with the flag-carrier, Air India, enjoying considerable monopoly rights. In 1994, however, the Air Corporation Act of 1953 was repealed with a view to remove monopoly of air corporations on scheduled services, enable private airlines to operate scheduled service, convert Indian Airlines and Air India to limited company and enable private participation in the national carriers. However, beginning 1990 private airline companies were allowed to operate air taxi services, resulting in the establishment of Jet Airways and Air Sahara. These changes in the Indian aviation policies resulted in an increase in the share of private airline operators in domestic passenger carriage to 68.5% in 2005 from 0.4 of 1991. More recently, over numerous low-cost carriers have entered the Indian domestic market including Air Deccan, Kingfisher Airlines, SpiceJet, GoAir, Paramount Airways and IndiGo Airlines since 2004 (O'Connell and Williams, 2006). Externally, India has liberalized many of its bilateral agreements, including signing an Open Skies agreement with the US in 2005 which has stimulated traffic, a trend that will inevitably continue at India's GDP increases.

7. Conclusions

93. The 21st century has seen the continued internationalization and globalization of the world's economy. There is also evidence of deeper globalization of cultures and politics. Air transport has played a part in fostering these developments, but airlines, and to a greater degree, air transport infrastructure has had to respond to changing demands for its services. Air transport is a facilitator and, as such, the demands for its services are derived from the requirements for high-quality, speedy, and reliable international transport. Globalization, almost by definition, means demands for greater mobility and access, but these demands are for different types of passengers and cargoes, to different places, and over different distances than was the previous norm.

94. International air transport is less than a century old, but is now a major contributor to globalization and is continually reshaping itself to meet the demands of the economic and social integration that globalization engenders. Economically, in static terms, globalization occurs to facilitate the greater division of labor and allows countries to exploit their comparative advantage more completely. Perhaps, however, more importantly, in the longer term, globalization stimulates technology and labor transfers and allows the dynamism that accompanies entrepreneurial activities to stimulate the development of new technologies and processes that enhance global welfare. To allow the flows of ideas, goods, and persons that facilitates both static and dynamic efficiency on a global scale, air transport has played a role in the past, and it seems inevitable that it this role will continue in the future.

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