

The Airline Industry: Facing The Challenges Of The 21st Century

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Introduction

The last quarter of the twentieth century has seen vast change in the transport sectors of many countries, imposing much dislocation on both people and companies engaged in the provision of transport services. Some of the problems have resulted from macroeconomic instabilities like the Asian financial crisis of 1997 and 9/11 in 2001 but most have been the product of changes within the industry. These sometimes-harsh transformations have contributed much to broader social welfare by strengthening exporters' competitiveness significantly, by making possible improvements in the variety and price of goods available to local consumers, and by reducing the burden of transport on government budgets. However, in the Western Hemisphere, North America Airlines have been brutalized by these 21st century changes coupled with External shocks such as oil price increases and more recently acts of blatant terrorism.

This paper will look at the Airline Transport Industry, worldwide examining trends that many small and large airline have been forced to do in order to survive

The Challenges Of The 21st Century.

Air Jamaica And Government Spending

The Sunday Herald carried recently a very good investigative piece on Air Jamaica losing \$JA33 Billion dollars over 10 years. It should be noted the last time Air Jamaica made a net profit was in 1974 of \$US 250,000 under President Guillermo “Bigge” Machado(a Jamaican President). The Government has come out and said clearly they will continue to support Air Jamaica. In addition not mentioned in the article, IATA has stated that World Airlines for 2004 will loose \$US5 Billion dollars. More importantly this speaks to a greater issue of Government spending and its effect or lack of thereof.

In contrast to the vast literature on determinants of economic growth, there has been less research on the cyclical behavior of macroeconomic aggregates (Inflation, Unemployment and Production) in developing countries. One reason for this is the relatively weak quality of data and its frequency in many developing countries. For example, quarterly GDP data are available for only a limited number of countries, and even when they are available they are usually of significantly lower quality and reliability than annual estimates. Another constraining factor is that developing countries often experience abrupt economic changes, making it particularly difficult to separate cyclical influences from structural breaks.

A better understanding of the factors underlying the cyclical pattern of macro economic aggregates is useful for at least two purposes. First, examining the relationship between overall economic activity and fiscal and monetary aggregates has analytical value from the perspective of business cycle modeling. Second, as Agénor and Montiel (1996) argue, this type of analysis can make a valuable contribution to the design of stabilization and adjustment programs (which Jamaica has had numerous problems with over the last 25 years)

In examining data from 51 countries a number of areas were paramount:

- 1) Co-movements of government spending and output.
- 2) The short-term variations between government spending and output from any longer-term relationship.
- 3) The variation in the relationship between government spending and output by focusing on key political and economic determinants.

With few exceptions (mostly for Latin America), existing studies of developing countries like Jamaica have either focused on the long-run relationship between spending and output, or have examined the *volatility* of growth and its relationship to the *volatility* of various fiscal aggregates (see, for example, Fatás and Mihov, 2003), without examining the factors underlying the cyclical behavior of the latter.

Three policy implications can be drawn from this argument:

- 1) In many countries there may be scope for fiscal rules or fiscal responsibility laws that limit the discretion for procyclical fiscal policy during upswings in the business cycle.
- 2) A strengthening of checks and balances—that is, a greater dispersion of power—is fully compatible with good economic policymaking, since it helps reduce the cyclical behavior of government outlays.
- 3) In many countries there is a long-term relationship between the level of output and government spending. In these countries, short-run cuts in spending, or surges in government outlays, will eventually be erased as the

government spending/GDP ratio returns to its long-term average. In countries like Jamaica, special care will need to be taken to ensure that spending cuts achieved over the short run are accompanied by longer-term structural reforms to ensure these savings are durable.

Social and Labour Consequences In The 21st Century Transport Industry

Transport¹ has not of course been unique; many other economic sectors have faced the need for vast adaptation to new trends in the growth of the world economy. Three underlying forces have been dominant:

- Globalization;
- Government budget constraints;
- Information revolution.

In the USA and the Caribbean many employees have been made redundant as a result of the scaling down of operations of national and regional carriers. In addition the rise of the Budget Carrier has forced many major carriers into bankruptcy and in order to compete, they have had to form their own budget subsidiary airlines to compete. In the Far east almost all National and regional airlines have shares in regional budget airlines or own fully.

These forces show no sign of slackening. If the world economy can continue to adapt successfully to them, then traffic will continue to increase strongly -- and especially so in the developing and transition economies, reflecting both the huge poverty backlog to be overcome there and the higher GDP growth rates those countries are capable of. Indeed, just as falling relative costs of transport and communication have been a major cause of globalization and the growth it has generated, so the further service improvements that we in the transport sector are

¹ Willouby C, Transport services in the twenty-first century: Seamless market or choice less churning?, Symposium on the Social and Labour Consequences of Technological Developments, Deregulation and Privatization of Transport Discussion Paper No. 3 Geneva, 1999

capable of could give a renewed boost to growth of incomes and employment more generally.

Chile is the one other country that liberalized most modes around the same time as the United States. Employment in the transport and communications sector, which had stagnated between 1966 and 1981, grew 90 per cent in the following 15 years - - even though this period also witnessed cutbacks of 70 per cent or more in the staffing of prominent individual enterprises, such as the railways, ports and the national airline.

The belief has been rapidly spreading that transport services are best organized in the private sector, and that that contributes to the effectiveness of competition in the sector. Many countries are also highly interested in attracting private investors in these services and related infrastructure, in order to reduce the burden on the government budget. Even in the most state-dominated countries, -- are more and more often provided by the private sector, as in China, India and the former Soviet Union. Almost all Latin American national airlines will be run by the private sector in the 21st century, and the wave of privatization is spreading rapidly to Africa and gradually to Eastern Europe. Initial experience has been very positive, with large increases in efficiency and service quality, and sometimes in traffic, and substantial reduction in the budgetary burden. Major staff retrenchment is often involved, and this needs careful preparation and execution to avoid undue suffering and facilitate reabsorption into other jobs. The problem seems to have been handled particularly well in the case of the Brazilian Federal Railways (RFFSA) largely because of extensive advance planning, in response to strong union concern, and transparency in the concessioning transactions.

Transport services have demonstrated a good capacity to adapt to the changing needs of the economy when the many people involved in their provision are all stimulated to think of new and better ways of serving customers. The major

challenge of the 21st century is to create a seamless transport market, for freight and for passengers, on regional and international bases, taking full advantage of the fruits of the continuing information revolution. The major adjustments involved are likely to be no less than those carried through in the last 20 years, but the range of emerging opportunities is expanding rather than receding. The largest threat to the transport community's benefiting fully from these opportunities is choiceless churning of issues, whether within the community itself as a result of modal jealousies or uncertainties about future employment or, as so often, in parliaments and society, reflecting understandable reluctance of people to give up past privileges, however unjustified they may have been. But we of the transport community itself have the greatest interest in being able to discover, exploit, and bring to the benefit of society generally the new opportunities. Hence some suggestions:

1. Key activities for labour unions and employer associations equally:

- Helping union members, and society at large, through the media, to foresee the broad directions of changes in prospect, and why they are coming.
- Promoting intermodal and cross-border cooperation and understanding, in so far as these will be key determinants of success in the transport service industries.
- Joint training programmes in the new disciplines and approaches affecting transport (notably logistics and Internet applications), to stimulate the development of promising new initiatives in service provision.

2. Key activities for labour unions:

- Promoting broader government policies that strongly encourage the creation of new enterprises and new jobs, recognizing that transport services may periodically be subject to major employment adjustments.
- Participating in the design of labour adjustment programmes when required, to help ensure fair selection and treatment of leavers and to help them in transition to new lives.
- Contributing to shaping and implementing regional regulatory arrangements that ensure adherence to essential safety and environmental standards but give fair opportunities to transport operators and employees from poorer countries.

3. Key activities for employer associations:

- Assisting government in transport infrastructure management by active support for, and participation in, transport/road fund boards.
- Strong participation in transport/trade facilitation committees, also with public sector involvement, to introduce international "best practice" and monitor performance.
- Promoting wide, participatory discussion throughout the industry of how it can best restructure and manage itself so as to secure the fullest advantage from regional liberalization of transport and the information revolution.

Passenger Average Trip Lengths and Fare Levels in US Domestic Markets

At a national level it is common to express the amount of air travel in terms of the number of revenue passenger miles flown or the number of enplaned passengers. This provides a way to resolve the difficulty of how to aggregate measures of air travel in many different markets of many different distances. However, information about the distribution of trip lengths is lost in the process.

This information is of interest for a number of reasons. The type of aircraft that is most appropriate for different markets depends on the distances involved. The length of the trip is also likely to influence traveler behavior in terms of the importance of convenient access to airports, frequency of service, and willingness to make intermediate stops.

A related issue is how the cost of air travel varies with the length of the trip. The cost structure of airline service is such that the cost per mile flown reduces with increasing trip length, and this is reflected in typical airline fares. However, other factors also influence fares, such as airline competition, and the fare structure may or may not reflect the costs involved for trips of different lengths.

An analysis of data in the Origin-Destination Survey of Airline Passenger Traffic for 1998² shows that:

1. Over half of the US markets are under 1000 miles

² Sheng-Chen Alex Huang, An Analysis of Air Passenger Average Trip Lengths and Fare Levels in US Domestic Markets, Institute of Transportation Studies University of California at Berkeley, Working Paper UCB-ITS-WP-2000-1

2. More than 60 percent of passengers have trip lengths under 1000 miles
3. On average, passengers paid 151 dollars for a trip length
4. In general, the number of passengers decreases with increasing trip length.

However, a secondary peak in the distribution occurs in the range between 2200 miles and 2800 miles due to coast-to-coast operations

Air Transport Costs and Competition Regimes

There is a close relationship between trade costs and the capacity of a country to increase its exports and to integrate in the world economy. The relevance of transport costs, as a component of trade costs, has been increasing as liberalization continues to reduce artificial barriers to trade. In many cases, the effective rate of protection provided by transport costs is higher than the one provided by tariffs (Clark et al., 2004; Hummels, 1999).

One of the most important and evident components of transport costs is distance. In its simplest formulation, the gravity model for trade, introduced by Linnemann (1966), states that bilateral trade flows depend positively on the product of the GDPs of both economies and negatively on the distance between them, which stands for bilateral transport costs. The impact of distance on countries' volume of trade is significant: recent estimates of the elasticity of trade volumes with respect to distance indicate that when distance increases by 10 percent, the volume of trade is reduced between 9 and 15 percent (Overman et al., 2003)

However, in addition to distance, many other elements influence transport costs. As explained by Limão and Venables (2001), transport costs and trade volumes depend on many complex details of geography, infrastructure, administrative barriers and the state of competition in the transport industry. Provided that distance and infrastructure related costs are major determinants of the success of a country's export sector, immediate questions arise: what can governments do to "get closer" to markets with high import demand? Can improvements in infrastructure and regulation reduce transport costs? Is it worthwhile to implement

policies designed to increase competition in transport markets? Do these policies have a quantifiable impact on transport costs?

Focusing on infrastructure and using data from maritime shipping companies, Limão and Venables (2001) show that poor infrastructure accounts for more than 40% of predicted transport costs. In a study specific to the port sector, Clark et al. (2004) show that an improvement in port efficiency from the 25th to the 75th percentile reduces shipping costs by more than 12 percent.⁴ Fink et al. (2002) argue that both public policies, like restrictions on the provision of port services and private practices—collusive carrier arrangements—exercise a significant influence on maritime transport costs. A policy implication derived from their estimation is the need to pursue attempts to break up international cartels in that market. Because their data do not include a change in the intensity of competition in the market (i.e., from cartel to non-collusive behavior), they cannot estimate the effects on transport costs of a change in the competition regime.

The advent of wide-body aircrafts in the 1970s made available large volumes of belly space. Being able to accept palletized or containerized freight, airlines began addressing the air cargo market more aggressively. As the evolution and design of aircrafts made it possible to carry more cargo in an efficient manner, dedicated cargo airlines entered this market.

The size of the airfreight and express market worldwide is approximately USD 75 billion, and during the 1990s this market grew at an average rate of 6% per year.⁷ The geographic distribution of the revenue generated in the air cargo and air passenger markets are similar, explaining the US almost 40 % of total revenue. In the United States, as indicated by Figure 1, the value of air shipments relative to the aggregate value of air and vessel shipments increased from 24% in 1990 to 35% in 2000.

The drastic drop in air shipments in 2001 may have been caused by the restrictions that the United States imposed to air traffic after September 11th 2001. In 1992 the United States signed the first open skies agreement with the Netherlands. Since then, the United States has signed more than 55 Open Skies Agreements with developed and developing countries on all continents. These agreements give us a unique opportunity to estimate the effect that a liberalized air cargo market has on transport costs.

The results obtained have important policy implications³. We find strong evidence that investments in airport infrastructure and improvements in the quality of regulation reduce air transport costs. In our sample, improvements in both variables from the 25th percentile to the 75th percentile reduce transport costs by more than 20 percent. In addition, we find that a more competitive air transport market—through Open Skies Agreements— reduces air transport costs by around 8 percent..

During the 1980s and 1990s, many countries engaged in a process of reduction of tariff and non-tariff barriers to trade. As a consequence, the relevance of transport costs as a determinant of the ability of a country to integrate into the global economy increased significantly. At first glance, it could be argued that governments cannot reduce transport costs because they are, to a great extent, determined by exogenous factors, mainly distance. Even though it is true that distance is an important explanatory variable of transport costs.

³ Alejandro Micco and Tomás Serebrisky, Infrastructure, Competition Regimes, and Air Transport Costs: Cross-Country Evidence, World Bank Policy Research Working Paper 3355, July 2004

Relying on detailed micro data and the opportunity that Open Skies Agreements provide to evaluate the impact of changes in the competition regime, our estimations show that improvements in infrastructure and the quality of regulation and a more liberal air cargo market significantly reduce transport costs. In our sample, an improvement in airport infrastructure from the 25th to 75th percentile reduces air transport costs 15 percent. A similar improvement in the quality of regulation reduces air transport costs 14 percent. Besides, deregulating the air cargo market—through what are usually called Open Skies Agreements—further reduces air transport costs around 8 percent. Using previous estimates of transport cost - trade elasticity (1.3),⁴² an Open Sky Agreement that reduces transport costs 8 percent implies an increase in trade of around 10 percent.

These results have important policy implications. Efforts aimed at improving the quality of regulation and the state of infrastructure (airports) have definite effects on the ability of local producers to compete in the global economy. Signing Open Skies Agreements has been difficult and strongly resisted, especially by airlines.

AIR FREIGHT IN ASIAN MARKETS: BOOM OR BUST?

The Bureau Of Transport Economics (BTE) Of The Commonwealth Of Australia in the year 2000 did a detailed analysis of the issue we share some of the highlights of this study with you.

How did the financial crisis of 1997-99, which originated in the Asian region, affect the supply of air freight capacity for Australian exports to Asian markets? Did the contraction in passenger markets (and therefore also belly-hold cargo capacity) leave Australian exporters without adequate air freight access to these markets? What is the outlook for the near-term future? These are the key questions addressed in this study.

The data analyses in this study were completed in August 1999. The analyses used the most recent data available (1998) to examine the impact of the crisis and to construct scenarios for 1999 and 2000. The scenario analyses reflect the outlook for the aviation freight industry from the middle of 1999 to 2000.

The study focused on twelve Asian markets—Hong Kong, Japan, Singapore, China, Indonesia, South Korea, Malaysia, Philippines, Taiwan, Thailand, India and Vietnam.

Export air freight capacity to Asian destinations is predominantly provided in the belly-holds of passenger aircraft. The aggregate supply of capacity to Asian markets is therefore likely to remain subject to the ebb and flow of passenger transport demand. While the financial crisis caused a significant contraction in passenger demand, it appears that most Asian markets are recovering quickly.

An economic analysis of belly-hold versus dedicated freight reveals that most Australian freight is carried in passenger aircraft because it is cheaper for exporters and profitable for airlines. Passengers generally yield greater revenue than freight, and in most instances the operation of dedicated freighters out of Australia is not economically viable. Revenues from passengers easily cover costs on combination aircraft, allowing flexible pricing of belly-hold capacity.

DETAILS OF THE ANALYTICAL APPROACH

The approach taken was to:

- Ascertain the demand for air freight capacity from Australia in 1998. The recent development and current profile of Australian exports were examined for each of the twelve Asian countries.
- Determine the amount of airfreight capacity provided over this period and identify whether there were any pressures evident. Capacity was measured using weight (tonnes) because, although some commodities may face volume constraints, airlines advised that weight was the crucial factor in aircraft loading decisions. The amount of 'guaranteed' cargo capacity was used (the weight capacity remaining after allowing for 100 per cent passenger loading and required trip fuel). This capacity represents the minimum available.
- Project the future level of air freight capacity supply and demand to identify whether there is any likelihood of emerging pressures. The approach involved developing a scenario for how the supply of flights and the demand for cargo space might unfold in 1999 and 2000. The purpose of scenario modelling was not to accurately estimate any emerging or future misalignment, but to identify the markets in which pressures might be likely.

Future demand

The approach used in projecting future demand was to use correlations between changes in economic growth rates and export growth rates (and/or magnitude of exports), as a basis for projecting 1999 and 2000 export volumes. The approach involved several decisions and assumptions:

- It was assumed that the modal shares of export commodities do not change in the short term.
- ‘Food’ and ‘other’ export commodity groups were forecast separately, using information from Supermarket to Asia Council and International Monetary Fund GDP forecasts.
- The ‘food’ category included only food commodity groups that comprised the top 15 in quantity in 1998. Lower volume food exports are included in the residual ‘other’ category.

Future supply

Projecting future supply involved analysing passenger market composition (Australian and foreign travellers) over time, the effect of the crisis on the market and the comparative proportions of origin–destination (OD) and uplift–discharge (UD) traffic. This, together with an assessment of how the supply of seats changed during 1998, provided a basis for a scenario projection on the supply of seats, and therefore cargo capacity, in 1999 and 2000.

Key assumptions underlying the analysis were that:

- all the Asian markets are predominantly passenger markets, with the majority of cargo capacity carried in the belly-holds of passenger aircraft; and
- the supply of seats approximately correlates with the supply of cargo space.

Scenario projections of air freight capacity supply and demand were then compared to determine whether pressures might arise in the near future.

FINDINGS

Using the measure of ‘guaranteed’ cargo capacity, it was found that, although some exporters may have faced constraints in obtaining cargo space on their preferred scheduled services, no significant overall capacity problems occurred in 1998.

However, seasonal pressures appeared to exist in 1998 for Hong Kong, Japan, China, Taiwan and Vietnam. For example, there is a difference of about 6000 tonnes in exports to Hong Kong between the first and third quarters of each year. The *fresh fruit* commodity group is largely responsible for this, with demand peaking sharply in the first quarter of each year, during which 40 to 50 per cent of the annual volume is freighted. Other markets show similar seasonality trends with commodities such as fresh vegetables and seafood.

The scenarios developed for 1999 and 2000 also did not identify any overall capacity pressures, except in the case of Vietnam. However, for some markets, the seasonal pressures appearing in 1998 are likely to persist in 1999 and 2000.

Overall, capacity pressures are not expected to occur in the next few years.

This study provides a sensible starting point and a solid base from which to pursue more detailed analyses of the Australian export air freight industry. Possible directions for further work include an investigation of pressures on the air freight system in each State/Territory and an examination of the adequacy of domestic transport links within Australia.

This study has attempted to shed some light on the complex issue of the adequacy of export air freight capacity. Although the approach has involved the analysis of a considerable amount of data (a large number of commodities carried by over 30 airlines on numerous direct and indirect air links to Asian destinations) it is a broad overview of relevant issues relating to twelve Asian markets.

The study has addressed the question of whether Australian exporters have been adversely affected by reductions in air freight capacity arising from the effects of the financial crisis that originated in Asia .

Export air freight capacity to Asian destinations is predominantly provided in the belly-holds of passenger aircraft. The aggregate supply of capacity to Asian markets is likely to remain subject to the ebb and flow of passenger transport demand. It appears that most Asian markets are recovering quickly.

An economic analysis of belly-hold versus dedicated freight reveals that most Australian freight is carried in passenger aircraft because it is cheaper for exporters and profitable for airlines. Passengers generally yield greater revenue than freight, and in most instances the operation of dedicated freighters out of Australia is not economically viable. Revenues from passengers easily cover costs on combination aircraft, allowing flexible pricing of belly-hold capacity.

This study has used the amount of 'guaranteed' cargo capacity (the weight capacity remaining after allowing for 100 per cent passenger loading and required trip fuel) on routes governed by air service agreements to determine whether any pressures have, or are likely to, occur. This capacity represents the minimum available.

Using this minimum measure, it was found that, although some exporters may have faced constraints in obtaining guaranteed cargo space on their preferred scheduled services, no significant capacity problems were encountered in 1998.

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Overall, capacity pressures are not expected to occur in the next few years.

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The Effects Of Fare Segmentation For Airline Bottom Line

AFTER deregulation of the airline industry airlines were able to charge any fare they wanted in the markets they served. During the period immediately following deregulation airlines struggled to find ways to compete in an open market. In addition to competing with other airlines, airlines compete with a number of alternatives available to the traveling public, the family minivan, the corporate jet and the telephone to name a few. Although the utility for particular product features varies along a spectrum of possibilities, air passengers can roughly be categorized into those which are highly “service oriented” and those which are “price driven.” An airline’s ability to tailor product features and fares to the desires of these different classifications allows the airline to increase the output of products available to both types of passengers and has made it possible to increase load factors dramatically since deregulation

Thus, although sometimes mystifying to consumers, effective segmentation allows an airline to increase output and provide more service to all segments of the traveling public. Fare segmentation is possible because each consumer has a different purpose and perceived value of an airline trip (ie. A flight from point A to point B is a different product for each consumer).

In addition to increased load factors, fare segmentation has given the airline industry the ability to keep the average fare paid by a passenger constant since deregulation. In fact, in constant dollar terms, the average fare has declined 40% since deregulation (Figure 2). So why does everybody think fares are too high?

Airlines have increased their higher fares to balance-out decreases in the discounted fares.

Almost 20 years after deregulation nobody is buying “Coach” or full fare tickets (the segment that everybody is concerned about). Again in our example markets, only 6% of coach passengers actually purchase the unrestricted “Y” fares and these passengers contributed less than 11% to passenger revenue of US airlines in 1997.

The higher end of the fare segmentation graph also has benefits for the “price driven” consumer. In addition to “saving seats” for the “service oriented” consumer, higher priced seats have made it possible for the airlines to offer deeply discounted fares to consumers who are more price sensitive. In total, all full fare passengers purchased 10.7% of the tickets sold in our example leaving 89.3% of the tickets purchased at a discount . In terms of revenue generated discount fares accounted for 72% of the revenue and full fare tickets accounted for 28%.

Deregulation and the resulting segmentation of fares have benefited consumers on both ends of the spectrum. Business and other “service oriented” passengers are able to purchase tickets and travel at the last minute and leisure or “price driven” passengers are able to find fares that allow them to bring their families, take multiple trips or stay at their destination longer/afford higher-end accommodations.

A move to re-regulation of the airline industry would allow the “service oriented” passenger to fly for less but unnecessarily penalize the “price driven” passenger through fare increases. Airlines would no longer be able to balance-out the deeply discounted fares with the higher fares paid by “service oriented” passengers. Rather than having 40-45% of the passengers purchasing tickets at 25-49% of the full fare, we would have more passengers paying closer to full price.

Understanding Airline Pricing

“The airline industry’s pricing system is a billion-dollar house of cards in which every customer is a futures speculator and Economics 101 is turned onto its head” (Fredrick, 1995).

This statement highlights one of the most hidden frustrations that many air travelers feel. Airline pricing is so distorted that often a full-fare paying passenger is seated next to a passenger who paid more than three hundred percent less for his or her ticket. What makes this situation so exasperating is that each passenger is receiving the same quality of seat and in-flight service, regardless of the airfare each paid. This paper will attempt to uncover the forces that have created this chaotic pricing system that has confused and annoyed passengers in today’s air travel industry.

Volatility in airfares is a relatively new phenomenon in the airline industry. Since air travel’s creation, U.S. airlines had been subject to government regulation similar to that of public utilities. In 1938, Congress passed the Civil Aeronautics Act, which gave regulatory power to the Civil Aeronautics Board (CAB) to oversee the airline industry. The main purpose of this act was to keep sound economic conditions in the industry since it provided for the public’s welfare. The CAB had the responsibility to regulate the following areas: market entry, rate determination, and antitrust authority. This allowed the CAB to determine which routes airlines would fly and establish airfares at rates the CAB found reasonable. Additionally, the CAB sought to prevent harmful alliances between airlines and stop any other forms of anti-competitive behavior between airlines (Dempsy & Gotz, 1992).

Regulation initially created a favorable environment and a group of established airlines arose and became known as the trunk carriers. For the next 40 years, the 11 trunk carriers provided 87% of the air travel needs of the United States (Bailey, Graham, and Kaplan, 1991). Over this time period, the CAB consistently kept fares higher than the market level and severely restricted entry of new competition. As a result, the trunk carriers were more than willing to exist with each other as long as they continued to make consistent profits.

Yet by the 1970's the trunk carriers all were operating at record losses. The main reason for this was that the trunk carriers had ordered large numbers of new jet aircraft in order to prepare for forecasted booms in passenger demand. However, the recession of the early 1970's slowed demand for air travel, which along with the high cost of these new jets created prolonged losses for the trunk carriers. Many airline executives pushed the blame on the CAB since it was an easy scapegoat, even though fault really lay with the airlines themselves (Bailey, Graham, and Kaplan 1991).

While this problem persisted in the industry, opposition by lawmakers to the CAB began to form out of concern that the airline industry needed to be more competitive. Many began to advocate that the CAB had failed to provide for public welfare because it had created a monopolistic industry with inflated airfares. Unfortunately for the CAB, ample proof for this claim existed. For example, a group of interstate airlines had grown to provide more affordable air travel on their flights. These airlines were not subject to CAB authority as long as they flew within only one state. The most famous of these interstate airlines was Southwest Airlines, which flew in Texas. Southwest competed with trunk carriers on many routes and charged fares significantly lower, which generated greater air travel

demand. More importantly, Southwest was also consistently profitable (Bailey, Graham, and Kaplan, 1991).

The prolonged stagnation of established airlines and the demand for more affordable air travel led to the passing of the Airline Deregulation Act in 1979. The result of this act was complete elimination of the CAB's authority, leaving the airline industry in a free market. Almost immediately, a number of new airlines arose to compete with the trunk carriers and the industry would be changed forever (Glab and Peterson, 1994).

To understand the roots of chaotic pricing in the airline industry, it is necessary to know the unique nature of competition that exists in the industry. In order to develop the most coherent model for airline pricing determination, the industry is modeled in terms of monopolistic competition. This firm model applies to industries with a large number of firms that have some degree of product differentiation. Additionally, this model assumes that there are few barriers to entry and that some amount of brand loyalty exists (Mansfield, 1997).

As a whole, the airline industry follows the monopolistic competition model quite well. The barriers to starting an airline are actually relatively small when compared to many industries. Initial start-up costs of an airline are expensive, but sufficient financing has always been readily available to fund these costs. Also, airlines often do not own their airplanes, favoring instead to take advantage of the lower initial costs of leasing aircraft for short periods. Finally, passengers tend to develop some degree of brand loyalty towards one airline, especially when compensated for their loyalty, such as with frequent flyer programs (O'Conner, 1995).

Large networks of flights and billions of dollars in revenue characterize the major airlines.

Low-cost airlines on the other hand fly only a limited number of routes and obtain far less revenue than the majors. Another difference between the two groups lies in their cost structures. Major airlines have highly unionized workforces and the most expensive airport facilities, while low-cost airlines are non-unionized and always focus on cost effective facilities. As the name implies, low-cost airlines hold a significant cost advantage over the major airlines. Another important difference is that major airlines offer more passenger amenities than their low-cost counterparts. This implies such items as in-flight meals, roomy seats, and frequent flyer programs. Low-cost airlines focus solely on offering the most cost effective travel to their customers. Also the major airlines are all well established with steady operating histories, such as American Airlines, which has existed for 80 years. On the other hand low-cost airlines often initiate and leave markets so rapidly that they barely make long-term impacts on passenger flows. In fact, no member of the lowcost group has even been in business longer than thirty years (Peteraf, 1993).

Airline pricing was drastically changed by the influx of low-cost airlines brought by deregulation and the creation of computer reservation systems. The revolutionary concept of varied pricing according to demand is one of the sole reasons that the major airlines were able to fend off the low-cost airlines and increase their dominance of the nation's air transportation needs. Deregulation has made air travel affordable for a much larger portion of the population.

The prime purpose of this paper was to serve as an overview of the events that lead to the creation of the pricing system used in air travel today.

Although airfares seem to change so chaotically, the system itself can be seen quite simply as evolving from the major airlines need to segment each customer based

on their willingness to pay for travel. Once this is determined from computer reservation systems, the airline simply follows through by discriminatorily pricing to steal consumer surplus.

Understanding how the airlines develop their price structure can allow for passengers to obtain low airfares.

A key policy implication that this paper makes apparent is that businesses should seek alternative methods to conduct transactions rather than through using air travel. Essentially finding alternatives to air travel will cause airlines to lose out on their most critical customers for producing revenue. As the information technology revolution continues, it may become more conceivable for business to be conducted through teleconferencing rather than in-person. As a result, the airlines will have to stop discriminating against business travelers in order to keep them flying. This will signify a major change in the strategy that airlines use to price.

Other technological advances such as the growth of internet travel bookings signify that the airlines must upgrade their pricing methods into the 21st century.

Nevertheless, market segmentation and price discrimination tactics have played a significant role in assuring the continued dominance of major airlines.

State Of the U.S. Commercial Airline Industry and Possible Issues for Congressional Consideration

The following are excerpts from a speech made by the Honorable David M. Walker Comptroller General of the United States; Mr Walker speaks to the role of The General Accounting Office (GAO) with respect to the airline Industry. Note this speech was made in 2001.

Some of you may not be familiar with the agency that I lead. The U.S. General Accounting Office, better known just as GAO, is in the legislative branch of government. Our mission is to help the Congress maximize the performance and assure the accountability of the federal government for the benefit of the American people. Simply stated, we try to make government work better for all Americans.

At GAO, we are uniquely positioned to focus on longer range and cross-governmental issues, including ways to improve the economy, efficiency and effectiveness of the federal government. Our scope includes everything the federal government is doing or thinking about doing anywhere in the world, from taxes to transportation, national security to Social Security, and health care to human capital.

Our audits, investigations, evaluations, policy analyses and legal services can also include reviews of key sectors of the economy, including the commercial airline industry. In this regard, the Congress has had a long-standing interest in the functioning of the industry, while it was regulated by the Civil Aeronautics Board and since the industry was deregulated in 1978. The Congress has been particularly active in connection with airline industry issues in the aftermath of the tragic events of 9/11, and GAO has been there to help.

As some of you may know, GAO was actively involved in Congressional deliberations that led to the Act which established the Air Transportation Stabilization Board. We testified on September 20 on overall principles for federal assistance. On the basis of GAO's institutional experience with other assistance programs (e.g., Chrysler, NYC), these principles included:

1. The need to get a clear understanding/definition of diverse challenges confronting industry (e.g., separate effects of economic downturn from actions by the federal government on Sept. 11-13 to close the National Air Space)
2. The need to identify the best tools for addressing distinct problems (e.g., grants vs. loan guarantees vs. other federal intervening mechanisms)
3. The importance of designing appropriate mechanisms to protect federal government and taxpayers
4.
 - o suggested oversight board
 - o discussed possible structure of assistance and eligibility and evaluation criteria

Of course, my reward for these efforts was to be tapped as a member of the Stabilization Board--a non-voting member. I don't believe that any the Board's members sought the honor of this appointment. GAO's position was that, if the Congress wanted to include me on the Board, it should be as a non-voting member. This was appropriate for both our institutional independence as well as my personal time management.

Having said that, I need to note that I am not speaking for the Board, and today's comments represent my personal perspectives on selected key challenges facing the airline industry.

It's appropriate that I make a few comments about the events of 9/11 first.

- September 11 served as a wake-up call for all Americans. We're now in a world that is very different from what it was on September 10. As citizens and as a country, we realize that we are going to have to do things differently.
- We will need to be more vigilant and in some cases, like at airports, more patient as we conduct our affairs. At the same time, we must get on with our lives and not live in fear.
- While many have been affected by the events of 9/11, the airline industry has been one of the most seriously impacted. Clearly, it is in the national interest to have an aviation industry that is vibrant, stable, efficient, and competitive. The real questions are: What is the best way to accomplish this, and what should be the proper role of government in the industry's future?

As you all know, industry profitability has been cyclical over time and negative since 9/11.

- Between 1990 and 1992, major U.S. carriers lost about \$10 billion. All but one major airline reported losses. Three major carriers--Braniff, Eastern, and Pan Am--went out of business and three others--TWA, Northwest, and Continental--entered bankruptcy proceedings.
- In 1992, Congress established the National Commission to Promote a Strong and Competitive Airline Industry. The commission made recommendations concerning FAA's structure, the airline industry's financial health, and foreign ownership limits.

- Between 1993 and 1999, nearly all major U.S. carriers reported annual operating profits.
- Most major airlines also reported net operating profits during each quarter of calendar 2000.

The events of 9/11 accelerated and aggravated negative financial trends already evident in the airline industry. That is, the industry was experiencing major net operating losses before 9/11. Over the long run, the airline industry must be profitable to sustain its financial health. Without profits, cash will not be generated internally and industry access to the capital markets will be limited. As we all know, net income is important, but cash flow is key!

In order for the industry to return to profitability, several steps must be taken to (1) increase consumer demand for air travel, especially business travel, (2) control costs, and (3) address certain pricing issues. In addition, certain other public policy issues should be considered. More on this later.

The Congress has enacted and the President has signed into law several measures aimed at helping us to recover and respond to terrorist attacks. All are necessary, but all will cost money. The most recently visible, important piece of federal legislation is the landmark airline and airport security bill that the President signed on November 19. That bill is an important part in overall efforts to restore consumer confidence and for alleviating travelers' apprehension about flying.

Two other acts certainly merit attention:

1. Congress provided \$40 billion for the federal response to the terrorist attacks, including funds for increased transportation security.
2. Congress passed the Air Transportation Safety and System Stabilization Act, which provided a means to stabilize the industry at a time when it was

financially reeling. This act provided a framework for federal financial assistance, including:

3.
 - o \$5 billion in direct compensation,
 - o up to \$10 billion in loan guarantees,
 - o insurance assistance, and
 - o liability protection

There are critical differences between the types of assistance. The \$5 billion is to compensate the carriers for direct losses associated with the federal action taken on 9/11 and for incremental losses accrued during the remainder of the calendar year.

Of the \$5 billion, DOT has issued approximately \$2.4 billion to 112 air carriers. DOT plans to release another \$1.75 billion in the near future. (No time is certain yet.)

GAO reviewed whether the \$5 billion figure was reasonable and found that, in the aggregate, it was. We also reported that, given the formula under the act, questions would arise regarding how to deal with industry segments (e.g., cargo) and carriers who do not incur losses equal to or in excess of their applicable caps. My own observation is that there are no procedures for any reallocation of funds associated with carriers whose losses may not reach their caps; therefore, I suspect that the entire \$5 billion will not necessarily be disbursed.

GAO has also been asked to assess whether actual losses incurred by major individual carriers through December 31 equal or exceed individual grant amounts to those carriers, as well as reasonableness of amounts claimed by airlines for insurance premium increases. We expect to answer these questions with a report in the summer of 2002.

The purpose of the loan guarantees is to assist air carriers who suffered incremental losses due to the terrorist attacks of 9/11 and to whom credit is not otherwise reasonably available. The Stabilization Act established the Air Transportation Stabilization Board to oversee the loan guarantee program. Along with the Chairman of the Federal Reserve Board and the Secretaries of Transportation and Treasury, I am a member of that Board. However, as previously noted, I am the only non-voting member.

The other Board members so far have delegated their day-to-day responsibilities to other staff members. I have not done so because, as the only non-voting member of the Board, I will not be involved in the review of individual carriers' applications for loan guarantees. All decisions regarding the Board's criteria, processes, approvals, and terms and conditions will be made only by the Board's three voting members. This is appropriate because such decisions should be made by executive branch officials.

Several major events have occurred to date:

- OMB issued final regulations for the loan guarantee program effective October 12, 2001
- Applications are being made available by the Treasury Department
- America West has applied for a loan guarantee

The Board also has to protect the interests of the federal government and American taxpayer. It is authorized to determine first whether to approve a loan guarantee and, if so, what terms and conditions will attach to the federal credit instrument. The Stabilization Act requires the Board to ensure that the government is compensated for its risk in assuming guarantees and authorizes the Board to enter into contracts under which the government would participate in any equity gains.

There are major challenges concerning the Board's decision-making and actions. **Let me emphasize again that this is only my personal view and not that of the Board!**

One obvious and critical policy question that the Board will have to face concerns the issue of how to define when a carrier has access to credit on "reasonable terms." What does that mean?

Another key policy question involves the more philosophic question of how the Board might look at applications from different carriers. One possible framework that might be useful is to think of the industry as divided into three categories of carriers, on the basis of their current financial health and long-term viability:

- Category 1: carriers that were viable before 9/11 are still viable after 9/11 and can obtain commercial credit on reasonable terms
- Category 2: carriers that were viable before 9/11, but are considerably worse off financially since then. These carriers may not be able to obtain increases to credit on reasonable terms but may be able to provide reasonable assurance to the Board that any guaranteed loan would be repaid.
- Category 3: carriers that were facing significant financial challenges before 9/11 and that may be facing extreme financial challenges now. These carriers may not be able to obtain access to credit on reasonable terms, and may not be able to provide a reasonable assurance that the loan would be repaid.

It is unclear at this time what impact the loan guarantee program might have on the airline industry's competitive structure. The Board should carefully consider the possible impact on competition of its actions. It should not pick winners and

losers. Rather, the burden should be on the carriers to demonstrate that they are in category 2.

GAO's role is not just oversight, but insight and foresight. In fact, I consider GAO's competitive advantage to be looking at longer range and cross-cutting issues. The GAO Strategic Plan identifies broad themes and trends such as increasing globalization, changing security threats, and a range of quality of life issues.

Thus, there is a place for GAO in raising broad issues for possible congressional consideration. I would offer the following:

Commercial aviation seems to be at a critical juncture in its history. The structure and relative competitiveness of U.S. commercial aviation is unlikely to resemble what existed prior to 9/11. Why?

- Major pressures on the industry for consolidation and cost control
- Possible long-term shift in demand – particularly by critical business travelers

Any such major structural upheaval will raise a number of business issues for carriers and public policy issues for consideration by the Congress.

The maintenance and application of economic merger analysis for domestic and international mergers, consolidations, and alliances. Public policy needs to be guided by sound principles. It is important to examine the substantive effect that mergers and alliances may have on competition in general and on consumers in particular. International alliances may have a somewhat different form than domestic mergers, but may have the same substantive effect on competition and thus appear to merit similar review and oversight. In general, I am a believer in a substance versus form doctrine.

Government needs to continue its reviews of various consolidations, using sound, traditional economic-based merger analysis. It should do so at all times, including times when the industry is experiencing financial difficulties.

The Transportation Research Board's 1999 report on Entry and Competition in the Airline Industry recommended that all collaboration plans among major U.S. airlines be subject to traditional, economic-based merger analyses by the Dept. of Justice. Clearly, both DOT and Justice need to be involved in this analysis.

However, who should be in charge?

TRB also recommended that Justice have distinct approval authority with international aviation agreements, in addition to the approval authority vested with DOT.

GAO is completing work on the potential impact on competition of the proposed international airline alliance between American and British Airways. The key issues concern the extent of the potential benefits to consumers and how those can be weighed against the potential competitive harm. We expect to issue our report on this issue in the near future.

Controls on the exercise of market power at major hubs. Congress may want to examine new approaches to large market shares at major airline hubs. As you know, the Senate took up this question last spring with S. 415. In general, we agreed with the overall thrust of that legislation--to increase competition in the market, especially at dominated hubs--but raised a number of concerns that it may not achieve its intended results.

A related issue is how a restructured industry will serve smaller communities. In many communities, airlines have reduced the amount of service they provide via their regional affiliate carriers. How should these communities be connected to the national network? How much air service is truly needed vs. wanted in connection with these communities?

GAO has work underway on the issue of small community service. Since the terrorist attacks, we have re-designed that work and expect to issue the first of a series of reports on air service to smaller communities at the beginning of 2002.

Pricing and allocation policies for slots at congested airports. The events of 9/11 provided a respite from the congestion that plagued the industry over the past several years. Even with sharply reduced forecasted growth, most believe that traffic will eventually return to pre-9/11 levels. The only question is when. That means that congestion will return.

There are real limits to the extent to which FAA can alleviate congestion--especially at key selected facilities--through current air traffic control technology and adding additional runways at existing airports. However, in addition to its management of air traffic and airport development, FAA policies and actions also affect competition and congestion.

Moreover, current FAA restrictions on airport pricing and policies for allocating slots at congested airports have adverse effects on competition. For competition to be healthy, new airlines have to have the ability to enter and compete in key markets. Current slot controls at major U.S. airports have long represented major barriers to entry for new carriers. The government may need to take a serious look at how access to those key facilities is provided.

Restrictions on foreign ownership and operation of U.S. based airlines. We live in a global economy, with global enterprises. We need to look at issues differently now--with a global framework. We are sensitive to the legitimate security concerns raised by the idea of foreign ownership of U.S. airlines and airlift capacity. Particularly in these times!

However, to a certain degree, our airlines are already international carriers, operating with foreign partners in international service. Now, it may be time to raise the question of whether to ease—not eliminate—the limits on foreign capital. To induce new competition into domestic markets or, in the event of a

financial failure of a large airline, to provide the capital needed for a competitive large network of airlines, the U.S. might need to reexamine current limits on foreign ownership.

Access to new sources of capital could allow weaker U.S. carriers to reduce debt costs, invest in new aircraft, and compete more effectively.

Federal law and policy limits foreign investment in U.S. airlines to 25 percent of the voting stock and limits foreign investors' ability to elect members of boards of directors and other key officers.

GAO has a long history of involvement with, and analysis of, key issues in the deregulated commercial airline industry. This includes issues relating to safety, security, airports, air traffic control, and domestic and international airline competition.

In the past year, GAO reported on the proposed merger between United and US Airways and on American's acquisition of TWA. We reported on how changing ticketing rules regarding back-to-back and hidden-city ticketing may affect consumers, especially in smaller communities. We testified on consolidation in the industry, and the possible exercise of market at major airline hubs.

We will continue do to our part to help Congress make timely and informed judgments on key issues.

I thank you for your time and attention and would be happy to answer your questions.

Airline Industry Case Studies

Case Study 1: The impact of 11 September 2001 on the civil aviation industry: Social and labour effects

In response to the crisis resulting from the 11 September 2001 events, the Director-General of the International Labour Office convened a Think Tank on the Impact of the 11 September Events for Civil Aviation, which was held in Geneva on 29 and 30 October 2001. It brought together Government, Employer and Worker experts, as well as independent and industry experts from the civil aviation industry, for two days of intensive discussions on the impact the crisis was having on the industry. The Think Tank agreed upon a number of recommendations for further work by the ILO in preparation for the meeting on civil aviation scheduled for January 2002. In November 2001, the Governing Body of the International Labour Office decided to change the purpose and the title of the Meeting to “Tripartite Meeting on Civil Aviation: Social and Safety Consequences of the Crisis Subsequent to 11 September 2001”. It also asked the Office to prepare an Issues Paper that would serve as the basis for the discussions at that Meeting. For the preparation of this paper, the ILO Sectoral Activities Department commissioned several studies as recommended by the Think Tank.

The present working paper by Peter Turnbull and Geraint Harvey on “The impact of 11 September on the civil aviation industry: Social and labour effects” is one of the studies that have been taken into consideration for the ILO paper. One of the interesting aspects of the paper is that it includes the results of a global questionnaire survey of trade union officials worldwide. The paper reviews the relationships between management and workers in the industry so as to better understand their responses to the present crisis. It describes the varied responses to

the 11 September events and gives examples of innovative and socially responsible practices. The next section presents the main results of the survey. The paper finally considers the differential impact of the crisis on men and women and minorities.

As a sectoral working paper, the study is meant as a preliminary document and circulated to stimulate discussion and to obtain comments. Earlier drafts of the paper were intensively discussed at the ILO; the opinions expressed are nevertheless those of the authors and not necessarily those of the ILO.

Events for Civil Aviation (Geneva, 29-30 October 2001). Amongst other conclusions, the Think Tank recommended that the ILO:

- (a) collect information on best practices and innovative and socially responsible ways to respond to the crisis, and disseminate this information to its constituents; and
- (b) undertake studies on the differential impact of the crisis on men and women and minorities.

This research paper, which addresses these two issues, is based on an extensive search of secondary materials, telephone interviews with managers, union officials and other representative organizations involved in the civil aviation industry, and a global questionnaire survey of trade union officials (a copy of the questionnaire is appended to the paper). Thirty-five unions responded to the questionnaire, including trade unions from North America (5), Europe (20), Latin America (2), Asia-Pacific (6) and Africa and the Middle East (2). Respondents included four specialist pilot unions as well as several unions representing air traffic controllers.

The impact of 11 September on employment and working conditions in the civil aviation industry has been immediate, significant, but also extremely varied. In some cases, recent events have served to exacerbate long-standing difficulties between the social partners. Given the importance of labour relations to the success of individual companies and the industry as a whole, new approaches must be found to establish “mutual gains” and a firmer foundation for management-labour relations.

In other cases, the events of 11 September have been seized as an opportunity to improve the quality of working life, the commitment of staff and the competitiveness of the organization. Instead of a simple “head-count” strategy, many organizations have developed innovative and socially responsible human resources strategies. It is important to learn from, rather than simply seek to imitate, such examples of best practice. Recent experience indicates that social dialogue is an effective, and certainly preferred, approach to the dissemination of best practice.

Case study 2: The Contribution Of The Aviation Industry To The UK Economy.

On 20th July 1998 the Integrated Transport White Paper was published. The White Paper stated that *“As recommended by the Transport Select Committee in May 1996, we will prepare a UK airports policy looking some 30 years ahead. This will develop the application to UK airports of the policies set out in this White Paper - of sustainable development, integration with surface transport and contribution to regional growth”* - Para 3.189.

In response to the publication of the Integrated Transport White paper, a consortium of the United Kingdom’s major airport operators, airlines and DETR agreed that a study of the contribution of aviation to the national economy should be commissioned to inform the wider sustainable aviation policy debate. In April 1999, Oxford Economic Forecasting Ltd were selected to undertake this work after a rigorous selection process.

Whilst the scope of this study is focused purely on the effects of aviation on the economic performance of the UK, such as the jobs it creates or investment it sustains, it is recognised that this report is only one part of what is needed to inform the debate. Thus, separate studies to assess the environmental and social inclusion consequences of the future development of aviation will be necessary to enable all of the factors relating to the sustainable development of aviation to be considered. The aviation industry supports the principles of sustainable development.

For the first time, this report encompasses the entire aviation industry and has been produced with the co-operation and support of that industry, working with DETR.

This report presents the results of analysis undertaken by Oxford Economic Forecasting (OEF) of the contribution of the aviation industry to the UK economy. The most important contribution aviation makes to the UK economy is through its impact on the performance of other industries and as a facilitator of their growth. And this contribution is likely to be more important in the UK than many other countries given the UK's geographical position as an island on the edge of Europe. But aviation also makes a contribution in its own right.

Aviation is a substantial industry

In 1998, the industry:

- Contributed £10.2 billion to GDP, 1.4% of the total.

- Directly employed 180,000 people in the UK, 0.8% of the total. In terms of the number of people directly employed in the industry, therefore, aviation is similar in size to car manufacturing, hotels or telecommunications services but around half the size of food manufacturing or computing and related activities.

- Supported up to three times as many additional jobs through the supply chain, induced effects and jobs depending on inbound and outbound travellers. (These additional jobs could still exist in the long run without the aviation sector, but they are likely to do so only at somewhat lower real wages and living standards.)

- Produced around two and half times as much value-added per head as the average across all UK industries, helping to support the government's vision of a high-productivity economy.

- Exported £6.6 billion of services, 11% of UK exports of services and 3% of total UK exports.

- Transported a further £35 billion of UK exports, over 20% of all exports of goods.
- Contributed £2.5 billion to the Exchequer, on a conservative estimate.
- Invested £2.5 billion a year over the past 5 years, 3% of total UK business investment.

A key component of the UK's transport infrastructure Aviation contributes to economic growth in the UK in several ways. Most importantly, the industry is part of the transport infrastructure on which many other parts of the economy depend. Evidence suggests that improvements in that infrastructure boost productivity growth across the rest of the economy. There are a number of ways this might come about:

- Better transport links expand the market. This allows greater scope for economies of scale, increased specialisation in areas of comparative advantage, and stiffer competitive pressures on companies, encouraging them to become more efficient. Air transport takes this a stage further than most other forms of transport through its role in facilitating world trade. This in turn means aviation supports foreign direct investment both into and out of the UK, which is often accompanied by improved technology.
- Networking acts as a spur to innovation. And aviation can allow effective networking and collaboration over longer distances, for example between companies in the UK and other countries.

- An improved transport infrastructure can improve the profitability of investment in other sectors, and so encourage greater innovation by companies - increasing the size of potential markets could allow the fixed costs of innovation to be spread over larger sales, for example.

We find evidence that transport infrastructure has a noticeable impact on productivity. Our econometric analysis, based on disaggregated industry-level data for the UK, is towards the conservative end of the range of earlier research. We estimate that a 10% increase in the provision of transport services increases overall UK productivity by 1.3%. Given the average growth we have seen in transport services over recent years, this implies that the average impact of transport growth on the increase in total output in the whole economy is of the order of £800 million a year.

Aviation boosts the rate of economic growth

There are several reasons for believing that the impact of transport growth on the economy is not all due to land- and sea-based transport. We have therefore assumed that aviation has contributed as much to productivity growth as other modes of transport for the same growth in output, even though we have been unable to identify in the data a separate effect for aviation from that caused by the transport infrastructure as a whole. Since the majority of the growth in transport output recorded in the National Accounts for the UK in the last 10 years has actually been growth in aviation, we estimate the average impact of aviation growth on the increase in total output in the whole economy is of the order of £550 million a year.

In addition to this key role of facilitating productivity growth throughout the economy, aviation also matters for growth because:

- It is a rapidly growing sector in its own right - over the past 10 years it has grown four times as rapidly as the economy as a whole and by 2015 it is projected to rise to 2.1% of GDP from 1.4% in 1998.
- Typically, sectors of the UK economy which we are likely to depend on for future growth make relatively heavy use of aviation. The very fact that these sectors are growing fast means that they represent an ever larger proportion of national output. The implication of this is that the future health of the UK economy as a whole is likely to become more dependent on aviation. Conversely, it implies that restrictions on the expansion of aviation could constrain overall economic growth.
- Good air transport links are one of the key considerations affecting where international companies choose to invest - it is unlikely to be purely coincidence that the UK is the number one European country both as a recipient of foreign investment and in terms of the frequency and choice of international destinations offered for air travel. In particular, the evidence suggests that good air transport links are important if the UK is to attract inward investment in a number of high technology sectors such as electronics and life sciences, as well as in many long-established industries such as the car industry, which depend increasingly on just-in-time deliveries. They are also important to attracting investment in a number of key functions, such as head office and R&D. For other sectors, air transport access plays a significant part in firms' international location decisions, although it is probably not an over-riding consideration.

Restricting aviation would hit growth and competitiveness

Not all of these effects are unique to aviation, by any means. But the industry is perhaps unusual in contributing to activity and growth in so many different ways.

This means there are dangers to the UK economy from restricting the supply of aviation. We estimate that a 25 million a year reduction in the number of passengers, spread proportionately across all types of passengers, would mean that GDP would be expected to be nearly £4 billion a year (in 1998 prices) lower by 2015. This is equivalent to around three times the annual net capital spending by the Department of Health and the NHS Trusts, for example.

The impact on the economy of restricting the number of passengers would depend on the types of passengers most affected. The main impact on the economic performance of the economy arises from business passengers and freight. On the other hand, if a reduction in passengers came entirely from leisure or transfer passengers, there would be a more limited impact on GDP, but there would still be important welfare consequences.

25 million passengers represents a fairly modest reduction in the total number of passengers envisaged by 2015. It is the equivalent, for example, of seeing 3½% a year growth in passengers rather than the 4% growth that underlies our base case. If the number of passengers were not allowed to grow at all over 1998 levels, the estimated effect would be to reduce the level of GDP by 2015 by around 2½% - more than £30 billion (in 1998 prices), or the equivalent of around four-fifths of the total UK education budget, for instance. Indeed, the increasingly severe difficulties in travelling that such a scenario would probably entail highlight the risk that the UK could lose its reputation as a good place for international business. If this were to happen in an increasingly globalised world economy, there is a risk that the impact of lost investment could spiral beyond the level allowed for in our scenarios, with potentially more damaging long-term effects on the competitiveness of the UK economy.

Of course, aviation is not only unusual in the number of ways it contributes to economic activity in the UK. It is also unusual in the degree to which it sparks debate over the sustainability of growth and the environmental impact of its activities. This is outside the terms of reference of this report. What we have demonstrated, though, is that there would be significant economic implications of restricting the growth of aviation, which need to be taken into account alongside environmental considerations in considering future policy towards aviation.

Case Study 3: The Russian Aviation Industry

The Russian aviation industry has suffered a serious decline over the last decade. This report contains information on major developments in the industry, which is undergoing a major restructuring. The majority of domestically- produced aircraft operated by Russian airlines do not meet international standards and need upgrading or replacement. However, domestic Russian manufacturers, with their current technical capabilities are unable to meet the demand for such aircraft.

Russian government and industry planners are considering various strategies to support the domestic aerospace industry. These include restructuring the industry to improve operational efficiency and attract investment, and developing aircraft leasing schemes,. They also seek broader cooperation with foreign firms in order to integrate Russian manufacturers into the global aviation industry. Over the long run, the Russian market presents significant opportunities for U.S. aerospace exports and investment. Several major U.S. commercial aviation companies - such as Boeing, United Technologies, General Electric, and Lockheed Martin - are engaged in joint production projects and component supply. While purchases by Russian airlines of western-made aircraft are severely constrained by high import tariffs, Russian manufacturers are seeking partnerships and cooperative ventures with western manufacturers.

A. Market trends and Best Prospects

According to the Russian Aerospace Agency, the overall growth of the Russian aerospace industry in 2001 was estimated at around 5.3 percent. However, production of civil aircraft remains at a very depressed level. In 2001 the State

Civil Aviation Authority reported that Russian airlines procured only 6 new aircraft and 1 helicopter.

According to industry experts, Russian airlines own between 3 and 4 times the number of aircraft than they currently need to service their current routes. Russia's airports are littered with out-of-date aircraft inherited from Soviet times, when domestic airline industry transported about 140 million passengers a year. During that period, airfares were priced at unrealistically low levels, set by the country's planning bureaucracy. Under the market conditions that have prevailed over the last decade, demand has dropped and most aircraft have become surplus to requirements. Many have been cannibalized for parts.

Most of the fleet currently operation is aging, unreliable and inefficient. Around 95% of existing aircraft were designed between 1960 and the early 1980s. Beginning in 1995, the federal budget stopped providing financing for aircraft procurement, which made replacement of the currently operating aircraft almost impossible. However, over the next few years, Russia's airlines will reach a point where they will be unable to continue on surplus aircraft, and will be forced to replace their fleets. By the end of 1999, the average fleet age of most Russian aircraft was 12.1 years, with 75% operating for more than 10 years. According to State Civil Aviation Authority (GSGA), the current Russian fleet includes 6,014 aircraft, only 46 of which are of foreign origin, and 27 new Russian types, (IL-96, TU-204 and AN-38). Consequently, Russian airlines are scheduled to replace as much as one third of their aging fleet over the next five years. Many would strongly prefer to lease or buy Boeing or Airbus planes, but are prevented from doing so by the high import tariffs.

The majority of Russia's current aircraft fleet do not meet international standards and need upgrading or replacement. Starting from April 1, 2001, all aircraft flying in the air space of the European Civil Aviation Conference Member States (ECAC) are required to have anti-collision equipment (TCAS). Installation of TCAS costs approximately \$150,000 per aircraft. Another strict requirement on noise and emissions came into force after April 1, 2002. Only 4% of the existing Russian aircraft fleet meet new international noise requirements and, according to GSGA, only 241 aircraft can be upgraded. Such aircraft as the IL-86 and IL76 and Tu134 can be upgraded only through installation of new engines, which industry experts consider economically inexpedient. Only a limited number of Russian aircraft, built after 1990, will be able to comply with European noise limits and be permitted to fly to Europe. These are the IL-96, Tu-214, Tu-204, and the newly developed Tu-334. Such aircraft as Tu154M and IL-62 may be allowed to fly only after their modernization. Moreover, in 2006 when new European environmental requirements come into effect, Russian airlines flying internationally will face even more severe restrictions.

Forecasting the Russian aircraft market is extremely difficult. According to Russian Ministry of Transport estimates, Russian airlines may acquire 1,400 Russian aircraft and 1,150 Russian helicopters through 2015. However, industry experts consider that the acquisition of 117 aircraft and 96 helicopters annually by Russian airlines seems exaggerated since acquisitions of only 6 aircraft and 1 helicopter reported by GSGA in 2001.

Ministry of Transport forecast for 2002-2010	2002 – 2005	2006 - 2010	Total
Supply of new domestic aircraft	198	725	923
Modernization of operating aircraft according to ICAO requirements	470	-	470

Another forecast of the Russian airliner market was made public by major Russian international carrier Aeroflot, which predicts that the market will be around 417 aircraft over 80 seats by 2015, including 53 long-range aircraft, 215 medium-range and 149 short-range aircraft. This forecast is based on the assumption that Russian economic growth will lead to 8% annual growth in traffic. According to Aeroflot officials, the introduction of new, reliable and fuel efficient aircraft combined with new air transport practices should reduce the existing fleet by 80% through 2010.

The civil aerospace industry is unable to produce suitable replacement aircraft within a realistic time frame, leaving domestic operators with few options to meet demand for transportation needs. Airlines appear to have lost confidence in the capabilities of the domestic industry. In fact, there is no mass production of aircraft in Russia. Those few craft delivered to customers, need significant technical maintenance. However, lack of spare parts prevents airlines from operating them efficiently. Though facing financial difficulties, the airline industry will be forced to procure foreign made aircraft in order to be able to fly internationally.

At the same time, opportunities arise in working with Russian partners on joint projects ranging from development of new aircraft, supply of fasteners and avionics, to joint production of jet engines. Best prospects for U.S. firms include exports of components for engines and avionics and technological and production equipment as many Russian manufacturing facilities need replacement of obsolete capital assets. Exports of components will enable Russian producers to bring their products up to world standards.

B. Competitive Situation

Overview of the Russian aviation industry

Russia's civil aviation industry is going through the most difficult period in its history. Originally established to supply the Soviet military, Russia's aerospace industry employed some 1.5 million people in 1990, accounting for more than 25% of the world's civil and 40% of the world's military production of aircraft. The civil aviation sector dropped dramatically in the 1990s, falling from production of 500 airplanes and 215 helicopters in 1990 to only 14 and 40 respectively in 1998. In 1999 Russia manufactured 9 civilian aircraft and 21 military, production of civilian aircraft dropped to 4 in 2000.

The aircraft industry's results for 2000 show that gross output amounted to 73.8 billion rubles (\$2.7 billion), for a profit of 17.1 billion rubles (\$600 million). Output grew 41.4%, with military aircraft and armaments accounting for 69.5% of the industry's total output, civil aircraft for around 14%, and consumer good for 17%. Exports of military aircraft reached \$1.33 billion with the share of civil aircraft amounting to 10.3 billion rubles (\$355 million).

The Russian aircraft industry is highly fragmented. It consists of around 300 design bureaus, plants and research facilities. This includes 10 major aircraft designers and over 20 major manufacturing facilities, which are involved in military and civil production. There is a rich heritage of design and construction of both commercial aviation and space products, and a continuing capability to produce a wide range of airplanes and rockets. At the same time, the industry is facing a crisis caused by the lack of clear policy in the field of domestic aviation development, a drastic decrease in defense orders and a decline in state funding. State funding of R&D

and aircraft procurement is around 7.5 percent of the level of Soviet times. At the same time, privatization within the industry hasn't produced the expected positive results.

The state no longer directly controls the industry, due to the sale of shares in the leading aircraft manufacturers that took place starting from 1992. Many aviation plants are struggling with a shortage of work, and declining state orders has meant that many are running at only 10-15 % of capacity. According to the Russian Aerospace Agency, only 14 of 300 Russian manufacturing research and design companies in the industry remain profitable and many are near collapse, due to reductions in state funding and significant decline of the domestic market.

In addition to common economic difficulties, the Russian aircraft industry faces a number of specific problems. Historically, the domestic civil aircraft industry was generally unresponsive to the needs of the marketplace. Development of new aircraft took place in an isolated environment, and was driven largely by a desire to hone the technical capabilities and ambitions of design bureaus. These tended to build aircraft similar to western analogs, not directly in response to the market potential of the aircraft. Thus, the domestic industry, having an excessive number of aircraft design facilities created a wide variety of aircraft types, that exceeded the number of aircraft types developed by the rest of the world. The current Russian airlines are seeking to restructure their fleets and reduce number of aircraft types they operate in order to simplify operations and reduce the cost of maintenance.

Restructuring plans

On October 11, 2001 the Russian government approved the Federal Program "Reforming of the Russian Military Industrial Complex during 2002-2006". The reorganization of Russia's aircraft industry is part of the country's defense industry restructuring plan, which is based on the principles of industry consolidation and establishment of holding companies. The goal is to reduce production costs, increase investment attractiveness (as well as to develop greater flexibility in the industry), in order to realize its potential.

A plan for consolidation of the aircraft industry, approved by the Russian government, calls for the creation of five large integrated holding companies. Two of these will focus on developing civil and military aircraft, as well as their upgrade. One holding company will include ANTK Tupolev, RSK MIG, and Kamov (helicopter) and the other will be formed on by consolidating AVPK Sukhoy, Aviation Complex Ilyushin and Mil MVZ (helicopter) under one umbrella. Under the restructuring program, an additional three holding companies will be created by consolidating firms specializing in aviation engines and parts, aviation armaments, and avionics.

The means by which consolidation will take place remains unclear. The new entities are to be formed on the basis of state enterprises and joint stock companies. Currently, according to industry sources, the Russian aviation complex comprises 29% of state-owned enterprises, 32% of joint stock companies with blocks of shares owned by the federal government, 5% of joint stock companies were the state exercises the special rights ("golden share"), and 34% of joint stock companies free of government ownership. Industry professionals are rather skeptical towards the Government decisions on consolidation, as purely

administrative measures are no longer effective without financial resources. One way for the government to gain more control over the industry could be to become a major customer of aviation equipment. At the same time, while official administrative plans are met with much skepticism among industry specialists, consolidation of the industry is inevitable, and is mainly driven by economic forces, namely the industry's need to better utilize capacities in order to carry out and finance new projects.

At present, the recovery and restructuring of the industry continues to be a slow and painful process. The government seems to have understood that the future of the industry lies in integrating into the global market not in the isolation.

According to some industry experts the long-term program of industry development calls for about 200 billion rubles investments (\$7 billion). However the government plans to invest only around 14% of the necessary amount, with the rest being attracted from other sources including private investments.

Taking into account that government officials frequently repeat phrases about attractiveness for investments, it seems that the government is hoping to integrate investors into the new structures, and to will look to them for substantial financing of the industry.

Core aircraft production groups:

Russian Aircraft Building Corporation, RSK MiG (former MAPO) was created by the Presidential decree # 92 in January 1996, and in 1999 was renamed RSK MiG. Currently it employs 15,000 people that design, produce parts and assemble MiG fighters and Ka-helicopters. The company includes the Mikoyan design bureau, the

Voronin Production Plant and Lukhovitsy Machine Building. It also includes component producer, Krasny Oktyabr, Pribor, Aviatest and Perm Instruments, helicopter designer Kamov, and the Arsenyev helicopter production facility. Recently, RSK MiG, announced plans to integrate the four companies currently involved in engine development and production - Klimov, Krasny Oktyabr, Moscow Chernyshov Machine-Building Plant and Tushinsky Machine-Building Design Bureau Soyuz - into a the new structure. The company reported that by the end of 2001 the total amount of the contracts signed reached \$1 billion. Demand for the company's main product, the MiG-29, is slowly recovering and the company centers its strategy on modernization of the aircraft. At the end of 2001, RSK MiG and ANTK Tupolev signed an agreement on investing in manufacturing and certification of 100 seater Tu-334. Tu-334 program is also supported by the government, which considers it as a priority project. The Russian Aerospace Agency, plans to invest around \$12.6 million in the program. Voronin Production Plant reportedly started serial production of 6 aircraft for the Atlant-Soyuz the first of which will be delivered in 2004. According to RSK MiG, the aircraft will comply with ICAO Charter 4 in terms of noise and emission.

The Aviation Military Industrial Complex "Sukhoi". A 51% state owned company, AVPK Sukhoi was created by a Presidential decree in August 1996. The main products of the Sukhoi group are the supersonic Sukhoi fighter jets and Beriev hydroplanes. AVPK Sukhoi is the major Russian exporter of military aircraft, enjoying a 14-15% share of the worlds military aircraft market . Sukhoi's exports account for 50% of total Russian exports of military products, and its export potential through 2005 is estimated at about \$17 billion. The major companies within the group include:

- Sukhoi Design Bureau;
- Beriev Design Bureau;

- KNAAPO, (Komsomolsk-na-Amure) ;
- IAPO (Irkutsk);
- NAPO (Novosibirsk);
- Taganrog Aviation Scientific and Technical Complex in the name of Beriyev

In April 2002, the Russian government announced that AVPK Sukhoy is the winner of a tender for the fifth generation fighter. Until the end of the current year, Sukhoy must develop initial designs for the aircraft and prepare a program of its development.

Sukhoy's daughter company Sukhoy Civil Aircraft teaming up with Boeing and Ilyushin to announce plans to built a new civil regional jet. Tender on the development of the Russian Regional Jet Program was announced on July 9, 2002 and will be completed by the end of November. Submission of bids will be closed by October 30. Within this project Honeywell and Rockwell Collins were invited to participate in the tender for onboard equipment.

Aviation Complex, AK Ilyushin was created in January 1997 to include all designers and producers of IL-family planes. At present the Ilyushin Complex includes

- Ilyushin R&D bureau;
- VASO (Voronezh Aircraft Manufacturing Enterprise);
- TAPOiCh (Tashkent Chkalov Aircraft Manufacturing Enterprise).

The main challenge for the Ilyushin Complex was the project of production of Il-96M/T. Powered with Pratt&Whitney engines and equipped with Rockwell-Collins avionics. It was supposed to be the only world-standard Russian long-range aircraft. The project received partial financing from ExIm Bank, and Aeroflot

placed an order for a number of aircraft. However, the project has been frozen due to a refusal by the Russian Ministry of Finance to provide sovereign guarantees to assure for Ex-Im Bank financing

Opened Joint stock Company " Tupolev", was formed in 1999 and includes ANTK (aviation scientific and technical complex)"Tupolev" and Ulyanovsk aircraft manufacturer "Aviastar", with 51% of shares belonging to the state. The Tu-134, Tu-154 are the workhorses of the Russian domestic airline industry, and together with the Tu-204 they account for 65% of the Russian aircraft market. The company plans to introduce a newly designed Tu-214, Tu-324 and Tu-334. In June 2002, the Egyptian finance company Sirocco announced plans to invest \$280 million in Ulyanovsk Aviastar, after which 25% minus one share will belong to the Egyptian company.

Engines

The aircraft engine industry suffered significant difficulties starting in 1990. Sales volume decreased to 16% of its Soviet-era peak and the number of employees reduced by 60 percent. About 85% engine enterprises were at the point of closure. Starting from 1999 the industry started to experience growth in production and sales volumes, increasing by 30-50% annually. However, engine builders have been able to reach only 45% of the production levels of the late 1980s. Though positive changes are seen in the development of engines for civil aircraft, such increases were caused mainly due to manufacturing of land-based turbines for the oil and gas industry. The Russian engine industry manufactures a broad range of engines for aircraft, which actually exceeds the demand, and at the same time aircraft producers are looking for western engines as they are of better quality in terms of noise and emission.

Salyut, one of the leading engine manufacturers generated a turnover of \$220m in 2001 with \$300m expected in 2002. There are currently 12 types of engines under development, including engines for the Tu-334, An-70 and Yak -130 aircraft, as well as motors for missiles, hypersonic aircraft, and gas turbine-powered electricity generators. The company is reported to be conducting a large-scale renovation plan. It invested \$52 million in capital equipment in 2001, and plans to invest \$60-65m in 2002.

Perm Motors Joint Stock Company manufacturer of the widely used PS-90A engine, reported 116% production growth in 2001 with the revenues of around 3.5 billion rubles (\$115m). PM announces its target revenue for the next year at 6.2 billion rubles. PM's strategic partner United Technology's Pratt &Whitney Division plans to invest \$125 million with about half of this amount going towards a modernization of the PS-90A and PS-90A2 programs, as well as investments in new technological processes at the Perm Motor Plant

NPO "Saturn", based in Rybinsk manufactures military and civil aircraft engines as well as power sets for industrial applications. Its main products include engines for the Su-27/Su-30 and Su-35 fighters and engines for Il-76, Il-62M and Tu-154M airliners. The company has close business relations with the French firm Snecma. It opened two joint operations in conjunction with Snecma, "Smartec", an engineering design office, and joint operation, "SM146 Program Office". These two projects confirm the Snecma Group's commitment to a long-term presence in Russia and are the signs that the Russian aerospace industry is slowly integrating into the global aviation industry. The SM146 program office has been established to support the Russian Regional Jet program.

Sukhoi Civil Aircraft, created for the development and production of the Russian Regional Jet, has listed two engines for the project. These include the PW800 to be jointly produced by United Technologies' Pratt & Whitney Canada Corp. (P&WC), Aviadvigatel, MTU (Germany) and Fiat Avio (Italy), and the SM146 produced by NPO Saturn and Snecma. A decision will be made by end of December 2002, with the two consortia required to submit detailed proposals by the end of October and evaluation being conducted in November. According to NPO Saturn, the cost of developing the engine and launching its production would be around \$600m. It is reported that the winning engine project may expect government support of up to 10-15% of its cost, which will be provided under a federal program for the development of the civil aircraft industry through to 2015.

Avionics

Major Russian holding companies in the avionics field are "Aerokosmicheskoye Oborudovaniye" (Aerospace Equipment) and Technocomplex (Scientific Production Centre Technical Association), which share respectively 60% and 40 % of the military avionics market. The current range of companies' products is somewhat similar.

"Aerokosmicheskoye oborudovaniye" corporation includes around 30 organizations involved in aircraft instrument making and onboard equipment production. The corporation is also involved in rocket production, the automotive industry and simulator manufacture. A Federal Center for Aircraft Simulator Building is being created as a part of the corporation. Current orders amount to \$2.7 billion.

"Technocomplex" one of the largest defense production complexes in Russia includes ten companies: the Ramenskoye Instrument Production and Design bureau, Ramenskii Instrument Production plant, OAO Aeropribor-Voshod (Moscow), OAO Pribor (Kursk), OAO Techpribor (St. Petersburg), OAO Chebosksary Instrument Production Plant "Elara" (that has recently acquired the Ulyanovsk Optical Mechanical Plant), the Institute of Applied Mechanics and the 2nd Moscow Instrument Production Plant. Recently two more companies joined the holding - St. Petersburg-based electronics producer ZAO ELKUS (producer of interface equipment, controllers and database systems) and Kazan-based Kazan Instrument Production and Design Bureau (specializing in microelectronics and components for fuel measuring system).

Sales of the companies within the Technocomplex group exceeded \$100 million in 2001. In 2002, Technocomplex plans to increase production by 30%.

Technocomplex has contracts to produce avionics for military purposes worth \$1 billion. To continue growth the group acknowledges that its members will have to invest around \$1.5 billion over the next 4-5 years, with \$400 million coming from the association's own resources. The group has an integrated plan of development that covers development, production, modernization and maintenance of onboard and ground equipment.

In accordance with its industry consolidation concept the Russian government has announced plans to create a new holding "Avionica," that will compete with the state holding "Aerokosmicheskoye Oborudovaniye". The government will retain 51% of the new holding, and NPZ Technocomplex", one of Russia's leading avionics groups will hold 49%.

Materials industry

The All Russian Institute of Aviation Materials (VIAM) was established in 1932 and is the major research center for new materials in the aviation industry. Around 96% of materials used in Russian aircraft industry were developed by VIAM specialists. Recently VIAM signed an agreement with "Russian Aluminum", a major Russian metals producer on cooperation in the development, manufacture and market promotion of aluminum alloys used in the aviation industry.

In the materials area Verkhnyaya Salda Metallurgical Plant (VSMPO) must be mentioned as the major producer of titanium products for the aircraft industry. VSMPO exports 70% of its production, 35% of which VSMPO sells directly to aircraft producers (including Boeing and Airbus), 25% to aircraft engine manufacturers and 40% to companies making alloys for the aerospace industry. The recently signed five year agreement with Airbus, worth \$200-300 million, constitutes 50% of Airbus's titanium consumption. Russian Aluminum is also reported to have been selected as a supplier of aluminum alloys to Airbus.

A number of Russian aerospace materials manufacturers announced their decision to create an industrial group including All Russia Institute of Light Alloys, Stupino Metallurgical Company, opened joint stock companies Kompozit and Normal and NIIGrafit. The new industrial group will bring together the R&D and manufacturing capabilities of its member companies in order to create new materials and develop new market opportunities. The group will supply a wide range of non-metal and metal materials for the aircraft industry as well as for other industrial applications.

Federal Program for the Development of the Russian Civil Aircraft Industry for 2002-2010 and further until 2015

The development of the domestic aircraft industry, in order to satisfy local demand and to export to external markets, is a top priority for the Russian government. About 70% of the existing fleet of aircraft is approaching retirement, while 30% of the country's passenger transportation is carried by air.

The program is to be realized in two stages. During the first stage (2002-5), aircraft developed during 1992-2001 will be upgraded and modernized. The idea is to bring these aircraft in accordance with international noise, emissions, navigation and other requirements, which will allow them to be competitive in the foreign markets. The second stage (2006-2010 and further up to 2015) calls for the design of new types of competitive aircraft.

Currently, priority projects include four types of aircraft – the long-range Il-96, the middle-range Tu-204, and the short-range Tu-334 and regional Tu-324.

The priority helicopter models are the heavy Mi-38 and Mi-382 with 6-ton load capacity. Mi-38 is being developed by Moscow's Mil helicopter plant and the Western investor Eurocopter. Certification of both helicopters is expected in 2005. Certification of the basic version of the Ka-62, with a load of 2 tons, is set for 2003.

The program call for the upgrade of existing aircraft and the development of new types of aircraft engines, avionics and navigation systems. Financing of the program is estimated at around 158 billion rubles (about \$5 billion) including 35

billion rubles (\$1.1 billion) from the federal budget and 122 billion rubles (\$3.9 billion) from other sources.

In 2002 the Russian government plans to finance the aircraft industry in the amount of 6 billion rubles (about \$190 million), half of which will be used to develop leasing programs.

Leasing

The Russian government, in cooperation with the aircraft and financial services industry are working to create an environment in which new leasing companies could provide financing for leases of Russian-made aircraft. Considering the financial state of Russian airlines and increases in fuel prices, aircraft leasing holds the best prospect for them to bring up to date airlines aircraft fleet. The leasing of newly-built Russian aircraft has been discussed for several years, with one of the major issues being state support of leasing schemes. The first leasing projects are supposed to provide financing for between 21 to 25 aircraft for Aeroflot, Transaero, Dalavia and Krasair. Two Russian leasing companies - Ilyushin Finance and FLC - won a government tender for leasing projects for the 10 IL-96-300 and 10 Tu-214 aircraft. These companies would be able to access state financing in return of the sale of a controlling interest to the government. Major customers for these two leasing projects were supposed to be Aeroflot and Transaero.

Ilyuhsin Finance has received state financing in the amount of 1.5 billion rubles (approximately \$47 million) and by the end of 2002 hopes to obtain an additional 1 billion rubles (around \$30 million). The government hopes to revive its moribund aircraft industry by helping the industry work with the airlines and financial

institutions to set up leasing companies, but appears hesitant to put up enough capital and backing to get these leasing companies off the ground.

Foreign investments and cooperative projects

Investments and cooperative projects with foreign companies could provide capital needed to market newly-designed aircraft in domestic and international markets. However, a severe constraint on such projects is a 1998 law that restricts foreign ownership in Russian aerospace companies to 25%. At the same time the Russian government and industry representatives are looking for broader cooperation with foreign firms in order to rescue the industry and integrate it into the global aviation industry.

In July 2002, EADS and the Russian Aerospace Agency signed an agreement on cooperation and investment in the Russian aerospace industry. The agreement calls for a broad range of cooperative projects in the military and civil aerospace areas, including Russian participation in the A-320, A-380 and other Airbus projects.

Recently, Kaskol Industrial Holding, which controls a number of aerospace enterprises signed an agreement with Airbus to establish an engineering center. Kaskol Group controls the Nizhni Novgorod-based aircraft manufacturer Sokol (MiG fighters), Rosveretol, landing gear manufacturer Gidromash, and the Volga - Dnepr heavy cargo carrier. The Kaskol Group is considered a good partner for Western producers because of its exceptionally entrepreneurial, aggressive and politically well-connected management. The company has an unusually market-oriented and competitive approach, in striking contrast to many other Russian aircraft manufacturers. The creation of an engineering center with Airbus follows an agreement between EADS and the Russian Aerospace Agency (RASA) to

invest over \$2 billion in the Russian aerospace industry over ten years. The engineering center, will employ 50 Russian engineers, who will be trained in Toulouse and Hamburg. The center will manage contracts and coordinate future Russian involvement in the production of Airbus aircraft, including the A-380.

Egyptian company Sirocco International, Tupolev, Aviastar-SP and the Russian State Property Fund, signed an agreement for a \$280 million investment by the Egyptian company in the Ulyanovsk aircraft producer Aviastar-SP. It will be used to develop the Tu-204-120 aircraft program. This deal is the largest foreign investment in the Russian aerospace industry to date. In return, Sirocco will receive 25% minus one share in OAO Tupolev, as well as 25% minus one share in Aviastar-SP.

India and Russia reached an agreement on future production of the Il-214 100. Having historically been a market and license producer of Russian aircraft, the Indian Government is very keen to develop its own aerospace industry. Ilyushin and Hal (Hindustan Aeronautics Ltd) reached principal agreement that covers the creation of a \$300m joint venture aimed at producing the Il-214, for the Indian market, and also the development of a cargo version, for the Indian Air Force. At the beginning of 2002, a number of protocols were signed by the Indian and Russian governments, for cooperation in the aerospace industry. These include HAL's involvement in developing a fifth generation fighter.

Russian Aerospace Agency and the Chinese State Committee on Defense Sciences, Technique and Industry signed an agreement in April 2002 for the development of a "cooperative program for design, production and supply of new aircraft equipment".

U.S. cooperative programs and investments

Over the long run, the Russian market presents significant opportunities for U.S. aerospace trade and investment. U.S. commercial aircraft and U.S. aircraft makers, such as Boeing, United Technologies, General Electric, Lockheed Martin, and Rockwell Collins, Honeywell are engaged projects for joint production and component and material supply.

Boeing's investment in Russia is estimated approximately over \$1 billion. It includes, a technical engineering center (employing about 300 Russian engineers), joint projects with a number of scientific and research institutes, participation in a number of space programs, such as International Space Station and Sea Launch. The new projects include development of the Regional Jet Program in cooperation with Sukhoy Civil Aircraft and a recent agreement with the East Line company (owner of Domodedovo airport) to create a technical maintenance center for servicing foreign aircraft.

United Technologies has invested \$400 million and participates in around 25 joint projects in Russia, including participation of Pratt & Whitney in the development of the PS-90A2 aircraft engine, engines for the Mi-38 helicopters Mi-38 and Ansat. Its joint venture "Hamilton Standard - Nauka" manufactures and exports heat exchangers for aircraft.

C. END-USER PROFILE

Airlines

Russia has a highly fragmented airline industry with about 267 airline companies operating in the sector. However, only 4 of them account for 50% of all passenger transport operations in the country, and about 35 account for 90.8% of such transport. Six companies handle 54% of countries' air freight.

Russia's airlines suffered in the 1990s from falling traffic, poor management and a financial squeeze. However, the sector leveled out at the end of the decade, due to a resurgence of real GDP growth in Russia, and new management teams that took over some airlines after the 1998 financial crisis. Clearly, the future for most of the smaller airlines is dim, and many will not survive. Many companies have as few as two aircraft, often in poor technical condition. According to Ministry of Transport's State Civil Aviation Authority (GSGA), the cause of many of the industry's problems lies in inexperienced managers who have taken control of small airlines and have in some cases compromised safety standards. In an effort to enforce greater safety standards on the airline industry, the Ministry of Transport introduced more stringent licensing requirements for airlines.. It closed 36 airlines in 2001 and a further 27 in 2002 to date.

A major trend of the Russian air transport sector is consolidation. The number of carriers is being reduced through mergers or the creation of alliances. Two major Russian airlines - Aeroflot and Sibir - are taking the lead in consolidating the industry through acquisitions, although many regional carriers that were once part of Aeroflot and now owned by the regional governments strongly oppose their advances.

In 2001, Russian airlines continued to experienced growth in passenger and cargo transportation with overall increases, respectively, of 14.8% and 12.1% in passenger and cargo traffic. Overall domestic traffic increased by 12%. The State Service for Civil Aviation (GSGA) reported that Russian airlines carried about 25.07 million passengers in 2001. Cargo and mail traffic in 2001, on both international and domestic routes, grew by 12.1% to about 0.613 million tons.

Passengers & Freight Air Transport in Russia.

1998 1999 2000 2001

Passengers (million people) 22.332 21.466 21.760 25. 07

Include:

International 8,415 7,145 8,40 10,04

Domestic 13,918 14,321 13,36 15,03

Freight (thousand tons) 468.37 493.78 530.0 612.5

Include:

International 288.16 289.13 300.0 344.5

Domestic 180.21 204.65 230.0 268.0

(Source: Air Transport Review Journal, State Civil Aviation Service)

First ten airline companies rated according to number of passengers carried in 2001:

1. Aeroflot-Russian airlines
2. Pulkovo

3. Sibir
4. Krasnoyarskiye airlines
5. Tyumenaviatrans
6. Domodedovo airlines
7. Uralskiye airlines
8. TULPAR
9. Vnukovo Airlines
10. Kvminvodyavia

First ten airline companies rated according to cargo volume transported in 2001:

1. Aeroflot-Russian Airlines
2. Atlant-Soyuz
3. Alrosa
4. VoLga-Dnepr
5. 224 letnyy otryad
6. Aerostars
7. Tesis
8. Krasnoyarsk airlines
9. Aviast
10. Il-avia

(Source: Air Transport Review Journal, State Civil Aviation Service)

Aeroflot

Aeroflot is the leading player in the Russian airline industry, carrying around 5.8 million passengers in 2001. Aeroflot dominates international routes and aggressively applies its superior management and other competitive advantages to

gain an increasingly large share of domestic passenger and cargo business.

Formerly a country-wide monopoly Aeroflot operates a fleet of 98 aircraft fleet that includes leased aircraft from Boeing (two 777-200s, four 767-300s, ten 737-400s and one DC-10 cargo) and Airbus (eleven A310s). Its local fleet includes Il-96-300, Il-62M, Il-86, Tu-154-M/B, Tu-134A, Il-76TD. The Russian Government retains 51 percent ownership of Aeroflot, other major shareholders (about 26%) are reported to have connection with "Sibneft," a large oil company. In 1999, the airline engaged consulting firm McKinsey to revamp its structure and improve its poor image. In November 2000, Aeroflot listed on the London Stock Exchange. Aeroflot's main response to international competition has been to improve its service and keep prices low -- 20-30 percent lower for economy and 30-50 percent lower for business class, than western competitors. Since the beginning of 2001, Aeroflot has introduced new standards for cabin service and ground handling, with specific attention paid to business and first-class passengers. One of the main goals of the company is to return to its dominating position in the domestic market. Currently Aeroflot controls only 11% of the domestic flights, while the company's strategy aims to consolidate the local market and increasing its share of domestic transportation to 30%. In order to achieve significant cost savings, the company made a decision to renew its current fleet and reduce the number of aircraft types in operation. Thus Aeroflot was considering leases of 9-10 long-range aircraft and 17-18 medium-range aircraft. In July 2001 the company finally announced that it plan to lease 18 Airbus A-320 and 9 Boeing-767s. The deal became feasible due to a Government decision to allow a roll-over of import duty waivers for the replacement of aircraft.

Sibir/Vnukovo

Sibir was formed in 1992 from the Novosibirsk branch of Aeroflot, and is based in Novosibirsk's Tolmachevo airport. It is one of the fastest growing airlines in Russia, due in large part to the efforts of its General Manager, Vladislav Filev, who came on board in 1998. The Russian government owns a 25 percent stake in Sibir, which plans to privatize in the near future.

Sibir took over Sayany Airlines in December 2000. Sibir's February 2001 acquisition of larger, but financially strapped, Vnukovo Airlines was another move that gave the airline access to profitable international and Moscow-Southern Russia routes. The combined Sibir/Vnukovo has only a modest international route network. Sibir does, however, have a code-sharing agreement with Lufthansa, which enhances its international presence. Most recently, Sibir has been negotiating the takeover of Irkutsk-based Baikal Airlines, which it could use to gain routes from Irkutsk to Dalian and Shenyang in China.

Sibir transported 1.9 million passengers in 2001. Prior to acquiring Vnukovo, Sibir operated 100 routes with an all-Russian fleet of 28 aircraft. Internationally, it flew to three German cities, Israel, China, South Korea, and the United Arab Emirates (UAE), and had charter flights to Turkey, Spain, Cyprus, Egypt and Thailand. It obtained a USD 15.8 million loan from Sberbank in 2000 to purchase two Tu-204 aircraft. Pre-acquisition, Vnukovo operated 50 routes and had 53 Ilyshin, Tupolev and Yak aircraft, of which only 23 were still operational. Sibir has recently moved its Moscow flights to East-Line's Domodedovo airport. The company also plans to open additional new routes including Irkutsk – Seoul and (according to its General Director) is ready to cooperate with other airlines using Domodedovo Airport, particularly foreign airlines. The arrival of Sibir will increase Domodedovo's 2002

traffic overall by some 20% and domestic traffic by 30-35%. It is unclear how much competition Sibir/Vnukovo will create for Aeroflot on domestic routes. It seems unlikely that it will be able to challenge Aeroflot's dominance of international routes in the near future. Most recently Sibir's planned to increase its fleet by leasing two foreign aircraft.

Other major Russian passenger carriers include:

TransAero

The first private airline in Russia, TransAero operates 7 Boeing aircraft (five B-737-200 and two B-737-700). In November 2001, the company celebrated its 10 - year anniversary. However it has suffered some financial difficulties, and was forced to close a number of routes. In 2000, passengers declined by 20 percent, and results of 2001 showed no increase in passenger transportation. In early 2002 the airline planned to open more domestic routes, with new flights to Ekaterinburg and Novosibirsk. It also expanded to Kazakhstan, where it operated four routes and planned to add a further three in December 2001-January 2002 to Aktyubinsk, Kustanai, and Aktau. Fleet modernization plans are not quite clear as, despite Ilyushin Finance's victory in the government's lease tender, the Transaero agreement with Ilyushin Finance for the Tu-204 was not included in the program.

Pulkovo

Based at St. Petersburg's Pulkovo Airport, the airline is a state owned enterprise with its own fleet of 41 Russian-made aircraft (IL-86, Tu-134A and Tu-154B/M) and two terminals. It operates on 16 regular routes to Europe and Asia, and 13 charter international routes and 40 domestic and CIS routes. It carried 1.76 million

people in 2001, including 965,000 people on domestic routes. It transported 465.2 ton of mail and 6,300 ton of cargo.

TyumenAviaTrans(TAT)

New management took over in 1999 to shake up this carrier, which is based in Surgut in Tyumen Oblast. The number of passengers that TAT transported grew 65.5% in 2001, allowing it to move to 5th place among major Russian airlines. TAT became profitable in 2000 partly because of contracts it won with the United Nations (UN) for humanitarian aid flights. In 2001, TAT received \$35 million from its international activity, primarily from the UN and reportedly secured \$31 million of contracts in 2002. TAT has 96 airplanes and 171 helicopters, which it also charters to oil and gas companies. The carrier is aggressively expanding to new markets, opening routes to Nizhniy Novgorod, , Volgograd, Rostov-Don, St. Petersburg and Kiev. Recently TAT has taken control over the Domodedovo Air Line by acquiring 49.6% of DAL's stake.

KrasAir

A former Aeroflot division in Siberian city of Krasnoyarsk, Kras flies domestically and does charters to Turkey, Cyprus, Bulgaria, China, South Korea, Indonesia, and Thailand. It was launched in 1993 as a joint-stock enterprise. A fifty-one percent share, that was previously owned by the Krasnoyarsk Kray Administration, was passed to the Ministry of State Property in 2001. The remaining 49 percent stake belongs to private investors. The company operates a fleet of 44 Ilyushin, Tupolev and Yakovlev aircraft. In 2001 the airline transported 1.03 million passengers, experiencing 41.8% growth compared to the previous year. Currently the airline is going ahead with a decision to lease two Boeing-767-200, one or both of which are

expected to come into service in 2002. The motivation for this acquisition, according to KrasAir, is that its current fleet cannot meet its development needs and there are no additional Tu-204s and Tu-214s available, so foreign built aircraft were its only choice despite the customs barriers. KrasAir's plans to develop its hub traffic business through Krasnoyarsk. Observers believe this can provide sufficient traffic to operate with profit.

Cargo Carriers

Atlant-Soyuz

Atlant-Soyuz, one of Russia's largest air cargo carriers, was established in 1993 with the Moscow government a major shareholder. The company operates a fleet of 20 Ilyushin, Tupolev and Antonov aircraft, and focuses on charter cargo transportation to Europe, China, South Korea, and Vietnam. It carries freight for Russia's arms export monopoly. The company has plans to significantly replace its current fleet with new domestic aircraft, mainly Il-96 and Tu-204 and Tu-214.

East Line

East Line is a leading cargo carrier on regular international routes. It operates from Moscow's Domodedovo Airport. Main international destinations are Turkey, Italy, India, China, and the UAE.

Volga-Dnepr

Volga-Dnepr was established in 1990, and has become a leading heavy-cargo carrier. It operates mainly charter flights. The company is based in the Volga-

region city of Ulyanovsk and deploys a fleet of nine giant Antonov-124 jet freighters with 120-ton capacity, three Il-76Ds and three Yak-40s. It has a unique niche in lifting heavy loads. It carries aerospace (28 percent of sales), military equipment and other bulky items. Around 25% of Volga-Dnepr's business in 2000 was with the UN. The company claims 56% of the world's super-cargo market and has licenses to operate in over 100 countries. In July 2002 the International Finance Corporation signed an agreement with Volga-Dnepr to provide a loan of about \$30 million for completion of a new AN-124 at Ulyanovsk's Aviastar.

D. MARKET ACCESS

Federal agencies to regulate aviation

State Civil Aviation Authority (GASGA)/ Ministry of Transport is the major regulating organization in the field of aviation affairs in Russia. It supervises compliance with federal and international regulations and requirements in aviation, is responsible for air-traffic control and airport issues and air-traffic safety, issues licenses for aviation and repair and maintenance activities, carries out registration of all operating aircraft and supervises continued airworthiness of operating aircraft. Procurement of air traffic control equipment lies within GASGA's responsibility.

Interstate Aviation Committee (MAK) was created in accordance with CIS interstate agreement on use of airspace and its activity, coordinates aviation activities of CIS countries. Aviation register of the Interstate Aviation Committee carries out certification of civil aircraft and component manufactures, issues type

certificates for aircraft, engines and propellers, initial airworthiness certificates and export certificates.

Russian Aerospace Agency (Rosaviakosmos) develops and administers government policy in the aerospace industry. It is responsible for state orders for the development of aerospace equipment for civil applications. Rosaviakosmos has more than 200 enterprises within its structure. According to the Government Decree #346 of May 27, 2002, development, manufacture, testing and repair activities of aircraft equipment and parts is subject to licensing. The decree appoints Rosaviacosmos as the agency responsible for issuing licenses for these activities, with the exception if repair activity is conducted by the organization within the supervision of the GSGA organizations.

Imports

In the Russian classification all flying air- and spacecraft and spare parts are coded as a Group 88. The current tariff for all manufactured crafts is 20% irrespective of their general designation or size. The tariff for spares of all flying crafts listed under 8801-8802 sections, including spares for civil aircraft and helicopters, is 5 percent. All other items, including planes, helicopters, spacecraft of various specifications for both civilian and military applications fall under a 20% tariff.

Large purchases of imported commercial aircraft by Russian airlines are currently constrained by high tariff barriers and a lack of financing. A 20% import tariff plus 20% VAT applied makes importing aircraft prohibitive, increasing the price for the aircraft by 44%. At the same time, while high tariff barriers prevent foreign aircraft coming into the market, Russian airlines need new equipment and domestic

manufacturers currently do not have the capacity or the funding to respond to the demand.

Until recently, a government decree, "On Additional Measures for State Support of Russian Civil Aviation," #716 of 1998, linked granting of tariff waivers for the purchase of foreign aircraft by Russian airlines to increasing purchases of Russian aircraft. Currently, domestic aircraft industry and regional authorities pressure against imports, has caused much discussion around the issue of granting tariff waivers. At the beginning of August, 2001, the ongoing debate over customs duties imposed on imports of aerospace equipment received a new boost. Prime Minister Mikhail Kasyanov approved a decree that pulls together various exemptions relating to the temporary imports of aerospace equipment, which is already in use in Russia and is mostly related to Aeroflot. At the same time this decree canceled the decree #716 and was accompanied by an announcement that the Russian Aerospace Agency and the Ministry of Transport must review the 20% customs duty currently levied on aerospace imports and proposes new reduced tariffs.

The issue of reducing import duties on aerospace equipment for Russian civil aviation has apparently not been welcomed by the Russian Aerospace Agency, or the State Civil Aviation Authority of the Ministry of Transport. Reportedly, they support continuation of tariff barriers to foreign aircraft. At the same time, most of the parties involved support reduction of tariffs for imported components, especially those that are not manufactured domestically. The industry has become dependent on Western components and engines and considers the continued use of these products as critical to its success.

Given domestic aircraft industry pressure in Russia against imports, the state appears to have no immediate plans to decrease customs duties, despite current

reports. Leasing imported aircraft would only occur when there are no comparable Russian aircraft available.

Procurement methods

Financing remains the most difficult challenge to U.S. firms selling in the Russian market. The heavy import duty on Western aircraft remains the major obstacle to fast fleet modernization. At present, sales to the Russian market are inhibited by chronic lack of financing. However, as the country is opening to the world market, there appear many opportunities for mutually profitable cooperation with the technologically advanced Russian aerospace firms. The long-term potential for U.S. company sales remains high, too.

Additionally, Russian aircraft manufacturers are eager to make their aircraft attractive and competitive by installing Western avionics and jet engines, another area that offers rich opportunities. As the sales of large airliners is inexpedient, due to high tariffs, leasing remains as an option. Direct sales of smaller aircraft, especially business-class jets, are often possible to private Russian companies willing to register them offshore to avoid taxes. Airlines practice offshore registration as a way to avoid taxes.

At present, attractive transactions include leasing aircraft to Russian carriers, joint ventures with Russian aircraft manufacturers, direct sales of light aircraft to large companies and airlines. The most important competitive factors are high quality, competitive prices and availability of services.

While the Russian government considers aviation a strategically important sector of the economy, it also lacks resources to support the aerospace industry, provide

subsidies, finance big orders and allow it to adjust to a competitive market economy. However, Russian officials often hint that favorable conditions could be created for those foreign aerospace companies that would be willing to invest in the Russian aircraft industry and create employment in Russia.

Export Control

U.S. Exporters must take into account that certain high technology or dual-use products are subject to United States Government export restrictions. Such restrictions may include pre-license checks and/or post-shipment verifications. Exporters should seek guidance from the Export Counseling Division of the U.S. Department of Commerce's Bureau of Export Administration. Russia also has export licensing regulations and weapons, military equipment and dual-use materials and technology continue to require Russian export licenses.

Trade show

MAKS is an international aviation exhibition held biannually in Zhukovsky, an aircraft research center 35 km outside Moscow. The exhibition is quickly growing and acquiring a status of an important international event. of all passenger transport operations in the country. MAKS 2001 attracted over 300 companies from 23 countries. The next exhibition will be held in August 2003.

Russian Aerospace Agency holds a biannual trade show featuring aerospace engines. 130 participants from 8 countries participated in the last Engines' 2002. The next show will be held in 2004.

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