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**AIR TRANSPORTATION SERVICES:  
BOTH A TRADED COMMODITY AND A  
TRANSACTIONS COST IN  
INTERNATIONAL TRADE**

*Paper submitted by Kenneth Button, George Mason University*

## **AIR TRANSPORTATION SERVICES: BOTH A TRADED COMMODITY AND A TRANSACTIONS COST IN INTERNATIONAL TRADE**

KENNETH BUTTON

*Director of the Center for Transportation, Policy, Operations  
and Logistics, and Director of the Aerospace Policy  
Research Center School of Public Policy George  
Mason University (MS 3C6) Fairfax, VA 22030, USA  
kbutton@gmu.edu*

Air transportation is a major facilitator of international trade in terms of the value of goods and services involved, and is important to specific industries, such as tourism, that are being developed by many lower income countries. High air transportation costs can pose a major impediment to the economic growth of countries, or to regions within them. But international air transportation is also an industry in its own right that can earn profits and foreign exchange for the parenting country. The newer international trade models treat transportation as a transactions cost, reductions of which confer in most cases, a gain to trading partners. Reducing air transportation costs, if resulting from rent seeking activities in protected markets, can, however reduce income for the air transportation-providing country and may impact on its foreign exchange earnings. This can reduce the incentive for a country to participate in Open Skies type situations where international air services are offered in a competitive market. Furthermore liberal trade in air transportation services can, in some cases lead to potentially less efficient provision of these services.

*Keywords:* Airlines; international trade; economic development; trade in services.

JEL Classification: F13, L93, O19

### **1. Introduction**

Traditionally classical, Ricardian trade theory focuses on the comparative advantages of nations in their production of a range of commodities. The appreciation of the importance of intra-industry trade, together with the development of the New Trade Theory with its focus on transactions costs and market imperfections,<sup>1</sup> has added considerable richness to our understanding of the economics of trade in the modern world. What is lacking, however, in much of the work that is done, is a detailed look at the links between the transactions costs involved in international trade (in our case, air transportation costs), and the providers of the services that benefit from their provision.

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<sup>1</sup>An up-to-date set of papers on intra-industry trade is to be found in [Greenaway and Milner \(2006\)](#), while Paul Krugman is generally associated with the pioneering work in the New Trade Theory e.g. ([Krugman, 1979](#)).

More directly, transportation is not simply a means of overcoming the physical impediments of geographical distance to international trade, it is a service that is traded in its own right by shipping companies, airlines, and a variety of surface based modes where there are land borders. This may affect the way that a country with a specialisation in transportation services assesses the more general gains from lower transactions costs if this means lower economic rents from ceasing being a quasi-monopoly supplier of transportation services.<sup>2</sup> The gains from trade for individual states, in a traditional sense, may be off-set by losses for its national transportation industries.

To keep the argument tractable and focused, this paper looks exclusively at international air transportation services. While accurate data is sparse, the United Nation's International Civil Aviation Organisation (ICAO) has estimated that about 35–40 per cent of world trade by value is moved by air.<sup>3</sup> But in addition to its overall importance, air transportation plays a key role in a number of specific sectors. Outside of Europe, it is the main mover of international tourists, and contributes significantly to specific industries including the trade in exotics (perishable plants and flowers), and the movement of high value final products and components associated with high-technology industries (Button *et al.*, 1999; Button and Taylor, 2000). Air transportation is also playing an increasing role in enhancing international labor mobility and, thus, adding to the flexibility of the international factor market, although this aspect of reduced transactions costs is not dealt explicitly here.<sup>4</sup>

## 2. International Air Cargo Transportation

While a lot of attention is paid to international passenger airlines, possibly because most individuals come into direct contact with them, air cargo is also a major global industry. In 2007, it was responsible for 193.6 billion Revenue Tonne Kilometers (RTK) of carriage, growing at 5.1 per cent beyond the previous year, following 3.2 per cent growth in 2006 and 1.7 per cent in 2005. While growth in the world economy is the main driver of demand for air cargo services, the link is not seen to be a linear one, at least not over the medium term. Over the longer period, and partly as a result of more flexible and liberal regulatory regimes, as well as more general trends in international trade, the overall global air cargo market expanded on average by 4.8 per cent

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<sup>2</sup>The importance of efficient transportation in facilitating international trade was, for example, recognised at an early stage in the development of the European Union [indeed, a Common Transport Policy, along with a Common Agricultural Policy, were the two main common policies articulated in the Treaty of Rome (Button, 2007)].

<sup>3</sup>In addition to the use of dedicated cargo aircraft, significant amounts of air cargo are carried in containers in the belly holds of what are primarily considered to be passenger aircraft. There are also “combi-aircraft” capable of simultaneously carrying passengers and cargo on the main deck, although these are relatively uncommon. In some cases “cargo flights” with a flight airway bill are actually transported short distances by surface modes, usually trucks. This, for example, is common practice in the intra-United Kingdom market. Additionally, passengers represent a trade in themselves as tourists, business travelers, and so on.

<sup>4</sup>A discussion of the role of air transportation in labor migration is contained in Button and Vega (2008). In recent years low cost, short haul international air transportation was, for example, was one of the primary drivers for the movement of large numbers workers from the former Soviet bloc states to the United Kingdom.

a year over the two decades to 2008 in terms of RTKs done, albeit with regular cyclical variations and more dramatic reactions to shocks such as the economic impacts of the terrorist attacks on the United States in 2001 and more recently with the onset of global recession in 2008–09. International Air Transportation Association data show that global air cargo traffic fell by 7.9 per cent in the year to October 2008, by 23.2 per cent in the year to January 2009, and between 21 to 24 per cent in the year to March 2009.<sup>5</sup>

Not surprisingly, markets for air cargo services have not grown evenly in geographic terms (Table 1). In general, the more mature markets, such as those within North America and Europe have grown more slowly, whereas markets such as Europe-Asia, intra-Asia and, domestically, intra-China have seen significant expansions.

There have also been important differences in the growth patterns of the various types of air cargo services offered. International express services of the type provided by FedEx, UPS, DHL, etc., and high-technology sectors have grown at more than twice the rate of worldwide air cargo traffic, averaging an 11 per cent annual increase in RTKs over the past decade. Since 2000, however, annual growth has been somewhat slower at 8.7 per cent. This pattern parallels, with a lag, the express industry's strong double-digit expansion within the United States domestic market during the 1970s and 1980s, followed later by slower growth.

As a proportion of international air cargo traffic, international express traffic grew from 4.1 per cent in 1992 to 13.2 per cent in 2007, reflecting higher-than-average

Table 1. Air cargo growth by major markets (RTK).

	2006/7	Annual Average Growth 1997/2007
World	5.1%	4.1%
Intra-North America	-1.2%	0.5%
Latin America-North America	7.7%	1.5%
Latin America-Europe	6.7%	3.5%
Europe-North America	7.0%	3.1%
Intra-Europe	3.7%	2.1%
Middle East-Europe	5.7%	6.5%
Africa-Europe	3.4%	4.0%
Asia-North America	5.7%	4.8%
Europe-Asia	8.4%	9.7%
Intra-Asia	3.7%	7.0%
Southwest Asia-Europe	3.6%	5.4%
Domestic China	11.9%	15.6%

Source: Boeing Commercial Airplanes, *World Air Cargo Forecast*, 2008–2009, ([www.boeing.com/commercial/cargo](http://www.boeing.com/commercial/cargo)).

<sup>5</sup><http://www.iata.org/pressroom/pr/2009-04-28-01.htm>.

Table 2. 2004 International Scheduled Cargo Tonne-Kilometers Flown.

1. Korean Air	8.164 million
2. Lufthansa Cargo	8.028 million
3. Singapore Airlines Cargo	7.143 million
4. Cathay Pacific	5.876 million
5. China Airlines	5.642 million
6. FedEx Express	5.595 million
7. Eva Airways	5.477 million
8. Air France	5.384 million
9. British Airways	4.771 million
10. Cargolux	4.670 million

*Source:* International Air Transport Association, ([www.iata.org/index.htm](http://www.iata.org/index.htm)).

annual growth compared to global economic performance. Average international express shipment size also grew from 2.7 kg in 1992 to 5.7 kg in 2007, adding to the overall express component of international airfreight traffic. This is despite the relatively slow growth (about a 1 per cent annual growth) in airmail RTKs and reflects a shift in demand on the part of users.

The suppliers of air cargo services are not homogeneous entities. The degree of heterogeneity has, however, been declining recently because of consolidations and the growth of integrated carriers. The bulk of air cargo moved in the world is done so by large carriers and Table 2 lists the airlines that did the greatest number of international freight tonne-kilometers in 2004. In aggregate these airlines accounted for about 75 per cent of the world's international tonne-kilometers done in that year. Notably, many of these, such as Lufthansa and Air France, are combined operators that carry both cargo and passengers.

Although the empirical evidence is limited, what we have suggests that the price demand for air cargo is rather inelastic and more so than for passenger movements. In an early study of the United States air cargo market covering the period from 1950 to 1977, Wang *et al.* (1981) produced elasticities in the range  $-0.42$  to  $-0.84$ . In a now dated review paper by Oum *et al.* (1990), the results of three studies on price elasticity of air cargo had estimated greater elasticities of between  $-0.82$  and  $-1.60$ , although these are based on weight rather than the value of goods being moved. More recently, using data from 1998 to 2002, and embracing 21 international air cargo markets involving the United States, the elasticity of exports with respect to air rates was  $-0.571$  (Yamaguchi, 2008).

What these types of data do not show, however, is the importance of reliability and speed of service in the modern supply chain. While the costs of moving a product or component by air may be a very small fraction of the cost of that item, the costs of delay in terms of inventory holding costs or losses due to deterioration in the case of

flowers and fruits, can be high. While service quality elasticities are poorly researched, nonetheless, they are an element in the way that the international air transportation industry is regulated.

### 3. The Gains from Freer International Trade in Air Services

As with any other sector, there are likely to be a variety of static and dynamic gains in efficiency as international air transportation markets are deregulated, although many of these may be indirect. Air transportation is a network industry such that changes in some links in the system can have profound ripple effects elsewhere in the network. Consequently, the reforms in international air transportation have stimulation effects through potential economies to domestic services as was appreciated by the [Brattle Group \(2002\)](#) and [Booz Allen Hamilton \(2007\)](#).

In Fig. 1, we examine the links between international transportation and a particular country. If initially regulated international airline services are liberalised, this will have direct affects on traffic into and out of the country of interest as fares and cargo rates fall and more capacity becomes available.<sup>6</sup> But this action also has secondary affects on airlines and other modes within the country that take traffic to and from the international airport; basically, it impacts positively on feeder services. Because the feeder services also offer capacity for purely domestic traffic and because of the economies of

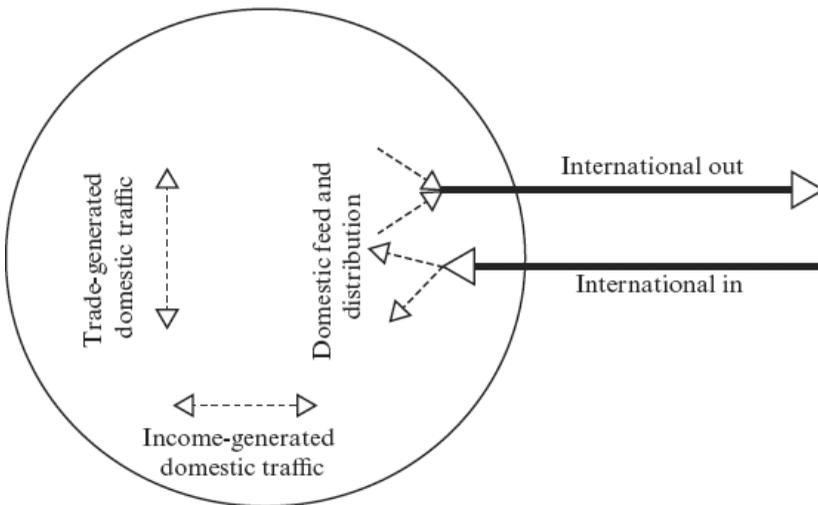


Figure 1. Links between international and domestic transport markets.

<sup>6</sup>In addition to airline regulation, there is also the regulation of airport services and air traffic control – essentially the infrastructure of the system. There has been a gradual deregulation of these with airports being privatised or moving towards concessionary systems and air navigation often being distanced from political interference through corporatisation ([Button, 2008](#)).

scope and density created by deregulation that lower the costs of some purely domestic services, it will increase local use of them.<sup>7</sup>

The additional markets will lead to further changes in both domestic and international traffic industries such as tourism and high-technology companies that use air transport, which changes the scale and nature of the products they supply. In effect, it will have a macro-income and employment effect of increasing national income that induces a further positive ripple effect on the demand for air transport. Greater flexibility in the provision of air services in the economy, whether reflected in services quality or simply lower fares and cargo rates, should be passed on because of competitive pressures to users of the network in a deregulated market.<sup>8</sup>

The overall impact of reforms in the international market on the economic development of the country will be bounded by the degree to which domestic services are offered in a liberal economic environment, the quality and capacity of the domestic, secondary airport system, and by the ability of airlines to have accesses to appropriate capital markets to invest in appropriate capacity. Getting a handle on the magnitude of these effects and the time lags involved is not easy and quantification has to date proven illusory.

## 4. The Institutional Context

### 4.1. *The regulated era*

The trade in air services has traditionally been highly regulated, both domestically and internationally, for a variety of economic, social, and strategic reasons.<sup>9</sup> For example, it was argued from the early days of manned flight that control of civilian air transportation gives the military significant “airlift” capacity at times of crises and therefore, needs protection, and schemes like the Essential Air Services Program in the United States provide important access for remote regions. In many cases, transportation is seen as a political unifying force for a country, a situation that certainly goes back to the support for the transcontinental railroads in Canada and the United States. More importantly, from a stricter economic perspective, there have been long standing

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<sup>7</sup>Technically, economies of scope are assessed when

$$S = \{[C(Q^1) + C(Q^2)] - C(Q^1 + Q^2)\} / \{C(Q^1 + Q^2)\}$$

where:  $C(Q^1)$  is the cost of producing  $Q^1$  units of output one alone;  $C(Q^2)$  is the cost of producing  $Q^2$  units of output two alone; and  $C(Q^1 + Q^2)$  is the cost of producing  $Q^1$  plus  $Q^2$  units of together. Economies of scope exist if  $S > 0$ . There are economies of scale if  $C/Q$  falls as  $Q$  expands.

Some studies have shown no indication of congestion internalisation at congested airports (Harback and Daniel, 2007).

<sup>8</sup>In a perfectly competitive, Marshallian type of world, any gains that come from additional trade through lower transactions costs, should be measured indirectly by the additional gains in willingness to pay for enhanced air services.

<sup>9</sup>While we focus on the international air markets, the modern logistics supply chain (both for passengers and freight) generally seeks to offer seamless services that ideally would have integrated and liberalised domestic feed and distribution systems that dovetail with international network. The importance of these linkages are highlighted in both the [Brattle Group \(2002\)](#) and [Booz Allen Hamilton's \(2007\)](#) study of transatlantic Open Skies effects.

concerns, because of the capital intensity of the industry, that monopoly power would distort the market.<sup>10</sup> From 1979, however, the United States began pursuing an “Open Skies” policy aimed at liberalizing some elements of the international air transportation services market albeit on a bilateral basis.

Traditionally, Air Service Agreements (ASAs) that grew up in the immediate post Second World War period varied between the involved country pairs but had many common features.<sup>11</sup> There were normal restrictions on fares/cargo rates, the carriers that could do business, the routes served, and the capacity that could be provided. In some cases, there was also revenue pooling. Table 3, however, provides details of the general characteristics of US bilateral ASAs prior to the move to Open Skies initiatives and more liberal arrangements.

Just as the traditional bilateral ASAs differed in detail so, the changes that have taken place have not been entirely consistent across country pairs, or mega regions. For example, a major difference between bilateral ASAs involving the US prior to the 1980s was that charter traffic was regulated in addition to scheduled services. Within Europe, while international scheduled services were subjected to fare and entry controls, the charter market was more liberal although still encumbered by restrictions that sought to limit its use to leisure travelers.

## 4.2. Economic deregulation

In the present, the situation is different. Following the deregulation of the United States domestic airline markets, cargo in 1977 and passenger in 1978, there was a gradual move to remove economic regulations in international markets, with the United States developing a the concept of an “Open Skies”.<sup>12</sup> Much of the spread of liberalisation was a result of the demonstration effects of the impacts on the United States domestic market,<sup>13</sup> but the United States, by focusing on key bilateral agreements with European

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<sup>10</sup> Arguments for regulations have shifted more to issues of environmental protection in recent years with air transportation thought to contribute about 2 per cent of CO<sub>2</sub> emissions, and about 3 per cent of overall climate change emissions.

<sup>11</sup> A major reason for the nature of the outcome of the Chicago Convention with its limitation on automatic free trade in air services was the fear that the United States would dominate international markets because of its huge air fleet capacity. While the Americans argued strongly for free trade in air services, most other countries wanted to ensure that this would not lead to high, monopoly driven airline rates and saw the allocation of basically tradable ASAs as a way of circumventing this.

<sup>12</sup> The United States began pursuing Open Skies agreements in 1979 and, by 1982, it had signed twenty-three bilateral air service agreements worldwide, mainly with smaller nations. The first major agreement, however, was with The Netherlands in 1992. The United States now has over 90 such bilateral agreements. The United States also signed the Multilateral Agreement on the Liberalization of International Air Transportation (MALIAT) with Brunei, Chile, New Zealand, and Singapore.

<sup>13</sup> The availability of a 10 per cent ticket sample in the United States market has provided a rich source of picking for academic analysis. The overall results of numerous studies is that in the decade after deregulation fares fell dramatically as yield management became widespread, employment in the industry grew considerably, and the choice of airlines on origin-destination pairs expanded in most markets as hub-and-spoke networks emerged. Trends towards improved safety continued (Morrison and Winston, 1995). There were numerous studies from the 1980s showing how other markets were performing less well than the domestic United States market – e.g. Good *et al.* (1995).

Table 3. Main features of US bilateral air service agreements.

Pre-1978 Bilateral Air Service Agreements		1978–1991 Open Market Bilateral		Post-1991 Open Skies Bilateral
		US Airlines	Foreign Airlines	
<b>Market Access</b>	Only to specified points	From any point in the US to specified points in foreign countries	Access limited to a number of US points	Unlimited
	Limited 5th freedom rights granted to US carriers	Exclusive 5th freedom rights granted		Unlimited 5th freedom rights granted
		7th freedom rights not granted		
		Cabotage not allowed		
<b>Designation</b>	Normally single — some multiple	Multiple		
	Airlines must be “substantially and effectively controlled” by nationals of designated state			
<b>Capacity</b>	Capacity agreed or shared 50:50	No frequency or capacity controls		
	No capacity/frequency controls in liberal ASA bilaterals, but subject to review	Break of gauge permitted in some agreements	Break-of-gauge rights granted	
<b>Tariffs</b>	Approval by both governments (double-approval) or as agreed by IATA	Double-disapproval (filed tariffs operative unless both governments disapproval) or country of origin rules		Free pricing
<b>Code-Sharing</b>		Not part of bilateral		Code sharing permitted

countries such as the Netherlands and Germany in the early 1990s, also played a beggar-thy-neighbor game in its international markets that led to domino effects.

Markets not directly involving the United States, often avoided the “Big Bang” approach involving a dramatic once-for-all shift in regulations.<sup>14</sup> The European Union, for example, put into train a series of “Packages” that gradually removed all fare controls and restrictions on international market access within the bloc. More widely, the ICAO estimates that in 2008 about 31 per cent of country-pairs with non-stop

<sup>14</sup> Additionally, at the domestic level, not all reforms have involved legal changes. In the United Kingdom, for example, domestic air transportation was *de facto* liberalized by actions of the Civil Aviation Authority without any *de jure* changes.

scheduled passenger services and about 58 per cent of the frequencies offered air transportation through Open Skies or other highly liberalised agreements compared to about 7 per cent and 35 per cent in the late 1970s. In some cases, this involves multilateral agreements as, for example, within the Single Aviation market within the European Union, the Banjul Accord signatories involve six African countries, and the Multilateral Air Service Agreement of the Caribbean Community.

The overall picture that one gets from the numerous industrial studies that have been done of the liberalisation of international airline markets is that it has led to lower fares and rates, increased capacity, and more route choices although a more limited overall choice in carriers.<sup>15</sup> The implications of Open Skies Agreements has been an increase in global economic welfare (Maillebiau and Hansen, 1996), although the remaining limitations on foreign ownership of carriers, and the continuing inability in most cases to enjoy the economic gains of on-going movements, basically cabotage, the ability to operate essentially domestic services in another country, has limited these impacts (Button, 2009). Airport and air navigation services pricing policies, which almost universally still do not reflect the true economic costs, also add to the imperfections that remain.

### **4.3. *The role of international agencies***

The move to more open air transportation markets have been essentially local in its orientation in the sense that it has largely involved bilateral or macro-regional initiatives; the major international agencies have played a very limited role in the process. Agencies such as the World Trade Organisation have played a minimal role in changing the way international air services are provided. Air transportation services are, for example, governed by a specific annex of the General Agreement on Trade in Services (GATS). The annex excludes from the agreement the largest part of air transport services: traffic rights and services directly related to traffic, and relate to minor, technical “doing business” activities. These services are nevertheless subject to a regular review by the Council for Trade in Services, with a view to considering the possible further application of the GATS to the sector. A first review took place in 2000–2003<sup>16</sup> although little came of it. This fairly tepid effort at the global level to reduce transportation imperfections in international trade can be explained by a number of factors.

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<sup>15</sup>The competition in airline markets is largely between networks of services rather than individual carriers. This is largely because of the merging of larger airlines (e.g. Air France and KLM, Lufthansa and Swiss, Delta and Northwest) and overlaying of this with the creation of global strategic alliances (the Star Alliance, oneworld and SkyTeam) in both the passenger and cargo sphere. The use of hub-and-spoke structures allow economies of scope, density, and market presence to be enjoyed by these larger units, and thus lowering of costs, but also instills competition by giving potential users a multiplicity of indirect route choices between their origins and destinations.

<sup>16</sup>Details are to be found in World Trade Organisation (2006). As stated the material gathered was not complete and effectively offers a description of the sector in the later part of the 20th Century.

The longer standing ICAO has equally been distant from the regulation of air transportation other than in terms of more technical matters, most notably common standards, to do with safety and, in recent years, security.<sup>17</sup> Indeed, in terms of economics, it has the remit of fostering the orderly growth of international air transportation, rather than being concerned with efficiency in its provision. The need for political agreement, if not consensus amongst its members, makes it difficult to allow market forces to ensure that the costs of services are minimized. Where there is an economic element to its activities, the ICAO seeks to establish common principals, for example, in terms of ways airport landing fees may be set, rather than looking to enhance economic efficiency. Although, to be fare, it was never set up to be an economic regulatory agency but rather as an institution to establish a basis upon which international air transportation could develop after a period of rapid technological advance and major political turmoil.

### 5. Conflicts between Gains from Transportation Deregulation and Gains from Trade

To highlight the added complexity that adding the rents enjoyed from a transaction activity, such as international air transportation, in trade negotiations, a simple intra-industry trade model can be used. Again, to keep the discussion manageable, it is useful to look at a specific case of transportation enhancement and the ways it may affect the performance of economies, and also to assume that air transportation is the only viable mode for conducting trade. Externally, improved airport facilities and international airlines permit countries to export their products to wider markets and gain foreign exchange; the latter often being particularly important to developing countries. It is helpful to think in terms of a more and a less developed economy by way of illustration but the same arguments apply, for example, to matters such as the development of the European Union. Fig. 2 does this in a fairly basic way.

The figure is a back-to-back diagram where  $S_i, D_i$  are the supply and demand schedule for the commodity in the developed country and  $S_j, D_j$  the supply and demand curves in the less economically developed nation. Demand for imports and supply of exports is obtained by subtracting horizontally the domestic supply from demand. The demand for imports (exports) at each price being the difference between the quantity supplied and demanded assuming domestic and import commodities are perfect substitutes.  $D_e$  and  $S_e$  in Fig. 2 are derived in this fashion the vertical difference between these curves then represents the demand for shipping shown as  $D_s$  (If air transportation were zero, for example, then the free trade equilibrium would be  $Z$ .) Suppose actual air shipping rates were  $P^1$ , then at that rate the price of imports from country  $i$  confronting country  $j$  is seen to be  $P_m^1$  (the cif price) while the cost of exports to country  $j$  would be seen in country  $i$  to be  $P_e^1$  (the fob price). Country  $i$  would then import an amount  $ab$  equal to country  $j$ 's (the less developed country's) exports of  $AB$ .

<sup>17</sup>These are largely dealt with in 18 Annexes to the Convention.

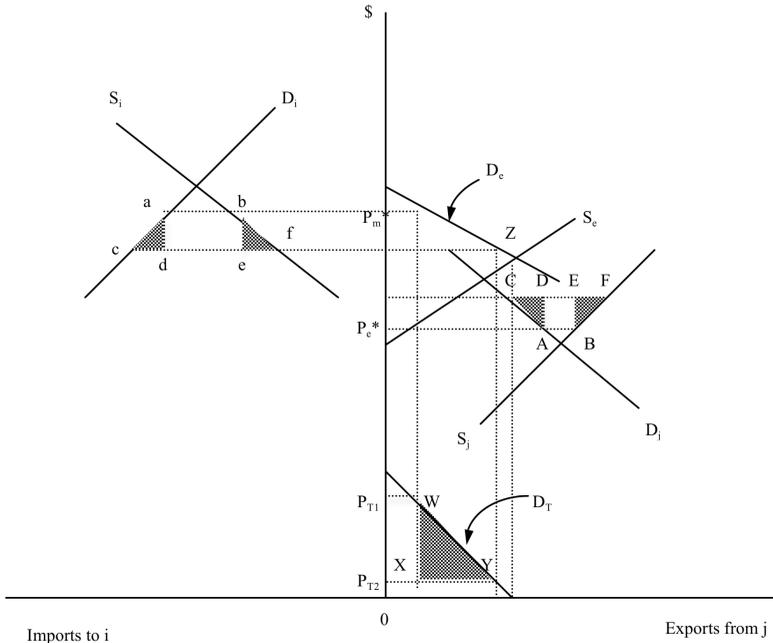


Figure 2. Simple analysis of air transport cost reductions.

There is now an improvement in air transportation services; this may take the form of better airport facilities, more aircraft or airlines or it may be administrative (e.g. relaxation of high rates associated with illiberal ASAs). The effect is that shipping costs fall to  $P^2$  resulting in exports from  $j$  rising to  $CF$  to match the higher imports of  $cf$  into the developed country  $i$ . Trade has expanded for the less developed country. Various surplus areas in the Figure represent the benefit of this trade to the two countries. Area  $adc$  is the extra consumption enjoyed by the developed, importing country as a result of the fall in the  $cif$  price while  $bef$  is a positive production effect resulting from a contraction of  $i$ 's relatively high-cost industry. The areas  $ADC$  and  $BEF$  are the symmetrical benefits to the less developed country. (Interestingly the sum of these benefits can be measured directly as the area  $WXY$  under the demand curve for air transportation services.)

This simple analysis assumes that the air transportation market is separate to that for the traded commodity and does not get involved in the benefits to either country. But someone provides the air transportation and gains from doing so; and in our two-economy case it must be by one of the nations involved in the trade. Country  $j$  is the monopoly supplier of air transportation services and, as such, may have a vested interest in keeping the air rates high even though this would mean a reduction in the gains from trade of the commodity. This conditions for which this would be the case can easily be derived by simply injecting cost and marginal revenue curves into the small diagram in the bottom of the Figure and calculating the monopoly price that

would maximize the combined gains from trade for country  $j$  from trade and from supplying the intermediate service, air transportation.<sup>18</sup>

Indeed, it was concern with this sort of situation that led to the framework international air transportation operated from the 1940s to the 1980s. Concern that their domination in the supply of air transportation by the United States after World War II led to the restrictive bilateral ASA system that emerged. Basically, the various freedoms of the skies<sup>19</sup> that were agreed upon as tradable rights, limited the power of countries to exercise monopoly power in the provision of air transportation capacity.

## 6. A Case for Less Free Trade in Air Services?

Trade theory may argue for more competitive markets in the service sectors like aviation that facilitate the movement of goods and services, and for overcoming the distortions that may exist when individual countries have an interest in institutionally protecting their airlines, and that this would normally entail more competition amongst the providers of air service providers. The argument may not always be sound. It basically assumes that competition leads to lower air service costs, lower transactions costs in trade, and thus greater benefits from trade.

Following Cambridge University's Alfred Marshall, there has been a proclivity to assume that competition leads to efficient markets and to Pareto optimality in the provision of goods and services. However, as pointed out by Alfred Marshall's counterpart at Oxford, Francis Edgeworth (1881), this is not always the case, and particularly so when there are indivisibilities, and thus fixed costs, in the supply function.<sup>20</sup> The presence of an

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<sup>18</sup>In practice, it may be more complicated than this if the air transportation sector is a major income generator for the supplying country. Taking again  $j$  as having this role, a reduction in international air transportation revenue would affect its citizens' demand for the commodity being traded by reducing income in  $j$  (*de facto* shifting the demand curve down) and, by realizing resources, would push out its supply curve. This would add to the complexity for policy makers in  $j$  of deciding whether to engage in more trade in the commodity by reducing air transportation costs or to retain its monopoly rent by having high air transportation costs. This is an empirical question.

<sup>19</sup>The Freedoms of the Skies have been added to since the initial five were instigated in Chicago in 1944 and now embrace the freedoms to:

- (1) To fly across the territory of either state without landing.
- (2) To land in either state for non-traffic purposes without boarding or disembarking passengers.
- (3) To land in the territory of the first state and disembark passengers coming from the home state of the airline.
- (4) To land in the territory of the first state and board passengers travelling to the home state of the airline.
- (5) To land in the territory of the first state and board passengers travelling on to a third state where the passengers disembark.
- (6) To transport passengers moving between two other states via the home state of the airline.
- (7) To transport passengers between the territory of the granting state and any third state without going through the home state of the airline.
- (8) To transport cabotage traffic between two points in the territory of the granting state on a service that originates or terminates in the home state of the foreign carrier or outside the territory of the granting state.
- (9) To transport cabotage traffic of the granting state on a service performed entirely within the territory of the granting state.

<sup>20</sup>There may also be a number of other reasons for the existence of an empty core in a competitive market — see [Telser \(1978\)](#) — but here we focus on the particular problems of providing a scheduled air service where for technical reasons discrete units of supply are offered. One may also think of it as a decreasing cost problem in a competitive market, along the lines developed by Jacob Viner.

empty core when there are various fixed costs, and given full information on the part of the suppliers, can lead in quite common conditions to market instability.

The problem is conceptually simple. In a competitive or contestable market for scheduled services where, by definition, there is free entry and exit, there is a tendency for airlines to price down to short-run marginal cost. This is because there are fixed costs in the supply function. Basically, the airlines are committed to an advanced schedule entailing sunk costs in terms of having to have a plane, crew, handling staff, take-off and landing slots, etc. available, and there will be a tendency for flights to bunch along the lines suggested by Hotelling's theories of oligopoly, and often seen in the scheduling of other modes of transportation.<sup>21</sup> This leads to competition to attract cargo and passengers with the resultant forcing of fares down to marginal costs.

In reality, airlines not confronted by competitors appear to practice a dynamic form of price discrimination by offering lower fares for those passengers (or consignors) that book early but raising fares as the date of departure approaches. In the case of cargo services, by exploiting differences in the demand elasticities of consumers, airlines enjoying monopoly power can use those willing to pay a premium for booking late to recover their full costs and enjoy economic rent.<sup>22</sup> Such rents, however, attract competitors when there is freedom of market entry, and this effectively precludes fares or cargo rates rising as departure time approaches.<sup>23</sup> Full costs are not recovered.<sup>24</sup>

Instability, and potentially sub-optimally low capacity occurs if the airlines act rationally and are risk averse. They appreciate the instabilities in the scheduled airline market, and even if the risk of not being able to recover costs is symmetrical with possibly earning rents, they will not provide the long-run optimal number of seats or cargo capacity.

There are, as Ronald Coase famously pointed out, *ad hoc* ways deployed by supplying firms in these types of condition and some are used in the airline sector. Following Michael Porter (1985) dichotomy, one approach is reduce costs and become a low cost airline – a model pursued by international carriers within intra-Europe markets such as Ryanair and easyJet, and domestically in the US by Southwest Airlines, and by Tiger Airways, Jetstar Airways and AirAsia in the Asia-Pacific.

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<sup>21</sup> Foster and Golay (1986) provide the rationale for the bunching of bus services but this extends to all forms of scheduled transportation.

<sup>22</sup> In detail, airlines, six to twelve months before a flight's departure, offers capacity to freight forwarders through auctioning arrangements. The freight forwarders offer "bids" (generally in terms of price per kilogram – "chargeable weight" — at the point of origin) based on the anticipated demands of their customers, the shippers. The remaining capacity, the cargo capacity, is then offered for sale one month before the flight departure. The final price may then depend on the published tariff, spot rate, negotiated rate or the air cargo tariff (TACT) rate that is offered to the general public. While there are considerable variations in the way thing are done, normally if a negotiated rate is available for a customer this will be taken up first, but if it is not, then the publish rate is adopted and finally the TACT rate.

<sup>23</sup> A number of empirical studies of passenger markets using data-scrapping from computer booking sites in Europe and the US, and then comparing the temporal fares offered curves for routes with different numbers of supplying airlines, supported this (Button and Vega, 2006).

<sup>24</sup> The problem is not unique to scheduled air services; it also applies to scheduled international shipping – liner services – and is one explanation why they have traditionally sought to form cartels – initially called conferences but more recently developed into consortia and alliances (Button, 2002).

The problem is that only one low cost airline is viable on a route if fares or cargo rates are the only differentiating factor, and the empirical evidence for both the US and Europe is that when two low cost airlines compete, costs are unlikely to be recovered by either.

Porter's second option, product differentiation, has been widely practiced with airlines competing on such things network differentiation (degree of on-line services), loyalty programs (frequent flier programs), complementary airport facilities (priority check-in and security and executive lounges), and on-plane facilities (different classes of service, entertainment, baggage allowances, and refreshments). In addition, the emergence of *de facto* cartels, the strategic airline alliances, has sought to limit competition from air carriers not in the arrangement, and to coordinate services for those within it.<sup>25</sup> But these measures, while sometimes offering a degree of market power for a time, have not proved enduring. Low cost airlines in Europe for example, offer combinations of fare and service that seem more attractive to customers than those of the alliance carriers, and there are countervailing powers exercised by freight forwarders that counteract some of the strength of alliances.

In these circumstances, arguments have been advanced that a stable, regulated international air transportation market, albeit likely less economically efficient in terms of average rates, would be preferable. However, it would mean that some countries, because of the particular characteristics of their airline industry and the markets they are engaged in, would enjoy a *de facto* monopoly advantage. In other words, world trade would gain from reduced fluctuations in transportation costs but at by paying in terms of slightly higher average rates. In terms of Fig. 2, in this second best world, the situation whereby some airlines enjoyed economic rents in the past regulated era, and thus impose higher costs on trade in airline services, would have been more than compensated for by smaller risks of rate changes confronting the users of air transportation services. In other words, the simple trade models of the type depicted in Fig. 2 ignores the stochastic realities of trade and the premiums that may attach to reducing risk, and possibly uncertainty, in international markets.<sup>26</sup> The extent to which this is a valid argument is an empirical matter, and not one that is easily tested.

It is not altogether clear in the early part of the twenty first century the extent to which imperfect international air service markets lead to sub-optimally high transactions costs. Many markets are now relatively open in terms of a carriers' abilities to enter markets and price as they wish, although this is perhaps less so for many lower income countries. As a judgment call, the continued political interference with airlines (most notably through state ownership), the general inability for foreign airlines to

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<sup>25</sup> Whether airlines cartels in an open market will actually push up rates and fares depends on the ability of the carriers to price discriminate. While managerial approaches to yield management impose high degrees of combined second and third order dynamic price discrimination, they are generally seen to fall short of first-degree discrimination. This suggests that the output of the cartel will not be Pareto Optimal.

<sup>26</sup> This is the sort of argument used by the Japanese in their minority report to the [Organisation for Economic Cooperation and Development](#) (1997) study of international airline regulation.

engage in cabotage, (and thus develop fully efficient networks), and the distortions in airport and air navigation service provision and pricing, would seem at least as important as any remaining bilateral restrictions. Nevertheless, there are good reasons for looking in more detail at the ways transactions costs impact on international trade, rather than treating them as some sort of simple impedance function in a gravity model.

## 7. Conclusions

Our understanding of international trade has changed as new intellectual concepts have emerged, but also as technology and institutional developments have shifted the focus of what is actually important. There is still a tendency, however, to view the optimization of transactions costs as exogenous to the process of freeing trade. This largely ignores the fact that those facilitating transactions are not some amorphous entities existing in abstractions, but are actually businesses associated with the trading nations. There is a natural tendency, especially if one begins to inject in to the analysis the coalitions of interests that inevitably emerge in any trade negotiations, for countries to look at possible losses from deregulating such things as international services as well as the impacts on sectors producing what are traditionally seen as exports.

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