

# The economic & social benefits of air transport



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# Foreword

In December 1944, when Franklin Roosevelt and his peers signed the Chicago Convention, which contains the basic rules for civil aviation, they emphasised that the future development of international civil aviation can greatly help and preserve friendship and understanding among the nations and peoples of the world.

Over sixty years later, this vision has become an evident reality, to such an extent that air transport is now accepted as a fundamental pillar of our global society, as indispensable to our daily lives as medicine and telecommunications, and essential for social progress and economic prosperity.

The growing availability of affordable air travel has considerably widened aviation's role in our sustainable society. Air travel is no longer a luxury commodity. The air transport industry has not only underpinned wealth creation in the developed world, but has also brought enormous benefits to developing economies by unlocking their potential for trade and tourism.

This brochure provides new data on the economic and social benefits of air transport – including its valuable contribution to job creation and Gross Domestic Product (GDP). It also supplies, for the first time, regional economic data for Africa, Asia-Pacific, Europe, the Middle East, Latin America & the Caribbean and North America.

Based on a study undertaken for the Air Transport Action Group (ATAG) by Oxford Economic Forecasting (OEF), this brochure is a reliable source of facts and figures, which highlights air transport's main benefits. This updated information should enable governments and industry to make sound decisions to ensure air transport's continued and sustainable growth according to mobility requirements.



Philippe Rochat  
Executive Director  
ATAG

The Air Transport Action Group is an independent coalition of organisations and companies throughout the air transport industry that have united to drive infrastructure improvements in an environmentally-responsible manner. ATAG's global membership includes airports, airlines, manufacturers, air navigation services providers, airline pilot and air traffic controller unions, chambers of commerce, travel and tourism institutions, ground transportation and communications providers.

ATAG has a worldwide mandate, and is active at regional and national levels to press for specific infrastructure developments and to provide sound advice to public authorities on behalf of the international air transport industry. It looks for a balance between the environmental, social and economic effects of increased infrastructure capacity and, therefore, works closely with governments, environmental groups, planning institutes and the public to achieve this balance and to ensure that the right degree of commitment is made in time to meet mobility requirements.

This brochure has been financed by ATAG's funding members:



Rolls-Royce



# The importance of the industry – facts & figures

## Air transport provides vital economic benefits

- Aviation provides the only worldwide transportation network, which makes it essential for global business and tourism. It plays a vital role in facilitating economic growth, particularly in developing countries.
- Aviation transports close to 2 billion<sup>†</sup> passengers annually and 40% of interregional exports of goods (by value).
- 40% of international tourists now travel by air.
- The air transport industry generates a total of 29 million jobs globally (through direct, indirect, induced and catalytic impacts).
- Aviation's global economic impact (direct, indirect, induced and catalytic) is estimated at US\$ 2,960 billion, equivalent to 8% of world Gross Domestic Product (GDP).
- The world's 900 airlines have a total fleet of nearly 22,000 aircraft<sup>1</sup>. They serve some 1,670 airports<sup>2</sup> through a route network of several million kilometres managed by around 160 air navigation service providers<sup>3</sup>.
- 25% of all companies' sales are dependent on air transport. 70% of businesses report that serving a bigger market is a key benefit of using air services.

## Air transport is a major employer

The air transport industry generates a total of **29 million jobs globally**.

### 5.0 million direct jobs

- The airline and airport industry directly employ 4.3 million people globally.
- The civil aerospace sector (manufacture of aircraft systems, frames and engines, etc.) employs 730,000 people.

**5.8 million indirect jobs** through purchases of goods and services from companies in its supply chain.

**2.7 million induced jobs** through spending by industry employees.

**15.5 million direct and indirect jobs** through air transport's catalytic impact on tourism. Some 6.7 million direct tourism jobs are supported by the spending of international visitors arriving by air.

As a capital-intensive business, productivity per worker in the air transport industry is very high, at three and a half times the average for other sectors.

## Air transport is a highly efficient user of resources and infrastructure

- Aviation boasts high occupancy rates of 65 to 70% – which is more than double those of road and rail transportation.
- Air transport entirely covers its infrastructure costs. Unlike road and rail, it is a net contributor to national treasuries<sup>4</sup> through taxation.
- Modern aircraft achieve fuel efficiencies of 3.5 litres per 100 passenger-km or 67 passenger-miles per US gallon. The next generation aircraft (A380 & B787) are targeting an efficiency of less than 3 litres per 100 passenger-km or 78 passenger-miles per US gallon<sup>5</sup>, which exceeds the efficiency of any modern compact car on the market.

Aviation provides the only worldwide transportation network, which makes it essential for global business and tourism. It plays a vital role in facilitating economic growth, particularly in developing countries.

<sup>1</sup> ICAO Annual Report of the Council, 2004  
<sup>2</sup> Airports Council International (ACI) figure, 2005  
<sup>3</sup> CANSO estimation, 2005  
<sup>4</sup> Mott MacDonald, 2005  
<sup>5</sup> Airbus and Boeing data

<sup>†</sup> The figure of 2 billion passengers is based on counting passengers per flight (method used by the majority of the air transport industry). This corresponds to ACI's 3.9 billion passenger figure, since airports count their passengers twice according to both passenger departure and arrival.

Air transport may provide the only transportation means in remote areas, thus promoting social inclusion.

### Air transport provides significant social benefits

- Air transport improves quality of life by broadening people's leisure and cultural experiences. It provides a wide choice of holiday destinations around the world and an affordable means to visit distant friends and relatives.
- Air transport helps to improve living standards and alleviate poverty, for instance, through tourism.
- Air transport may provide the only transportation means in remote areas, thus promoting social inclusion.
- Air transport contributes to sustainable development. By facilitating tourism and trade, it generates economic growth, provides jobs, increases revenues from taxes, and fosters the conservation of protected areas.
- The air transport network facilitates the delivery of emergency and humanitarian aid relief anywhere on earth, and ensures the swift delivery of medical supplies and organs for transplantation.



### Air transport is responsibly reducing its environmental impact

- Aircraft entering today's fleets are 20 decibels (dB) quieter than comparable aircraft 40 years ago. This corresponds to a reduction in noise annoyance of 75%.
- A further 50% reduction in noise during take-off and landing (minus 10dB) is expected by 2020<sup>6</sup>.
- Aircraft entering today's fleets are 70% more fuel-efficient than they were 40 years ago. Carbon monoxide emissions have been simultaneously reduced by 50%, while unburned hydrocarbon and smoke have been cut by 90%.
- Research programmes aim to achieve a further 50% fuel saving and an 80% reduction in oxides of nitrogen by 2020<sup>7</sup>.
- Enhancements in air traffic management have the potential to reduce fuel burn by 6-12%, while operational improvements can bring an additional 2-6% fuel saving<sup>8</sup>.

<sup>6</sup> ACARE and NASA goals

<sup>7</sup> ACARE and NASA goals

<sup>8</sup> IPCC Special Report on Aviation, 1999

# The air transport industry

Air transport is one of the world's most important industries. Its development and its technical and service achievements make it one of the greatest contributors to the advancement of modern society.

Since the first jet airliner flew in 1949, use of commercial aviation has grown more than seventy-fold. This growth is unmatched by any other major form of transport and is essential to economic progress.

Demand for air services increases the influence of air transport on the global economy, making possible the rapid movement of millions of people and billions of dollars' worth of goods to markets around the world.

The industry plays a decisive role in the work and leisure of millions of people. It promotes an improved quality of life and helps to improve living standards.

By facilitating tourism, air transport also helps generate economic growth and alleviate poverty – providing employment opportunities, increasing revenues from taxes and fostering the conservation of protected areas.

The world's 900 airlines have a total fleet of nearly 22,000 aircraft. They serve some 1,670 airports through a route network of several million kilometres managed by around 160 air navigation service providers.

## Air transport – what it comprises

The air transport industry includes those activities that are directly dependent on transporting people and goods by air. This includes:

- the **aviation sector** – airports, airlines, general aviation, air navigation service providers and those activities directly serving passengers or providing airfreight services; and
- the **civil aerospace sector**, which comprises the manufacture and maintenance of aircraft systems, frames and engines.

Together, these two sectors provide a measure of the total industry, which we have termed the **air transport industry**.

## Drivers of growth

The demand for air transport has increased steadily over the years. Passenger numbers have grown by 45% over the last decade and have more than doubled since the mid-1980s. Freight traffic has increased even more rapidly, by over 80% on a tonne-kilometre performed basis over the last decade and almost three-fold since the mid-1980s. In 2004, the air transport industry carried 1,890 million scheduled passengers and 38 million tonnes of freight<sup>9</sup>.

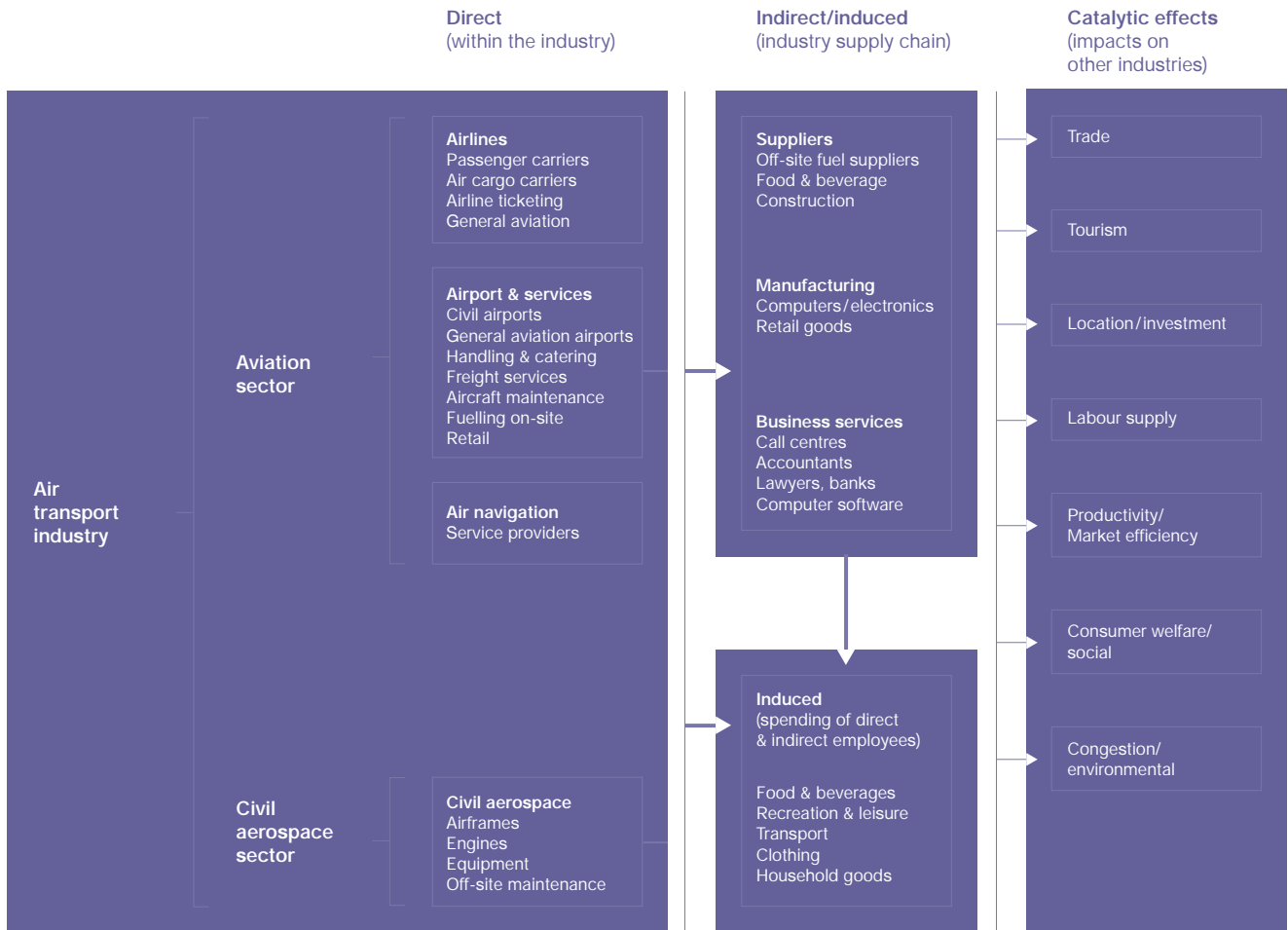
Its rapid growth has been driven by a number of factors, including:

- **Rising GDP, disposable income, and living standards** – increasing the demand for travel for both business and leisure purposes.
- **Reduced air travel costs** – improvements in airline efficiency and increased competition have reduced world airfares by around 40% in real (i.e. inflation-adjusted) terms since the mid-1970s<sup>10</sup>.
- **Globalisation** – the average distance travelled tends to increase as people take long-haul holidays and do business in countries which now have more favourable political and social environments.
- **Deregulation** – starting with the US domestic air market in the late 1970s, followed in the 1980s by the European Union (effectively completed in the late 1990s), with other regions deregulating gradually.

<sup>9</sup> ICAO Annual Report of the Council, 2004

<sup>10</sup> World Air Cargo Forecast 2004/2005, Boeing (2004); The Economic Benefits of Air Transport, ATAG (2000)

# The air transport industry and its economic impacts



Source: OEF, 2005

Air transport is one of the world's most important industries. Its development and its technical and service achievements make it one of the greatest contributors to the advancement of modern society.

# The economic benefits of air transport

## Air transport generates employment and wealth

Air transport generates a total of 13.5 million jobs (direct, indirect and induced). Of these, 5 million are direct jobs.

The air transport industry has a substantial economic impact, both through its own activities and as an enabler of other industries. Its contribution includes direct, indirect and induced impacts, which are related to the total revenues of the air transport industry. The catalytic impacts of the industry are "spin-off" effects on other industries (outlined on page 9.)

### Direct impacts

These cover employment and activity within the air transport industry including airline and airport operations, aircraft maintenance, air traffic control and regulation, and activities directly serving air passengers, such as check-in, baggage-handling, on-site retail and catering facilities. Not all of these activities necessarily take place at an airport, with some taking place at head office. Direct impacts also include the activities of the aerospace manufacturers selling aircraft and components to airlines and related businesses.

Of the **5 million direct jobs** generated by the air transport industry worldwide, 4.3 million people are employed by the airlines and airports (aviation sector) globally, contributing around US\$ 275 billion of GDP to the global economy. This is as large a world industry as the pharmaceuticals sector.

The breakdown of the 5 million direct jobs is as follows:

- The civil aerospace sector (manufacture of aircraft systems, frames and engines, etc.) employed 730,000 (14% of total direct jobs) people in 2004.
- An estimated 2.1 million people (or 41%) work for airlines or handling agents (e.g. as flight crew, check-in staff, maintenance crew, etc.).

- Around 330,000 people (7%) work directly for airport operators (e.g. in airport management, maintenance, security, etc.).
- A further 1.9 million (38%) work on-site at airports in retail outlets, restaurants, hotels, etc.

### Indirect impacts

These include employment and activities of suppliers to the air transport industry, for example, jobs linked to aviation fuel suppliers; construction companies that build additional facilities; the manufacture of goods sold in airport retail outlets, and a wide variety of activities in the business services sector (call centres, IT, accountancy, etc.).

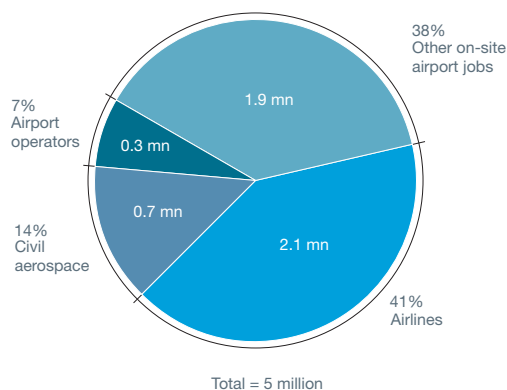
**5.8 million indirect jobs** are supported through purchases of goods and services by companies in the air transport industry. Examples include jobs in the energy sector generated through the purchase of aircraft fuel; employment in the IT sector providing computer systems for the air transport industry; or the workers required to manufacture retail goods. The contribution of these indirect jobs to global GDP is US\$ 375 billion.

### Induced impacts

These include spending by those directly or indirectly employed in the air transport sector that supports jobs in industries such as retail outlets, companies producing consumer goods and a range of service industries (e.g. banks, restaurants, etc.).

**2.7 million induced jobs** are supported through employees in the air transport industry (whether direct or indirect) using their income to purchase goods and services for their own consumption. This includes jobs in retail and a range of service industries. The induced contribution to global GDP is US\$ 175 billion (2004 estimation).

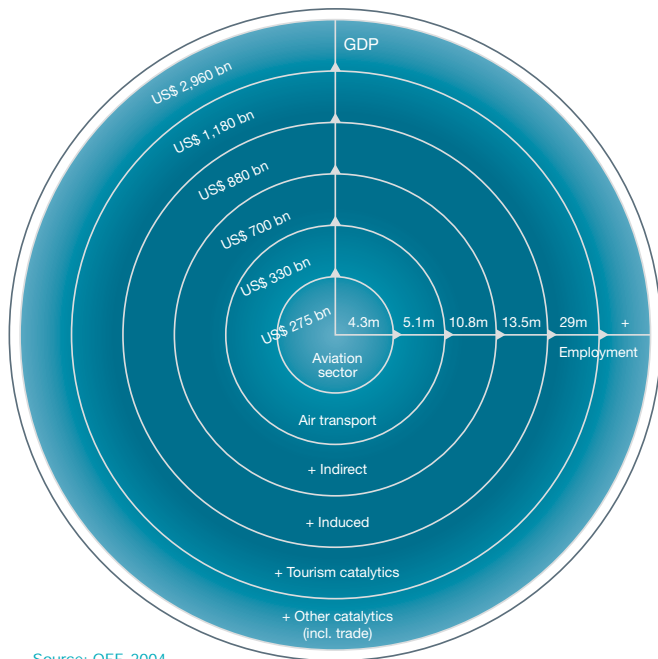
Direct employment by sector in the air transport industry, 2004



Source: OEF, 2004



## Global economic impact – employment and GDP, 2004



Source: OEF, 2004

GDP in billions of US\$

The air transport industry contributes around US\$ 880 billion a year to world GDP, taking into account direct, indirect and induced impacts – equivalent to 2.4% of global GDP. Its direct impact on GDP is US\$ 330 billion.

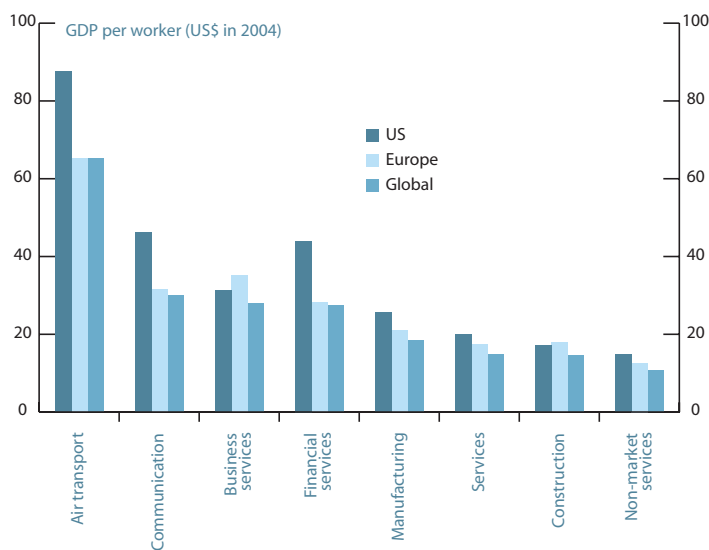
### GDP per air transport worker

The air transport industry is one of the most efficient sectors measured in terms of GDP per worker. At US\$ 65,000 per worker per year, this is around three and a half times the average across the world economy as a whole and exceeds most other sectors of the economy. This means that air transport employees individually make a greater contribution to the global economy.

There are several reasons for this:

- The industry is highly capital-intensive.
- The air transport industry is typically concentrated in more developed economies, where it makes a greater than average contribution to the global economy simply because GDP per worker is generally higher.
- Air transport employees are highly skilled, trained and experienced – and the industry carries out intensive research and development.

### GDP per worker by sector, 2004



Source: OEF, 2004

As a capital-intensive business, productivity per worker is very high – indeed it is three and a half times the average in other sectors.

# The economic benefits of air transport

## Air transport generates employment and wealth

### Air transport's regional economic benefits

**Employment:** Most air transport employment is in the developed regions of the world. Some 1.8 million people are directly employed in North America, 1.5 million in Europe and 1.2 million in Asia-Pacific.

However, the air transport industry also makes a substantial direct contribution to developing and transition economies. For example, air transport supports 170,000 jobs in Africa, 165,000 jobs in the Middle East and 210,000 jobs in Latin America (see Regional Annexes from page 23).

**GDP:** The air transport industry in Europe and North America make the greatest contribution to GDP when comparing all regions. North America accounted for 37% of global employment in the aviation industry in 2004, but accounted for over 50% of the contribution of air transport to global GDP. Europe accounts for around 27% of global air transport employment and GDP (see Regional Annexes from page 23).

### Regional employment and GDP impacts, 2004

	Africa	Asia-Pacific	Europe	Latin America	Middle East	North America
<b>Jobs (in millions)</b>						
Direct/indirect/induced	0.5	3.2	4.1	0.6	0.5	4.6
Catalytic	2.6	6.6	3.4	1.6	0.5	0.8
<b>Total</b>	<b>3.1</b>	<b>9.8</b>	<b>7.5</b>	<b>2.2</b>	<b>1.0</b>	<b>5.4</b>
<b>GDP (in billions)</b>						
Direct/indirect/induced	11.3	148.4	273.6	20.6	16.1	409.6
Catalytic	44.2	540.1	768.1	101.4	46.0	583.2
<b>Total</b>	<b>55.5</b>	<b>688.5</b>	<b>1041.7</b>	<b>122.0</b>	<b>62.1</b>	<b>992.8</b>

Source: OEF, 2004

### The economic impact of the Houston Airport System

The Houston Airport System provides passenger, cargo and general aviation services via three airports (George Bush Intercontinental Airport, William P. Hobby Airport and Ellington Field). It is the sixth largest airport system in the world, handling 42 million passengers and 740 million pounds of freight in 2003. An economic impact study<sup>11</sup> undertaken in 2003 found:

- The total economic impact in terms of sales is US\$ 24.2 billion, supporting 151,000 jobs in the local economy. This economic impact is expected to double as passenger numbers are forecast to increase to 80 million passengers in 2020.
- Around one-third of sales (US\$ 8.9 billion) was attributable to on-site airport activity, around 8% (US\$ 2.0 billion) to spending in travel and tourism industries by visitors to Houston, and over 50% (US\$ 13.3 billion) to the multiplier impacts from the spending of both wages and sales in the local economy.

- The corresponding number of jobs supported in each of these areas was 37,000 people in on-site activities, 26,000 jobs from visitor spending and 88,000 jobs from induced/supplier multiplier impacts.
- The largest amount of sales (US\$ 19.4 billion) originated from George Bush Intercontinental Airport, which supported the employment of 118,000, followed by US\$ 4.5 billion at Hobby Airport, supporting 29,000 jobs and US\$ 328 million at Ellington Field supporting 3,600 jobs.

One of the key benefits of the Houston Airports System is the way it operates as a network. George Bush Intercontinental acts as the main international hub, Hobby focuses on regional and low-cost airlines and Ellington Field is geared towards general aviation. Each airport, therefore, has its own specialised role, meaning that economies of scale can be better exploited and overall efficiency improved.

<sup>11</sup> Economic Impact Study Houston Airport System, City of Houston by the Campbell-Hill Aviation Group and Dr. Steven G. Craig, University of Houston (2003 and 1998)

# The economic benefits of air transport

## Air transport generates wider catalytic (spin-off) benefits

The air transport industry's most important economic contribution is through its impact on the performance of other industries and as a facilitator of their growth. It affects the performance of the world economy, improving the efficiency of other industries across the whole spectrum of economic activity – referred to as catalytic or “spin-off” benefits.

- **Air transport facilitates world trade:** air transport helps countries participate in the global market by increasing access to main markets and allowing globalisation of production. Air transport also encourages countries to specialise in activities in which they have a comparative advantage, and to trade with countries producing other goods and services. See page 14.
- **Air transport is indispensable for tourism,** particularly for remote and island destinations. Tourism directly supports jobs in airlines and airports, and spending of visitors arriving by air creates a substantial number of jobs in the tourism industry. See page 17.
- **Air transport boosts productivity across the global economy:** improved transport links expand the market in which companies operate. As a result, companies are better able to exploit economies of scale thereby reducing costs, and to specialise in areas of comparative advantage. By opening up markets, air services expose companies to stiffer competition, encouraging them to become more efficient.
- **Air transport improves the efficiency of the supply chain,** for example, many industries use air transport to shorten delivery times as part of their just-in-time delivery systems, enabling them to deliver products to clients quickly and reliably and to reduce costs.
- **Air transport is an enabler of investment both into and out of countries and regions:** viable air transport links are one of the key considerations that influence where international companies choose to invest.
- **Air transport can act as a spur to innovation** by encouraging effective networking and collaboration between companies located in different parts of the globe. A good transport infrastructure can also encourage greater spending on research and development by companies – for example, increasing the size of potential markets allows the fixed costs of innovation to be spread over larger sales.
- **Air transport provides consumer welfare benefits to individuals** in terms of the increased availability of travel connections, and for local airport communities. These must be taken into account when considering environmental impacts on, for example, air quality, noise and congestion in the vicinity of airports.

There is a clear distinction between these ‘catalytic’ impacts and the direct, indirect and induced economic impacts of air transport. In simple terms, the economic value of the direct, indirect and induced effects is related to the total revenues of the air transport industry, whereas the catalytic impacts are “spin-off” effects on other industries.

The economic catalytic impacts generated by air transport are greater than the combined direct/indirect/induced impacts.

# The economic benefits of air transport

## Air transport generates wider catalytic (spin-off) benefits

70% of businesses say that a key benefit of using air services is the ability to serve a bigger market.

### Air transport's ability to serve larger markets

Air transport enables easier and cheaper trade with distant markets and marketing of goods and services on a global basis. A survey of companies in Chile, China, the Czech Republic, France and the US<sup>12</sup> found that 70% of businesses reported the ability to serve a bigger market as a key benefit.

Implications included:

- **Increased competition:** a significant benefit for consumers which can force companies to be more efficient, drive down prices and even improve the quality of goods as companies seek to maintain their global market position.

- **Innovation spur:** 30% of businesses reported a substantial impact on their ability to innovate through the potential to serve a bigger market and 70% reported some impact.
- **Increased sales:** air services enable global marketing of goods and services, providing a competitive transportation medium, especially for time-sensitive products and trade with distant markets. Over 80% of businesses reported that air services are sometimes important for their impact on sales, with almost 60% considering them either vital or very important. Companies reported that on average, 25% of all sales are dependent on air services.
- **Better exploitation of economies of scale:** around 25% of businesses report that air transport services have a substantial impact on their ability to exploit economies of scale, and over 40% report an impact to some extent.

### Express carrier industry<sup>13</sup>

The express industry simplifies and speeds up the process of transporting goods. It enables small companies, which almost by definition include many suppliers in developing countries, to utilise high quality, rapid delivery services that they could not provide themselves. This is particularly important in facilitating participation in export markets.

The express industry is one of the world's fastest-growing sectors, expanding at double the rate of the global economy especially in transition and emerging market economies.

- The direct contribution of the global express industry to world GDP was US\$ 64 billion in 2003 – double that of the electrical appliances industry and almost 50% larger than the shipbuilding industry.
- The express industry supports 1.25 million jobs, more than the petroleum refinery industry, and helps to support at least 2.65 million jobs in total (including those employed in companies supplying the express operators and jobs dependent on the spending of express industry workers).

The most important impacts of the express industry, however, are on the operations of companies in other sectors – for example, by enabling companies to source spare parts rapidly to avoid production shutdowns and by allowing the implementation of techniques such as build-to-order.

### Implications of serving a bigger market



<sup>12</sup> Survey conducted on behalf of IATA: Measuring Airline Network Benefits, OEF (2005)

<sup>13</sup> See 'The Impact of the Express Delivery Industry on the Global Economy', OEF (March 2005) for a more detailed discussion of the express carrier industry.

Air transport enables companies to service and meet clients, and promotes the efficient organisation of production.

Air transport's impact on business operations

Air transport enables companies to service and meet clients, and promotes the efficient organisation of production.

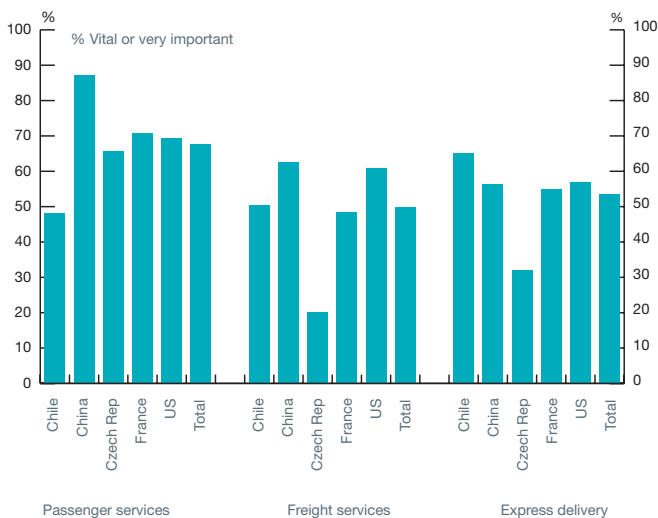
- **Servicing and meeting customers:** air services allow better contact and more effective communication between buyers and sellers, which contributes to companies making new sales and to meeting the needs of their existing customers.
- **Production efficiency:** some 50% of businesses rely on air services for production efficiency. Passenger services enable managers to visit overseas sites and other sub-sections of their business in other countries, enable a choice of the best suppliers from a range of competitors, facilitate the spread of new production techniques and make it easier for companies to attract high quality employees.

The global supply chain is becoming increasingly dependent on the rapid and reliable movement of high-value low-weight goods such as computer parts. Air transportation facilitates such movements by:

- **providing fast and reliable delivery of high-value products:** especially relevant to modern-dynamic industries, such as the pharmaceutical/ biotechnology and telecommunication equipment sectors;
- **increasing the range of product markets:** the development of e-business helps companies identify low-cost suppliers and air transport helps connect buyers and suppliers;
- **improving companies' handling of returns and complaints:** for example, allowing a quick turnaround of repairs or delivery of replacement parts;

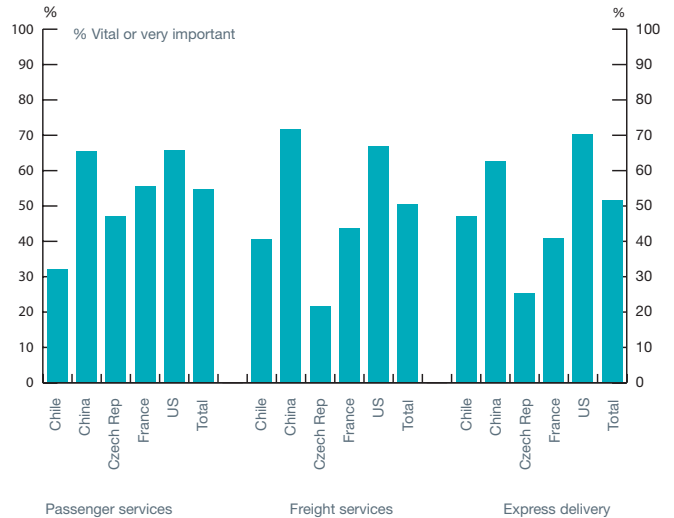
- **facilitating the development of e-commerce:** enabling, for example, companies to transport online shopping orders quickly and reliably between countries, allowing products to be stored in large warehouses reducing retail and distribution costs;
- **facilitating improved stock-management and production techniques:** reducing companies' storage costs, losses due to stock-outages and disruption caused by failure of machinery on production lines; and
- **facilitating the development of the express carrier industry:** which provides guaranteed, rapid, door-to-door delivery services and increasingly offers logistics support for companies.

Importance of air services for servicing/meeting with customers



Source: OEF survey, 2005

Importance of air services on efficiency of production



Source: OEF survey, 2005

# The economic benefits of air transport

## Air transport generates wider catalytic (spin-off) benefits

On average, 25% of companies' sales are dependent on air services.

### Air transport's influence on investment

Good air transport links influence where companies choose to invest. According to a survey<sup>14</sup>, 56% of companies consider international transport links to be an essential factor for locating businesses in Europe.

Another survey<sup>15</sup> found that 18% of businesses' past investment decisions were directly affected by the absence of good air transport links, especially in high-tech sectors. Around 28% of companies believe that innovation and investment in research and development would be very badly or fairly badly affected if air transport services were constrained.

### Changi International Airport, – an attractive location

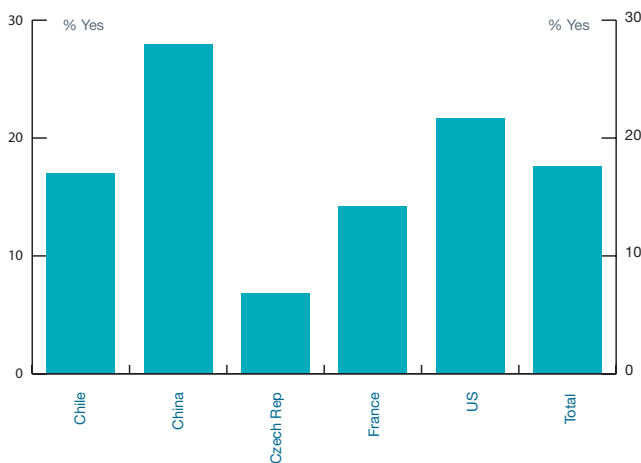
Singapore Changi International Airport is one of the world's leading airports, in terms of throughput and quality of service to both airlines and customers. It handled 30.4 million passengers<sup>16</sup> in 2004. It is also a key part of the global airline network with 40% of passengers transferring to another airline and a further 10-15% making a temporary stop-over. Changi also handles a large volume of cargo with 1.7 million tonnes carried in 2004 – an increase of 10% on the previous year.

The airport is one of Singapore's primary economic assets and has a significant influence on the economy. A 1999 study<sup>17</sup> on the economic impact of Changi Airport found:

- S\$13.3 billion of GDP was generated by Changi Airport from the combined direct and indirect impacts, equating to 9.2% of total Singapore GDP.

- On-site employment comprised 14,000 airline employees and a further 30,000 workers in ground support, aircraft parts, concessionaries, air cargo agents, CAAS, etc. The high ratio of airline jobs to airport employment at 2:1 mainly reflects Changi's role as a major international hub airport.
- A further 36,000 jobs were supported in sectors providing services to air passengers outside the airport, such as travel agents and accommodation for crew.
- The indirect employment in the supply chain, as a result of the purchase of goods and services by businesses at Changi Airport, supported a further 33,600 workers.

### Has the absence of good air transport links ever affected your organisation's investment?



Source: OEF survey, 2005

Air transport facilitates improved investment and productivity.

<sup>14</sup> Healey and Baker, 2003

<sup>15</sup> Survey conducted on behalf of IATA: Measuring Airline Network Benefits, OEF, 2005

<sup>16</sup> Passenger Traffic 2004 Preliminary, ACI

<sup>17</sup> Economic impact of Singapore Changi Airport, National University of Singapore, 2001

The impact of Changi, however, goes far beyond employment and GDP. The airport is increasingly becoming a key attractor of domestic and foreign companies. Large numbers of airport-linked businesses have clustered in a wide geographical area around the airport. These businesses include logistics companies wishing to benefit from close proximity to the airport, plus a range of other industries. Businesses benefit not only from airport accessibility but also from economic benefits such as knowledge spillovers from other firms, access to specialist labour and a reduction in search costs that proximity to suppliers and customers brings.

Combining these off-site impacts with those provided on-site – the numerous retail, entertainment, food and beverage outlets, business centres and transit hotels – means that Changi has become a major employment and economic centre in its own right.

### Air transport's impact on the labour market

Air transport improves the labour market by making it easier for companies to attract high quality employees from around the globe. This is important for senior staff and professionals for whom access to good international links influences their decision on where to live and work – as confirmed by 43% of companies in a 2005 survey<sup>18</sup>.

Similarly, high quality employees may find it easier to commute by air on a weekly basis or to be based in two locations (i.e. headquarters and a regional location). Overall, improved access to a wider pool of appropriately skilled labour will improve productivity leading ultimately to higher employment in the local economy.

### Value of air transport's wider catalytic impacts

Recent research by Oxford Economic Forecasting (OEF) provides direct evidence of the value of the wider spin-off effect of air transport on investment and productivity throughout the economy. The analysis is based on ten years of data from 25 European Union countries. It shows that the wider supply-side impact of the expansion of air services over the past decade has contributed an additional 4% to European GDP. The same scale of impact at the global level would imply that the contribution to world GDP was around US\$ 1,550 billion in 2004. These supply-side catalytic effects are additional to those arising from trade and tourism.

The same statistical research shows that the expansion of trade by air services over the past decade has contributed an additional 0.6% to European GDP. This translated into an impact at the global level of around US\$ 230 billion in 2004. Adding together the trade catalytic impact with the above supply-side catalytic effects provides a total catalytic impact (excluding tourism) of around US\$ 1,780 billion.

Air transport improves the labour market by making it easier for companies to attract high quality employees from around the globe.

<sup>18</sup> Survey conducted on behalf of IATA: Measuring Airline Network Benefits, OEF, 2005

# The economic benefits of air transport

## Air transport contributes to world trade

Air transport plays a major role in the development of a globalised economy. Some US\$ 1,750 billion of goods were transported internationally by air in 2004.

One of air transport's most important economic benefits is its spin-off effect on international trade – which plays a key role in promoting economic growth in countries in different stages of development.

Air transport is an important trade facilitator. It increases the global reach of companies, enables them to get products to market more quickly and allows them to be more responsive to customer needs, thereby contributing to improved living standards.

### The value of international trade

Trade performance is determined by economic growth and prosperity. Over the last 40 years, countries that have grown the fastest have been those with the fastest growth in international trade.

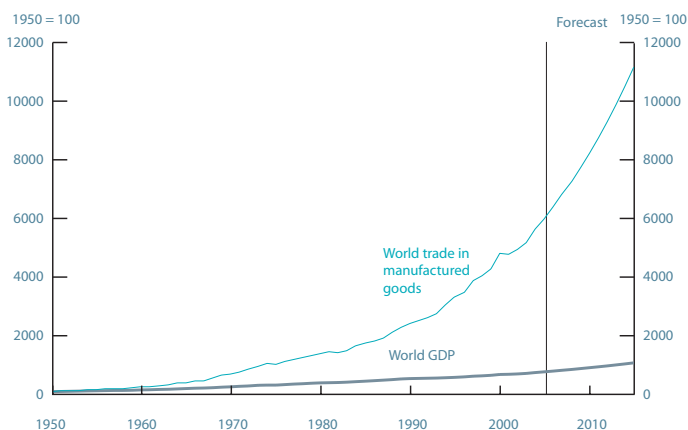
The surge in international trade has been driven by:

- **Reductions in barriers to international trade:** most notably, the creation of free trade blocs such as the European Single Market, North American Free Trade Agreement (NAFTA) and Mercosur, and the widening influence of the World Trade Organization (WTO). In addition, many bilateral trade barriers have also been removed.
- **Increased specialisation:** countries have specialised in activities where they have a comparative advantage, and trade with countries specialising in other goods and services.
- **Globalisation:** more companies have established international operations and foreign subsidiaries, leading to the homogenisation of domestic markets, more global brands and greater import penetration.

- **Technological advances:** improved communication systems have enabled companies to market their products globally and liaise with customers and suppliers around the world.
- **Political developments:** more favourable political circumstances have increased the number of potential trading partners to include former communist countries – a number of which are now members of the EU – and some remaining communist economies, such as China and Vietnam.

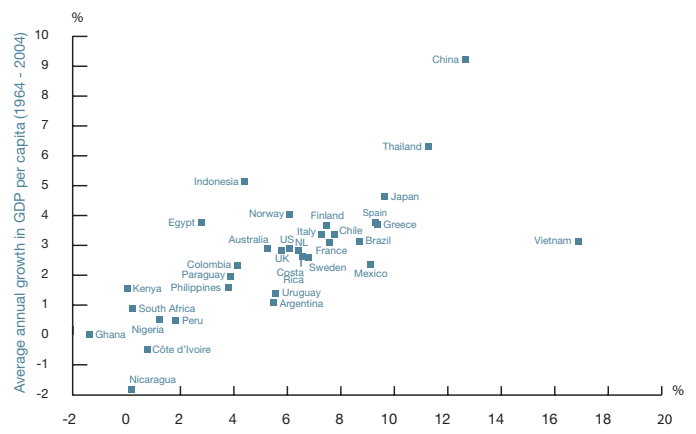
Forecasts suggest that the global economy will become even more dependent on trade over the next decade. World trade is expected to nearly double, rising at more than twice the rate of global GDP growth, with emerging markets leading the way.

World trade and GDP



Source: WTO/OEF

Economic growth and trade



Source: WDI, OEF calculations



## 40% of the value of inter-regional manufacturing exports is transported by air.

### Airfreight's role in international trade

Most air cargo consists of manufactured products or products that will be used in a manufacturing process. The bulk of growth in world trade has come about further to the increased trade of manufactured goods.

40% of the value of inter-regional trade<sup>19</sup> in manufactured goods is transported by air. Larger amounts of traded goods within regions are transported by other modes, including road and rail-based transport. If intra-regional trade is included, then around 25% of the total value of international trade in manufactured goods is transported by air, which corresponded to a value of approximately US\$ 1,750 billion in 2004.

The air transport industry has also contributed to trade in same-day and next-day delivery services and to the transportation of urgent or time-sensitive goods, such as post and packages, foreign newspapers and perishable goods, such as fresh fruit, vegetables and flowers – benefiting many developing nations.

### Passenger air services' role in international trade

Passenger air services are vital for creating trading opportunities: they enable companies to market their business globally and to meet their clients face-to-face. By allowing better personal contact and more effective communication between buyers and sellers, air services contribute both to companies making new sales and to meeting the needs of their existing customers.

### Air transport and trade: a catalyst for economic development

Air transport contributes to improved living standards for many developing nations by expanding opportunities to join the global economy. Air cargo is important for getting supplies to landlocked and developing island countries, and for countries whose main exports are high value goods or perishables. For example:

- In Kenya, exports by air of agricultural products (e.g. fresh vegetables and cut flowers), largely to Europe, already constitute one of the country's largest industries and the second biggest earner of foreign exchange.
- Ghana's World Bank-sponsored Trade and Investment Gateway Project aims to attract export-orientated investors and to place the country as a hub in West Africa for trade and passenger flows through measures such as creating free-trade zones with labour-intensive export industries, deregulation of the air transport industry and investments in Kotoka International Airport.
- Fresh and dried fruits and fish are important export commodities for many Caribbean economies.
- Colombia is the largest exporter to North America of cut flowers, with vegetables and clothing also being important air exports. An estimated 16% of the value of merchandise exports from Colombia is by air.

### The importance of passenger air services to companies

A survey of companies in Chile, China, the Czech Republic, France and the US<sup>20</sup> focusing on the importance of air services for their operations found that more than 65% of businesses consider passenger air services as vital or very important for servicing or meeting customers. Chinese firms place the greatest reliance on passenger air services for servicing or

meeting clients, with nearly 90% of businesses reporting that they are vital or very important. Overall, 85% of businesses report that passenger air services are at least sometimes important for their sales, with 70% considering them to be either vital or very important. This dependency on air services means that companies have incentives to locate their operations in the vicinity of major airports.

<sup>19</sup> Intra-Asia Pacific trade is included in this definition due to the geographically disparate nature of the countries in the region. A technical note is available from OEF setting out the basis of this calculation.

<sup>20</sup> Survey conducted on behalf of IATA: Measuring Airline Network Benefits, OEF, 2005

# The economic benefits of air transport

## Air transport contributes to world trade

Growing world trade in services depends on air transport to facilitate meetings and the individual attention often required to tailor financial and business services.

According to a survey of financial and business service companies<sup>21</sup>:

- almost 70% of firms consider air services to be critical for business travel;
- 50% of respondents consider air services to be critical for travel by their clients to meet with them; and
- while new technology, such as video-conferencing, can be useful, companies in the financial and business services sector still consider flying for face-to-face meetings to be essential for winning new business and developing clients' relationships.

### Schiphol Airport: essential for trade<sup>22</sup>

Trade has for many centuries been important to the development of the Dutch economy. The Netherlands has developed into Europe's key entrepôt, providing a gateway for international trade between Europe and the rest of the world. The development of the Netherlands' modern transport network has been centred on Amsterdam's Schiphol Airport. A specific goal of the Dutch government is to establish Amsterdam as Europe's most efficient transport hub by 2015. To achieve this, the Netherlands has introduced liberal policies for aviation, foreign investment and trade, as well as developing Schiphol Airport as a complete business environment and a leading European 'Mainport', which is crucial to the future growth prospects of the Randstad region in Holland.

- Schiphol is Europe's 3rd largest cargo airport (accounting for around 10% of the European air cargo market) and 4th largest passenger airport. In 2004, the total volume of cargo amounted to 1.4 million tonnes, an increase of 8.5% on 2003, while the number of passengers went up by 6.5% to over 42.5 million. Over 20 airlines that carry cargo operate from Schiphol and overall there are 237 direct connections in 87 countries.
- The Dutch government estimates that Schiphol accounts for nearly 2% of GDP, with this figure expected to rise to 2.8% in 2015. The Mainport generates between 80,000 and 120,000 jobs, with almost 60,000 direct jobs. If employment in all companies in the Schiphol Mainport region is taken into account, this corresponds to approximately 12.5% of total Dutch employment. Employment growth in the region was almost 7% during the 1990s, which was three times the national average.
- There are more than 1,800 foreign companies located in Amsterdam, including 250 European regional headquarters, and over 1,100 firms are located within the Amsterdam Airport area.
- Over 50% of all American and Asian companies' European logistics centres are located in the Netherlands. Moreover, the Economist Intelligence Unit rates the Netherlands as the number one business location in Europe for the period 2004-2008.
- The percentage of businesses in different sectors dependent on the airport are 88% in the transport and distribution sector, 72% in large international operations, 75% in leisure hotels, 46% in business and financial services, and 42% in the technology sector<sup>23</sup>.

<sup>21</sup> Survey carried out in the Central London Business District, Aviation Services for the City of London, OEF, 2002

<sup>22</sup> See 'Air Cargo: Engine of Economic Development', Kasarda, J.D., Green, J. and Sullivan, D (2004) for a more detailed discussion.

<sup>23</sup> Survey of businesses around Schiphol Airport undertaken by VNO-NCW

# The economic benefits of air transport

## Air transport stimulates tourism

The tourism industry worldwide directly employs 72 million people, accounting for 3.8% of world GDP<sup>24</sup> (direct impact).

One of air transport's most important economic benefits is its spin-off effect on other industries. Tourism is one such industry. It is also inextricably linked with air transport: tourism depends on transportation to bring visitors, while the transport industry depends on tourism to generate demand for its services.

### Benefits of tourism

The importance of tourism as an economic activity has increased dramatically in recent years.

- Tourism employs 72 million people worldwide.
- Global tourism expenditure is estimated to be nearly US\$ 3 trillion.
- Tourism accounts directly for 3.8% of world GDP.

Moreover, tourism is expected to maintain its growth. By 2014, the World Travel & Tourism Council (WTTC) expects the tourism industry to employ more than 84 million people globally.

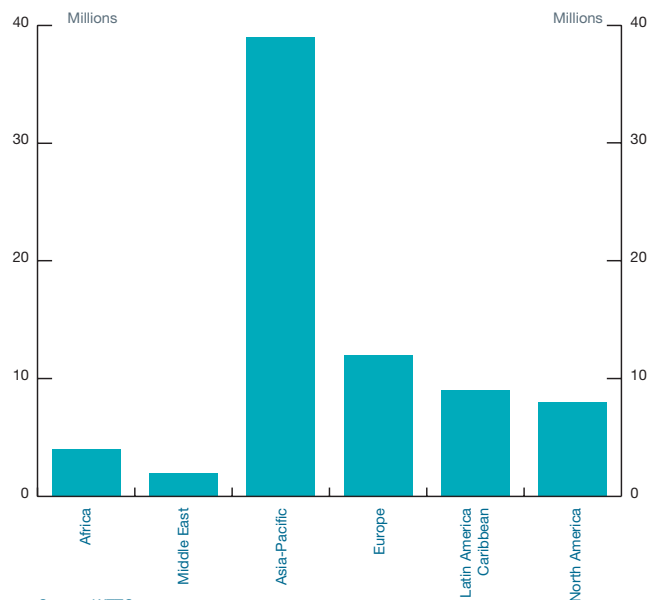
The tourism industry includes obvious sectors like hotels, restaurants and bars, and recreational activities plus other less obvious sectors, such as retailing in many heavily-visited areas. Tourism has the potential to generate strong linkages with other industries, including agriculture, fishing, construction and craft production – and it is particularly important in many developing countries, where it is a major contributor to the balance of payments, and a significant source of foreign exchange.

### Contribution of tourism to the balance of payments in Costa Rica

Costa Rica is a good example of tourism's potential to generate foreign exchange and employment, as well as playing a role in conservation. Costa Rica started promoting eco-tourism at the beginning of the 1980s as a way of reversing a growing process of deforestation. Now the tourism industry is the second largest source of foreign exchange – after microchip exports – and provides the resources needed to maintain the country's national parks.

The tourism industry's rapid development is highlighted by a number of indicators. Between 1990 and 2001, international tourism spending increased five-fold, to US\$ 1.3 billion (26% of total exports), while spending per arrival nearly doubled. In 2001, the number of international arrivals in the country reached 1.1 million (of which 72% arrived by air), more than 25% of the country's population. In terms of accommodation capacity, the number of hotel rooms almost doubled in less than a decade, from 8,548 in 1992 to 14,990 in 2001.

Tourism employment, 2004



<sup>24</sup> Tourism Satellite Accounts, WTTC, 2005

# The economic benefits of air transport

## Air transport stimulates tourism

Air transport is indispensable for tourism.  
Around 40% of international tourists now travel by air.

### Air transport's role in supporting tourism

Air transport has contributed to a huge expansion in the range of tourist destinations and thereby plays a major role in shaping the scale and diversity of tourism worldwide.

Some 40% of international tourists now travel by air, up from 35% in 1990<sup>25</sup>, including business travellers, as well as those on leisure trips or visiting friends and relatives. At the same time, the WTTC estimates that foreign visitors account for just under 25% of overall tourism spending around the world.

### The economic impact of tourism at Minneapolis airport<sup>27</sup>

A 2005 study explored the local and regional economic impacts of Minneapolis/St. Paul International Airport and estimates that the airport generates 28,545 direct jobs in the air transport industry. Of these, around 63% (18,000) are in airlines that use the airport. In addition, 3,000 people are employed by freight airlines/freight forwarders and around 2,300 by ground transportation companies, such as taxis and car rental firms. Retail outlets at the airport terminal support 1,200 jobs with various other sectors accounting for the remaining 4,045 jobs.

From this direct activity:

- 11,264 indirect jobs are generated as a result of expenditure by firms located at the airport, on the goods and services they buy from their suppliers; and
- 26,406 jobs are induced by the spending of those directly employed in the airport.

However, by far the biggest impact on the local economy is visitor spending. The study estimates that this supports a total of around 87,000 jobs (60,500 directly and the remainder from indirect and induced effects of tourism). The tourism impact is, therefore, over 30% greater than the employment generated by the combined direct-indirect-induced effects of air transport. Nearly 75% of these jobs are within the hotel, restaurant, retail outlets and entertainment sectors.

### Employment and GDP in tourism – air transport's spin-off effect

**Direct:** 6.7 million direct jobs in tourism are supported by the spending of foreign visitors arriving by air, taking into account both the importance of overseas visitors for tourism spending and the importance of air travel for overseas visitors. This includes jobs in industries such as hotels, restaurants, visitor attractions, local transport, car rental, etc., but it does not include air transport industry jobs.

**Indirect:** A further 5.7 million indirect jobs in tourism (industries supplying the tourism industry) are supported by visitors arriving by air.

**Induced:** These direct and indirect tourism jobs – supported by air transport – generate a further 3.1 million jobs in other parts of the economy, through employees spending their earnings on other goods and services.

**Total of air transport's spin-off effect:** These direct, indirect and induced tourism jobs add up to a total of 15.5 million jobs globally that are supported by the spending of foreign visitors travelling by air, contributing an estimated US\$ 300 billion a year to world GDP<sup>26</sup>.

Spending by international visitors arriving by air directly supports 6.7 million tourism jobs.

<sup>25</sup> Economic Contribution of Civil Aviation, ICAO, 2004

<sup>26</sup> Does not include air transport's contribution to domestic tourism, which is significant in large countries – e.g. the USA.

<sup>27</sup> The Local and Regional Impacts of the Minneapolis/St. Paul International Airport, prepared for: The Metropolitan Airports Commission, 7 March 2005, by John C Martin Associates LLC

Air transport’s spin-off effect supports 15.5 million jobs within tourism, contributing around US\$ 300 billion a year to world GDP.

### Regional impacts of tourism and air transport

The importance of tourism jobs supported by air transport varies according to different regions. Tourism is a particularly important source of new jobs and increased prosperity in a number of developing countries.

The WTTC simulated Tourism Satellite Accounts illustrate that spending by foreign visitors ranges from a little over 10% of overall tourism spending in North America to more than 50% in Africa. In Africa, the jobs of an estimated 675,000 people directly employed in tourism are supported by overseas visitors arriving by air, representing 20% of all tourism jobs in Africa. In contrast, the estimated 310,000 direct jobs in tourism in North America supported by overseas visitors arriving by air represent only slightly less than 4% of all direct tourism jobs.

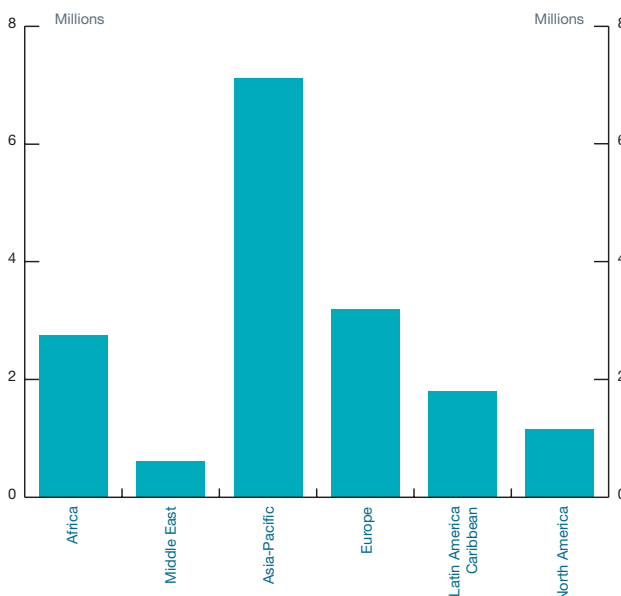
#### The role of tourism in Africa

In Africa, tourism has driven the expansion of the domestic economy and employment. Tourism is key to economic activity in countries such as Mauritius, Morocco, Tunisia, Egypt and Ghana.

Africa has enjoyed the fastest growth of tourist arrivals worldwide in recent years, although this partly reflects its low starting point. The recent expansion has been particularly strong in Tanzania, Ghana and Senegal – driven by an active promotion of nature-based tourism. Tourism to the African islands has also been buoyant. Not surprisingly, these countries have also been among the fastest-growing African economies.

There is also an association between tourism, investment and standards of living. The African non-oil economies with the fastest growth in investment and the highest GDP per capita tend to be those with the largest share of tourism in GDP. This is particularly the case for Tunisia, Mauritius, Morocco, and Egypt. This is evidence of a virtuous cycle where the tourism potential of a country attracts foreign and local investment, inducing and supporting economic growth and improving the living conditions of the population.

Tourism-related employment supported by air, 2004



Source: OEF, 2004

# The economic benefits of air transport

## Air transport is a significant tax payer

The air transport industry finances its infrastructure through user charges and also pays taxes to national treasuries.

The air transport industry finances its infrastructure through user charges and also pays taxes to national treasuries. It is, therefore, totally misleading to suggest that aviation enjoys tax privileges versus other transport modes.

Airlines pay some US\$ 42 billion<sup>28</sup> each year to airports and air navigation service providers. This includes specific user charges, such as landing, air navigation and passenger service charges, for domestic and international traffic worldwide.

### The difference between user charges and taxes

User charges defray the costs of providing facilities and services for civil aviation. Taxes are generally levied to raise general governmental revenues that are not applied directly for aviation purposes.

### Levying user charges

The air transport industry covers its infrastructure costs (airport operations and air traffic management) through the payment of user charges, by airlines to airports and air navigation services providers. These charges are generally included and sometimes identified in the price of the airline ticket.

### Levying taxation

The air transport industry pays substantial taxes to local, provincial and national authorities around the world via passenger duties, domestic value-added tax (VAT), customs or immigration levies, etc. In the United States, for example, taxes levied on aviation exceeded US\$ 14 billion in 2004, corresponding to 25% of airfares<sup>29</sup>.

### Air transport is the only transport mode that pays both user charges and taxes

In the road and rail sectors, user charges are not applied as such except in the case of some highways that apply a toll charge to road users.

- In the road sector, governments levy taxes such as fuel taxes, which in turn balance state investments in road networks.
- In the rail sector, governments levy taxes such as VAT, eco-taxes, etc. that are included in the rail ticket price. However, total revenues collected in this way are not sufficient to fully cover the rail sector's infrastructure costs, which is why most States heavily subsidise this sector. In Europe, for example, governmental aid to the rail sector represents close to US\$ 50 billion per year.

### Air transport makes a net contribution to public funds in the developed world

According to a recent study<sup>30</sup>, air transport frequently makes a net contribution to public funds. This study compares road, rail and aviation in terms of infrastructure costs versus taxes and charges per 1,000 revenue-kilometre (000 rkm):

- Germany: aviation infrastructure costs represent US\$ 112 per 000 rkm, while user charges and taxes generate US\$ 125, thus resulting in a net surplus of US\$13 per 000 rkm. Conversely, revenues from German rail users represent US\$ 41 per 000 rkm, while infrastructure costs amount to US\$ 107, thus resulting in a public subsidy of US\$ 66 per 000 rkm.
- United Kingdom: aviation's net contribution to public funds is around US\$ 14 per 000 rkm while government subsidies for rail correspond to US\$ 43.
- France: the situation is comparable with a net contribution of aviation to public funds of around US\$ 83 per 000 rkm and government subsidies for rail of US\$ 97.

Aviation pays for all of its infrastructure costs, and more, through taxes and user charges – making a net contribution to public funds in most developed States.

<sup>28</sup> IATA

<sup>29</sup> Air Transport Association of America (ATA)

<sup>30</sup> Mott Mac Donald (February 2005) 'Comparison of Taxation and Subsidy for Transport Modes around the World'

# The social benefits of air transport

Air transport expands the range of consumer choices and opportunities to visit other countries and to experience new cultures.

The impact of the air transport industry is not just a result of the economic activity it generates or facilitates. Air transport also contributes to people's quality of life in a number of other ways that are not captured in standard economic indicators: for example, by contributing to sustainable development, supporting remote communities and widening consumer choice.

## Air transport contributes to sustainable development

Air transport makes a major contribution to sustainable development by supporting and promoting international tourism. Tourism helps reduce poverty by generating economic growth, providing employment opportunities, increasing tax collection, and by fostering the development and conservation of protected areas and the environment.

In effect, protecting the environment attracts tourism and the development of the tourism industry, which in turn makes it possible to finance the protection of nature and cultural heritage, thereby increasing the benefits of protected areas to the country. Moreover, the promotion of nature-based tourism is an effective lobbying tool that favours nature conservation over non-sustainable agricultural activities. It can also increase the sense of ownership and responsibility for natural resources, among local communities.

### Sustainable development in Africa

Air transport can make a significant contribution to sustainable development in Africa. This continent is home to nearly 15% of the total protected areas worldwide, giving Africa a valuable comparative advantage in attracting international visitors. The expansion of nature-based tourism (eco-tourism) could become a significant source of revenue and employment, whilst helping to ensure the conservation of protected areas.

## Air transport provides access to remote areas

Air transport provides access to remote areas where other transport modes are limited, thus opening them up to contact with other communities, and providing a means for the delivery of essential supplies. Many essential services such as hospitals, education, post, etc. would not be available for people in such locations, without the presence of air services.

## Air transport delivers humanitarian aid

Air services play an essential role in humanitarian assistance to countries facing natural disasters, famine and war – through cargo deliveries, refugee transfers or the evacuation of people trapped by natural disasters. They are particularly important in situations where access is a problem.

Natural disasters often mean that whole communities are cut off. Humanitarian assistance in such circumstances can only be delivered rapidly to those in need through the use of airports and air services. In certain circumstances when even the airports are damaged, 'air drops' are among the first response of aid agencies to stem a humanitarian crisis.

Air transport also plays a vital role in the rapid delivery of medical supplies and organs for transplantation worldwide.

## Air transport contributes to consumer welfare

Travel and tourism provide substantial consumer welfare and social benefits.

- **Increasing understanding of different cultures and nationalities** which facilitates closer international integration.
- **Improving living standards by widening choice:** cheaper and more frequent access to air travel has increased the range of potential holiday destinations. Seasonal fruit and vegetables are now available year round at reasonable prices. The large number of overseas visitors has also helped widen the range of leisure and cultural activities available in many countries.

## Air transport is fundamental for effective humanitarian aid-relief.

Air transport plays a vital role in the rapid delivery of medical supplies and organs for transplantation worldwide.

## Conclusions

Since the beginning of time, people have dreamed of flying. This dream has become a reality for a growing number of us.

Air transport is an innovative and environmentally-responsible industry that drives economic and social progress. It has become one of the greatest contributors to the advancement of modern-day society and is the consumer's preferred mode of transportation.

This new ATAG brochure confirms air transport's enormous economic and social benefits by providing an update to reliable findings at both worldwide and regional levels. The information provided is essential in order for governments and industry to take sound decisions and responsible actions, working in close partnership.

The air transport industry has responded to the growing demand for mobility, by investing regularly in:

- new technologies;
- safety and security improvements;
- quieter and more fuel-efficient aircraft;
- infrastructure modernisation and adaptation; and
- business simplification, improved services and facilitation for its customers.

"In more than 50 years with ICAO, I have witnessed the extraordinary contribution of civil aviation to national, regional and global economies. When ICAO was created in 1944, barely 9 million passengers travelled on the world's airlines. In 2004, there were close to 1.9 billion passengers on scheduled services alone, while 37.7 million tonnes of freight were transported by air. This activity was supported by extensive airport and air navigation facilities and a dynamic manufacturing sector for aircraft, engines and avionics. Air transport generates millions of jobs and supports many more millions in associated industries, including the world's largest – travel & tourism."

Dr Assad Kotaite, President of the ICAO Council

The air transport industry's efforts must be matched by government action and investment. Governments are urged to:

- further liberalise aviation markets without micro-managing the industry nor over-taxing it;
- provide a suitable framework for a mass transportation system without perpetuating nationalistic rules nor distorting competition through subsidies; and
- support infrastructure improvements – through new and shorter air routes, increased airport capacity and improved ground access to airports – without imposing unreasonable conditions nor restricting the industry's sustainable growth.

People want to fly!

Let's make it possible for each and everyone of us now and in the future.

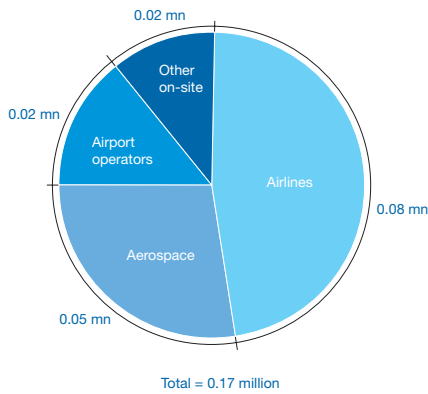


# Economic impact per region

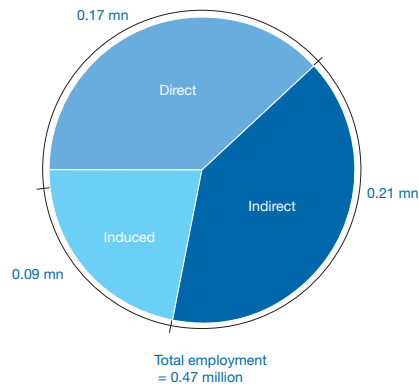
## Africa (2004)

The air transport industry generates around 470,000 jobs in Africa and contributes more than US\$ 11.3 billion to African GDP (direct, indirect and induced impacts). If catalytic impacts are included, the number of jobs increases to 3.1 million and GDP to US\$ 55.5 billion.

Direct employment  
in the air transport industry



Total employment  
in the air transport industry



Direct and total employment and GDP (2004)

	Employment		GDP US\$ million	
	Direct	Total (incl. direct, indirect & induced)	Direct	Total (incl. direct, indirect & induced)
Airport operators	21,459	56,331	816	2,141
Other on-site airport jobs	17,849	46,852	49	129
Airlines	82,562	216,725	2,851	7,485
Aerospace	46,486	151,079	483	1,570
<b>Total</b>	<b>168,355</b>	<b>470,986</b>	<b>4,199</b>	<b>11,325</b>

Direct, indirect and induced employment, GDP and gross output (2004)

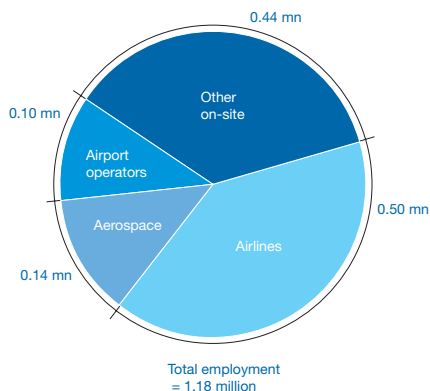
Impact	Employment	GDP US\$ million	Output US\$ million
Direct	168,355	4,199	9,879
Indirect	208,434	4,861	11,166
Induced	94,197	2,265	5,261
<b>Total</b>	<b>470,986</b>	<b>11,325</b>	<b>26,307</b>

# Economic impact per region

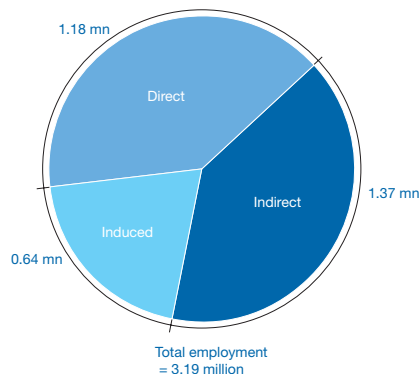
## Asia-Pacific (2004)

The air transport industry generates around 3.2 million jobs in the Asia-Pacific region and contributes more than US\$ 148 billion to Asia-Pacific GDP (direct, indirect and induced impacts). If catalytic impacts are included, the number of jobs increases to 9.8 million and GDP to US\$ 688.5 billion.

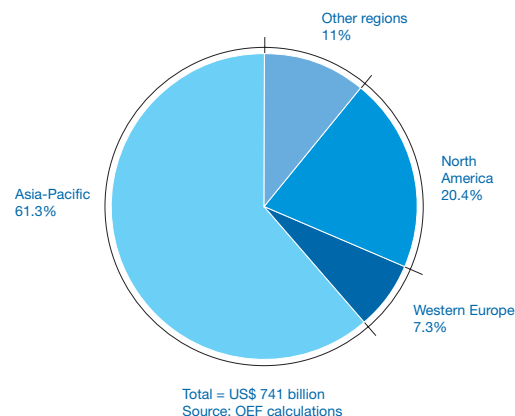
Direct employment  
in the air transport industry



Total employment  
in the air transport industry



Merchandise exports  
by air



Direct and total employment and GDP (2004)

	Employment		GDP US\$ million	
	Direct	Total (incl. direct, indirect & induced)	Direct	Total (incl. direct, indirect & induced)
Airport operators	102,000	267,750	8,477	22,252
Other on-site airport jobs	443,179	1,163,345	5,052	13,262
Airlines	498,613	1,308,859	32,440	85,155
Aerospace	138,272	449,383	8,541	27,757
<b>Total</b>	<b>1,182,064</b>	<b>3,189,336</b>	<b>54,510</b>	<b>148,426</b>

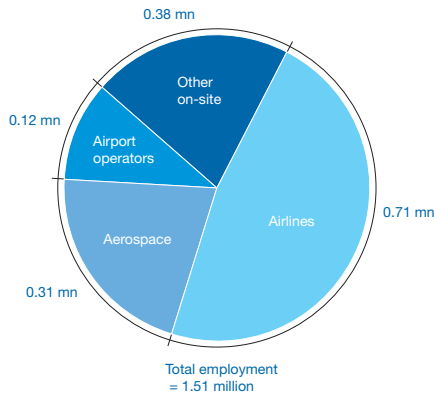
Direct, indirect and induced employment, GDP and gross output (2004)

Impact	Employment	GDP US\$ million	Output US\$ million
Direct	1,182,064	54,510	123,956
Indirect	1,369,406	64,231	145,404
Induced	637,867	29,685	67,340
<b>Total</b>	<b>3,189,336</b>	<b>148,426</b>	<b>336,700</b>

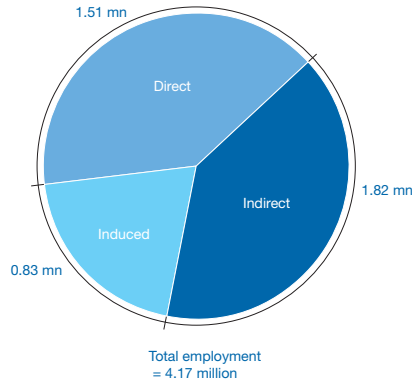
# Economic impact per region Europe (2004)

The air transport industry generates around 4.1 million jobs in Europe and contributes nearly US\$ 274 billion to European GDP (direct, indirect and induced impacts). If catalytic impacts are included, the number of jobs increases to 7.5 million and GDP to US\$ 1,041.7 billion.

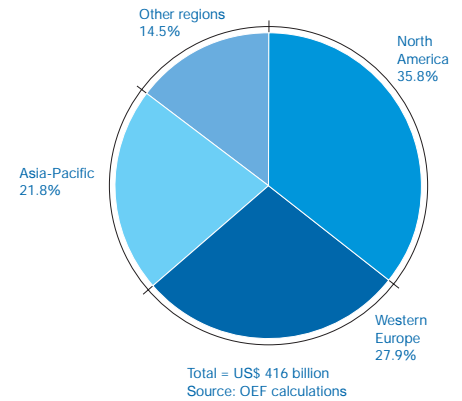
Direct employment  
in the air transport industry



Total employment  
in the air transport industry



Merchandise exports  
by air



Direct and total employment and GDP (2004)

	Employment		GDP US\$ million	
	Direct	Total (incl. direct, indirect & induced)	Direct	Total (incl. direct, indirect & induced)
Airport operators	120,000	315,000	17,312	45,444
Other on-site airport jobs	377,119	989,937	12,656	33,223
Airlines	709,272	1,861,839	44,716	117,380
Aerospace	307,313	998,767	23,871	77,581
<b>Total</b>	<b>1,513,704</b>	<b>4,165,543</b>	<b>98,556</b>	<b>273,628</b>

Direct, indirect and induced employment, GDP and gross output (2004)

Impact	Employment	GDP US\$ million	Output US\$ million
Direct	1,513,704	98,556	211,680
Indirect	1,818,731	120,347	260,966
Induced	833,109	54,726	118,161
<b>Total</b>	<b>4,165,543</b>	<b>273,628</b>	<b>590,807</b>

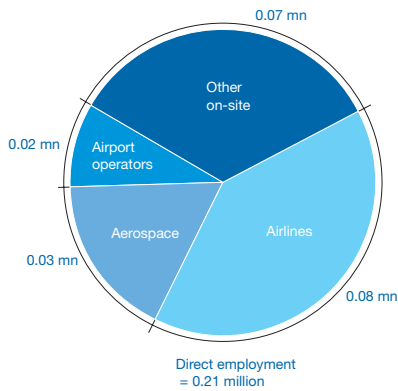
Europe: EU25 and other non-EU countries (e.g. Switzerland), plus Russia and former Soviet Union countries in Eastern Europe (Estonia, Latvia, Lithuania, Belarus, Ukraine, Moldova, etc.).

# Economic impact per region

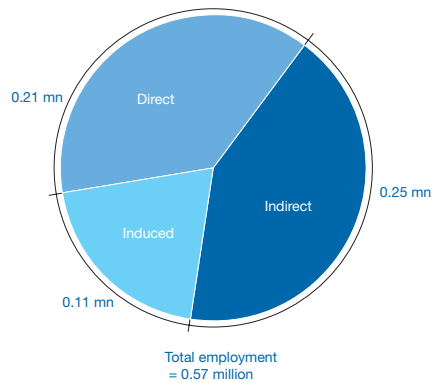
## Latin America and the Caribbean (2004)

The air transport industry generates around 570,000 jobs in Latin America & the Caribbean and contributes more than US\$ 20.6 billion to Latin American & Caribbean GDP (direct, indirect and induced impacts). If catalytic impacts are included, the number of jobs increases to 2.2 million and GDP to US\$ 122 billion.

**Direct employment**  
in the air transport industry



**Total employment**  
in the air transport industry



**Direct and total employment and GDP (2004)**

	Employment		GDP US\$ million	
	Direct	Total (incl. direct, indirect & induced)	Direct	Total (incl. direct, indirect & induced)
Airport operators	19,380	50,873	1,060	2,782
Other on-site airport jobs	72,207	189,545	487	1,278
Airlines	84,250	221,156	5,237	13,748
Aerospace	33,907	110,197	849	2,759
<b>Total</b>	<b>209,744</b>	<b>571,770</b>	<b>7,633</b>	<b>20,566</b>

**Direct, indirect and induced employment, GDP and gross output (2004)**

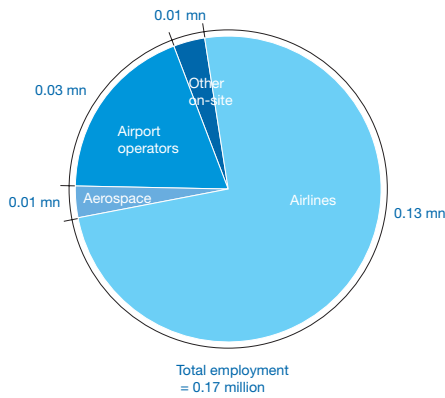
Impact	Employment	GDP US\$ million	Output US\$ million
Direct	209,744	7,633	18,864
Indirect	247,672	8,820	21,523
Induced	114,354	4,113	10,097
<b>Total</b>	<b>571,770</b>	<b>20,566</b>	<b>50,483</b>

# Economic impact per region

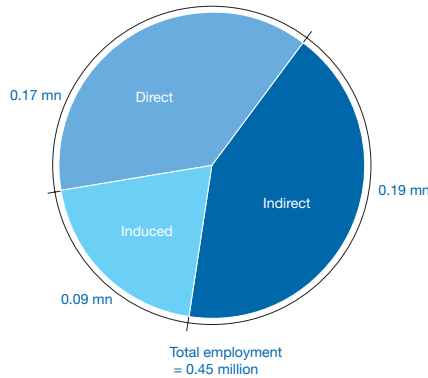
## Middle East (2004)

The air transport industry generates around 450,000 jobs in the Middle East and contributes some US\$ 16.1 billion to Middle Eastern GDP (direct, indirect and induced impacts). If catalytic impacts are included, the number of jobs increases to 1 million and GDP to US\$ 122 billion.

Direct employment  
in the air transport industry



Total employment  
in the air transport industry



Direct and total employment and GDP (2004)

	Employment		GDP US\$ million	
	Direct	Total (incl. direct, indirect & induced)	Direct	Total (incl. direct, indirect & induced)
Airport operators	28,521	74,867	1,084	2,846
Other on-site airport jobs	8,395	22,037	93	244
Airlines	127,764	335,379	3,967	10,413
Aerospace	5,003	16,261	814	2,645
<b>Total</b>	<b>169,683</b>	<b>448,544</b>	<b>5,958</b>	<b>16,148</b>

Direct, indirect and induced employment, GDP and gross output (2004)

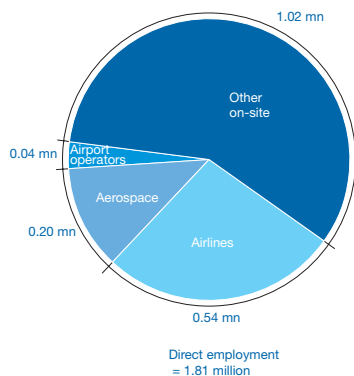
Impact	Employment	GDP US\$ million	Output US\$ million
Direct	169,683	5,958	14,835
Indirect	189,153	6,961	17,411
Induced	89,709	3,230	8,062
<b>Total</b>	<b>448,544</b>	<b>16,148</b>	<b>40,308</b>

# Economic impact per region

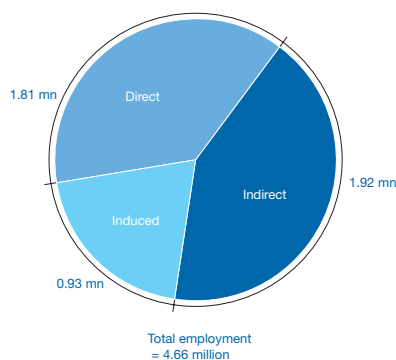
## North America (2004)

The air transport industry generates around 4.7 million jobs in North America and contributes nearly US\$ 410 billion to North American GDP (direct, indirect and induced impacts). If catalytic impacts are included, the number of jobs increases to 5.4 million and GDP to US\$ 992.8 billion

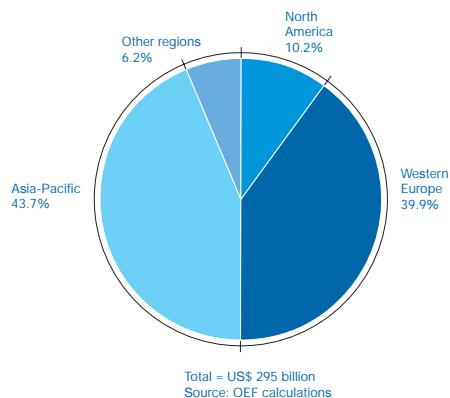
Direct employment in the air transport industry



Total employment in the air transport industry



Merchandise exports by air



Direct and total employment and GDP (2004)

	Employment		GDP US\$ million	
	Direct	Total (incl. direct, indirect & induced)	Direct	Total (incl. direct, indirect & induced)
Airport operators	42,840	107,100	10,231	25,577
Other on-site airport jobs	1,024,099	2,560,248	73,022	182,556
Airlines	544,778	1,361,944	55,672	139,180
Aerospace	195,387	635,007	19,172	62,308
<b>Total</b>	<b>1,807,103</b>	<b>4,664,298</b>	<b>158,097</b>	<b>409,620</b>

Direct, indirect and induced employment, GDP and gross output (2004)

Impact	Employment	GDP US\$ million	Output US\$ million
Direct	1,807,103	158,097	314,826
Indirect	1,924,335	169,599	341,107
Induced	932,860	81,924	163,983
<b>Total</b>	<b>4,664,298</b>	<b>409,620</b>	<b>819,916</b>

## Glossary and abbreviations

ACARE	Advisory Council for Aeronautics Research in Europe
ACI	Airports Council International
Air transport industry	Aviation and civil aerospace sectors
ATA	Air Transport Association of America
ATAG	Air Transport Action Group
ATC	Air traffic control
Aviation sector	Airports, airlines, commercial aviation, activities directly serving passengers or providing airfreight services, air navigation service providers
Balance of payments	The difference between a country's exports and imports of goods and services
CAAS	Civil Aviation Authority of Singapore
CANSO	Civil Air Navigation Services Organisation
Catalytic impact of air transport	Impact on industries that are outside (includes tourism) of air transport
Civil aerospace sector	Manufacture and maintenance of aircraft systems, frames and engines
dB	Decibels
Direct impact of air transport	Employment and activity within the air transport industry
Economies of scale	Where the average cost of production decreases as output increases
GDP	Gross Domestic Product. The 'total market' value of all final goods and services produced in a country.
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
Indirect impact of air transport	Employment and activity linked to supplying the air transport industry
Induced impact of air transport	Employment and activity supported by the spending of air transport employees (e.g. suppliers of goods and services that employees purchase)
IPCC	Intergovernmental panel on climate change
Intraregional trade	Trade (excluding domestic) within a region
Interregional trade	Trade between different regions
Labour productivity	Contribution to the global economy, per worker
Mercosur	South American Free Trade Association
NAFTA	North American Free Trade Agreement
NASA	National Aeronautics and Space Administration
OEF	Oxford Economic Forecasting
Productivity per worker	The amount of output or GDP per worker
Spin-off effect of air transport	Impact on industries that are outside (includes tourism) of air transport
VAT	Value added tax
WTO	World Trade Organization
WTO-OMT	World Tourism Organisation-Organisation Mondiale du Tourisme
WTTC	World Travel & Tourism Council

This brochure is based on 2004 figures and estimations.

Oxford Economic Forecasting (OEF) undertook the research for this brochure.

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