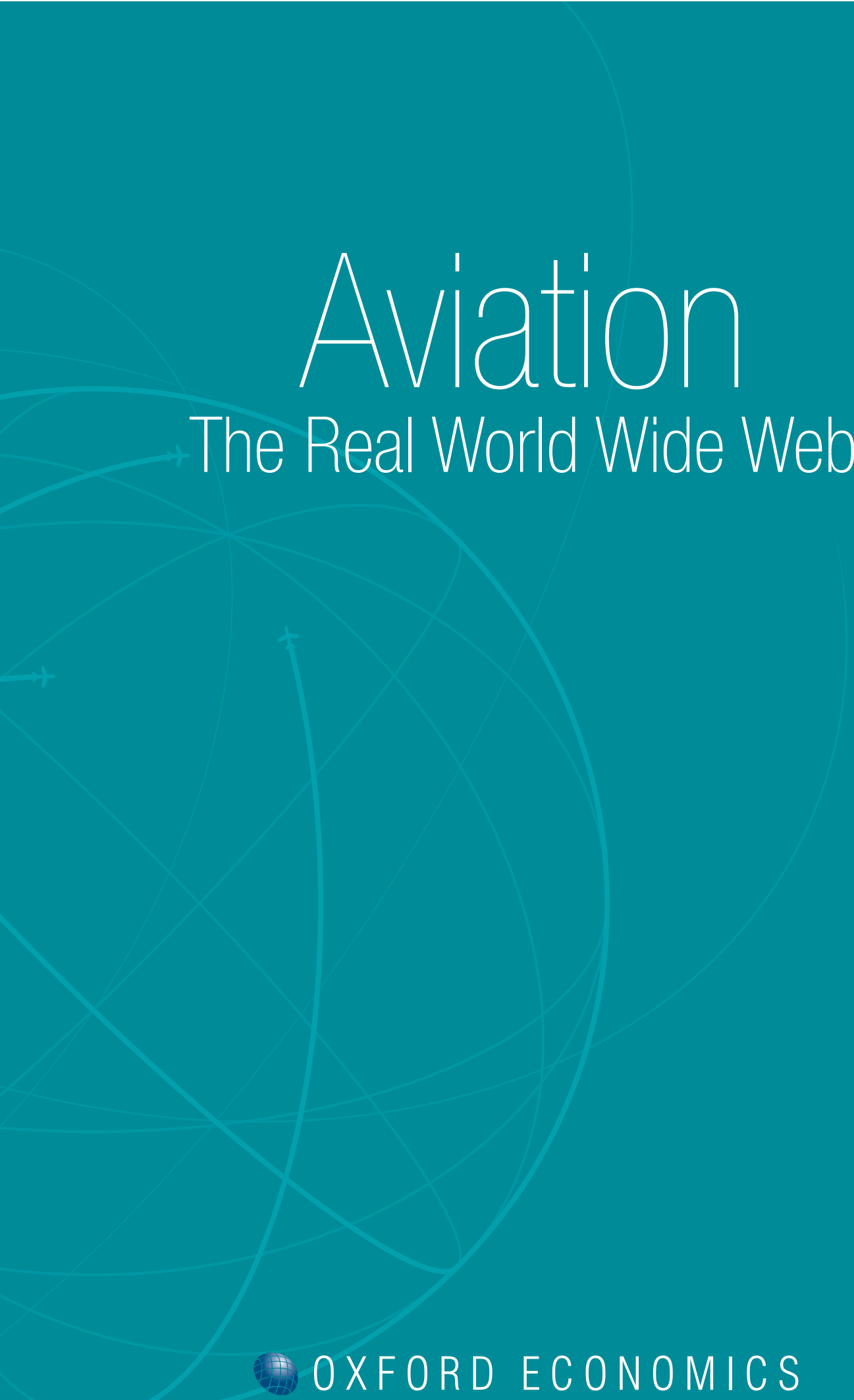
Aviation

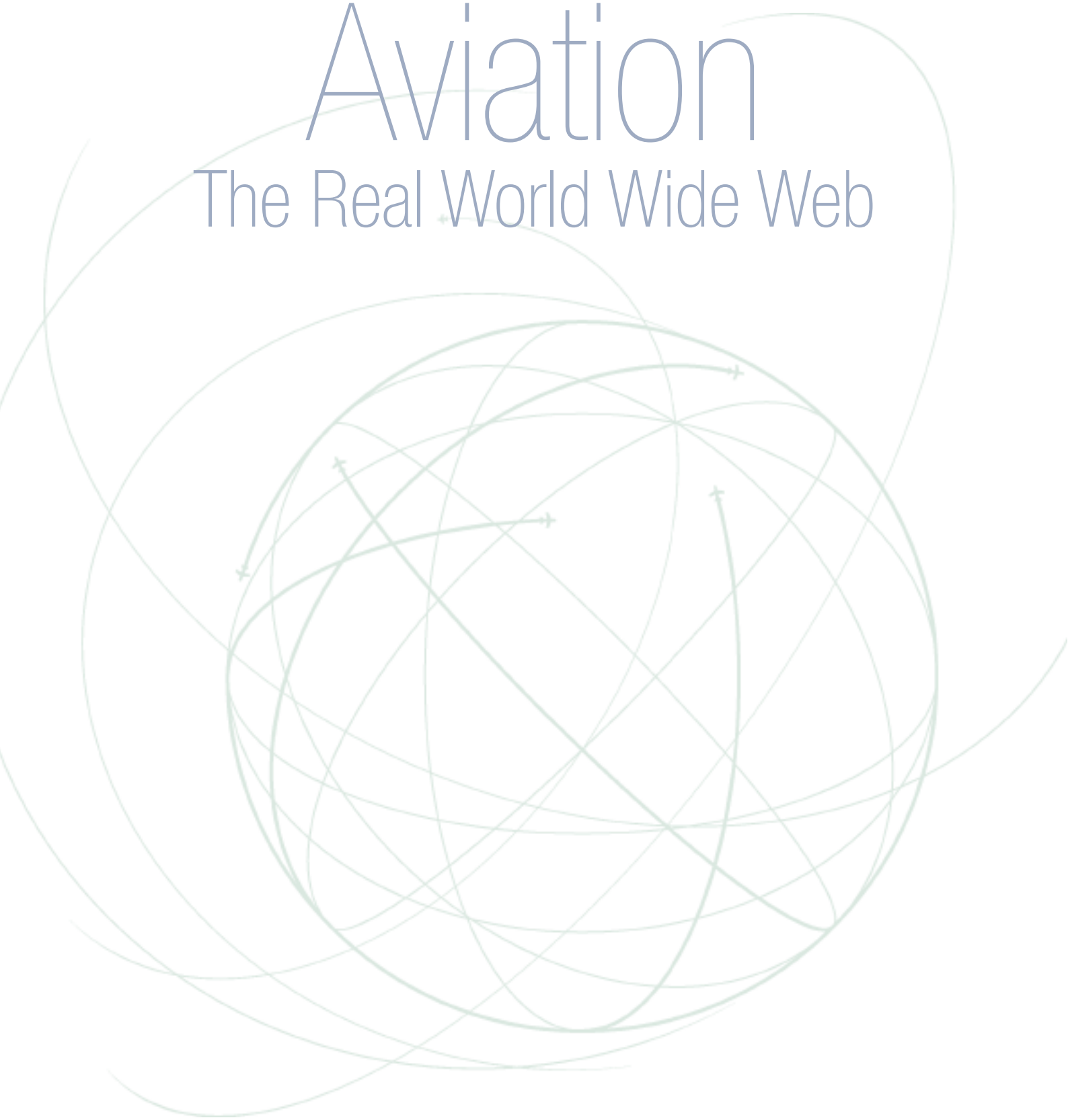
The Real World Wide Web



OXFORD ECONOMICS

Aviation

The Real World Wide Web



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Key conclusions

The direct economic benefits of the aviation industry:

- Air transport lies at the heart of modern, globalised economies: a total of 2.5 billion passengers and approximately 50 million tonnes of freight are flown worldwide annually.
- Over 5.5 million workers are employed directly in the industry worldwide, with a turnover of more than US$1 trillion. If aviation was a country, it would rank 21st in the world in terms of Gross Domestic Product (GDP), generating US$425 billion of GDP, which is considerably larger than some members of the G20.
- Aviation, its supply chain and the spending of employees in these businesses support more than 15 million jobs and US$1.1 trillion of GDP worldwide. Taking into account the additional industries that depend on air transport these figures are even larger. For example, just including air transport's contribution to tourism the figures grow to over 33 million jobs and US$1.5 trillion of GDP. As a country this would rank aviation's position eighth between Italy and Spain.
- Aviation gives companies fast, efficient access to markets and stimulates international trade. A key advantage of air transport over other forms of transport is its guarantee of shorter, more predictable journey times over longer routes, with studies showing that improved shipping times play a key role in the growth of world trade: a 20 day shipping time is equivalent to slapping a 16% tariff on imports and for some perishable goods and medicines, there is simply no alternative.
- As of 2007 35% of the value of trade in manufactured goods (US$3.5 trillion) is transported by air, and air freight has increased by 65% in 10 years.
- Aviation facilitates a growing freedom of movement of goods, workers and tourists, thereby increasing international investment and stimulating growth. A survey of over 600 companies by IATA found 80% of firms reporting air transport as important to efficiency and 50% regarding it as vital.
- The investment resulting from improved air transport networks can give workers in developing countries access to higher, more stable incomes.
- Aviation enhances efficiencies through economies of scale, increased competition, intensified innovation and access to wider pools of employees. In particular, the benefits to society of R&D spending by the aerospace industry are estimated to be much higher than in manufacturing as a whole – every US$100 million of R&D eventually generating additional GDP of US$70 million year-after-year.

Beyond the multiple economic benefits, air transport has radically changed how economies and societies operate and interact. The continued growth of the industry:

- Makes global travel more accessible to more people than at any time in history.
- Diffuses the knowledge gained from investment in research and development, and multiplies the effects of innovation across economies.
- Helps maintain social networks for the increasing numbers of migrants in modern, globalised economies. In turn these migrants often help their home economy by sending money back to their families. In some countries, these foreign currency remittances can account for over 30% of GDP.
- Fosters the protection of fragile ecosystems by increasing awareness of preservation initiatives and boosting sustainable ecotourism.
- Amplifies the benefits of cross-cultural exchange, bringing visitors to countries with native cultures.

By 2026:

- Airbus projects the number of passengers to rise by 145% between 2007 and 2026 from just below 2.5 billion to 6 billion.
- Air transport will directly employ some 8.5 million people and contribute US$1 trillion to world GDP.
- Measuring across aviation, its supply chain, and the spending of employees in these businesses, the industry will support 23 million jobs and US$2.6 trillion of GDP.
- When you also take account of the contribution air transport makes to tourism, this grows to 50 million jobs and US$3.6 trillion of GDP; even more when you consider the impact of other industries dependent on aviation that are harder to measure.

However, should growth in passenger and cargo traffic be one percentage point lower than currently forecast for 2007-26:

- The number of jobs supported by air transport would be reduced by 6 million to 44 million and the contribution to GDP by US$600 billion.
- The job losses would equate to around 2 million in Asia-Pacific, 1.5 million each in Europe and North America, 400-500 thousand each in Africa and Latin America and over 200,000 in the Middle East.

Stopping or reducing air transport would not automatically lower emissions. This would depend on:

- the level of emissions released directly by air transport and its supply chain;
- the level of emissions released by the alternative forms of transport and related infrastructure that replace aviation, as well as their supply chains;
- the level of emissions released directly by the replacement activity; and its supply chain.

CONTENTS

* Visiting friends and relatives

Impact Report: Part I

1. Introduction

We live on a planet that is now more interconnected than at any time in history. In tandem with the great swathes of information that now swirl worldwide at the click of a mouse, vast movements of goods and people happen everyday in the skies above us; our globalised world has long been woven together by a web of flights, creating ever-expanding social and economic networks across the planet.

As the horse and cart once drove social and commercial interaction between medieval villages and as the oceans acted as waterways for 19th-century trade and exploration, the air transport industry is now the primary network for our global exchange of goods, ideas, and cultures in the 21st century.

The empty skies of the week following 9/11 left many travellers stranded far from home. Yet the social and economic effects left a deeper sense of isolation and disconnect: the sudden disruption proved that the skies now linked economies and societies in ways that are practically irreversible. The price paid for a regression into a past, where long-transcended borders are reinstated, would be a sacrifice of the very normalcy of our modern lives. How many countries or individuals would readily sacrifice the benefits, convenience and freedom of movement which the air transport industry provides?

Many of the benefits of sustained growth in the air transport industry are self-evident: increased living standards through trade, improved communications and security, travel and leisure benefits, cultural exchange and social connectivity.

Increasingly, however, the potential negative effects are now being questioned. Many ask what price we really pay in terms of carbon emissions. Others question whether improved consumer choice always benefits local producers in developing countries.

This report will assess many aspects of the global air transport industry, including the direct and indirect benefits that increased access to flight offers individuals, economies and societies. We will examine the industry in the context of its effects worldwide, including case studies on the impact of air transport on modern lives in various regions around the globe. The report will ultimately point to ways in which continued growth in the industry can act as a force for economic and social progress and help to shape a better future for many of the world's citizens.

2. Air transport: A major global industry on a par with some G20 economies

In 2007, the air transport industry transported around 2.5 billion passengers and nearly 50 million tonnes of freight worldwide. Aviation accounted for around 2% of global man-made green house gas emissions in 2004. Passenger journeys of over 1,500 kilometres, for which no practical alternatives exist, account for 80% of aviation's green house gas emissions and 35% of world trade by value is dependent on aviation.

The air transport industry directly employed over 5.5 million people in a broad range of positions, generating US$1.1 trillion in turnover and US$425 billion in value added (Table 2.1). Comparing the industry to a country, its Gross Domestic Product (GDP) (a widely used measure of value-added) is roughly equal to that of Switzerland or Poland, which would rank it 21st in the world and make it bigger than some current members of the G20.

Table 2.1 Air Transport's economic and social benefits in 2007

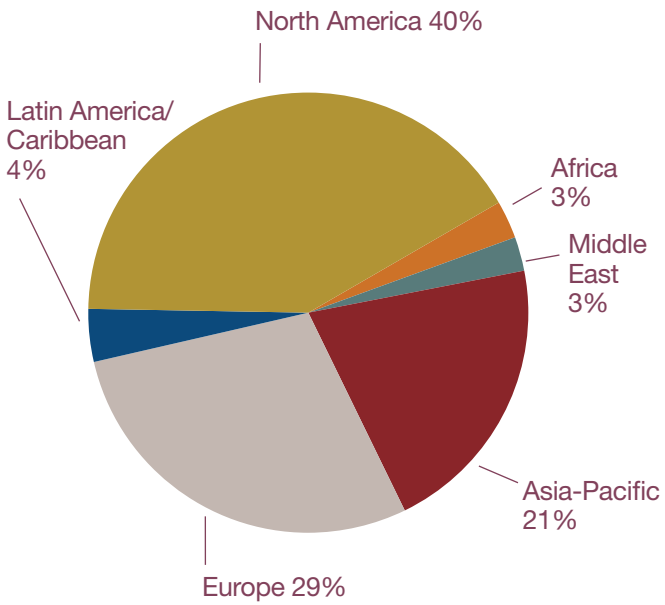
	EMPLOYMENT Direct ('000s)	GDP Direct (US$bn)
Africa	158	4
Middle East	143	6
Asia-Pacific	1,177	62
Europe	1,617	134
Latin America/ Caribbean	226	8
North America	2,333	212
Global	**5,655**	**425**

Source: Oxford Economics
All figures rounded. Total of items may differ from listed sum.

Compared with the GDP contribution of other sectors, the global air transport industry is larger than the pharmaceuticals (US$270 billion), the textiles (US$286 billion) or the motor production industries (US$322 billion) and around half as big as the global chemicals (US$846 billion) and electronic engineering (US$799 billion) sectors.

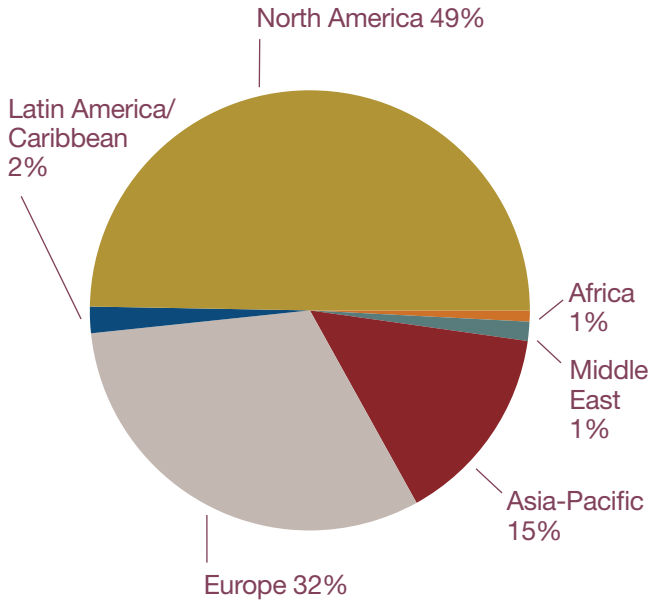
Comparing the size of the air transport industry across regions, North America accounts for about 40-50% of the world total, followed by Europe at around 30% and Asia-Pacific at around 15-20% (Charts 2.1 and 2.2).

Chart 2.1 Shares of direct employment in air transport in world total



Source: Oxford Economics

Chart 2.2 Shares of direct GDP in air transport in world total



Source: Oxford Economics

Jobs in air transport cover a wide range of activities and skills:

- Skilled work by technicians building and maintaining aircraft.
- A diversity of technical engineering jobs, from aircraft design to air traffic control to logistics for airlines and airports, and highly complex IT systems.
- Service industry support jobs such as chefs in catering companies and restaurants at airports.
- Creative positions in design and marketing.
- Customer services occupations in airline ticketing, retailing etc.

The air transport sector generates very high amounts of value added per employee. As shown in Table 2.2, GDP per person employed is four times higher than in the economy as a whole. This is particularly true for the large populations of Asia-Pacific, Africa and Latin America. This points to important benefits from the air transport sector:

- Employees tend to enjoy higher wages than other sectors on average.
- Profits generated can be reinvested in the economy, thereby stimulating long-term sustainable growth.
- Significant tax revenues accrue to local and central governments worldwide (see 'Taxing Times: Air transport and taxation', Part III, page 113).
- Growth in GDP sustains improvements in living standards (see Part IV, page 120).

Table 2.2 GDP per employee in 2007

	Air transport		Whole economy		Ratio air/whole economy
	US$	PPP*	US$	PPP*	
Africa	22,294	41,801	5,609	10,517	4.0
Middle East	43,302	115,808	24,060	64,347	1.8
Asia-Pacific	52,499	111,821	7,305	15,558	7.2
Europe	82,883	91,467	54,976	60,670	1.5
Latin America/Caribbean	35,673	55,841	13,250	20,741	2.7
North America	90,673	90,673	77,420	77,420	1.2
Global	**75,188**	**90,561**	**19,319**	**23,269**	**3.9**

*PPP = Purchasing Power Parity
All figures rounded. Total of items may differ from listed sum.

The air transport sector's contribution to the economy is much wider and further-reaching than the direct contribution. Many companies rely on the industry as a source of prime customers and profit from its growth. The indirect contribution of the industry includes jobs and activity generated along its supply chain. This covers a diversity of industries and services, from suppliers of aircraft materials to services companies fulfilling insurance, accounting or catering needs (see boxes 'The jobs impact of Heathrow airport on the local economy' and 'Why the Texan economy thrives under the "lone star" sky'). Growth in air transport permeates to supplier industries via increased orders. Moreover, as those employed directly and indirectly purchase goods and services, activity is stimulated throughout the economy – an effect known as the induced contribution.

Taking account of the purchases of air transport companies from other sectors of the economy,[1] i.e. the indirect effects, shows that for every dollar of value added directly generated in the air transport sector, more than one dollar is generated in the supply chain. Similarly, for every job directly generated by the air transport industry, more than one job is created indirectly in the supply chain (Table 2.3). Spending by employees in air transport and its supply chain helps support a quarter as much additional value added and jobs elsewhere in the economy.

[1] Some parts of the industry purchase goods or services from other parts (e.g. airlines purchase aircraft from aircraft manufacturers). As these intra-industry purchases are captured in the calculations of the direct impacts they are excluded from the estimation of indirect effects that focus on purchases from outside the sector.

Table 2.3 Air transport's economic and social benefits in 2007

	Employment ('000s)		GDP (US$bn)	
	Indirect	Induced	Indirect	Induced
Africa	199	89	4	2
Middle East	160	76	7	3
Asia-Pacific	1,375	638	74	34
Europe	1,949	892	167	75
Latin America/Caribbean	267	123	9	4
North America	2,480	1,203	229	110
Global	**6,430**	**3,021**	**490**	**229**

Source: Oxford Economics
All figures rounded. Total of items may differ from listed sum.

Combining the direct, indirect and induced contributions, the sector supports more than 15 million jobs globally and contributes US$1.1 trillion to world GDP.

The air transport industry relies on a wide range of suppliers that provide essential goods and services. In turn, these companies benefit from having air transport companies as customers through the sales that this generates and the quality image that this gives to their company. The range of suppliers is long and surprisingly diverse. Too long to list exhaustively. Some examples include:

- Suppliers of aviation materials used in aircraft and engine manufacture, maintenance and repair.
- Providers of technical training services.
- Companies selling test equipment for aircraft and the wide variety of other equipment used by airlines and airport operators.
- Suppliers of interior equipment for aircraft: insulation equipment, safety kits, seating etc.
- Companies providing services that ensure smooth airline operations, which can be as diverse as financial management software, in-flight catering, airline booking, check-in equipment etc.
- Specialist suppliers of aviation software that may be used for crew scheduling, maintenance planning, simulation systems etc.
- Suppliers of ground support equipment including baggage handling, cargo handling and airfield services.

The box on Heathrow airport illustrates how a major aviation hub creates opportunities for people and businesses located in nearby communities, while the box on Texas, 'Why the Texan economy thrives under the "lone star" sky', demonstrates the key role aviation plays in the success of the State's geographically dispersed economy.

The jobs impact of Heathrow airport on the local economy

The jobs data for the local authority areas around Heathrow airport demonstrate the key role it plays in this otherwise relatively deprived area of London.

Heathrow airport employs 72,000 people and supports another 100,000 jobs in the area. Nearly half of the 72,000 people directly employed at Heathrow live in the 5 boroughs adjacent to the airport (see table below).

Proportion of residents in the boroughs surrounding Heathrow that work in the airport

Local authority	Total number of people in employment	Number of people employed at Heathrow	% of people in employment who work at Heathrow	Proportion who work at Heathrow
Ealing	142,700	5,312	3.7%	1 in 27
Hilingdon	120,400	8,254	6.9%	1 in 15
Hounslow	107,200	10,695	10.0%	1 in 10
Slough	59,700	3,015	5.1%	1 in 20
Spelthorne	45,700	5,240	11.5%	1 in 9
Total	**475,700**	**32,516**	**6.8%**	**1 in 15**

Source: BAA corporate responsibility Report, 2007
All figures rounded. Total of items may differ from listed sum.

To ease labour supply constraints and to leverage the impact on the local economy, Heathrow airport has engaged formally with the surrounding communities. This public-private partnership, the Heathrow City Growth Strategy, provides resources to expedite regeneration projects near the airport.

In particular, Heathrow has provided significant work opportunities for residents through the creation of jobs and investment in skills. For example, the Heathrow Local Labour Strategy gives opportunities to unemployed local residents to access airport jobs and improve their skills.

With retailers struggling to recruit and retain staff with the necessary skills, and with many jobs awaiting the opening of Terminal 5, the Heathrow Retail Academy was set up to help bridge the skills gap and give local people opportunities to start retail careers at the airport. The Academy is a partnership between retailers, training and recruitment companies, local charities and Thames Valley University, which awards accredited qualifications.

Heathrow airport has also committed to engage with local businesses: 'Meet the Buyer' events give local businesses the chance to sell their products and services directly to airport companies. In 2007, the event attracted 474 local companies and 23% of buyers said they would definitely be placing order with companies they met at the event.

Source: BAA 2007 Corporate Responsibility Report, 2007

Case Study:

Why the Texan economy thrives under the 'lone star' sky

Residents of the Lone Star State take pride in a history of being different, open, adaptable and resourceful. They have lived at the intersection of two very different cultures for centuries: these days planes crisscross the skies of Texas every day, carrying a wealth of goods and passengers, not just south of the border, but to all points national and global.

Texas covers an area greater than France. However, with a population of 24 million concentrated in a handful of metropolitan areas, large swathes of this desert and prairie state are sparsely populated. This makes air travel an efficient mode of transport both intra-State and to and from other parts of North America and abroad.

Tourism is an important export-oriented industry for Texas. The industry generated a direct GDP contribution of US$23 billion in 2007, around 2% of the State total. The industry is an important source of tax revenue, providing 8% of local and State taxes. Without aviation a significant part of this economic impact on Texas would be lost. During 2007 16.6 million visitors travelled to Texan destinations by air. This represents about 15% of all overnight visitors to the state and about one half of all, potentially higher spending, out-of-state overnight visitors.

Texas is the largest exporter of any of the United States, with a high degree of specialisation in sectors such as information technology (Texas Instruments, Electronic Data Systems, AT&T), and oil and natural gas (Exxon Mobil, ConocoPhillips).

Aerospace and aviation have also traditionally had a very strong presence in Texas. The Lyndon B. Johnson Space Centre in Houston is home to NASA. Southwest Airlines (largest airline in the world by number of passengers carried) has its headquarters in Dallas and Continental Airlines is based in Houston at the airline's biggest hub. In addition, Lockheed Martin's Aeronautics division is located in Fort Worth.

In 2007 Dallas Fort Worth International Airport, with 685,000 was the third busiest airport in the world in terms of aircraft movements, the seventh busiest in terms of passenger numbers – almost 60 million; and was rated as the 'Best Cargo Airport in the World' in the Air Cargo World Survey. George Bush Intercontinental Airport in Houston is the sixth busiest in the world in terms of aircraft movements and the sixteenth busiest in the world in terms of passenger numbers in 2007.

In 2005, aviation services in Texas generated 524,000 jobs and US$27 billion of GDP through direct and indirect activity, and a further 259,000 jobs and US$8 billion of GDP through induced effects. In total, aviation services were responsible for 4.9% of GDP and 7.25% of jobs in Texas and generated employee earnings of US$21 billion, an average of US$26,200.

When aircraft manufacturing and related activities are added, the aggregate number of aviation related jobs in Texas is almost 1 million, 10.7% of all Texan jobs, while the total GDP impact is US$127 billion, or 12.8% of the total Texan GDP.

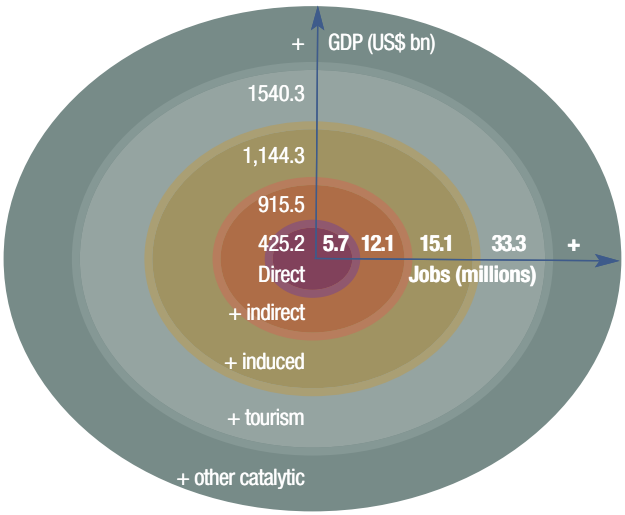
See case study 'Why the Texan economy thrives under the "lone star" sky', Part III, page 75.

Catalytic Impacts: As described in the next chapter and in the case studies in Part III, aviation plays an enabling role across economies, far wider than its immediate contribution across its supply chain. The ways in which the air transport industry influences other sectors include:

- Opening up new markets and favouring international trade.
- Spurring growth in the tourism sector.
- Encouraging companies to invest in one country or region driving efficiency gains.
- Enabling people to work abroad and companies to access a wider pool of qualified workers.

In such ways, the availability of air transport changes how economies operate and enables development in many other sectors. For detailed examples of catalytic impacts, see the box: 'Memphis airport and Etihad Airways: how aviation goes beyond the direct trade benefits'.

Chart 2.3 Contributions of air transport to the global economy



Source: Oxford Economics

How aviation goes beyond the direct trade benefits

Memphis Airport

Memphis International Airport in the US state of Tennessee is a major international airport particularly in terms of cargo services (the largest in the world). A recent survey of local businesses about their views and use of the airport highlights the many ways in which air transport benefits the economy.

- A recent survey showed that 80% of businesses canvassed use the airport to transport company personnel; close to 60% use the airport to transport customers and business associates, and around 25% to ship supplies in and products out.
- Around 55% agreed or strongly agreed that growth in the airport would automatically cause their businesses to grow.
- The survey indicated that 44% agreed that their company's future decisions to invest in their Memphis facilities will be partly based on the services offered by the airport.

Etihad Airways

Oxford Economics' study of the overall contribution of Etihad Airways to the economy of the Emirate of Abu Dhabi shows that the benefits are far reaching. The airline is one of the key elements of the Emirate's strategy to diversify the economy from its reliance on oil extraction. Based on a survey of businesses, the study showed that:

- International business is mobile and high quality air links are vital to attracting and retaining investment.
- Etihad Airways is integral to the future of Abu Dhabi as a tourism destination – providing broad and absolutely vital access to visitor markets.
- The Etihad brand has already been recognised for a high level of customer service and amenities. Awards & accolades (and the travel experiences they represent) are directly raising the stock of 'destination Abu Dhabi'.
- The airline not only provides air services to major markets, but is an active partner in generating visitor demand. In this sense, Etihad supplies added assurance of investor returns and mitigates certain areas of risk.
- Most importantly, the findings of the study have played a key role in providing quantitative evidence to shareholders of the long-term impact of Etihad Airways on the Abu Dhabi economy. In particular, the study has shown that the balance sheet of Etihad Airways does not represent its true economic value to Abu Dhabi – the overall economic impact is significantly wider.

Source: Memphis-Shelby County Airport Authority; Oxford Economics

These effects correspond to developments that are already deeply rooted in the economic structure of a country or region and boost the population's living standards. Two case studies drawn from the opposite ends of the Americas provide vivid illustrations. The box 'Patagonia: new beginnings at the end of the world' describes the impact of the opening of the new airport at Calafate in Patagonia, the southern-most region of Argentina and Chile. Not only does the new airport connect locals with the rest of the country, it also contributes to diversification within a fragile economy and to raised awareness of threatened ecosystems in one of the Earth's most remote beauty spots. The box 'Air Inuit's Arctic Lifeline: Helping indigenous people in a harsh climate get the best of both worlds' describes how air transport is improving health-care and nutrition at the same time as supporting an ancient culture in the Canadian Arctic.

Case Study:

Patagonia: new beginnings at the end of the world

Patagonia, the sparsely populated wilderness at the southernmost tip of South America is beginning to attract a new breed of visitors.

Among the main attractions is the spectacular Perito Moreno glacier, which forms part of the Southern Patagonian ice-field. A UNESCO World Heritage site, this glacial spectacle is one of the few advancing glaciers in the world. The glacier and its associated ice-fields are now bringing visitors to this remote region at a fast-increasing rate. Until recently, these natural wonders were inaccessible to all but a few adventurers with the luxuries of plentiful time and money. But improved air transport in the region has now put Patagonia within the reach and budget of many more eco-tourists.

Until 2000, reaching El Calafate, the town closest to the glacier and ice-field was a major undertaking, necessitating a flight from Buenos Aries to Rio Gallegos, a 200-mile bus trip on unpaved roads and a day-long trek at least.

The El Calafate airport opened in November 2001, cutting the journey time from Buenos Aries to just three hours. By 2006 passenger arrivals at the airport reached 408,000. The local population has grown in tandem, from around 5,000 in 1996 to 20,000 in 2006. This has driven investment in hotels, shops and local infrastructure. As well as giving easier, faster access to tourists and increased connectivity among a remote local population, the airport is also driving a growing diversification of a narrowly based economy in the region.

The rise in ecotourism is likely to raise environmental awareness and to reinforce support for conservation among visitors. It is also likely to foster an ethos of conservation among locals who seek secure, sustainable livelihoods. Conscious of the growing national awareness of the Perito Moreno site, Greenpeace now use images of the glacier to promote energy-saving light-bulbs in Argentina.

See 'Patagonia: New beginnings at the end of the world', Part III, page 76.

Case Study:

Air Inuit's Arctic Lifeline: Helping indigenous people in a harsh climate get the best of both worlds

For many people living in the Arctic far north, flying is the only means of transport that provides timely access to services, such as health-care, that much of world takes for granted. There are over 200 communities in Alaska and more than 1,050 in northern Russia with no road access.

Nunavik, the area of Quebec north of the 55th parallel, is home to approximately 10,000 people concentrated in fourteen communities along the eastern Hudson Bay coast, the southern shore of the Hudson Strait, and the Ungava coasts. Prior to the arrival of Europeans, Inuit in the region lived a nomadic, subsistence lifestyle in an extremely harsh environment. They traditionally lived in small bands of a few families who followed a seasonal pattern of hunting, fishing and gathering. Nunavik is part of the circumpolar world, comprising (from east to west) Greenland, Labrador, Nunavut, the Inuvialuit region of the Northwest Territories (Canada), Alaska, and Siberia (Russia).

In a region with no ground transportation, the community-owned Air Inuit has built a successful near thirty-year record of providing an essential lifeline in this harshest of environments, via scheduled services, charter, cargo and emergency flights. Now employing more than 400 people, Air Inuit has carried over 1.3 million passengers on its flights.

The airline also supports year-round, Nunavik-wide cultural activities such as music festivals, sporting events and study groups. Via the company's Wings of Knowledge Bursary program, Air Inuit encourages and enables young people in Nunavik to pursue career ambitions. Another beneficiary is the Avataq Cultural Institute, which, through its language, heritage and cultural programmes, strives to support and preserve Inuit culture for present and future generations.

In terms of care, the airline's role is widening. As well as providing a vital link to medical services for patients in need of treatment beyond the local-facilities, the airline is also sponsors pilot projects to promote healthier diets and well-being. Diets in Arctic regions tend to be deficient in vitamin A and D, the latter partly due to lack of strong sunlight for much of the year. By offering reduced air-cargo rates for priority perishable foods – such as milk, cheese, yogurt, fruit, vegetables, frozen juice concentrate and eggs – the project aims to combat these diet deficiencies by lowering the costs to the Inuit consumer.

See 'Air Inuit's Arctic Lifeline: Helping indigenous people in a harsh climate get the best of both worlds' Part III, page 77.

The catalytic impacts will be reinforced if air travel becomes more accessible to lower-income households and smaller businesses. One measure of accessibility for such passengers is a comparison of changes in cost of air travel with GDP growth (see Table 2.4). For countries that identify air transport as a separate component of their consumer price index, the data shows that flying costs have dropped for most relative to GDP in the last decade, widening access for many.

Table 2.4: Change in air transport prices relative to GDP 1996-2008

	Air transport prices % change	GDP % change	Air transport prices relative to GDP
Turkey	3,667%	7,735%	0.48
New Zealand	-2%	87%	0.52
Norway	53%	160%	0.59
Poland	135%	235%	0.70
Sweden	23%	71%	0.72
UK	53%	91%	0.80
United States	35%	68%	0.80
France	41%	61%	0.88
Canada	99%	100%	1.00
Germany	52%	35%	1.13
Italy	83%	61%	1.14

Source: Haver Analytics and Oxford Economics

3. Air transport catalysing international trade

3.1. Trade: aviation's engine of growth

Based on our studies, increasing international trade has been a major source of growth across the world over the past century. Trade leads to growth and this in turn this leads to rising average living standards, so that even those who initially lose out because of competition from new, cheaper sources of supply, are likely to end up better off than would have been the case without trade.

Aviation plays a significant role in the processes by which trade raises growth and living standards. Cargo is the most obvious aspect of this role, but aviation's influence on competition, learning, adoption of new techniques and interaction, all contribute to the process, explaining why studies show that expanding aviation services boosts economic growth rates.

Conversely, limiting trade acts as a drag on growth and welfare. Among the causes of the Great Depression in the 1930s, the rise of protectionism – that placed tariffs and other barriers in the way of trade – is viewed by many as one of the culprits in explaining the sharp falls in economic output and consequent mass unemployment that afflicted both developed and developing countries. In contrast, liberalisation since the World War II is viewed as one of the key drivers of growth in living standards. The UK's Department of Business Enterprise and Regulatory Reform points out that since the war, "average industrial tariffs of developed countries have fallen from nearly 40% to less than 5% through eight rounds of multilateral trade liberalisation. This has gone hand-in-hand with a more than twenty-fold increase in world trade and a more than six-fold increase in world incomes."

As highlighted in this report, by facilitating many aspects of trade, aviation plays an important role in this process of economic enrichment.

3.2. Aviation: An essential means to fast and efficient trade

Aviation plays a central role in international trade. It provides a means for the fast, reliable and frequent flow of goods and people across international boundaries.

How airport transport links drive location decisions

Access to markets and external and international transport links are key factors for business location and success. Examples include:

• Following the demise of Swissair, it was estimated that passengers would be willing to spend between €87 and €115 more for a direct flight from Zurich Airport than for an indirect route. Based on passenger numbers, it could be inferred that the value to the Swiss economy of having direct routes through Zurich was €773 million in 2002. This having been said, connecting passengers are becoming an increasingly important proportion of the airports total passengers. Increasing from 29.6% in 2005 to 35.2% in 2008.

• The area around the new Munich airport has experienced rapid economic development. A survey among companies relocating to the area showed that whereas only 14% of them were engaged in businesses directly related to the area, 31% cited the airport as the primary factor in their location decision.

• Air freight is becoming critical to businesses as it plays an important role in the management of supply chain logistics. The use of air freight is increasing, particularly for high-value, low-weight goods. For instance, although air freight accounts for only 3.8% of the export tonnage in the Île de France region, it represents 20% of the value of imports and 30% of exports.

• A survey among UK Confederation of British Industry (CBI) members revealed that if next day deliveries were not available, 40% of companies would have to hold increased inventories, 32% would expect to lose orders, and 16% of firms would consider relocating.

Sources: Airports Council International, Oxford Economics

Probably the main advantage of aviation as a means of transporting goods and people is its speed. Several academic studies have quantified the benefits from improved transport time on trade and found significant impacts (see box 'Evidence of time as a factor in trade'). These studies imply that in many cases the cost savings from flying goods and people to their destination much more quickly than is possible via alternative transportation are crucial in encouraging trade. Geography also often makes air the only viable means of transport, for instance for isolated areas with poor road or rail links. Journeys of over 1,500 kilometres, for which no practical alternatives exist, account for 80% of aviation's green house gas emissions.

Evidence of time as a factor in trade

If time is money, it is effectively a transportation cost and therefore acts as a trade barrier. For example, a new supplier/customer relationship requires fixed up-front costs on both sides. An Organisation for Economic Co-operation and Development (OECD) study points out that if firms cannot meet foreign customers' lead time and delivery requirements, they will not be short-listed for bidding on contracts. A key advantage of air transport over other forms of transport is its guarantee of shorter, more predictable journey times over longer routes.

Since transport time is a major factor in world trade, the aviation industry has obviously played a leading role in world trade growth in the last 50 years. At the same time, products for which developing countries have a comparative advantage are becoming increasingly time-sensitive due to consumer demand for new and differentiated products, lean retailing and the rise of just-in-time production technologies.

One study estimated the value of time to trade and found highly significant results. It suggests that improvements in shipping times (air and sea) have played a significant role in world trade growth since World War II, with the reduction in transport time equivalent to reducing tariffs from 20% to 5.5% between 1950 and 1998. The study found that each additional day spent in transport reduces the probability that the US will source manufactured goods from a given country by 1.5%. And assuming that this country does export to the US, each day saved in shipping time is worth 0.8% of the value of the good. This amounts to a tariff rate of 16% on a 20-day sea transport route, which is the average for sea-borne imports to the United States. This far exceeds the actual average tariff rate.

Translated to the scale of world trade, this would imply that each day saved in shipping time is worth more than US$100 billion.

Source: Time as a Trade Barrier: Implications for Low-Income Countries, OECD; Time as a Trade Barrier, David Hummels, Purdue University.

Aviation thus stimulates trade, which in many cases only air transport can make possible, through the following mechanisms:

- Opening international markets to suppliers for whom **alternative means of transport are not a viable option**. Perishable commodities (such as fresh food and cut flowers) would not survive long shipping times. Aviation is also more cost-effective than other forms of transport for the movement of high-value, low-weight products. A variety of industries are now characterised by elaborate global production networks and a need for timely deliveries, with key export sectors relying heavily on a foreign supply chain. A 2001 study[3] found that in the clothing sector, the import content of exports was 43% in Sri Lanka, 40% in Vietnam, 80% in Botswana and 38% in the Philippines. A survey of firms in five countries by Oxford Economics for IATA[4] reported that 40% of high-tech sales are dependent on good quality air transport links.

- Access to **wider markets** offers companies the opportunity to benefit from economies of scale and thereby lower the price of their goods. Moreover, by opening up markets to international competition, air transport encourages firms within countries to specialise in the production of goods and services in which they have an advantage, either through labour or capital costs or the availability of natural resources. Increased specialisation is one of the factors that have driven long-term growth across the world.

[3] Nordås, H.K. (2003), Vertical Specialization and the Quality of Infrastructure, ERSD Staff Working Paper No. 03-2003, World Trade Organization

[4] IATA Economics Briefing No. 3: Airline Network Benefits, 2006

- Air transport enables companies to source the component parts required for production from around the world. In particular, aviation facilitates **'just-in-time' production** requiring rapid and reliable delivery of parts at the various stages and locations of the production process. Just-in-time production, with its elimination of excess storage and transport costs, has enabled many sectors to achieve considerable efficiency gains and trade in more time-sensitive goods has grown more rapidly than trade in other goods.
- Reduced time between production and delivery **better connects suppliers with customer needs** around the world. Firms can quickly respond to changing customer demand (e.g. in fashion) and deliver custom-made goods (e.g. cars or computers fitted to a particular purchaser's requirements).
- Air transport encourages **international business ties** by linking firms to potential customers and suppliers. For instance, a survey[5] of City of London companies found that almost three-quarters of companies reported air services were "critical" or "very important" for meeting clients and service providers (Table 3.1).

[5] York Aviation, Aviation Services and the City, 2008

Table 3.1 Importance of air transport to business

	How important would you say air services are to your organisation?				
	Critical	Very important	Quite important	Not important	Don't know
…for business travel by staff for internal company purposes?	30%	34%	18%	18%	-
…for business travel by staff for meeting clients/service providers?	43%	30%	18%	7%	2%
…for business travel by staff for other purposes?	9%	25%	34%	30%	2%
…for delivery of air freight?	7%	18%	9%	59%	5%
…for sending/receiving express delivery packages/documents?	23%	30%	23%	23%	2%

Source: Aviation Services and the City, York Aviation 2008

Data on the products that are imported and exported by air by the EU support the view that the factors described above are determinants in companies' choice of air as a means of transport. The most important products in value terms include machinery parts, electronics, medical equipment, drugs and blood samples and precious stones.

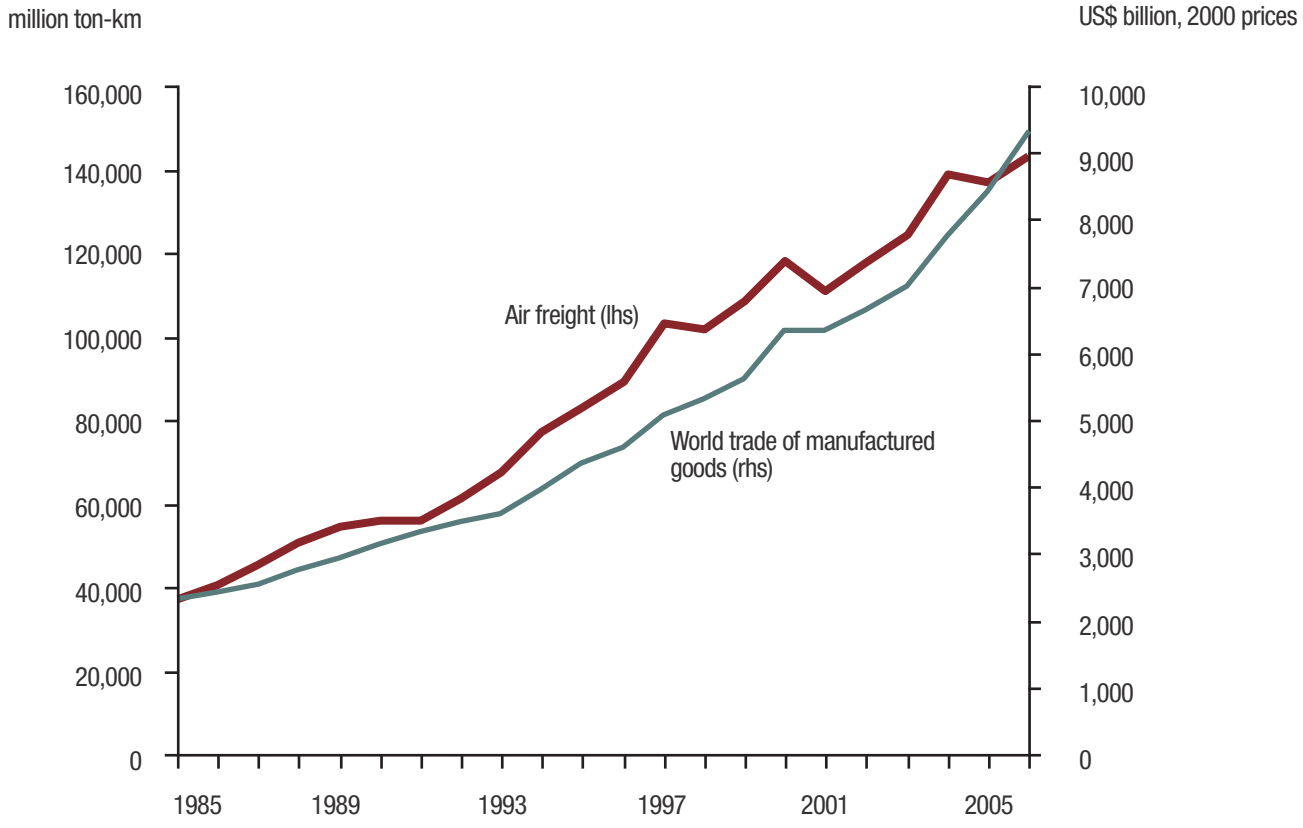
3.3. Trends in air freight and international trade

Growth in air freight depends on (and generates) growth in the world economy (and hence demand for transport of goods), the cost of air freight relative to other transport modes and the extent to which companies prefer to pay a premium for speed and reliable delivery. In many cases air freight is carried in the hold of passenger planes. Over the ten years to 2006, the volume of freight carried by air has grown by 5% per year on average, or a cumulative 65%, i.e. at about the same pace as total trade (Chart 3.1).

During the last couple of years, air freight has risen somewhat more slowly than overall world trade. Two main factors probably account for this relative slowdown. First, the rapid increases in fuel prices over the period have made air freight less price competitive compared with other means of transport. Second, a slowdown in the semi-conductor industry, a major user of air freight, has also had a negative impact. While the rapid decline in oil prices since mid-2008 is reducing fuel prices, the benefits for air cargo growth in the short-term are suffering from the impact of the global economic downturn.

[6] World Bank, World Development Indicators. Air transport freight in tonne-kms

Chart 3.1 World trade and air freight



Source: World Bank WDI, Oxford Economics

As of 2007, we estimate that 35% of the value of trade in global manufactured goods[7] i.e. around US$3.5 trillion, is transported by air. The volume share is much lower, typically around or below 5%, reflecting the high unit value of goods transported by air.

In some cases, rapid air transport using cargo planes or in the hold of scheduled passenger planes is not fast enough. Some companies need immediate delivery of their goods. The express delivery industry fulfils this demand and relies largely on air transport. The main findings of our research on this industry are summarised in the box 'The express delivery industry: how a speedy high flyer delivers the goods'.

[7] excluding intra-EU trade

The express delivery industry: how a speedy high flyer delivers the goods

The express delivery industry provides fast and reliable door-to-door delivery of shipments, which are tracked throughout the journey. Aviation is critical to express delivery as it allows the industry to operate longer domestic or international routes and to deliver goods to places where alternative transport links are not adequate.

Oxford Economics estimates show that in 2005 the express delivery industry supported 2.65 million jobs worldwide. The impact of the industry extends beyond this however, through its effect on stimulating international trade. The speed of express delivery enables international transportation of perishable goods, e.g. pharmaceuticals, fruit, flowers etc. Reliability of delivery meanwhile encourages and facilitates international ties between customers and suppliers. Express delivery is crucial to 'just-in-time' production. It also allows customers to get sub-components or spare parts for production or repair quickly and at short notice. Aviation allows companies to potentially source these components or parts from overseas. On a macroeconomic level, the express industry stimulates international trade by encouraging the specialisation of production in different countries.

Surveys of companies confirm the importance of express delivery. A survey in Italy found that, without guaranteed international next-day delivery, about 7% of Italian firms would possibly have to relocate some of their operations to another country.

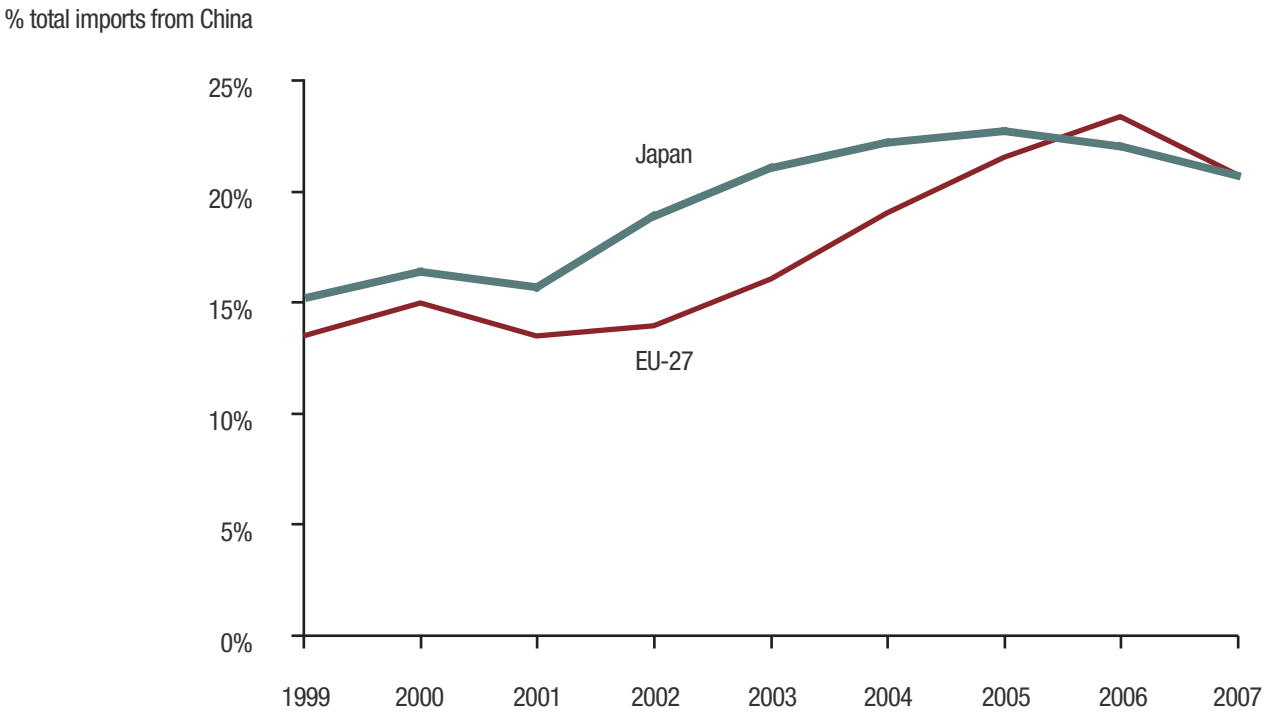
In a survey of Chinese companies three-quarters reported that customers were demanding faster and more reliable delivery of products. The express delivery industry is therefore crucial to Chinese exports.

As shown in Table 3.1, 76% of businesses in the City of London consider express parcel services either critical, very important or quite important to the smooth running of their operations.

Source: Oxford Economics

In developed countries, the value of air freighted goods in total trade has remained broadly constant in recent years. But air has become a more common choice of transport for some developing countries, as they have become more integrated in the world economy and their production has moved up the value chain. For instance, the air-freighted share in exports from China to Japan and the EU has risen from around 15% at the beginning of the decade to close to 25% (Chart 3.2).

Chart 3.2 Share of air transport in value of imports from China



Source: Eurostat, Japanese Ministry of trade, Oxford Economics

One example is found in southwest China. The province of Yunnan has developed a thriving horticulture business that exports fresh-cut flowers to the United States and Europe. Based on the region's unique environmental suitability for floriculture, farmers can now enjoy the benefits of a high value-added trade and younger people have been able to train in horticulture in the Netherlands. The box 'Sowing the seeds for rural and urban growth' summarises how the emergence of this new industry, made possible by air links, has raised income levels in what was a relatively poor region of China. Part III (page 79) of this study looks at this example in more detail.

Case Study:

Sowing the seeds for rural and urban growth

The story of Yunnan's blossoming into one of the world's foremost producers of cut flowers begins with a local man named Hua Zhongyi. A vegetable grower from the small, rural village of Dounan, Zhongyi was the first from his village to identify and supply the burgeoning demand in China's cities for cut flowers.

In 1979 the government gave farmers increased flexibility to decide what to produce under the 'household responsibility system'. Many began focusing on vegetables. However, a limited regional population and a mass conversion to the same crops soon resulted in a precipitous drop in price.

Some growers decided to go a different route. Beginning in 1983, farmers in the city of Dounan moved toward flowers after seeing the success of Hua Zhongyi. The forward-thinking Zhongyi had brought back bulbs of gladioli to plant on his land. In 1988, vegetable prices in the province fell sharply due to oversupply and the vegetable growers of Dounan suffered heavy losses. However, Zhongyi had by then built a house and bought an apartment in Kunming with his increased income from flowers. Inspired by this, many Dounan villagers opted to also grow flowers. In less than five years, Dounan became one of the main production and wholesale centres for cut flowers in China. The next step was to go international.

Yunnan, in the southwest of China, is ideal for floriculture with a climate that allows natural cultivation. Aviation unlocks the potential of the region to serve national and international markets with a high-value product that uses local labour intensively. This spreads the benefits of China's accession to the World Trade Organisation (WTO) to the rural population, who might otherwise be left behind in China's incredible transformation into a modern economic powerhouse.

Yunnan has now become one of the largest producers of flowers in the world – with a trade market second only to Amsterdam's. Beijing anticipates that the industry will provide secure and lucrative jobs for large numbers of isolated workers and thus help narrow the income gap between affluent city dwellers and unemployed farmers. Key among the related infrastructure developments is the building of a new international airport at Songming, near the capital city Kunming.

The international success of floriculture in Yunnan is attracting foreign investment and increasing expertise within the local industry. A number of Dutch horticultural firms have been attracted to the region. Aalsmeer Flower Auction VBA and Kunming International Flower Auction (KIFA) have entered into a long-term co-operation, and Van Hall Larenstein University of Applied Sciences is co-operating with Yunnan Agricultural University to educate Chinese students in international horticulture and marketing.

The industry has also been helped by the establishment of the Yunnan Flower Association (YFA) in 1997. YFA is an economical co-operative, an alliance of voluntary enterprises and growers in Yunnan, which incorporates all those engaged in the production, processing, marketing, research, and transportation of flowers. YFA offers governmental support and guidance in the development of Yunnan's flower industry, promoting co-operation between enterprises and local growers to optimise production. It also seeks to maximise the competitive advantages of Yunnan's flower industry in both domestic and overseas markets. The establishment of an English-language website to market Yunnan's floriculture produce worldwide is a sign of the global reach of plans for the region's future.

Sources: Yunnan Flower Association, extracted from http://www.yunnan-flower.org.cn/en_ynhh/Blurb_Info.aspx

Cut Flowers in Yunnan Province of China, Xuejun Jiang, Senior Trade Promotion Officer, ITC, Regional Workshop on Commodity Export Diversification and Poverty Reduction in South and South-East Asia, (Bangkok, 3-5 April, 2001) and http://www.chinaexpat.commore prosperous parts of China.

See 'Sowing the seeds for rural and urban growth', Part III, page 79.

Increasing reliance of developing countries on air transport for their exports is not limited to China though. According to the World Bank, air freight from low and middle income countries has risen by more than 6% per year on average over the past ten years (Table 3.2), with many countries recording double-digit growth rates. Air freight has grown most rapidly in what the World Bank refers to as lower-middle income countries such as Colombia, Egypt and Thailand from 1997-2006, with per annum growth of 13%, 23% and 7% per year respectively.

Table 3.2 Air freight

	Freight volume 2006 (million tonne-km)	Share of world freight, 2006 (%)	Average annual growth rate 1997-2006 (%)
High income	117,698	82	4.6
Upper-middle income	9,966	7	4.6
Lower-middle income	13,979	10	8.2
Low	1,569	1	2.1
Total	143,212	100	4.8

Source: World Bank Development Indicators
All figures rounded. Total of items may differ from listed sum.

3.4. Fresh food: Unaffordable luxury or effective development tool?

The importance of air freight to developing countries is highlighted in research by the International Trade Centre (ITC) on the impact of banning air freighted organic produce to the UK[8] in response to concerns about the impact on climate change. Some 79% of UK air freighted imports of organic produce are from poorer countries of the world, including Kenya, Ghana and Zambia. Air freight has played a large part in the economic success of organic exports in Africa. The ITC warned that "A ban could have profound economic impacts on local communities in some of the world's poorest countries[9]". Their case studies in Kenya and Ghana showed that without the fresh food trade:

- Workers, particularly women, risked a decline in living standards, as many people who lost their jobs would probably be forced to sell their assets, as alternative job opportunities are scarce and, where available, pay about half of what workers can earn producing and processing organic food.
- Communities might lose educational opportunities, as without the export income the children or extended family members of smallholders and other workers might not be able to attend fee-paying schools (in Kenya this includes all government secondary schools). Family income from organic export enterprises pays for the education of an average of two extended family members.
- There are likely to be fewer opportunities for other local work. Smallholders and other workers will no longer be able to afford to pay local workers for agricultural and domestic services.

[8] The Economic Impact of a Ban on Imports of Airfreighted Organic Products to the UK, ITC UNCTAD/WTO, 2007

[9] ITC Press Release No. 269, October 2007

The UK's Department for International Development (DFID) gives a similar assessment: "Almost a million African farmers and their families rely on the fruit and vegetable trade with the UK...this is an export trade success story...and it's one of the reasons why African economies are growing around 5%[10]".

Fresh produce accounts for a large share of air imports from developing countries to developed countries. This has raised a debate about the environment costs of such imports that has crystallised around the 'food miles', i.e. the carbon footprint related to the transport of such goods from local suppliers versus more distant sources. As the case studies in Part III (see page 81) show, this is a very complex issue. Transport is one element, but only one of many, in the production and delivery chain of fresh produce. Carbon emissions arise throughout the supply chain and only a comprehensive – and complex – assessment of the whole system can provide a reliable comparison between alternative sources of supplies.

For example, tomatoes grown in heated greenhouses are likely to generate more green house gas (GHG) emissions in the cultivation stage than those grown in a naturally adapted environment. Similarly, mechanised farming uses equipment whose production itself generates GHG emissions; whereas labour intensive cultivation with little machinery scores better in this aspect of the 'GHG budget' of the food we consume. The concept of 'food miles' that simply equates the distance food has travelled from field to the retailer fails to take account of this complexity.

As yet, the evidence available to enable fair comparisons between alternative production locations for specific foodstuffs is not well developed. This is partly due to the challenges involved in measuring all aspects of the life cycle affecting emissions.

Air-freighted fresh produce, which is typically carried in the cargohold of scheduled flights, offers clear benefits to western consumers, but it also provides one of the few routes to improved living standards, health and life-expectancy for rural populations in relatively poor countries. For these populations even small improvements to living standards and economic welfare should weigh significantly in the cost benefit analysis of the emissions involved. Many poor areas of Africa are well adapted to growing fresh produce that is in demand in Europe or North America. These areas have many advantages over alternative production locations: a year round growing season, soils that require only traditional fertilisers such as cow dung, and plentiful low-cost labour. Air transportation allows these advantages to be realised. For example, a shift of European preferences from food transported over long distances would hit a range of poor sub-Saharan economies. Fresh produce imports to the UK provide a route to development that would otherwise be closed off for as many as 1-1.5 million African's, putting an estimated £200 million into rural economies in Africa, while only accounting for a small fraction of the UK's carbon emissions (0.2%)[11].

Some recent comments on this topic are summarised in the box 'Miles better' while Part III (see page 81) of this study provides an extensive overview of the argument.

[10] DFID Press Release, 17th September 2007

[11] 'Fair miles'? The concept of 'food miles' through a sustainable development lens, James MacGregor and Bill Vorley, iied, October 2006

Case Study:

Miles better?

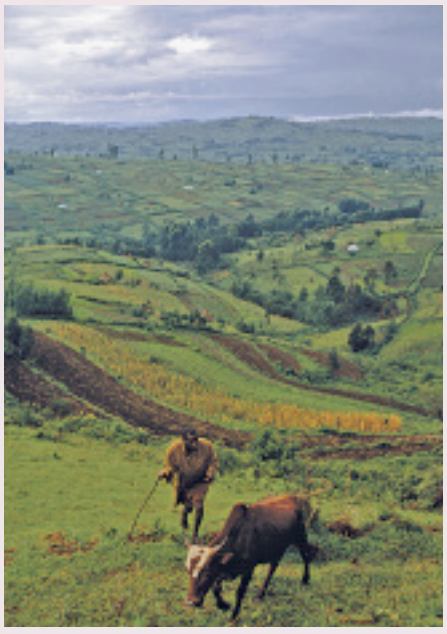
Why fruit and vegetables from Africa's faraway hills are often greener

European consumers of fresh food produce now demand both quantity and quality, so Virginia Wangira and 200 other farmers in the village of Kinangop in the Kenya's Aberdare hills formed a growers' group to set and maintain high standards. "I have built a good business out of this crop," says Virginia, a tiny lady in her sixties. "Now life is better."

The group work under the leadership of Russell Ng'ang'a. Chairman Ng'ang'a is increasingly concerned that shoppers may pass over their vegetables due to concerns about pollution from air-freighted produce. "It's so very unfortunate, all these worries about food miles", he sighs. "For three years we've worked hard to meet all the high standards the European consumer demands: we built grading sheds and stores for our agrochemicals and set up record-keeping for complete traceability. Emissions of carbon dioxide should be reduced by other means than stopping altogether our produce."

Growing export-quality produce is tough. When hot winds blow up from the rift valley below, the pods shrivel. A sudden dive in temperature in the cool season and the pods are ruined by the cold. There is also the occasional march of invading insects to contend with. Not to mention wild elephants foraging at night for just-ripe vegetables, leaving a trail of broken fence and pea vines to repair in the morning.

A fierce determination to improve and constant attention to detail has meant the smallholder farms – numbering more than 500,000 – have succeeded where large farms failed. Indeed, economic analysis confirms that export horticulture in Kenya has become a powerful engine for rural economic growth. In Kirinyaga, a farming community in another exporting area, the crop of choice is a different temperate vegetable: green beans. The area is a mosaic of green smallholder plots between lush groves of bananas and maize. Edwin Mgenge, the exporter's representative in the village, explains the benefits to locals: "the great thing here is that young people can leave education with a future in the field." He reacts to news about the food-mile furore with dismay. "These villages produce hardly any pollution," he reasons. "They use hand tools in the fields and use very little electricity in the home. But, because of rich country pollution, Europeans think food miles are bad! Where is their heart?"



Virginia Mwai from the Kenyan Ministry of Agriculture summed up the arguments against focusing blame for global warming on developing-world farmers, such as those of her country. Farm-fresh produce often fills the cargo holds of passenger aircraft leaving Kenya to supply the consumer markets of Europe and beyond: "Our farming contributes very little to global warming. We use people to weed the fields. We don't use tractors to produce the food that is exported. I wonder whether stopping the export of our produce to Europe would stop the planes flying? Would hurting our farmers really reduce the carbon emissions?"

"Many are from the Akamba tribe (Kenya), former cattle herders who took up (bean) farming half a century ago when their over-grazed hills started turning to desert. Today their land is lush and productive." *Buying local and fair trade don't mix, Fred Pearce, Daily Telegraph, 20th July 2007*

"Driving 6.5 miles to buy your shopping emits more carbon than flying a pack of Kenyan green beans to the UK." *Gareth Thomas, UK Minister for Trade and Development, Department for International Development.*

Source: Developments Magazine, The Department of International Developments, http://www.developments.org.uk/articles/miles-better/

See 'What price fresh produce?', Part III, page 81.

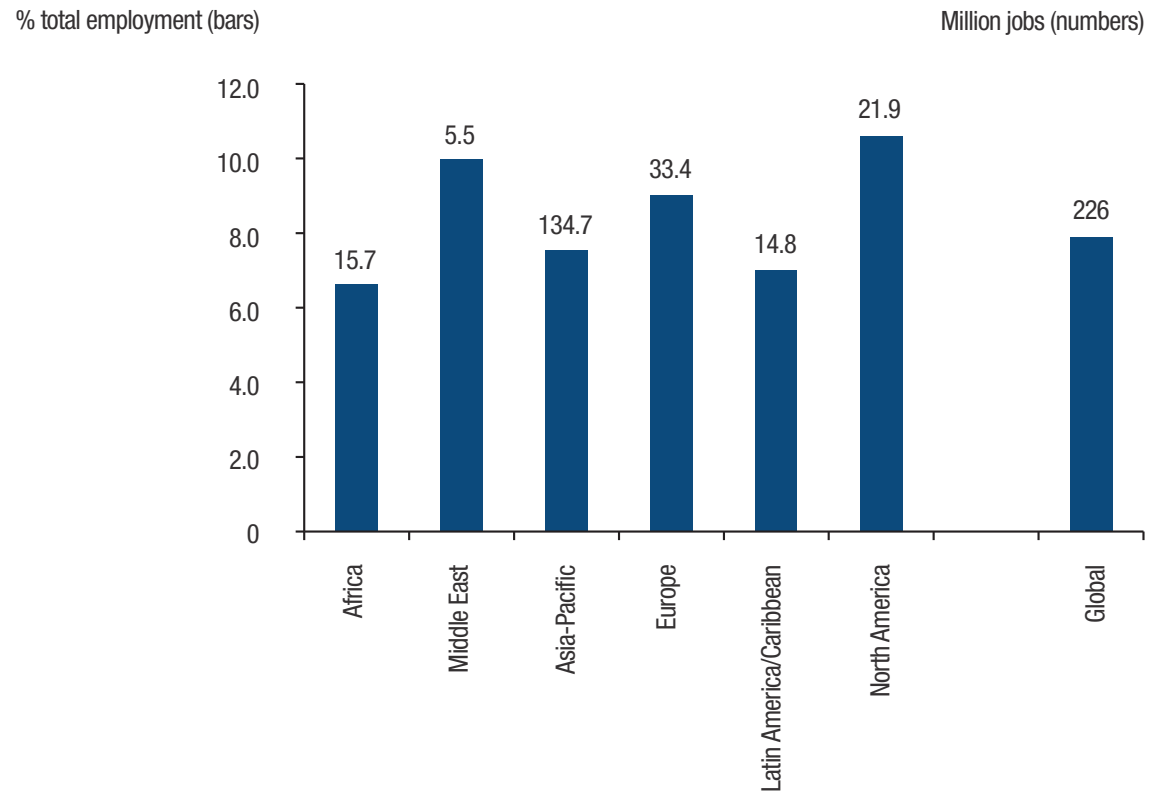
4. Air transport unlocking tourism's benefits

4.1 Tourism is a very large jobs creator

Tourism is a major industry in the global economy, providing jobs and wealth to regions that often are relatively poor in other resources and offering sustainable diversification away from agriculture or declining manufacturing industries.

According to the World Travel and Tourism Council (WTTC), globally tourism directly employs 79 million people and in total supports 226 million jobs when downstream effects are taken into account. Across regions, tourism accounts for between 6.6% of total employment in Africa and 10.6% of employment in North America (Chart 4.1). The sector directly accounts for US$5.8 trillion, i.e. 9.6% of world GDP.

Chart 4.1 Tourism employment, 2008



Source: WTTC

How airports are driving tourism development

The role of airports as a gateway to tourist destinations becomes ever more vital in the modern age.

For the EU as a whole, tourism directly accounts for 5% of total employment and GDP and as much as 30% of the total external trade in services. Five EU countries are now among the top seven tourist destinations in the world (France – 1st, Spain – 2nd, Italy – 5th, UK – 6th, and Germany – 7th).

Airports play a major role in facilitating the development of inbound tourism, particularly in the case of islands or remote destinations. For instance, 70% of foreign visitors to the United Kingdom arrive by air, and 21% of all foreign tourist arrivals in Greece travel through Athens Airport, while just 32% of tourists in the Lisbon area arrive through Lisbon Airport. However, major European city airports also play a significant role in local tourism, with more than a third of foreign visitors in the Île-de-France region arriving through Paris airports.

UNWTO World Tourism Barometer, June 2008

Malta & Cyprus – how tourism takes wing on island states

Tourism has become one of the leading economic activities in many small island states worldwide. Changes in tourism access and demand can have considerable economic impacts, both at the macroeconomic level and on different sectors within the economy. Most island states depend on air access for visitors. Two EU island members where GDP per head is well below the EU average — Malta and Cyprus — have economies that are crucially dependent on airborne tourism. Nearly 98% of tourists to Malta arrive by air, while the figure for Cyprus is 94%.

The travel and tourism economy, which takes account of both the direct impact of tourism spending and the wider effects this spending has on support activities, account for nearly 23% of Maltese GDP and 21% of Cypriot GDP. In comparison, the average share for the EU27 is 10%, while even in economies with large tourism sectors, such as Spain and Greece this share is only 17%.

The dependence of the Maltese and Cypriot economies on tourism-related employment is even starker. More than one in four of all jobs in both economies are dependent on the tourist industry.

Aviation directly contributes 11% to annual GDP of Cyprus. Without air travel, the economies of these islands would be severely weakened. A decline in the air transport industry would stunt efforts to raise Maltese and Cypriot output, wages, and living standards towards the EU average, and would likely spark large scale emigration to other parts of the EU.

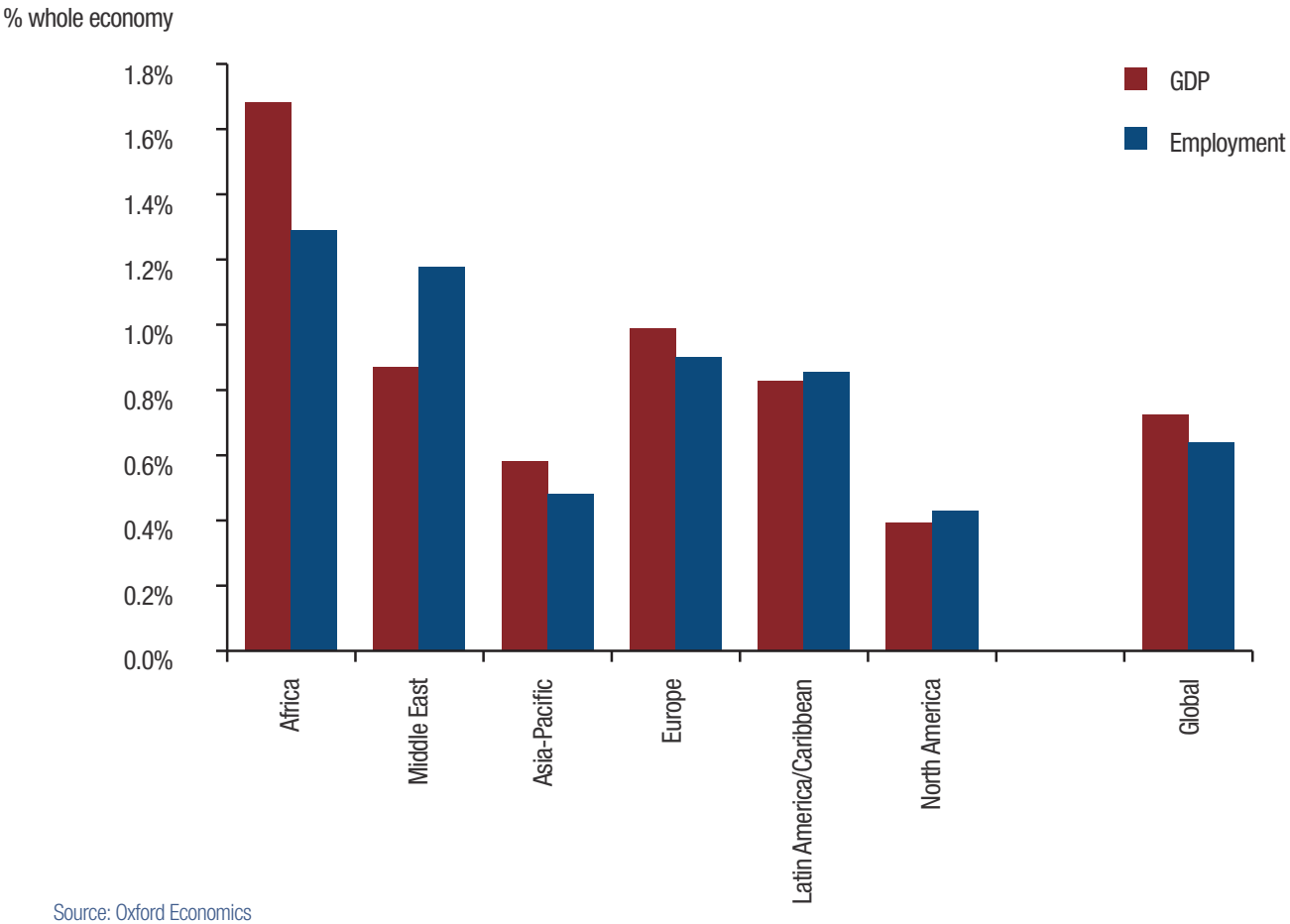
4.2. Air transport essential to growth and sustainability of tourism

With over 40% of international tourists[12] travelling by air, air transport provides essential support to tourism. Air transport thus contributes to raising or maintaining activity in the tourism sector directly. Moreover, similarly to the discussion of the overall effects of aviation, the contribution of air tourism to the economy goes well beyond activity in the tourism sector itself. Jobs and value added are created along the supply chain as tourism companies purchase goods and services from other sectors ('indirect effects'). And there are induced effects accounted for by spending by employees in tourism and at tourism suppliers on goods and services across the economy.

In 2007, more than 8 million tourism jobs were supported directly by the spending of foreign visitors arriving by air (Table 4.2). Taking into account the indirect and induced jobs, air tourism accounted for more than 18 million jobs worldwide. This represents 0.6% of world employment (Chart 4.2). In developing countries, and particularly Africa, air tourism supports an even larger share of total employment (1.3%), highlighting the key role that the aviation sector plays in supporting growth in these regions.

[12] In line with standard definitions, 'tourists' here include leisure and business visitors as well as people travelling to visit friends and relatives.

Chart 4.2 Direct, indirect and induced contributions of air tourism



Source: Oxford Economics

Table 4.2 Air tourism economic and social benefits in 2007

	Employment (000s)		GDP (US$ billions)
	Direct	Total	Total
Africa	1,561	2,985	22
Middle East	295	633	12
Asia-Pacific	3,799	8,480	75
Europe	1,343	3,306	199
Latin America/ Caribbean	799	1,754	23
North America	369	884	64
Global	**8,166**	**18,043**	**396**

Source: Oxford Economics
All figures rounded. Total of items may differ from listed sum.

4.3. Governments focusing on tourism as growth strategy

Tourism offers the potential for some developing economies to diversify their industry structure away from traditional agriculture or natural resources exploitation. The benefits of such a move are multiple. First, tourism is less weather-dependent than agriculture and, therefore, provides a more stable source of revenue from year-to-year. Second, tourism generates jobs across a whole range of skills and occupations that are attractive, particularly to younger workers that might otherwise emigrate to find employment elsewhere. Third, tourist resorts can develop across the country, in both urban and rural surroundings, thereby offering a revenue source to many parts of the population.

Recognising these benefits, the Moroccan government has put in place a strategy focused on the development of the tourism industry. Around half the foreign visitors to Morocco arrive in the country by air. The government's strategy therefore put special emphasis on ensuring attractive air connections. The objectives of this plan and achievements so far are summarised in the box 'Morocco's Vision 2010: How airborne tourists bring jobs and development.' Part III (see page 90) looks at this project in more detail.

Case Study:

Fès: Reborn as a modern showcase of Morocco's ancient culture

Morocco's Vision 2010 plan has opened up many aviation portals to an ancient land that has historically been traversed by armies, merchants, migrants and nomads. The country's location at the nexus between Africa and Europe has contributed to a rich brew of cultural influences, incorporating influences as diverse as those of the Phoenicians, the Berbers and the Spanish.

Continuing this rich tradition of inclusiveness is the Festival of World Sacred Music (Festival des Musiques Sacrées du Monde). Each June sees performers from every corner of the Earth fly into Morocco for a week of artistic performance in Fès, the country's ancient holy city. The festival represents the spiritual heart of Islam – peaceful, pluralistic, generous and joyous, with the aim of honouring all the world's spiritual traditions and dissolving musical boundaries. Bono, the singer of the Irish rock group U2, spoke of the spirit of the event: "Fès is a holy place for musicians. We came to pay tribute and to learn. We are on a pilgrimage."

The Moroccan government has been keen to promote the country's rich cultural heritage and to encourage cultural exchange which will bring more visitors through Morocco's airports. U2's recording of part of their latest CD in Fès has been a timely boost to these efforts. It is hoped that the attendant media interest in the band's choice of recording venue will rekindle Morocco's reputation as a favourite artistic retreat in the 1950s and 60s, when artists such as the Rolling Stones were regular visitors. The legendary rock group returned to Morocco in 1989 to record with the country's most popular traditional artists, the Master Musicians of Jajouka, an all-male guild trained from childhood.

Fès lies inland, 200km northeast of Casablanca. It is the oldest of Morocco's imperial cities and commonly recognised as the spiritual, cultural and intellectual capital of Morocco. It is home to Fès El Bali, the largest medina in Morocco. This ancient site — a maze of mosques, food markets and bazaars — is now a UN World Heritage Site and was extensively renovated as part of the Vision 2010 plan. Fès is famed for its quality craftsmanship, particularly in metalwork, rugs and leather goods.

Despite its status Fès El Bali had become run down and its tourist potential unexploited. Accordingly, the regional plan calls for establishing Fès as a tourist destination. The plan aims to promote the city as a "Lively Millennial Museum, based on its authenticity as the only remaining place in the world where daily lives still reflect an ancient way of life and its associated culture and art."

The tourism development plans include:

- the creation of additional accommodation in the Medina by converting houses with high historical value and Fondouks into high-quality guest houses
- the conversion of Fondouks into theme-based cafés or exhibition spaces
- the creation of a religious arts museum
- the rehabilitation of two pilot neighbourhoods, including restoration of the original Medina walls
- the opening of local handicraft industries to tourist access, and the facilitation of electronic payment and overseas shipping
- the development of tourism in the hinterland of Fès, to allow these rural areas to benefit from the city's role as a tourist hub

Crucially for Fès, the realisation of the city's tourist potential and its successful entry into the European city-break market depends on the introduction of point-to-point flights from the major cities of Morocco's key overseas markets. This will involve more flights on existing routes from France and the UK, and the introduction of new routes, from untapped sources such as Barcelona, Madrid, Milan and Rome.

To realise this ambition it is anticipated that investments totalling 3 billion dirhams (US$350 million) will be required over the ten years to 2015. In turn this is expected to create an additional 4,500 beds in tourist accommodation, annual revenues of 1.26 dirhams (US$150 million) and an additional 13,500 jobs in and around Fès.

Source: http://www.tourisme.gov.ma/docspdf/PDRT/PDRT%20F%C3%A8s/Brochure-An.pdf

See 'Morocco's Vision 2010: How airborne tourists bring jobs and development', Part III, page 90.

4.4. Flights bringing expatriates (and their savings) back home

Tourism in general, and air tourism in particular, can benefit local economies and populations through other, possibly less obvious ways. First, it is worth noting that air tourists include travellers to and from their host country of work. Air links enable migrant workers to stay in touch with family and friends sometimes more easily than other means of transport would, so enhancing labour mobility. Labour mobility is beneficial for both the host and the home country. The host country benefits from labour inputs with skills that may not be readily available, such as foreign languages, specific skills, technological, cultural or knowledge transfers. Second, the home country may benefit in various forms whilst the migrant is away (e.g. in the form of remittances sent home to their family), and upon the return of the migrant who brings new skills to his home country, capital and possibly a network of business contacts.

Keeping families & social networks together

Research conducted by the Civil Aviation Authority (CAA) has shown that 'Visiting Friends and Relatives' (VFR) is the strongest component of the growing international passenger traffic at UK airports. Whereas VFR represents one quarter of international traffic at UK airports, it accounts for half the growth in international passengers. Between 2001 and 2007, international passengers grew by one-third, whereas international VFR traffic increased by two thirds.

Increasing VFR travel is a reflection of the closer relationships developing between EU countries, both from an individual perspective and at a country level. The free movement of goods and people across the EU has made possible social and economic movements that allow the development of social and economic networks that have long-lasting effects, and that bring benefits to both the host and originating countries in the form of increased social and economic integration. For instance, labour mobility, which is a key contributor to long-term economic performance, is enhanced by air travel as it allows migrants to return home more often and friends and family to visit from the home country. Besides, once migrants return to their home country, they have established new social (or family) networks in their country of stay which will be more easily maintained via air travel.

Increases in VFR traffic appear closely related to the rise of no-frills airlines, and the consequent expansion of route networks to the EU. Short-haul VFR traffic has grown strongly at Stansted and Luton in London and at those regional airports that have become no-frills bases (such as Bristol, East Midlands and Liverpool). CAA survey data confirm that VFR passengers differ from other types of leisure travel:

- they tend to be younger (the 25-44 age group is the largest amongst VFR passengers, versus 45-64 for leisure passengers);
- their income tends to be lower – whereas only 27% of international holiday passengers have an income under £28,750, 41% of international VFR passengers have household incomes below that figure.

Source: Enhancing Social Networks Across Europe, Civil Aviation Authority, November 2008

Kangaroo route demonstrates the leaps and bounds

The Kangaroo Route, one of the longest established intercontinental air routes, provides a vivid illustration of what a world without aviation might look like. For much of the twentieth century emigration to Australia or New Zealand from Europe meant the acceptance that contact among family members would reduce to occasional letters, Christmas cards and perhaps the prospect of one visit to the 'old country' in retirement. And even the mails were hardly instantaneous. Before the advent of flights and air mail in the 1930s letters and parcels could be expected to take at least six weeks. Yet, from the beginning of the twentieth-century to the era before the jumbo-jet, Australia saw a net inflow of 2.8 million people, initially predominantly from the British Isles, but increasingly, in the years after the war, from southern Europe. Little wonder that many of us have long lost relations somewhere in Australia.

The first commercial flights from the UK to Australia carried half a tonne of mail and cargo, but no passengers for destinations beyond Singapore. The flight, by flying-boat, took 12 days. By 1947 things had moved on markedly, but were still only a shadow of current service levels. Still the journey involved 55 hours of flying-time, six re-fuelling stops and two overnight stays for the complement of 29 passengers. And air travel between Europe and Australia was only for the wealthiest. The cost of a return ticket in the late 1940s equated to the cost of a small house or 130 weeks of earnings for the average Australian, compared with only around two weeks' salary today.

Sources: Immigration Federation to Century's End, 1901–2000, Department of Immigration and Multicultural Affairs, Commonwealth of Australia, 2001; Flight, 16 December 1955; Quantas' Kangaroo route 60th birthday, The Australian, 30 November, 2007

One specific way through which air tourism benefits the economy is by strengthening the contact between migrants and their country of origin. This is likely to encourage migrants to send money home and even to use trips home as an opportunity to take money across borders. For some countries, particularly in the developing world, these so-called 'remittances' are an important source of revenue. Remittances are sometimes highlighted as a sign of large emigration from a country, with possible negative effects such as a 'brain drain'. However, studies that attempt to look at the overall effects of remittances find that they significantly benefit the recipient economies:

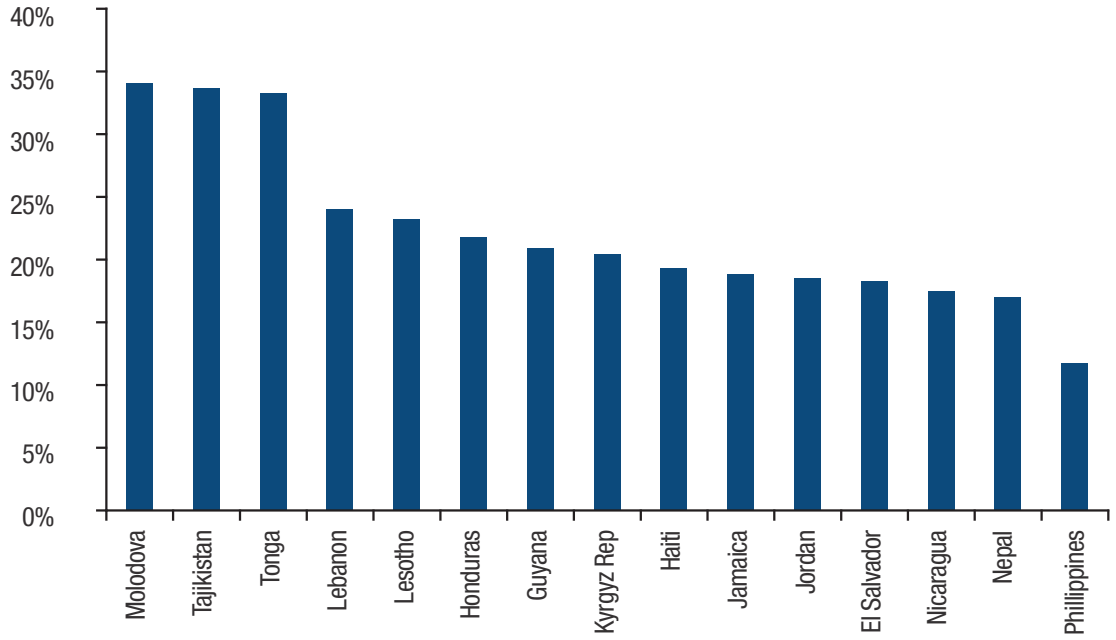
- Official remittances amount to more than 30% of GDP for countries like Tajikistan and Moldova (see Chart 4.3) and around 10% of GDP for countries like Bangladesh or the Philippines.
- According to the World Bank, official remittances were twice the level of official development assistance flows to developing countries in 2007.[13] These estimates are based on funds transferred via recognised banking channels, but as there are likely to be substantial flows through private channels, the actual amount is likely to be much larger.
- There is evidence that remittances rise during crises, natural disasters and conflicts, thereby contributing to the stability of the home economy. For instance, remittances to Indonesia rose during the 1997 Asian financial crisis.[14]
- International remittances reduce the level and depth of poverty. According to World Bank research, a 10% increase in international remittances from each individual migrant will lead to a 3.5% decline in the share of people living in poverty.
- Each dollar of remittances generates $2 or more additional economic activity as money is spent to build or improve housing, on locally produced goods or invested in equipment and small businesses.

The box 'Filipinos abroad: a major source of revenue for the country' looks at the example of the Philippines, one of the countries that receives the largest amounts of money in remittances from its citizens working abroad.

[13] Increasing the Macroeconomic Impact of Remittances on Development, D. Ratha and S. Mohapatra, Development Prospects Group, World Bank, November 2007.

[14] Yang, Dean. 2006. "International Migration, Remittances, and Household Investment: Evidence from Philippine Migrants' Exchange Rate Shocks." Working Paper W12325. National Bureau of Economic Research. June.

Chart 4.3 Remittances as a % of GDP



Source: World Bank

Filipinos abroad: a major source of revenue for the country

The Philippines receive a very large amount in remittances from Filipinos working abroad. In 2007, remittances received by the Philippines amounted to $16 billion, making the country the fourth largest in terms of remittance receipts. There are more than 3.5 million Filipinos living and working on permanent contracts abroad and at least as many who are on temporary contracts or irregular workers, i.e. around 15% of the country's working-age population. The US, Saudi Arabia and Canada are the top destinations. Many of these Filipinos travel by air to and from their host country.

Remittances provided relief during the Asian financial crisis of the late 1990s, as emigrants who were working in countries relatively sheltered from the crisis, such as the United States, were able to send more money back home. Latest estimates for 2008 show remittances have risen rapidly, up 15.5% in the period January-October compared with the same period a year earlier (estimates from The Bangko Sentral ng Pilipinas). This has helped sustain growth, in particular consumer spending. However, the global nature of the current downturn raises concerns about remittances flows. A significant fall in remittances could have a large negative impact on growth in the country.

Source: World Bank

4.5. Spreading knowledge, supporting education

As well as travelling overseas to work there is an increasing trend to studying abroad. Universities in the United States and Europe attract many foreign students each year. For most air travel is the only practical means of travelling between home and their place of study. In particular there has been a sharp growth in students from the emerging economies studying in developed world universities. Most of these students will take the benefits of their education back home at the end of their studies, adding to the local pool of highly educated talent that is crucial to productivity growth and economic development. The networks they develop when studying abroad are likely to provide them with life-long contacts in a range of countries, contributing to both global social cohesion and the development of trade.

The number of foreign students in the United States[15] has grown by 21% since the beginning of the decade, totalling over 620,000 in 2007-08, and generating fee income for universities of over $10 billion per annum. Growth in numbers has been particularly strong from India (73%), China (35%) and South Korea (51%), with these three Asian countries accounting for almost 40% of foreign students in the United States.

[15] Institute of International Education - http://opendoors.iienetwork.org/?p=131533

Table 4.4 Growth in international student numbers in the United States, top ten origins

	2007/08 student numbers	% growth 1999/00 to 2007/08
India	94,563	73%
China	81,127	35%
South Korea	69,124	51%
Japan	33,974	-27%
Canada	29,051	15%
Taiwan	29,001	2%
Mexico	14,837	39%
Turkey	12,030	10%
Saudi Arabia	9,873	n/a
Thailand	9,004	-20%
Global	**623,805**	**21%**

Source: International Institute of Education

4.6. Responsible tourism as a means to help protect the environment

Another potential benefit of tourism is related to environment preservation. In the past, tourism development has often harmed the environment: one example was the building of large accommodation complexes which spoiled the natural beauty of a region or threatened the local habitat. Today, however, several initiatives show that tourism can benefit the environment by drawing attention to some unique ecosystems, reducing deforestation, which is responsible for 20% of man-made CO_2 emissions, and providing funds to sustain such places. Three such examples are found in Costa Rica, Rwanda and Borneo (see Part III, page 91, for more details).

Case Study:

How Costa Rica's ecotourism brings foreign exchange, jobs and a boost to conservation

Costa Rica demonstrates the potential of ecotourism to generate foreign exchange, employment and progress in conservation. The promotion of ecotourism began in the 1980s as a way of reversing the devastating effects of deforestation. Since then the tourist industry has become a major source of foreign exchange and provides the resources needed to maintain the country's famous national park system. Between 1988 and 2007 international tourism spending increased six-fold, to US$2 billion, with nearly 1.9 million international visitors.

Most of these visitors come from the developed world – with North Americans making up nearly half of total arrivals and the EU accounting for a further one in seven tourists. This focus on developed world tourists underpins the relatively high spend per tourist of US$1,000 per trip (2007). In terms of economic impact, it is estimated that in 2005, tourism contributed 7.9% of Costa Rica's GDP, 22.3% of foreign exchange earnings and supported over 13% of all jobs.

In recent years the Costa Rican government's efforts have been concentrated on education and training, particularly of local residents, and on improvements in regulation and evaluation of tourist activities. In 1998 the government implemented an evaluation system under the name of Certificate for Sustainable Tourism (CST).

Similar eco-rating or tourism certificate schemes have now been introduced in New Zealand, Australia, the Dominican Republic, Haiti, Jamaica and Kenya. Such schemes help to improve the environmental and social contribution of each country's tourism industry.

Source: The contribution of air transport to sustainable development in Africa, Oxford Economics

See 'Ecotourism: Borneo, Costa Rica, Rwanda and Namibia', Part III, page 91.

Case Study:

Rwanda's ecotourism effect: mountain gorilla numbers on the upswing

First revealed to the outside world 100 years ago, the endangered population of mountain gorillas inhabiting the volcanic highlands on the borders of Rwanda, the Congo and Uganda has grown over the last 30 years. This recovery has occurred despite the wars and social upheavals that have blighted these nations at different points in that period. In 1978 Bill Weber, a leading conservationist, counted a population of mountain gorillas in Rwanda of 262. The latest estimates are closer to 400.

Airborne tourism has been a central part of this story. On the basis of their study of the mountain gorilla ecology and the socio-economic context for conservation in the late 1970s, Weber and his wife Amy Vedder, helped to establish a program of gorilla tourism as a way of generating revenue and employment for local people and helping protect the gorillas and their habitat.

The unique mountain gorillas are a strong draw for nature tourists, with cost acting as little deterrent to those wanting to spend an hour watching these primates in their natural habitat. This tourism underwrites the conservation of the mountain gorillas. Without it, human population pressures would destroy important habitat for the gorillas and poaching for bush meat would go unrestrained.

In 1989 gorilla tourism drew 7,000 visitors to Rwanda's Volcano National Park, providing Rwanda with much needed foreign exchange. With the advent of war and genocide, this tourism disappeared in the mid-1990s. Now gorilla tourism to Rwanda is flourishing again. Visitor numbers of approximately 20,000 are expected this year, with virtually all tourists arriving in Rwanda or other parts of Africa by air.

This revival in Rwanda contrasts starkly with the absence of visitors across the border in the Congo where another civil war has quelled tourism. While it is difficult to assess how gorillas in this area of the Congo are faring, the low regard for conservation in the absence of tourism is illustrated by the slaughter of seven endangered mountain gorillas in Virunga National Park in 2007. With its unique biological and geological diversity, Virunga has traditionally been seen as the crown jewel of African parks: yet this killing of endangered animals was carried out in a climate of lawlessness in which the perpetrators felt free to commit their crimes with impunity. In the absence of any rule of law, it was the publication of the photos of journalist Brent Stirton that brought the case to light internationally. The subsequent outcry against the killing of the Virunga gorillas and the arrest of the crime's suspected mastermind, has served as a reminder of how such dark deeds can only continue in the absence of funds to support committed, conservation-minded people in such ecological hotspots.

See 'Ecotourism: Borneo, Costa Rica, Rwanda and Namibia', Part III, page 91.

Case Study:

How visitors bring physical and financial assistance in the fight to save the orangutan

Over the last 50 years, the indigenous populations of the Lower Kinabatangan in Borneo have seen dramatic changes in their livelihoods. Around 90% of their traditional forest resources have been lost, replaced by large-scale agricultural plantations owned by outside companies. Local people are thus forced to seek alternatives to a once sustainable, traditional, forest life. Without alternatives, many face the temptations of illegal activities for quick profit, such as illicit hunting or logging.

In the rainforests of Lower Kinabatangan, the threat of logging casts its shadow over important orangutan habitat. To alleviate the pressure on these last remaining rainforests, Model Ecologically Sustainable Community Conservation & Tourism Initiative (MESCOT) aims to provide livelihoods for indigenous workers, while also protecting the orangutans. The initiative generates incomes by treating the forests as a valuable resource, which must be sustained and preserved.

Additionally, by attracting visitors and tourists who gain an appreciation for the area and its challenges, support for the conservation of forest resources and orangutan habitat is generated in ever-widening circles. A large proportion of these visitors participate directly in forest habitat restoration or contribute financially to these programmes. MESCOT hopes to foster and expand such activities through the Tungog Rainforest Eco Camp project.

This community owned and run "jungle camp" is designed to cater for a minimal number of visitors with a keen interest in conservation, who are open to new experiences, such as gravity and solar powered water-systems, sharing forest foods and local traditions with indigenous hosts, and sleeping in exposed, camp-style accommodation. It is further hoped that they will make a contribution, either financial or manual, towards the conservation of the surrounding forests and habitats of the Lower Kinabatangan.

Source: Arcus Great Apes Fund – MESCOT Initiative, Arcus Grant F06-57

See 'Ecotourism: Borneo, Costa Rica, Rwanda and Namibia', Part III, page 91.

4.7. Flying as a means to essential direct communication

A number of tourists, especially air tourists, are people travelling for business purposes. Despite technologies such as videoconferencing having been available for some time, uptake is still limited and business flights have continued to increase faster than GDP growth.[16]

Being there: why communication is more than words

Modern communication technology means that it is easier than ever to keep touch without personal meetings. However, while technology can ease the task of building global teams or keeping in touch with overseas customers, these technologies cannot yet replace the benefits, or need for, face-to-face communication.

Humans have developed the ability to read each other through verbal and non-verbal cues. Studies have shown that non-verbal cues can account for up to 63% of social meaning in face-to-face exchanges. Many of these cues are minute and include pupil dilation, eye movements, turn-taking, hand gestures, body language and mutual gaze. The perception of eye contact increases arousal, which aids in the proper allocation of brain resources and in regulating interpersonal relationship. As much as 60% of face-to-face conversations involve gaze; in 30% of cases the gaze is mutual and people make eye contact twice as much while listening (75%) than when speaking (41%).

Visual clues from face-to-face meetings are at the heart of how humans develop trust. Research into the evolution of co-operation among humans has found that the ability for reciprocal co-operation "can be stable with a large range of individuals through face recognition".

This crucial role of face-to-face communication is borne out by experimental work. This shows that the type of video conferencing used in these experiments affects the quality of the outcome. CISCO observes that the most commonly used forms of video conferencing (video telephony, web-based video conferences, and video conferencing) suffer from the absence of audio and visual clues. Users of electronic communication can take up to four times as long to exchange the same number of messages as communicating face-to-face, Telepresences, the use of full size images to more closely replicate actual face-to-face meetings, still does not allow an image quality realistic enough for the perception of precise eye contact, although it does improve on showing body language and subtle gestures.

Sources: Argyle, M and Cook, M. (1977) Gaze and Mutual Gaze. London: Cambridge University Press; Axelrod, R. and Hamilton W.D. The evolution of co-operation, Science 221, 4489 (1981), 1390-1396.CISCO Fragile trust in virtual teams threatens business performance- research identifies new rules for communication;. (September 19, 2006); Mistry, N. Looking beyond the eye: Pupillary Dilation and its relationship to conversational behavior in computer-mediated-conversation and face-to-face conversation; Vertigaal, R. and Ding, Y. (2002) Explaining effects of eye movement on mediated group conversations: Amount of synchronization? In Proceedings of CSCW 2002. New Orleans: ACM Press.

[16] Corporate Air Travel Survey – 2009, IATA

This suggests that business contacts rely on physical meetings at certain key points of their negotiations. These might include the opening discussion of the details of a contract or project, the signing of a new contract or follow-up visits to factories to check on the production process. The shortcomings of remote communication technologies are obvious in such cases. However, distance communication help maintain these relationships through ease of day-to-day contact. Therefore, videoconferencing seems to complement, rather than substitute flying. For example, a recent survey by Barclaycard[17] found that, even with the modern business traveller embracing technology as a method of avoiding business travel when possible, 56% of respondents travelled more in 2007 than in 2006. This was also the finding of a survey of businesses carried out by Oxford Economics on behalf of IATA.[18] The study found that businesses expected new technologies to result in more air travel rather than less.

Think local, enact global: governing in the modern world

The two largest economic blocs in the western world — the EU and the US — share a common challenge when it comes to effective government: how can politicians and policy-makers transcend the huge distances that separate many from their constituencies, as they complete a working week in Brussels, Strasbourg, or Washington, DC?

The centres of power in both Europe and America are well served by the air transport industry. Thanks to the proximity of several major airports to Brussels, Strasbourg and Washington, the MEP from the Highlands of Scotland or the Representative from Alaska is always just a matter of hours away from the people they represent.

Certainly, advances in communication technology will help decision makers stay informed of the opinions of constituents: as the campaign of Barack Obama demonstrated, emails, text-messaging and the internet all have the capacity to revolutionise the democratic process. Yet every savvy politician knows that an hour spent in person with one's constituents is still an imperative to gain (and retain) trust, respect…and ultimately votes. The one-to-one local clinic or the 'town-hall' style meeting is still the politician's best connection with constituents; and taking the plane continues to be the fastest, most efficient means for those in power to stay in touch with the mood on the ground back home.

Helping European Parliamentarians do their job

The European Parliament currently consists of 785 members (MEPs) elected from the 27 member countries of the EU. Typically MEPs divide their time between Strasbourg and Brussels, where the Parliament sits, and their home country or constituency. Adequate representation requires frequent travel to and from Brussels/ Strasbourg and the home locality. At least* 526 MEPs, representing approximately 60% of the EU population, must make journeys of upwards of 1,000 km, or make sea crossings, when travelling to or from Brussels or Strasbourg. Without air travel, this ability to combine frequent face-to-face contact with electors and regular attendance at the European Parliament would be lost.

A week in the life of a Scottish MEP, whose constituency is at least 14 hours drive from Strasbourg, illustrates the necessity for air travel to ably represent his constituency:

- Monday: 5am: Leave Glasgow, Arrive European Parliament, Brussels, 2-3pm
- Thursday: 12.45pm: Leave European Parliament, Brussels, Arrive Glasgow 5pm
- Friday: constituency meetings in Glasgow and south-west Scotland
- Saturday: constituency business in Glasgow

* Assumes all Belgian, Dutch, Luxembourg, German, Czech Republic and some French MEPs travel by road or rail.

Source: The Independent, 29 August, 2002

[17] The Barclaycard Business Travel Survey 2008, Barclaycard Business

[18] Airline network benefits, IATA Economic briefing no3.

The knock-on effects of the closure of Washington's Reagan National Airport following the 9/11 attacks

In the wake of the 9/11 attacks, speculation raged in Washington about the terrorists' intentions for United Airlines Flight 93. The White House and the Capitol were thought to have been the likeliest targets: the plot was assumed to have included a direct strike at the very heart of American power.

As a result of its close proximity to such targets in Washington, officials quickly decided to close Reagan National Airport. This move was taken despite pleas from heads of the airline industry, who warned of potentially dire economic consequences. Reagan National Airport remained closed for the next 23 days and was only allowed to reopen in four phases over six months, with certain restrictions remaining in effect.

Among those most affected by the closure were US political representatives and their staff, who had long relied on Reagan National Airport's close proximity to downtown Washington and Capitol Hill. Many were forced to seek alternative arrival points through Dulles Airport and Baltimore-Washington International Airport.

The lengthy disruptions caused substantial losses to a wide range of regional businesses. The economic impact of the closure was estimated at US$330 million per day to the airport and Northern Virginia businesses and US$27 million to state and local tax revenues.

Passenger numbers in Reagan National Airport fell from 15.9 million in 2000 to 13.3 million in 2001 and even further to 12.9 million in 2002. Several factors contributed to this decline: the prolonged closure, some potentially permanent losses in passengers to competing airports, and overall trends in North American aviation following 9/11. The fall in passenger traffic had major impacts on several related sectors: airlines, businesses established in the airport, tourism and hospitality, taxicabs and fixed-base operators.

A second study estimates that the cost of closing the US air space following a terrorist attack amounts to US$2.5 billion per day, including the direct and indirect effects from the loss of sales, and the loss in consumer surpluses from business and leisure passengers.

Source: Airport closures in natural and human induced disasters: Business vulnerability and planning, The Disaster Preparedness Resource Centre, 2003. The Economic Implications of Terrorist Attacks on Commercial Aviation in the USA, USC, September 4, 2005.

5. Air transport: A symbiotic relationship to investment

Trade and investment follow each other. The benefits that air transport brings to international trade also foster investment, both by domestic firms and by foreign direct investors. Air transport provides accessibility to national and international customer and supplier markets for firms and the availability of air services are, therefore, a key determinant of business location and investment. Moreover, by increasing the potential customer-base of existing firms, air transport can raise productivity and efficiency, which in turn stimulates greater investment in the region.

In an IATA survey of over 600 companies in five countries[19], 63% of firms stated that air transport networks are 'vital' or 'very important' to investment decisions. At the same time 30% of firms stated they would be highly likely to invest less in a region if air networks were constrained. Investment by the high-tech sector was found to be particularly sensitive to the quality of air transport networks, consistent with the importance of air freight for this sector. India provides a striking example of a very rapid development of a whole industry – Information Technology – that has in part been made possible by air transport connections. Indeed, Indian companies would not be able to win so many outsourcing contracts without the possibility for the outsourcer to visit their supplier easily (see box 'Boom time for Bangalore: How an airport helped realise the potential of India's "silicon valley"' on page 104 in Part III of this study).

[19] IATA Economics Briefing No.3, 2006. The five countries comprised Chile, China, the Czech Republic, France and the US.

Case Study:

Boom time for Bangalore – how an airport helped realise the potential of India's 'silicon valley'

Availability of air services is one of the key factors identified by investors and investment promotion bodies in determining the location of business projects in India, particularly those involving service-related activities or high-value to weight products. Indian economic growth in the 1980s and early 1990s was hamstrung by a constraining lack of air passenger and aviation cargo services. Despite a well-educated workforce, investment dollars and pounds flew elsewhere as manufacturers and exporters were unable to rely on timely deliveries of components and finished goods.

The city-region of Bangalore is one of India's critical growth areas. India's third biggest metropolis is home to over five million people, with an economy that has been growing at over 10% per annum. Bangalore has earned the title of the 'silicon valley' of India because of the cluster of domestic and foreign IT companies located in the city, estimated to contribute 33% of India's US$32 billion in IT exports in 2006-07. This success has resulted in the growing affluence of the city. Around 83% of the households in Bangalore own television sets, compared with a national average of around 50%.

With the wide range of international companies operating from Bangalore, international and domestic air-links are a crucial ingredient in growing the city's infrastructure at a pace that matches the needs of its burgeoning ecosystem of high-tech firms. Construction of a new international airport began in July 2005, with flights finally commencing nearly three years later, in May 2008. The new airport was originally planned to accommodate 3.5 million passengers a year, but with the liberalisation of air services and the demand for travel to and from Bangalore, this capacity was increased to 12 million passengers per annum. The new airport serves a total of 21 Asian, Middle East and European destinations with scheduled cargo flights.

Today, the people of Bangalore are the beneficiaries of an economic miracle: a boom brought about by increased overseas investment combined with an educated, motivated workforce, which has realised the full potential of India's 'silicon valley'.

See 'Boom time for Bangalore – how an airport helped realise the potential of India's "silicon valley"' Part III, page 104.

Access to airports as a determinant for business locations

Access to markets and transport links are key factors in business location decisions. Ease of access to suppliers, enhances business efficiency and productivity, particularly where medium to long distances are involved.

For instance, a survey of new companies or companies relocating to the area around Munich Airport since 1988, revealed that, although only 14% of companies were engaged in business directly related to the Airport itself, access to air links had been the primary factor in the location decision for 31% of the companies.

A study investigating the factors influencing individual company location decisions showed that proximity to a major airport was the 4th most important factor when deciding the country of location of the European Headquarters of companies, and the most important factor when deciding the region of location within the country. For distribution and assembly activities, proximity to a major airport was the 5th most important factor when deciding the country of location, whereas it was the 4th most important factor for the choice of region within a country. Finally, for manufacturing plants, proximity to a major airport was the 7th and 13th most important factor affecting the country and region of location respectively.

Airports also act as national economic engines. Amsterdam Schiphol Airport's role as a regional hub facilitates the ability to operate a wider network of services, for both airport and non-airport activities, than would be possible for the local market alone. The level of connectivity that Schiphol Airport offers is a fundamental part of the Dutch national strategy to achieve a competitive economy.

Airports are increasingly developing as multi-modal interchange nodes and their network positioning creates strategic advantages which enables them to act as magnets of a broad range of economic activity, functioning as new development poles. The trend towards globalisation of companies and supply chains creates a demand for an ever widening network of air services. Additionally, synergies may arise between the role of the airport and other modes of transport, such as ports (for instance on the case of Hamburg airport and the Port of Hamburg, or in the case of Amsterdam Schiphol Airport and the Port of Rotterdam).

Source: The Social and Economic Impacts of Airports in Europe, York Aviation, January 2004. New Location Factors for Mobile Investment in Europe, Netherlands Economic Institute/Ernst and Young. The Contribution of the Aviation Sector to the UK Economy, Oxford Economics, November 1999.

Economic data provides further evidence that air transport is a significant factor influencing developments. Oxford Economics analysed data for European Union countries on air transport connectivity (as measured by the number and importance of destination airports, frequency of flights and seats per flight) and investment and found a significant link.[20] Vienna airport provides an example of development in air transport links that has been a major factor in attracting investment to the region (see box 'Vienna Airport: a magnetic hub for regional investment'). In the same vein, the development of Dube TradePort in KwaZulu-Natal, South Africa, is expected to make the region attractive to domestic and foreign companies alike (see 'Southern Africa's global gateway' on page 105 in Part III of this study).

[20] IATA Economics Briefing No. 3: Airline Network Benefits, 2006

Vienna Airport: a magnetic hub for regional investment

Success in the global economy requires the quick, reliable movement of people and services, in addtition to the smooth movement of products and parts. In this fast-paced business climate, the company that can quickly and easily transfer personnel and expertise across borders – and even continents – has a distinct competitive advantage over more static opposition.

As a key attraction to businesses, the Austrian government advertises Vienna airport's ability to connect to anywhere in Europe within three hours. The success of this policy is evident: Vienna is home to the regional headquarters of several multinationals such as Coca-Cola, Ericsson and IBM. According to the Boston Consulting Group, around 300 multinationals have established their Eastern European headquarters in Austria, including 28 Fortune 500 firms. Many of these companies use Vienna as a base from which to do business in Central and Eastern Europe. This has enabled the region to benefit from the recent rapid growth in the neighbouring transition economies.

Putting these facts into a broader context, an academic study looked at the impact of European regional headquarters on the local economy and markets in Austria. It found significant positive effects on employment and skill levels.

Case Study:

How airport development helps growth and tourism in Southern Africa

The Dube TradePort (DTP) is a strategic and critical infrastructure investment which aims to serve as a major catalyst for economic growth in KwaZulu-Natal and South Africa. The development demonstrates the central role that improved air services play in facilitating sustainable economic growth, widening the development options available and spreading prosperity. The creation of a new airport will be integral to improvements in production processes, trade stimulation, foreign direct investment, natural habitat preservation and the development of tourism.

A new fully-integrated international passenger and freight airport is to be constructed as part of the overall DTP development initiative. Included in the plans is a Trade Zone that will be linked to the airport's freight facility, providing scheduled space for the import and export through KwaZulu-Natal of high-value goods. By providing state-of-the-art air freight handling facilities, comprising a cargo terminal and a perishables centre, the Trade Zone is seeking to attract industries, such as motor components, electronics, clothing and textiles, perishables and value-added logistics, which are critically dependent on specialised and scheduled air cargo that guarantees timely delivery.

The plans also include an integrated agricultural export zone. This will include land and facilities for the cultivation and export of high-value farming products, providing opportunities for exporters of high-yield, time-sensitive, air-freighted horticultural produce and will include pre-harvest and post-harvest facilities required by on-site producers and growers from surrounding areas.

As well as its direct impact on GDP, the DTP is designed to have catalytic benefits in terms of local economic empowerment, competitiveness and skills development. And, given the tourism ambitions of the project, related efforts to eradicate malaria from destination areas have delivered significant health benefits to the local population.

It is hoped that South Africa has almost reached the day when the country's trade and tourism prospects will be freed of the curse of malaria. South Africa's natural resources make it an ideal destination for many international visitors. Its competitive tourism advantages are many: accessible wildlife, varied ecosystems, impressive scenery, unspoiled wilderness, diverse cultures, temperate sunny climate, and the absence of 'jet lag' from Europe. In addition, the KwaZulu Natal region boasts unique archaeological sites and the availability of excellent conference, exhibition and sporting facilities.

To take advantage of such attractions, the building of King Shaka International Airport at DTP, and the potential it offers for direct flights from key markets, is a central part of the strategy to increase the flow of tourists to a region. The FIFA World Cup in 2010 provides a major incentive to have construction complete and the airport operational.

Thanks to the success of regional anti-malaria campaigns, the local KwaZulu Natal authorities now believe they have taken large strides to guarantee visitors immunity from the age-old disease that has long blighted the continent of Africa.

See 'Airport development as an integral part of economic development initiatives in Southern Africa' Part III, page 105.

Finally, the case study on Charleroi airport provides a vivid illustration of the role air transport can play in regenerating a region suffering the after-effects of industrial decline (see box below 'Charleroi – a depressed region elevated by the tailwinds of aviation' and Part III, page 101).

Case Study:

Charleroi – a depressed region elevated by the tailwinds of aviation

The Brussels South-Charleroi Airport (BSCA) is located near the town of Charleroi, 46 kilometres. south of Brussels, in the Belgian province of Hainault. The airport is situated within one of the most densely populated areas of Europe, with 5 million inhabitants within a one-hour drive, and 15 million inhabitants within 2 hours. The closure of the coal industry and the restructuring of the steel industry during the 1970s left the region around Charleroi among the most depressed in Western Europe.

In the early 1990s the provincial government adopted a strategy to attract investment into the region. This focused on the partial privatisation and conversion of the existing Gosselies airport to take international flights, competing with the main Belgian airport at Zaventem, near Brussels. Substantial benefits, including reduced landing fees, were offered to companies locating in Charleroi. The real impulse to growth came in 2001, when a low cost carrier decided to establish its main base of operations in continental Europe in Charleroi, opening routes to 7 new destinations, pushing that year's number of passengers to 800,000.

By 2008, 26 destinations were served from the newly named Brussels South-Charleroi Airport (BSCA), and passenger numbers were estimated to be close to 3 million. The growth in passenger numbers at the BSCA has been among the highest for a regional airport in Europe.

The airport now employs approximately 4,000 people directly and indirectly in Charleroi, equivalent to 3% of the labour force of the city. More importantly, in terms of acting as a catalyst for growth in this deprived region, companies have located nearby to benefit from the transport links now offered by the airport. These include GlaxoSmithKline and Caterpillar. A business incubator and science park (aéropole) was also developed next to the airport, attracting several research centres from the Université Libre de Bruxelles (ULB). As a result, a cluster of aerospace, biotechnology, and medical research industries has now emerged, employing 2,500 staff, many highly qualified. In turn, their spending power reinforces growth in the region.

The airport's success is also leading to wider benefits. Prominent among these are road and rail connections from Charleroi to the rest of the Benelux countries, the widening of business connections for local businesses across national and linguistic borders, the improvement of the region's image, the development of new skills in the labour force, and the realisation of tourism potential in Wallonia, including the picturesque Ardennes region.

See 'Charleroi – a depressed region elevated by the tailwinds of aviation', Part III, page 101.

6. Air transport: Driving efficiency and leading innovation

Some of the benefits of air transport that translate into increased investment and trade come about via improved productivity. A survey of over 600 companies by IATA[21] found 80% of the firms surveyed reported air transport is important to efficiency and 50% feel it is vital. Improved efficiency can be achieved in various ways. For instance, 70% of the companies surveyed thought aviation had allowed them to benefit from economies of scale which leads to greater efficiency. Economies of scale may be reached via access to export markets and the resulting improved efficiency encourages further investment. Air transport can also improve efficiency through lower costs: 56% of companies stated aviation had helped reduce costs.

In addition, the opening of markets to international competition drives innovation, which typically leads to efficiency improvements. Surveys have found that over a quarter of companies believe that innovation and investment in research and development would probably be badly affected if air transport services were constrained.[22]

The aviation industry is itself an important contributor to research and development (R&D) and innovation. In 2006, 39 aerospace and defence companies qualified for the top 1,250 R&D spenders globally.[23] These companies undertook US$19.9 billion of R&D expenditure in 2006, over 4% of the total. It is not possible to identify how much of this total was devoted solely to civil aviation; however, there is considerable evidence that in addition to driving innovation in the sectors that undertake R&D, the beneficial effects spread to other sectors of the economy.[24] Successful innovations in aviation have inevitable impacts up and down the industry's supply chain. This might happen when companies supplying aircraft manufacturers work to the innovators specifications, for example, adopting new techniques or materials. In turn, this new knowledge can often be applied in other lines of the supplier's business. Similarly, where purchasers of better aviation services are able to improve their own products or services, the benefit of the original R&D permeates into the wider economy. And, as these benefits accrue to such secondary companies free of the cost of the original R&D, the overall rate of return to society is well above the return received by that the aerospace businesses that fund the original R&D. Moreover, for aerospace the social return to R&D spend is estimated to be 70%, compared with 50% for manufacturing as a whole.[25] In other words, once it matures, a typical investment of US$100 million in R&D by the aerospace sector adds US$70 million to the level of GDP year-after-year.

[21] Airline Network Benefits, IATA Economics Briefing No. 3, 2006

[22] The Economic and Social Benefits of Air Transport 2008, ATAG

[23] The 2007 R&D Scoreboard, Department for Innovation, Universities & Skills, London

[24] Economic Analysis of Research Spillovers Implications for the Advanced Technology Program, Adam B. Jaffe, Brandeis University and National Bureau of Economic Research

[25] Assessing the Economic Impact of Aerospace Research & Development, Oxford Economics, May 2006

R&D — benefits far beyond aviation

Economists and other social scientists have demonstrated that the R&D activities of private firms generate widespread benefits enjoyed by consumers and society at large. As a result, the overall economic value to society often exceeds the economic benefits enjoyed by innovating firms as a result of their research efforts. This excess of the social rate of return over the private rate of return enjoyed by innovating firms is described by economists as a positive externality or spillover.

These spillovers flow through a number of distinct channels. First, spillovers occur because the workings of the market or markets for an innovative product or process create benefits for consumers and non-innovating firms ('market spillovers'). Second, spillovers occur because knowledge created by one firm is typically not contained within that firm, and thereby creates value for other firms and other firms' customers ('knowledge spillovers'). Finally, because the profitability of a set of interrelated and interdependent technologies may depend on achieving a critical mass of success, each firm pursuing one or more of these related technologies creates economic benefits for other firms and their customers ('network spillovers').

Source: Economic Analysis Of Research Spillovers Implications For The Advanced Technology Program, Jaffe, NBER, 1996

Air transport is also likely to promote R&D spillover effects elsewhere in the economy, for example between universities and businesses and among firms across all economic sectors. Research studies[26] point to geographic proximity as an important influence on the degree and speed of spillovers from business to business. By increasing connectivity, shrinking distance and promoting the development of social and business networks aviation eases the flow of new knowledge and the significant benefits to the wider economy it brings.

Air transport also increases the pool of labour available to companies by helping firms to expand operations and facilitating the movement of labour domestically and internationally. This enables a better matching of employers and workers. The movement of people and the building of relationships between organisations made possible by aviation encourage the transfer of knowledge and ideas. Finally, from a European perspective increased mobility of labour is an important component of ensuring the success of monetary union. Greater labour mobility improves the ability of individual economies in the Eurozone that no longer have separate control over monetary policy to adjust to changing economic conditions.[27]

Two studies[28,29] have attempted to quantitatively measure the improvements productivity due to air transport. The two studies look at different countries (EU countries in the IATA report and 48 countries worldwide, including many developing countries, in the InterVISTAS study). Both found that an increase in connectivity typically leads to a sizeable improvement in labour productivity.

To capitalise on such efficiency gains, certain cities and regions have developed business parks adjacent to the airport. These parks cluster companies together. These are typically highly productive companies that benefit from being close to each other, thus facilitating the exchange of ideas and staff. One example is offered by the business park in Cork, Ireland (see box 'Cork Airport Business Park: symbol of transition from agriculture to hi-tech' on page 51).

[26] The Increasing Importance of Geographical Proximity in Technological Innovation: An Analysis of U.S. Patent Citations, 1975-1971, Sonn & Storper, UCLA & LSE, 2003

[27] Cross-border labour mobility within an enlarged EU, ECB Occasional Paper, October 2006

[28] Airline Network Benefits, IATA Economics Briefing No. 3, 2006

[29] Measuring the Economic Rate of Return on Investment, InterVISTAS, 2006

Cork Airport Business Park: symbol of transition from agriculture to hi-tech

Since the early 1990s, the Irish economy has experienced growth at an extremely accelerated pace. The 1980s had seen many leave the island in search of employment, as an economy built on a strong agricultural sector stagnated. Much of the success of the Celtic Tiger economic boom around the turn of the century can be attributed to various policies implemented specifically to attract foreign companies. These policies included low corporation tax rates and an emphasis on high-quality education.

These national policies have been complemented by local initiatives that have made some regions of the country particularly attractive for foreign investors. The business park set up next to the city of Cork is one such example. The Cork Airport Business Park located just two minutes from Cork airport was set up in 1998. By 2005, the park had attracted many international companies employing around 1,800 people. Building on this success, the Irish government launched a new phase, which would nearly double the park's office capacity and provide jobs for an extra 1,500 people. The business park hosts tenants such as Pfizer, Marriot, Motorola and Amazon.

The Cork Airport Business Park has contributed to the local economy's diversification away from declining agriculture to the fast growing pharmaceutical and IT sectors, two sectors that rely heavily on air transport.

Since 2000, growth of output in Cork has averaged 5.5%, outperforming the fast growth in the Irish economy over that period by 0.5% per annum. Moreover output per head is nearly 30% above the Irish average. In tandem with this fast growth the proportion of the working-age population that is economically active has risen from approximately 60% in the mid-1980s to 72% today. The number of jobs has increased by 83% over the same period, ensuring that the benefits of this growth have been widely spread throughout the community.

Based on the key metrics of share of regional GDP, growth in value added and productivity, Cork ranks highly in globally successful IT and Life Science locations.

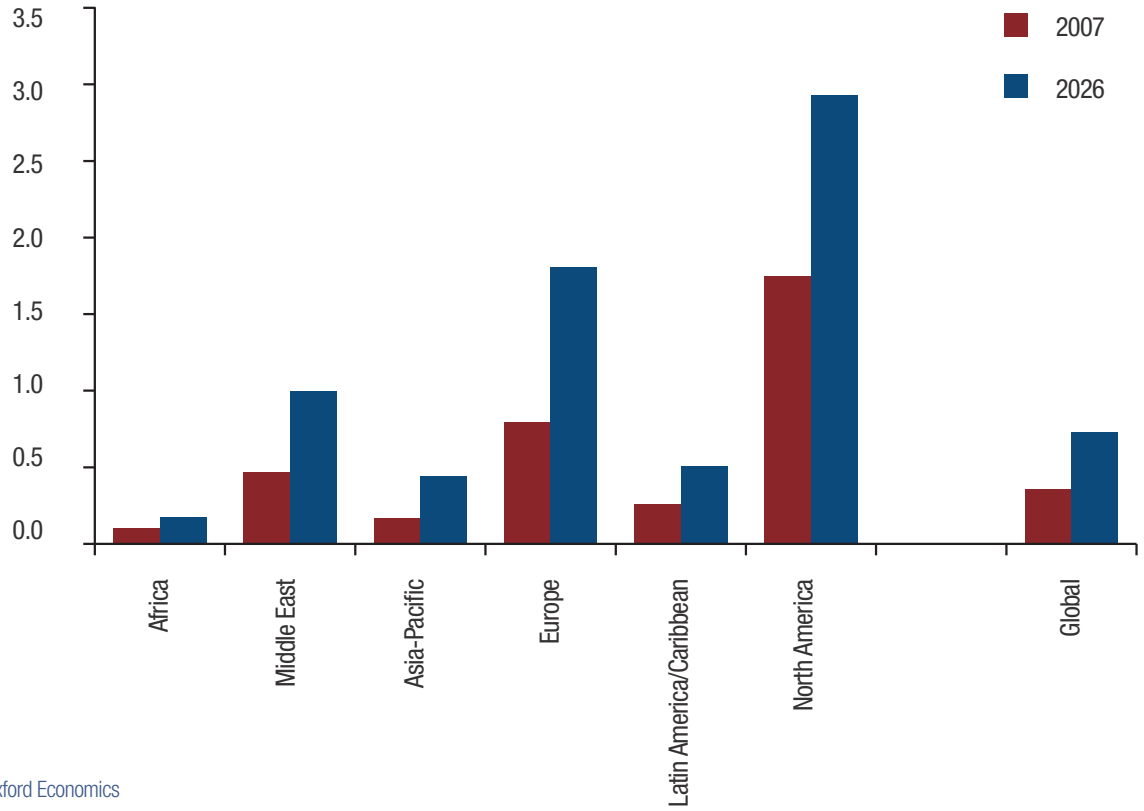
Among the key factors that have attracted these knowledge-intensive industries to Cork are accessibility, R&D investment, tertiary education and quality universities.

Source: Cork Airport Business Park; Regional Forecasts (a division of Oxford Economics); 'Regions as Technology and Life Science Locations', BAK Basel Economics Forum 2006.

7. Contributing even more to the economy in the coming 20 years

After a temporary slowdown related to the economic downturn, demand for air transport is expected to continue to grow robustly over the next 20 years. Airbus projects the number of passengers to rise by 145% between 2007 and 2026 from just below 2.5 "billion to 6 billion.[30] This represents an annual average growth rate of just below 5%, compared with expected population growth of around 1% per annum over that period. In other words, the number of passengers per inhabitant would about double from 0.36 to 0.73 (Chart 7.1). The fastest growing region is expected to be Asia-Pacific, with a 170% rise in the number of passengers per inhabitants from 0.16 to 0.44. The slowest growing region is expected to be North America (+68% from 1.74 to 2.93) where the number of passengers per inhabitants is currently well above that of any other region.

Chart 7.1 Number of passengers per inhabitant



Source: Oxford Economics

Demand for freight is also expected to rise strongly over the next 20 years. Airbus forecasts that the amount of freight will grow by 5.8% per annum on average between now and 2026 (Table 7.1). Asia-Pacific is expected to be the fastest growing region for freight as well, with an annual growth rate of 6.5%. But all the regions and, in particular, developing economies are expected to see a fast growth in freight demand with, for instance, freight out of Africa up by 5.4% per annum on average and freight out of Latin America and the Caribbean up by 5.2% per year.

[30] Airbus Global Market Forecast 2007-26 http://www.airbus.com/en/corporate/gmf/

Table 7.1 Air freight (tonne-kms)

	2006 share of world freight	2007-26 annual growth rate
Africa	2%	5.4%
Middle East	1%	4.3%
Asia-Pacific	40%	6.5%
Europe	21%	5.0%
Latin America/ Caribbean	5%	5.2%
North America	30%	4.1%
Global	**100%**	**5.8%**
World trade (Oxford Economics)		**6.9%**

Source: Airbus, Oxford Economics
All figures rounded. Total of items may differ from listed sum.

Combining the Airbus forecast with Oxford Economics' model, it is estimated that the air transport industry will contribute:

- Directly: around 8.5 million jobs and US$1 trillion in 2026 to the world economy (Table 7.2).
- Taking into account the indirect and induced contributions, the air transport industry is expected to contribute around 23 million jobs and US$2.6 trillion.
- Adding the contribution of the air transport industry to tourism raises the contribution of the air transport sector to more than 50 million jobs in 2026 and to around US$3.6 trillion of GDP.

Other, hard-to-quantify catalytic effects will magnify this output and job contribution of the aviation sector beyond these identifiable impacts.

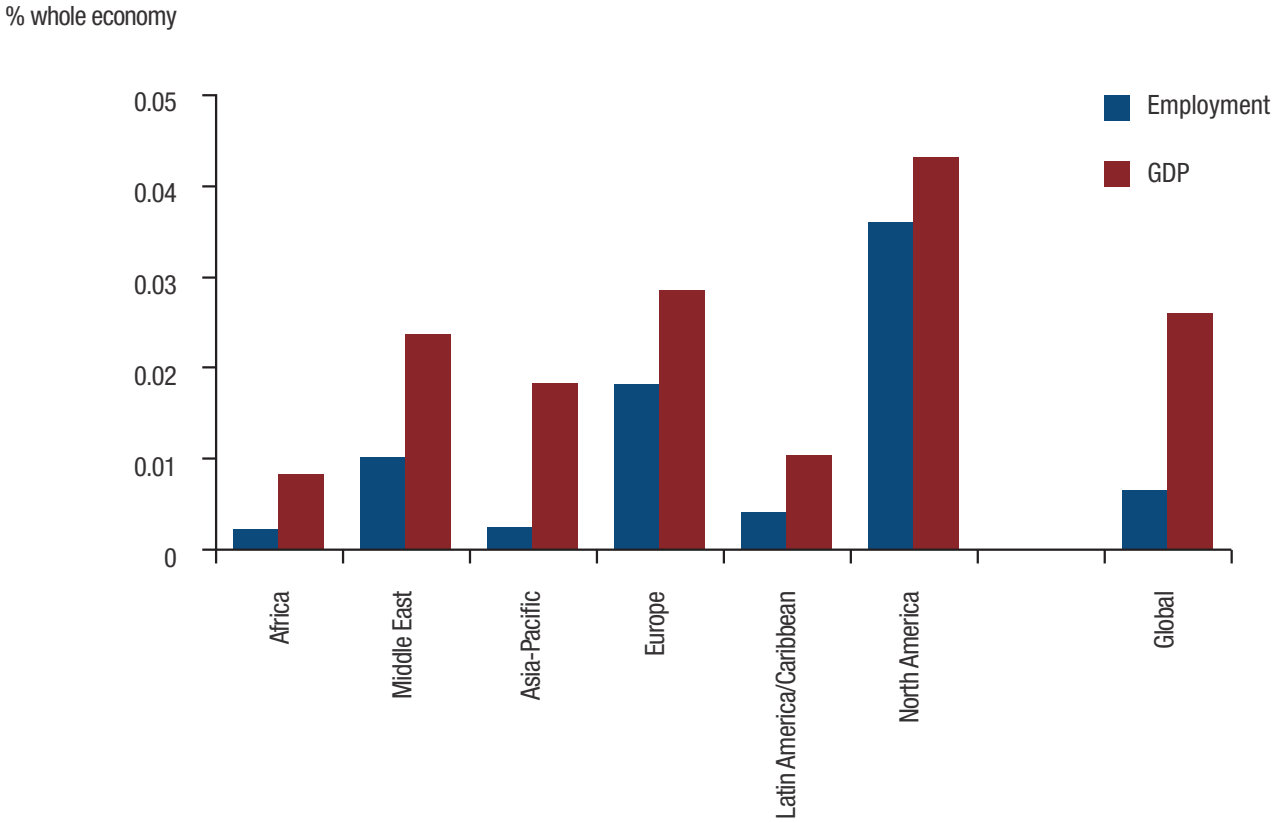
Table 7.2 Air transport's economic and social benefits – 2007 & 2026

(Thousands of jobs and US$billion of GDP)

	2007		2026	
	Employment	GDP	Employment	GDP
Direct	5,655	425	8,518	973
Indirect	6,430	490	9,716	1,131
Induced	3,021	229	4,559	526
Direct, Indirect, Induced	**15,106**	**1,144**	**22,793**	**2,632**
Tourism	18,043	396	28,781	983

Source: Oxford Economics

Chart 7.2 Direct, indirect and induced contributions of air transport — 2026



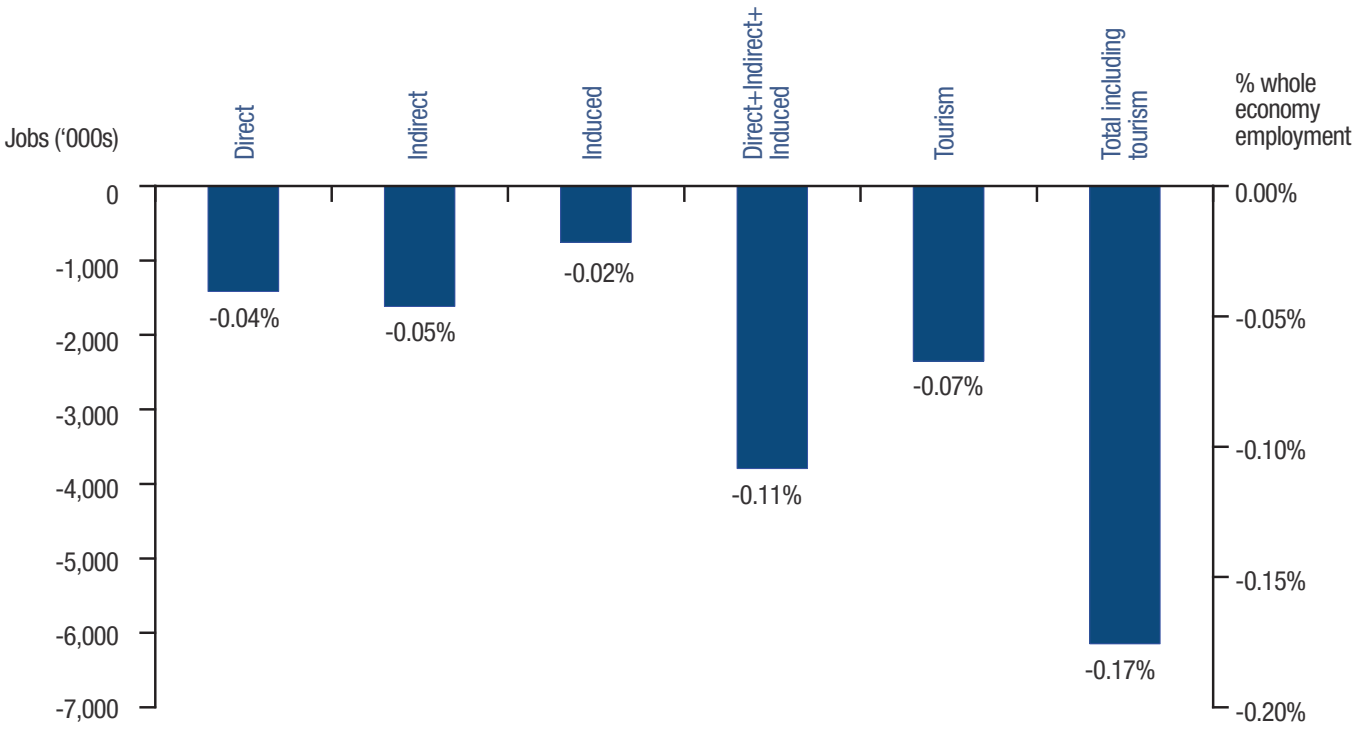
8. Big downsides to constrained air transport

While the short-term influence of the current world economic downturn on air transport is marked, demand is likely to bounce back as recovery gets underway. However, a number of factors could disrupt the long-term forecasts. A sensitivity analysis of future growth in passenger and cargo traffic shows how the economic contribution of aviation would be impacted.

Should growth in passenger and cargo traffic be one percentage point lower during 2007-26 (i.e. down to 3.8% and 4.8% per year respectively), in 2026:

- A drop of close to 1.5 million jobs would result directly in the air transport sector.
- Taking into account the indirect and induced impacts, the number of jobs supported by air transport would be 3.8 million lower.
- Adding the impact on tourism, the total number of jobs supported by air transport would be more than 6 million lower, which would represent 0.2% of world employment in 2026 (Chart 8.1). By region, the fall in jobs supported by air transport would amount to around 2 million in Asia-Pacific, 1.5 million in each of Europe and North America, 400-500 thousand in each of Africa and Latin America and more than 200,000 in the Middle East.

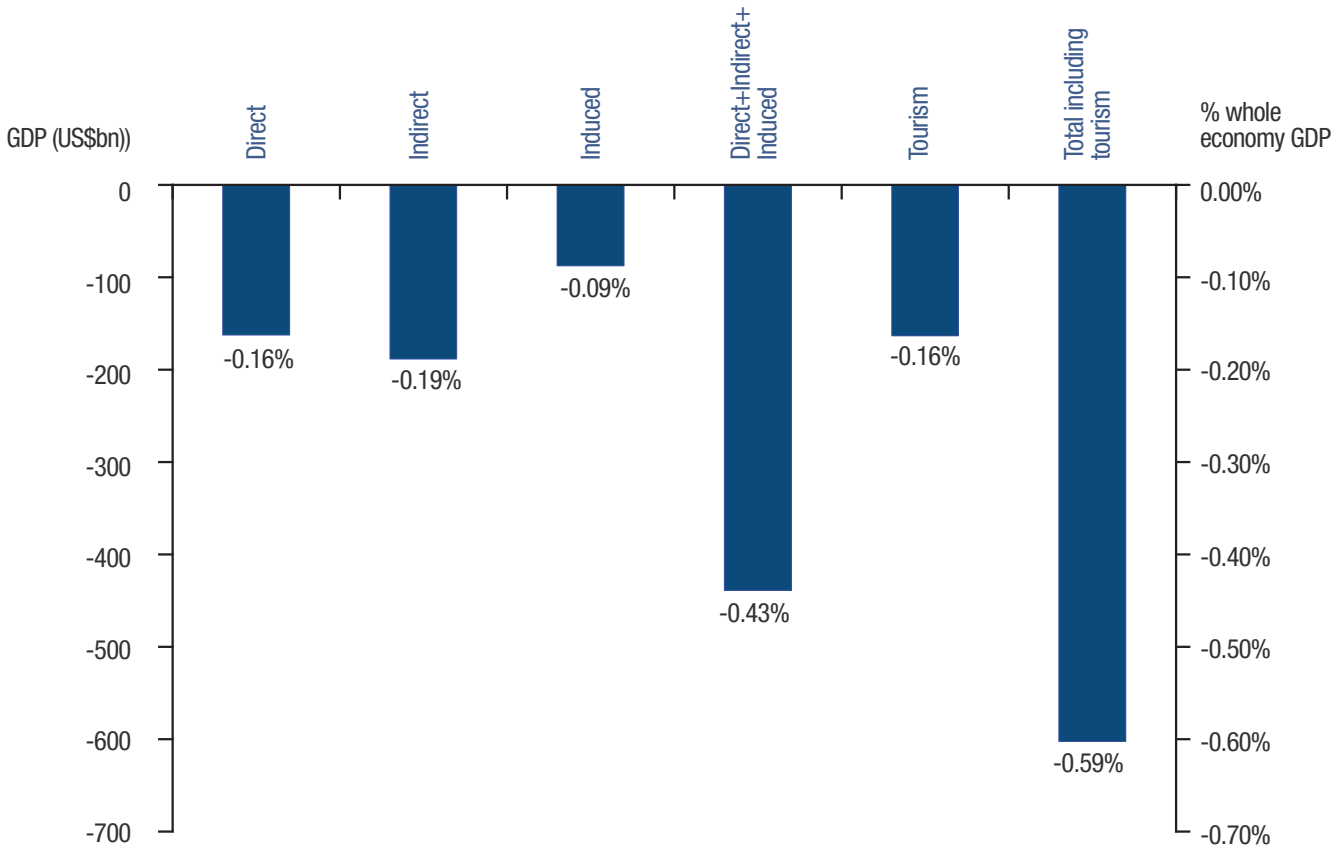
Chart 8.1 Employment impact of 1% lower growth in demand



Source: Oxford Economics

- The direct, indirect and induced contribution of the air transport sector to world GDP would be US$440 billion lower, with an additional US$164 billion lost through lower tourism activity. Therefore, in total air transport would contribute 0.6% less to world GDP in 2026 than in the base case (Chart 8.2).

Chart 8.2 GDP impact of 1% lower growth in demand

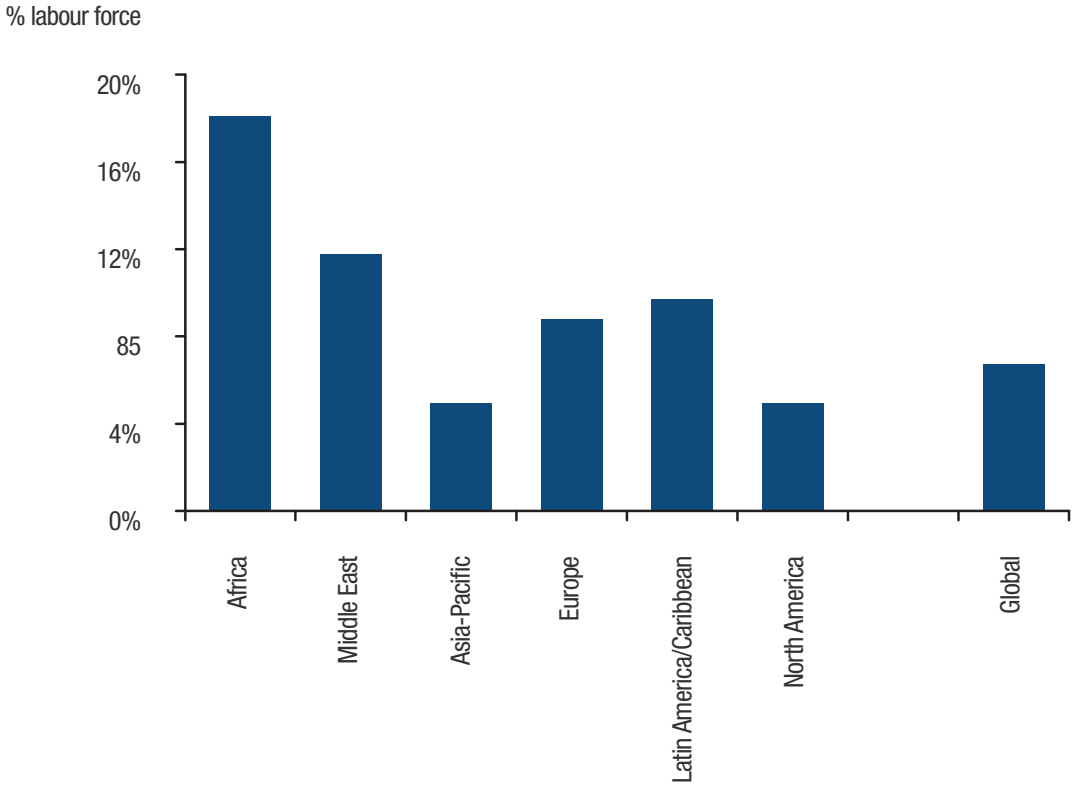


Source: Oxford Economics

In a world of lower growth in air transport, resources would be reallocated to other sectors, so that a number of the jobs lost from the lower activity in air transport would be offset by job gains in other industries. However, transfers of resources and jobs between sectors take time as technologies need to be adapted and workers retrained, requiring considerable time and investment.

This is especially true in economies where existing resources are not currently being fully employed (Chart 8.3). In these circumstances lower growth in air transport would imply a significant net loss of jobs for many years.

Chart 8.3 Unemployment rates — 2005



Source: Oxford Economics

In addition, many of the catalytic effects of the aviation industry mentioned in sections 3-6 would be weakened or lost. For example, with lower growth in air transport, some regions would lose a stable and relatively weather-independent source of revenue, some companies would be less productive, and migrant workers may be discouraged, potentially undermining remittance flows.

Moreover, the fact that the share of the air transport industry in world GDP is much higher than its share in world employment shows that the industry is highly productive: it generates a very high level of value added per employee. In an environment of lower growth in air transport, alternative means of generating wealth may not be as productive resulting in a net loss for the economy.

8.1. Why lower growth in air transport does not necessarily imply lower emissions

Reducing aviation activity such as passenger travel or air freight could cut green house gas (GHG) emissions. However, if alternative means of transport and alternative means of generating wealth and jobs do emerge then these will also generate green house gases. Whether or not a switch away from aviation would reduce GHG emissions depends on a large number of factors including:

- the level of emissions released directly by air transport;
- the level of emissions released by the suppliers of the air transport (i.e. indirect emissions);
- the level of emissions released by the alternative forms of transport and related infrastructure that replace aviation;
- the level of emissions released directly by the replacement activity; and
- the level of emissions released by the suppliers of the replacement activity.

To the extent that there is uncertainty over the type(s) of replacement activity and the emission intensity of the replacement activity, it is not possible to estimate with a reasonable degree of confidence the impact of reduced activity in aviation on GHG emissions.

The example of food miles (see 'What price fresh produce?' Part III, page 81) illustrates that the net impact on carbon or GHG emissions of substituting air transport for other modes or other activities is a complex issue. As a further example, consider CO_2 emissions resulting from air-related tourism. A study by the United Nations World Tourism Organization (UNWTO) and United Nations Environment Programme (UNEP) found that tourism contributes to climate change mainly through transport (people travelling by air, road, rail and sea) and accommodation (e.g. heating and lighting in hotels). If there were fewer tourists, or fewer tourists travelling by air, emissions by aircraft carrying international tourists would be lower as would GHG levels from tourist accommodation. If, in order to maintain living standards, the loss of activity in (air) tourism is offset by increased activity in manufacturing,[31] GHG emissions would arise first from the manufacturing production process and second from the transport of the manufactured goods to market (as tourism is an 'export' the demand for the replacement activity would also need to come from abroad). Emissions vary a lot depending on the type of manufacturing activity and on the distance and mode of transport that is required to take their production to market. It is these factors that are key to determining if a switch away from an aviation dependent industry would ultimately lower GHGs. A more complete analysis would also need to take account of emissions ensuing from activity supporting and supported by air-related tourism (e.g. caterers) and manufacturing (e.g. equipment suppliers) and of other unintended consequences. For example, if stripped of visitor revenues, areas dependent on ecotourism might shift towards damaging activities involving deforestation, pushing CO_2 emissions from this source above its current 20% share[32] and undermining biodiversity.

[31] Especially for developing countries, this seems the most likely sector in which compensating activity would develop. Indeed, developing countries have typically less advanced markets in services.

[32] Carbon emissions from forest loss in protected areas, A report commissioned by The Nature Conservancy as part of the PACT 2020 Innovation Initiative in collaboration with UNEP-WCMC and the IUCN World Commission on Protected Areas, September 2008.

9. Conclusion: Air transport brings our economies and societies a worldwide range of far-reaching benefits

The numbers in this report clearly demonstrate that air transport is a major source of jobs and revenues worldwide. The industry also supports jobs and activity in a wide range of related industries across the globe.

But the contribution of air transport goes far beyond such obvious economic effects. The mass movement of goods and people also has a major impact on new ways in which modern economies and societies operate. By promoting international trade, encouraging tourism, and stimulating investment throughout our globalised world, air transport has the potential to positively transform economic and social systems. For producers of goods and services it can lead to efficiency gains, facilitate links between businesses and potential customers, and bring long-distance and international contracts within reach. For workers in the developing world it can offer a means to sustainable and stable incomes. Freedom of movement into and out of developing regions can also provide opportunities to learn new, marketable skills, leading to long-term employment, increased local enterprise, and raising standards of living.

Of course, there is a price to be paid for growth. This report acknowledges that aviation is estimated to account for around 2% of global CO_2 emissions. Available projections on CO_2 emissions from aviation vary greatly, depending on assumptions about projected growth and technological progress. Non-CO_2 emissions should also be taken into account. While the science to measure this is still evolving, it is also likely that technical progress will help mitigate their impact. However, any discussion about carbon costs should recognise the benefits that air transport brings to many worldwide; and responsible policy should work toward a sustainable balance between these positive impacts and the cost inherent in future growth.

Social and environmental concerns have been raised about many aspects of air transport's role in driving globalised growth. What hazards might result from an increased drain on natural resources caused by growing produce in developing countries for consumption abroad? What carbon footprint will be left by flying this fresh produce to markets far away? In the second part of this report, case studies directly address such issues. As no completely reliable way currently exists to weigh the economic and social benefits of aviation against environment costs, efforts are made in these case studies to acknowledge both aspects and to garner the views and research on the socio-economic benefits. The carbon footprint of fresh produce, for example, is examined as an aggregate of the complete life-cycle of the product rather than simply as an 'air-mileage' carbon cost. These cases weigh and balance the true costs of the continued growth of the air transport industry in the wider context of the alternatives available, and the economic prospects of those impacted.

Beyond the economic sphere, air transport also brings a wealth of difficult-to-measure yet potent benefits to communities around the world. These include effects as diverse as the maintenance of family and social ties for emigrants, the fostering of habitat protection, the promotion of cross-cultural exchange and the delivery of the fastest possible response to disaster-stricken communities.

The ultimate measure of the benefits of air transport in our globalised world is practically impossible to quantify: perhaps an hour spent observing the flow of humanity and goods through a busy, international airport such as London Heathrow, Amsterdam Schiphol or New York JFK gives one some small insight into how the 21st-century's staggering daily exchange of goods, ideas and cultures takes wing today, as well as the demand from ordinary citizens for the benefits it can bring.

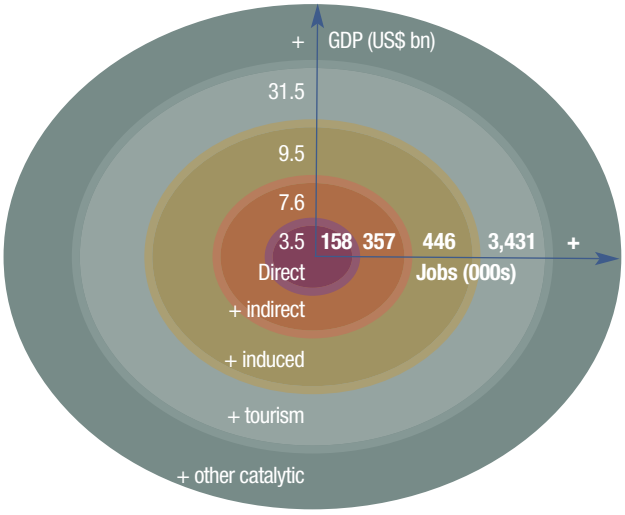
Regional Summaries: Part II

Regional Summary — Africa

Air transport directly employs and supports jobs for approximately 450,000 people in Africa

- In 2007, Africa-based airlines transported approximately 90 million passengers and carried 1 million tonnes of freight.
- We estimate that the air transport **industry directly employed more than 150,000 people** in Africa and contributed **US$3.5 billion to GDP**. The industry is about four times as productive as the economy as a whole.
- Combining the direct, indirect and induced contributions, the air transport sector supported close to **450,000** jobs in Africa and contributed **US$10 billion to GDP**.

Contribution of air transport to the African economy



Source: Oxford Economics

The contribution of air transport goes beyond jobs and GDP, providing a means for sustainable development…

- As explained at the global level, the contribution of the air transport sector goes beyond employment and value added in sectors that directly depend on it. For Africa, these deeper indirect and catalytic effects are particularly relevant. Air transport offers a means towards sustainable development by enabling activities that provide stable revenues through attractive jobs, especially for young people. The effects of the industry in fostering exchanges of techniques and knowledge with developed countries inevitably result in investment, a boost in trade, and the creation of long-term jobs.
- In particular, air transport supports regional tourism. The **tourism industry** is an important source of jobs, skills and incomes throughout Africa. We estimate that **three million jobs** in tourism are supported by air transport, contributing around **US$22 billion** to the continent's **GDP**.
- The recent initiative of the Moroccan government to develop tourism is a measure of how African nations can shape their long-term growth via improvements in air transport infrastructure. By focusing on facilitating arrivals of tourists by air, Morocco's Vision 2010 aims to realise many of potential long-term benefits from aviation (see Part III, page 90).

… and with social benefits such as increased concern for the environment or disaster relief

- This report has also highlighted the many ways in which aviation benefits populations, beyond economic effects. Examples in Africa include:
  - Promotion of tourism. In Morocco Fès is being promoted as a "Lively Millennial Museum, based on its authenticity as the only remaining place in the world where daily lives still reflect an ancient way of life and its associated culture and art." Crucially for Fès, the realisation of the city's tourist potential and its successful entry into the European city-break market depends on the

introduction of point-to-point flights from the major cities of Morocco's key overseas markets (see Part I, page 33).

- Blue Skies, an association that supports farmers in Ghana. Without the means to export their produce by air to developed markets, production of fresh produce for international markets would not be viable with widespread consequences, including the ability of farmers to pay for education for their children (see Part III, page 86).
- Raised concern for the environment, as illustrated by the example of the mountain gorillas in Rwanda: the potential for increased interest in preservation, caused by an influx of ecotourists, applies to many of Africa's unique ecosystems (see Part III, page 94).
- Actions to attract investment by improving air links, such as the new Dube TradePort in South Africa. The TradePort is currently under development and will include a new airport at the centre of a state-of-the-art trade zone. Such improvements in infrastructure will likely achieve the long-term goal of bringing trade and growth to the region (see Part III, page 105).
- Acting, in conjunction with tourism ambitions, as a spur for initiatives to eradicate malaria with substantial health and well-being benefits for the local population (see Part III, page 111).

Over 5 million jobs could be supported by Africa's air transport sector in the next 20 years

- Demand for air transport from Africa is forecast to grow by about 5% per annum over the next 20 years. We estimate that by 2026 air transport will provide and support jobs for almost 700,000 people, making a GDP contribution of US$25 billion. It will support an additional 4 million jobs and US$77 billion of GDP in the tourism sector.
- Every one percentage point lower growth in passenger and freight traffic would reduce the number of jobs supported by air transport in the next 20 years by around 500,000 and GDP by around US$13 billion.

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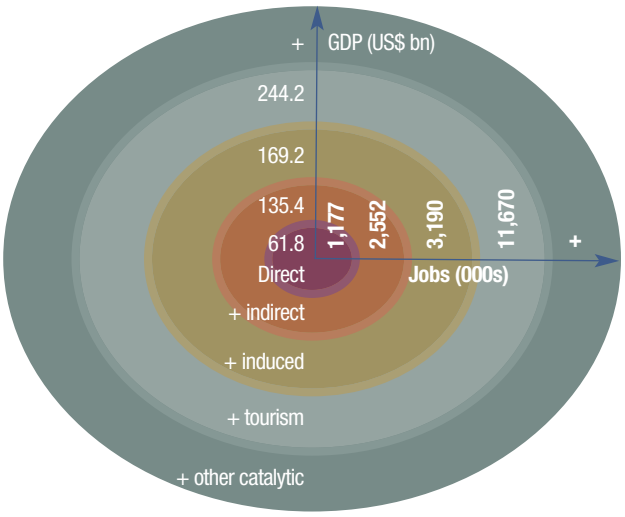
Regional Summary — Asia-Pacific

Air transport directly employs and supports jobs for approximately 3 million people in Asia-Pacific

- In 2007, Asia-Pacific based airlines transported approximately 630 million passengers and carried 20 million tonnes of freight.
- We estimate that the air transport industry **directly employed more than 1.2 million people in the region** and contributed more than US$60 billion to GDP. The industry is more than seven times as productive as the economy as a whole.
- Combining the direct, indirect and induced contributions, the air transport sector supported more than **3 million jobs** in Asia-Pacific and contributed **US$170 billion to GDP**.

Contributions of air transport to the Asia-Pacific economy



Source: Oxford Economics

The contribution of air transport goes beyond jobs and GDP, changing the way companies operate and raising living standards…

- As explained at the global level, the contribution of the air transport sector goes beyond employment and value added creation in sectors that directly depend on it. **Air transport changes how whole economies and societies operate.** The industry stimulates development in certain sectors in a number of ways: by opening up new markets, by boosting international trade, and by encouraging companies to invest in particular countries or regions.
- In particular, air transport supports regional tourism. The **tourism industry** is an important source of jobs, skills and incomes throughout Asia-Pacific. We estimate that **8.5 million jobs** in tourism are supported by air transport, contributing around **US$75 billion** to the continent's **GDP**.
- For Asia-Pacific, one major contribution of air transport to the region's living standards has been the fostering of investment and outsourcing to the region. This is likely to continue in the future. Direct contact is essential for these contracts, as Western investors and customers favour regular onsite visits: from the initial contact, to the signing of the deal, to the monitoring of the production process. The growing trend for international investment has created jobs across a wide range of sectors and skills in a region where underemployment has long been a social and economic problem.
- The report shows various examples of these deep-rooted benefits of aviation in Asia-Pacific including:
  - The first commercial flights from the UK to Australia, the Kangaroo route, carried half a tonne of mail and cargo, but no passengers for destinations beyond Singapore. The flight, by flying-boat, took 12 days. By 1947 things had moved on markedly, but were still only a shadow of current service levels. Still the journey involved 55 hours of flying-time, six re-fuelling stops and two overnight stays for the complement of 29

passengers. And air travel between Europe and Australia was only for the wealthiest. The cost of a return ticket in the late 1940s equated to the cost of a small house or 130 weeks of earnings for the average Australian, compared with only around two weeks' salary today (see Part I, page 35).

- By enabling Filipinos work abroad and send a very large amount in remittances home. In 2007, remittances received by the Philippines amounted to US$16 billion. There are more than 3.5 million Filipinos living and working on permanent contracts abroad, many of them travel by air to and from their host country (see Part I, page 36).

- The case study of farmers in a region of southwest China who have established a thriving floriculture business exporting flowers to the west. Inhabitants of this once relatively poor region now enjoy significant incomes and jobs from this business (see Part III, page 79).

- By attracting visitors and tourists who gain an appreciation for the area and a first-hand understanding of the many environmental challenges it faces, support is now growing for the sustained conservation of the Lower Kinabatangan rainforest in Borneo and for the area's threatened orangutan habitat (see Part III, page 91).

- Air cargo and international passenger capacity has grown significantly in India over the last couple of decades. As air connections have developed, India–and in particular the city of Bangalore – has established itself as one of the main IT nerve centres of the world (see Part III, page 104).

Close to 20 million jobs could be supported by Asia-Pacific's air transport sector in the next 20 years

- With demand increasing by over 6% per annum, Asia-Pacific is expected to be the fastest growing region in the world for air transport over the next 20 years. We estimate that, by 2026, air transport will provide and support jobs for around 5 million people, making a GDP contribution of US$540 billion. It will support an additional 13.5 million jobs and US$780 of GDP billion in the tourism sector.

- Every 1 percentage point lower growth in passenger and freight traffic would reduce the number of jobs supported by air transport in the next 20 years by around 2 million and GDP by around US$130 billion.

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Flights bringing expatriates (and their savings) back home. Page 34

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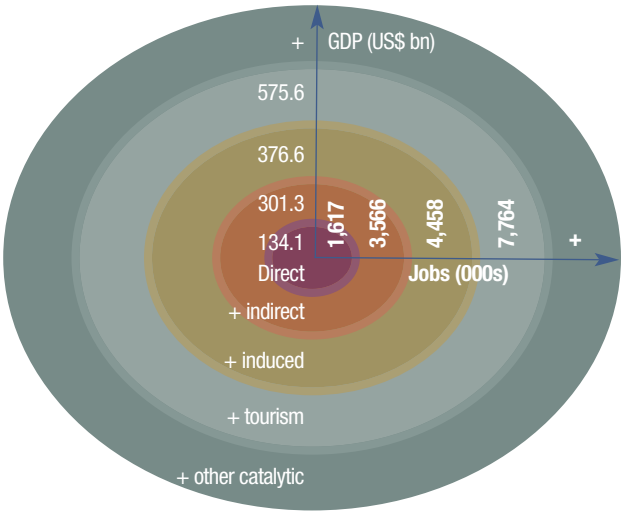
Regional Summary — Europe

Air transport directly employs and supports jobs for close to 4.5 million people in Europe[33]

- In 2007, European airlines transported approximately 700 million passengers and carried 10 million tonnes of freight.
- We estimate that the air transport industry **directly employed more than 1.6 million people in Europe** and contributed US$134 billion to GDP. The industry is about 50% more productive than the economy as a whole.
- Combining the direct, indirect and induced contributions, the air transport sector supported close to **4.5 million jobs** in the region and contributed **US$380 billion to GDP**.
- Air transport supports regional tourism. The **tourism industry** is an important source of jobs, skills and incomes throughout **Europe**. We estimate that **3.3 million jobs** in tourism are supported by air transport, contributing nearly **US$200 billion** to the continent's **GDP**.

Contributions of air transport to the European economy



Source: Oxford Economics

The contribution of air transport goes beyond jobs and GDP, providing a means for sustainable development…

The contribution of the air transport sector goes beyond employment and value added in sectors that directly depend on it. **Air transport changes how whole economies and societies operate**. The industry stimulates development in various sectors in a number of ways: by opening up new markets, by boosting international trade and by encouraging companies to invest in particular countries or regions. Air transport also enables people to travel for business or leisure. By increasing labour mobility in Europe, aviation helps the functioning of monetary union. Taken together these spill-over effects underpin economic and social development.

- The report shows various examples of these deep-rooted benefits of aviation in Europe including:
  - Two EU island members where GDP per head is well below the EU average – Malta and Cyprus – have economies that are crucially dependent on airborne tourism. Nearly 98% of tourists to Malta arrive by air, while the figure for Cyprus is 94%. The travel and tourism economy, account for nearly 23% of Maltese GDP and 21% of Cypriot GDP (see Part I, page 30).
  - A study investigating the factors influencing individual company location decisions showed that proximity to a major airport was the fourth most important factor when deciding the country of location of the European Headquarters of companies and the most important factor when deciding the region of location within a particular country (see Part I, page 45).

[33] EU27 and other non-EU countries, plus Turkey and Russia and former Soviet Union countries in Eastern Europe (Belarus, Ukraine, Moldova, etc.).

- As a key attraction to businesses, the Austrian government advertises that Vienna's airport offers connections to anywhere in Europe within three hours. The success of this policy is evident: Vienna is home to the regional headquarters of several multinationals such as Coca-Cola, Ericsson and IBM. According to the Boston Consulting Group, around 300 multinationals have established their Eastern European headquarters in Austria (see Part III, page 46).

- The Cork Airport Business Park has contributed to the local economy's diversification away from declining agriculture to the fast growing pharmaceutical and IT sectors, two sectors that rely heavily on air transport (see Part I, page 51).

- The development of Charleroi Airport has acted as a key element in breathing new economic life into the Belgian province of Hainault. As a region previously dependent on coal and steel, it has suffered high unemployment and social problems as these heavy industries declined. The opening of the airport to international flights has been a catalyst for the location of multinational companies nearby. The creation of a business-oriented science park, aided by the increased air access, has also helped spawn a cluster of aerospace, biotech and medical industries. In turn, this has attracted highly-qualified, well-paid staff to the region, further spurring local development (see Part III, page 101).

Close to 12 million jobs could be supported by Europe's air transport sector in the next 20 years

- Demand for air transport from Europe is forecast to grow by slightly less than 5% per annum over the next 20 years. We estimate that, by 2026, air transport will support jobs for close to 7 million people, making a GDP contribution of US$870 billion. It will support an additional 5 million jobs and US$470 billion of GDP in the tourism sector.

- Every 1 percentage point lower growth in passenger and freight traffic would reduce the number of jobs supported by air transport in Europe in the next 20 years by around 1.5 million and GDP by around US$225 billion.

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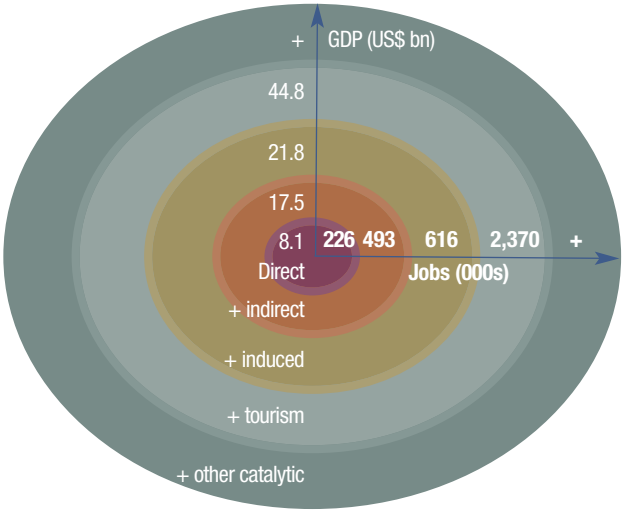
Regional Summary — Latin America & the Caribbean

Air transport directly employs and supports jobs for more than 600,000 people in Latin America & the Caribbean[34]

- In 2007, airlines based in Latin America & the Caribbean transported approximately 120 million passengers and carried 3 million tonnes of freight.
- We estimate that the air transport industry **directly employed more than 225,000 people in Latin America & the Caribbean** and contributed around US$8 billion to GDP. The industry is close to three times as productive as the economy as a whole.
- Combining the direct, indirect and induced contributions, the air transport sector supported close to **600,000 jobs** in Latin America & the Caribbean and contributed **US$22 billion to GDP**.
- In particular, air transport supports regional tourism. The **tourism industry** is an important source of jobs, skills and incomes throughout Latin America & the Caribbean. We estimate that nearly **1.8 million jobs** in tourism are supported by air transport, contributing around **US$23 billion** to the continent's **GDP**.

[34] Latin America: Central & Southern America plus the Caribbean islands but excluding Mexico

Contributions of air transport to the Latin American & the Caribbean economy



Source: Oxford Economics

The contribution of air transport goes beyond jobs and GDP, providing a means for sustainable development…

- The report shows various examples of these deep-rooted benefits of aviation in Latin America & the Caribbean including:
  - The El Calafate airport in Patagonia opened in November 2001, cutting the journey time from Buenos Aries to just three hours. By 2006 passenger arrivals at the airport reached 408,000. As well as giving easier, faster access to tourists and increased connectivity among a remote local population, the airport is also driving a growing diversification of a narrowly based economy in the region (see Part III, page 76).

- Costa Rica demonstrates the potential of ecotourism to generate foreign exchange, employment, and progress in conservation. The promotion of ecotourism began in the 1980s as a way of reversing the devastating effects of deforestation. Since then the tourist industry has become a major source of foreign exchange and provides the resources needed to maintain the country's famous national park system. Between 1988 and 2007 international tourism spending increased six-fold to US$2 billion, with nearly 1.9 million international visitors. In terms of economic impact it is estimated that in 2005 tourism contributed 7.9% of Costa Rica's GDP, 22.3% of foreign exchange earnings and supported over 13% of all jobs (see Part III, page 93).

Over 4 million jobs could be supported by Latin America & the Caribbean's air transport sector in the next 20 years

- Demand for air transport from Latin America & the Caribbean is expected to rise by about 5% per annum over the next 20 years. We estimate that by 2026 air transport will provide and support jobs for more than 1 million people, making a GDP contribution of nearly US$55 billion. It will support an additional 3 million jobs and US$57 billion of GDP in the tourism sector.

- Every 1 percentage point lower growth in passenger and freight traffic would reduce the number of jobs supported by air transport in the next 20 years by around 430,000 and GDP by around US$18 billion.

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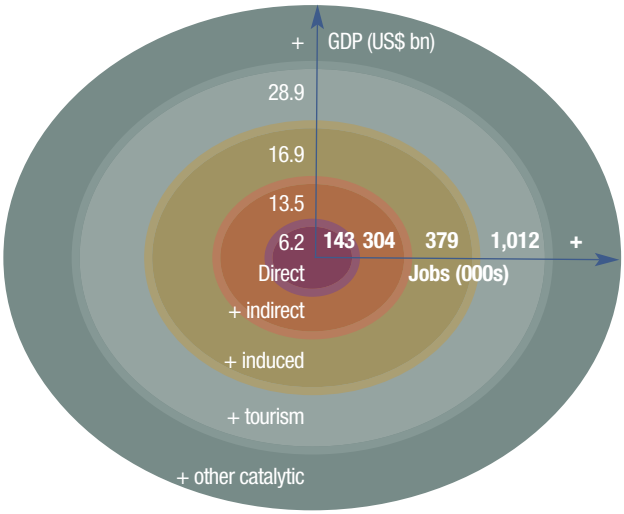
Regional Summary — Middle East

Air transport directly employs and supports jobs for approximately 400,000 people in the Middle East[35]

- In 2007, airlines based in the Middle East transported approximately 90 million passengers and carried 1 million tonnes of freight.
- We estimate that the air transport industry **directly employed close to 150,000 people in the Middle East** and contributed more than US$6 billion to GDP. The industry is about 80% more productive than the economy as a whole. This is despite the fact that the oil industry, which dominates many economies in the Middle East, is a very highly productive sector.
- Combining the direct, indirect and induced contributions, the air transport sector supported close to **400,000 jobs** in the Middle East and contributed **US$17 billion to GDP**.
- In particular, air transport supports regional tourism. The **tourism industry** is an important source of jobs, skills and incomes throughout the Middle East. We estimate that over **600 thousand jobs** in tourism are supported by air transport, contributing around **US$12 billion** to the continent's **GDP**.

[35] Middle East: the Gulf States and the core Middle Eastern countries (excluding Egypt).

Contributions of air transport to the Middle East economy



Source: Oxford Economics

The contribution of air transport goes beyond jobs and GDP, providing a means for sustainable development…

- The report shows various examples of these deep-rooted benefits of aviation in the Middle East including:
  - Oxford Economics' study of the overall contribution of Etihad Airways to the economy of the Emirate of Abu Dhabi shows that the benefits are far reaching. The airline is one of the key elements of the Emirate's strategy to diversify the economy from its reliance on oil extraction (see Part I, page 15).

Close to 2 million jobs could be supported by the Middle East's air transport sector in the next 20 years

- Demand for air transport is expected to rise particularly fast in the Middle East, with an average growth in the number of passengers over the next 20 years of 6% per year and 4.3% for cargo. We estimate that by 2026, air transport will provide and support jobs for close to 750,000 people, making a GDP contribution of US$50 billion. It will support an additional 1.2 million jobs and US$35 billion of GDP in the tourism sector.
- Every 1 percentage point lower growth in passenger and freight traffic would reduce the number of jobs supported by air transport in the next 20 years by close to 240,000 and GDP by around US$14 billion.

Report cross references

Part I

Memphis Airport and Etihad Airways: how aviation goes beyond the direct trade benefits. Page 15

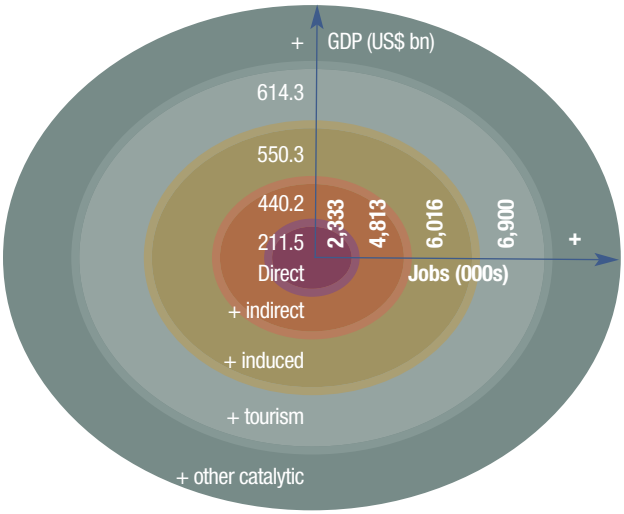
Regional Summary — North America

Air transport directly employs and supports jobs for nearly 7 million people in North America[36]

- In 2007, North American airlines transported close to 800 million passengers and carried 14 million tonnes of freight.
- We estimate that the air transport industry **directly employed approximately 2.3 million people in North America** and contributed more than US$200 billion to GDP. The industry is about 20% more productive than the economy as a whole.
- Combining the direct, indirect and induced contributions, the air transport sector supported over **6 million jobs** in North America and contributed **US$550 billion to GDP**.
- In particular, air transport supports regional tourism. The **tourism industry** is an important source of jobs, skills and incomes throughout North America. We estimate that **0.9 million jobs** in tourism are supported by air transport, contributing around **US$64 billion** to the continent's **GDP**.

[36] United States, Canada and Mexico.

Contributions of air transport to the North American economy



Source: Oxford Economics

The contribution of air transport goes beyond jobs and GDP, providing a means for sustainable development…

- The report shows various examples of these deep-rooted benefits of aviation in North America including:
  - Memphis International Airport in the state of Tennessee is a major international airport particularly in terms of cargo services (the largest in the world). A recent survey of local businesses about their views and use of the airport highlights the many ways in which air transport benefits the economy: 80% of businesses canvassed use the airport to transport company personnel; close to 60% use the airport to transport customers and business associates and around 25% to ship supplies in and products out. Around 55% agreed or strongly agreed that growth in the airport would automatically cause their businesses to grow (see Part I, page 15).
  - In 2005, aviation services in Texas generated 524,000 jobs and US$27 billion of GDP through direct and indirect activity, and a further 259,000 jobs and US$8 billion of GDP

through induced effects. In total, aviation services were responsible for 4.9% of GDP and 7.25% of jobs in Texas. When aircraft manufacturing and related activities are added, the aggregate number of aviation related jobs in Texas is almost 1 million, 10.7% of all Texan jobs, while the total GDP impact is US$127 billion, or 12.8% of the total Texan GDP (see Part III, page 75).

- In a region with no ground transportation, Air Inuit has built a successful near 30-year record providing an essential lifeline in this harshest of environments, via scheduled services, charter, cargo and emergency flights. Now employing more than 400 people, Air Inuit has carried over 1.3 million passengers on its flights. Air Inuit is owned by the people it serves. The airline works to preserve Inuit culture and language and to promote health, welfare, relief of poverty, and education among the Inuit. Preferential hiring policies and investments in training aim to provide community-based employment opportunities for Inuit, so safeguarding employment access for aboriginal staff (see Part III, page 77).

More than 9 million jobs could be supported by North America's air transport sector in the next 20 years

- Despite a slowdown in the short term related to the economic downturn, demand for air transport is expected to rise sharply over the next two decades. Between 2007 and 2026, the number of passengers and the amount of cargo carried by North American airlines is forecast to rise by nearly 4% per annum.
- This implies that by 2026 air transport would provide and support jobs for more than 8 million people, making a GDP contribution of US$1,100 billion. It will support an additional 1.3 million jobs and US$136 billion of GDP in the tourism sector.
- Every 1 percentage point lower growth in passenger and freight traffic would reduce the number of jobs supported by air transport in the next 20 years by close to 1.5 million, and GDP by around US$210 billion.

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Case Studies: Part III

1. Introduction

Part III of this study is devoted to case studies that highlight the many ways through which aviation benefits economies and societies.

2. Why the Texan economy thrives under the 'lone star' sky

Texas is a state that stands alone: residents of the Lone Star State take pride in a history of being different.

Yet, like many border dwellers, Texans are open, adaptable and resourceful. They have lived at the intersection of two very different cultures for centuries: these days planes crisscross the skies of Texas every day, carrying a wealth of goods and passengers, not just south of the border, but to all points national and global.

Texas covers an area greater than France. However, with a population of 24 million concentrated in a handful of metropolitan areas, large swathes of this desert and prairie state are sparsely populated. This makes air travel an efficient mode of transport both intra-State and to and from other parts of North America and abroad.

Tourism is an important export-oriented industry for Texas. The industry generated a direct GDP contribution of US$23 billion in 2007, around 2% of the State total. The industry is an important source of tax revenue, providing 8% of local and State taxes. Without aviation a significant part of this economic impact on Texas would be lost. During 2007 16.6 million visitors travelled to Texan destinations by air. This represents about 15% of all overnight visitors to the state and about one-half of all, potentially higher spending, out-of-state overnight visitors.

Texas is the largest exporter of any of the United States, with a high degree of specialisation in sectors such as information technology (Texas Instruments, Electronic Data Systems, AT&T), and oil and natural gas (Exxon Mobil, ConocoPhillips).

Aerospace and aviation have also traditionally had a very strong presence in Texas. The Lyndon B. Johnson Space Centre in Houston is home to NASA. Southwest Airlines (largest airline in the world by number of passengers carried) has its headquarters in Dallas and Continental Airlines is based in Houston at the airline's biggest hub. In addition, Lockheed Martin's Aeronautics division is located in Fort Worth.

Dallas Fort Worth International, with 685,000 in 2007, is the third busiest airport in the world in terms of aircraft movements, the seventh busiest in terms of passenger numbers – almost 60 million – in 2007; and is rated as the "Best Cargo Airport in

the World" in the World Cargo Survey. George Bush Intercontinental Airport in Houston is the sixth busiest in the world in terms of aircraft movements, and the sixteenth busiest in the world in terms of passenger numbers in 2007.

In 2005, aviation services in Texas generated 524,000 jobs and US$27 billion of GDP through direct and indirect activity, and a further 259,000 jobs and US$22 billion of GDP through induced effects. In total, aviation services were responsible for 4.9% of GDP and 7.3% of jobs in Texas and generated employee earnings of US$21 billion, an average of US$26,200.

When aircraft manufacturing and related activities are added, the aggregate number of aviation related jobs in Texas is almost 1 million, 10.7% of all Texan jobs, while the total GDP impact is US$127 billion, or 12.8% of the total Texan GDP.

3. Patagonia: New beginnings at the end of the world

The writer Bruce Chatwin famously resigned from his newspaper with a telegram stating simply GONE TO PATAGONIA. He had fled London's crowded streets for a journey to the end of the world, at the southernmost tip of South America. Patagonia's sparsely populated emptiness also attracted Butch Cassidy and the Sundance Kid, when the pair went on the run from US justice. There they found a region similar to the American west: large stretches of nothingness, dust, silence and dark skies. Lying mostly south of the 40th parallel, Patagonia still feels like end of the world. But it is beginning to attract a new breed of visitors.

One of the main attractions is the spectacular Perito Moreno glacier, which forms part of the Southern Patagonian ice-field in the Andes. A UNESCO World Heritage site, this glacial spectacle is one of the few advancing glaciers in the world. At times the glacier advances across "Lago Argentino" creating a natural dam, with water levels up to 30 meters higher on the blocked side of the lake. Eventually the pressure of this build-up produces an awe-inspiring rupture in the ice. The glacier and its associated ice-fields – said to be the world's third-largest reservoir of freshwater – are now bringing visitors to this remote region at a fast-increasing rate. Until recently, these natural wonders were inaccessible to all but a few adventurers with the luxuries of plentiful time and money. But improved air transport in the region has now put Patagonia within the reach and budget of many more eco–tourists.

Until 2000, reaching El Calafate, the town closest to the glacier and ice-field, was a major undertaking. This necessitated a flight from Buenos Aries to the industrial city of Rio Gallegos and a 200-mile bus journey on unpaved roads, followed by a day-long

trek at least. Therefore, getting to and from El Calafate consumed a considerable part of a vacation, cutting the amount of time available at the final destination and likely reducing the average visitor's spend-per-trip in the El Calafate area. In 1999 some 60,000 tourists reached the town – drawn by the magic of the glacier and iconic peaks like Mount Fitzroy.

The El Calafate airport opened in November 2001, cutting the journey time from Buenos Aries to just three hours. By 2006 passenger arrivals at the airport were up to 408,000, compared with only 60,000 visitors in 1999. The local population has grown in tandem, from around 5,000 in 1996 to 20,000 in 2006. While this puts developmental pressure on the town, it also drives investment in hotels, shops and local infrastructure. As well as giving easier, faster access to tourists and increased connectivity among a remote local population, the airport is driving a growing diversification of a narrowly based economy in the region.

It is also very likely that the increase in visitors to Patagonia will reinforce concern for the environment and support for conservation. Tour operators have noted these effects in feedback from visitors to other polar regions. The rise in ecotourism also fosters an ethos of conservation among locals who seek secure, sustainable livelihoods. Conscious of the growing national awareness of the Perito Moreno site, Greenpeace now use images of the glacier to promote energy-saving light-bulbs in Argentina.

Patagonia covers an area broadly equivalent to Texas and Ohio combined (or France, Germany and England). Population density averages only 1.9 people per square kilometre, with a total population of just 2 million. This is a sparsely populated country of wide, open spaces, and largely empty skies, crossed by few planes. Yet aviation is now playing a positive role in bringing Patagonia closer to the rest of the world, increasing worldwide awareness of the region and playing a vital part in the conservation of its rich natural resources for future generations.

4. Air Inuit's Arctic Lifeline: Helping indigenous people in a harsh climate get the best of both worlds

The Inuit peoples of Greenland look to the skies at the time of the northern lights and see the souls of the dead playing heavenly football with a walrus skull. They refer to the aurora borealis as arsarnerit or 'the players.' Their Canadian cousins have for the last three decades looked to the skies and decided to become players themselves in the modern world of opportunity and progress that the airline industry offers.

For many people living in the Arctic far north flying is the only means of transport that provides timely access to services, such as health-care, that much of world takes for granted. There are over 200 communities in Alaska and more than 1,050 in northern Russia with no road access. In recognition of the special needs of the region a recent Institute of the North report concluded that improved transportation is needed to enable indigenous people and all residents to receive advanced medical care. The Institute urges Arctic governments to enhance northern aviation by involving indigenous organisations as a catalyst in this process through communication, consultation and collaboration.

Air Inuit demonstrates the contribution that community-owned aviation can make to a more comfortable life in the harsh Arctic climate, while, at the same time, helping preserve the indigenous culture.

Nunavik, the area of Quebec north of the 55th parallel, is home to approximately 10,000 people concentrated in fourteen communities along the eastern Hudson Bay coast, the southern shore of the Hudson Strait, and the Ungava coasts. Prior to the arrival of Europeans, Inuit in the region lived a nomadic, subsistence lifestyle in an extremely harsh environment. They traditionally lived in small bands of a few families who followed

a seasonal pattern of hunting, fishing and gathering. Nunavik is part of the circumpolar world, comprising (from east to west) Greenland, Labrador, Nunavut, the Inuvialuit region of the Northwest Territories (Canada), Alaska, and Siberia (Russia).

In only a few generations the Inuit have experienced dramatic changes in lifestyle. Social and political infrastructures, western technology, and a capitalist economy all represent quite massive alterations to Inuit culture. Despite such significant influencing elements, Inuit continue to hold a unique cultural identity that is sustained by a shared language, shared history, a strong sense of community; and, a vital relationship with the land.

The James Bay and Northern Québec Agreement, which was signed in 1975, is widely recognised as the first modern land claims agreement in Canada. The Agreement protects the traditional rights of the Inuit of Nunavik and establishes a foundation for mutually respectful relations between the Inuit and the governments of Québec and Canada.

The Agreement encompasses a wide range of issues, including the hunting, fishing and trapping regime, education, health, economic development, and public administration. This agreement paved the way for the creation of Air Inuit.

In a region with no ground transportation, Air Inuit has built a successful near thirty-year record of providing an essential lifeline in this harshest of environments, via scheduled services, charter, cargo and emergency flights. Now employing more than 400 people, Air Inuit has carried over 1.3 million passengers on its flights. But, Air Inuit is more than just a commercial enterprise. The airline, via the Makivik Corporation, is owned by the people it serves. In accord with Makivik's social philosophy, the airline works to preserve Inuit culture and language and to promote health, welfare, relief of poverty, and education among the Inuit. Preferential hiring policies and investments in training aim to provide community-based employment opportunities for Inuit, so safeguarding employment access for aboriginal staff.

The airline also supports year-round, Nunavik-wide cultural activities such as music festivals, sporting events and study groups. Via the company's Wings of Knowledge Bursary program Air Inuit encourages and enables young people in Nunavik to pursue career ambitions. Another beneficiary is the Avataq Cultural Institute, which, through its language, heritage and cultural programmes, strives to support and preserve Inuit culture for present and future generations.

In terms of care the airline's role is widening. As well as providing a vital link to medical services for patients in need of treatment beyond the local-facilities, the airlines also sponsors pilot projects to promote healthier diets and well-being. Diets in Arctic regions tend to be deficient in vitamin A and D, the latter partly due to lack of strong sunlight for much of the year. By offering reduced air-cargo rates for priority perishable foods – such as milk, cheese, yogurt, fruit, vegetables, frozen juice concentrate and eggs – the project aims to combat these diet deficiencies by lowering the costs to the Inuit consumer.

Air Inuit also makes tourism to the region possible. In recognition of the area's unique characteristics, three areas are at different stages of being transformed into parks: Pingualuit, Kuururjuaq and the Richmond Gulf–Clearwater Lake. These parks are expected to encourage ecotourism by facilitating access to some of the region's most spectacular natural attractions, including herds of Caribou that make up the largest population of migrating land mammals anywhere on the planet.

Sources: Air Inuit

Institute of the North, http://www.institutenorth.org/

Nunavik Regional Board of Health and Social Services, Annual Report, 2005-06

Revised Northern Food Basket - Highlights of Price Survey Results for 2006, 2007 and 2008, Indian & Northern Affairs, Canada

Vitamin A and D Intakes in Food Mail Pilot Project Communities, Judith Lawn and Dan Harvey, Dialogos Educational Consultants Inc

Nunavik Tourism Association, http://www.nunavik-tourism.com/default.aspx

5. Sowing the seeds of success: How China's floriculture nurtures rural and urban growth

The story of Yunnan's blossoming into one of the world's foremost producers of cut flowers begins with a local man named Hua Zhongyi. A vegetable grower from the small, rural village of Dounan, Zhongyi wisely took the time when visiting the city to stop and smell the roses. He had seen the future and soon became the first from his village to supply the burgeoning demand in China's cities for cut flowers.

Around 30 years ago the government gave farmers increased flexibility to decide what to produce under the 'household responsibility system.' Instead of growing sugar and rice as required in the past, many began focusing on vegetables. While this made economic sense in theory, the limited regional population and a mass conversion to the same crops soon resulted in a precipitous drop in price.

As the rush to produce vegetables swept through the region, some growers decided to go a different route, and were rewarded handsomely. Beginning in 1983 farmers in the city of Dounan moved toward flowers after seeing the success of Hua Zhongyi. The forward-thinking Zhongyi had brought back bulbs of gladioli to plant on his land. At the time, few in the village understood why he was growing inedible produce on the land which was his only source of income.

In 1988, vegetable prices in the province fell sharply due to oversupply and the vegetable growers of Dounan suffered heavy losses. However the first farmer to grow flowers had built a house and bought a three-bedroom apartment in Kunming with his increased income. Inspired by their neighbour's newfound affluence, many villagers decided to also grow flowers. The flower cultivation area expanded quickly. In less than five years, Dounan became one of the main production and wholesale centres for cut flowers in China. The next step was to market internationally.

Yunnan, in the southwest of China, is remote and relatively poor. As with several similar regions, the government has implemented various initiatives to stimulate development and raise living standards, particularly among rural populations. The region's climate is ideal for floriculture. Aviation unlocks the potential of the region to serve national and international markets with a high-value product that uses local labour intensively. This spreads the many benefits of China's accession to the World Trade Organisation (WTO) to the rural population, who might otherwise be left behind in China's incredible transformation into a modern economic powerhouse.

Yunnan has now become one of the largest producers of flowers in the world – with a trade market second only to Amsterdam's. Chinese government policy now aims to develop the Yunnan floriculture industry into the largest flower production and market trading centre in Asia. Beijing anticipates that the industry will provide secure, lucrative jobs for large numbers of isolated workers and thus help narrow the income gap between affluent city dwellers and unemployed farmers. Key among the related infrastructural developments is the building of a new international airport at Songming, near the capital city Kunming.

The international success of floriculture in Yunnan is attracting foreign investment and increasing expertise within the local industry. Using the increased access offered by aviation routes, several Dutch horticultural firms have been attracted to Yunnan. Aalsmeer Flower Auction VBA and Kunming International Flower Auction (KIFA) have entered into a long-term co-operation, and Van Hall Larenstein University of Applied Sciences is co-operating with Yunnan Agricultural University to educate Chinese students in international horticulture and marketing, with a two-year study programme in Holland comprising part of its course.

Aviation will help unlock the natural advantages of Yunnan. Without regular and reliable air services the industry could not get flowers to international markets in time. The region would have fewer options for development, would be unlikely to benefit from international investment and its young people more likely to seek prosperity in more developed parts of China.

6. What price fresh produce?

Is the availability of long-distance food just wasteful, Western gratification, or can it plant the seeds of efficient, effective and sustainable development? Virginia Mwai from the Kenyan Ministry of Agriculture summed up the arguments against focusing blame for global warming on developing-world farmers, such as those of her country. Farm-fresh produce often fills the cargo holds of passenger aircraft leaving Kenya to supply the consumer markets of Europe and beyond: "Our farming contributes very little to global warming. We use people to weed the fields. We don't use tractors to produce the food that is exported. I wonder whether stopping the export of our produce to Europe would stop the planes flying? Would hurting our farmers really reduce the carbon emissions?"

Every meal we eat these days serves up some of the major ethical questions of our globalised world. For starters, who puts this food on our plate? Then comes the main issues of how our food is grown, or raised, and where? Next comes the question of cost. Once, we considered only the bottom line of production expenses – how much to produce the crops or livestock and to get it to market? But in the global village of our information age, where air transport makes the international local, we now increasingly consider other factors such as labour conditions for food growers, the long-term effects of green house gases and the real price paid in 'food miles' (sometimes referred to as 'air miles').

For many the term 'food miles' leaves a negative aftertaste. We imagine salmon plucked from the North Atlantic by a factory ship, somehow served in a five-star restaurant in California 24 hours later. We compare this to a mental image of a millionaire's jet flying caviar halfway round the world to sate a jaded palate. We think of a struggling coffee grower as we sip coffee that costs the equivalent of his weekly wage. So we vow to become more responsible consumers: we tell ourselves we will NOT buy into this modern economic, environmental and moral morass.

Celebrity TV chefs encourage us to buy only locally grown produce, yet as Gareth Thomas, UK Minister for Trade and Development points out, "Driving 6.5 miles to buy your shopping emits more carbon than flying a pack of Kenyan green beans to the UK." To ethically answer the question of food miles, the consumer must take into consideration a whole world of alternatives: if this fresh food is not flown to our market, have we calculated the full alternative costs of growing it locally in a different climate, including storage, local transport and the environmental cost of soil usage? In our complicated world of interconnectedness, knowledge is power; and knowing the bigger picture is what makes us truly connected consumers. Knowing the full range of benefits that the growth of air transport has brought to many worldwide is also essential in making the correct consumer choices we now

face daily. The positive contributions of air transport to the complex human food chain of the 21st century include:

- The establishment of a sustainable path to development for poor farmers in the developing world.
- The engaging of economic dialog between wealthy western consumers and developing-world producers.
- The transfer of knowledge and expertise between developed and developing countries.
- Improvements in environmental management that result from this transfer of agricultural knowledge.

The linking of low-GHG-emission growing areas to high-value markets: the net environmental cost in GHGs can often be less when food is grown in suitable climates and conditions and transported in bulk, often reducing the overall GHG emissions budget for fresh produce, despite the emissions from air transport.

6.1 Food and green house gases

The production and distribution processes that take our food from the fields to our plates involves a set of complex interactions with the environment, which cannot simply be reduced to a net measurement of green house gas (GHG) emissions. The simplified concept of 'food miles', measuring only the distance food has travelled from field to retailer, fails to fully recognise the full complexity of the cost/benefit analysis that is necessary to make the right choices.

A broader approach – Life Cycle Assessment – attempts to analyse and quantify the environmental impact of each link in the chain of events that ends with the food on our plates. In its most extensive form – this method takes a close account of all aspects in the production, packaging, storage, transport, retailing, purchasing and preparation of food, as well as the disposal of wastage in the catering industry. This more comprehensive approach recognises a bigger picture: for example, even if a food product is grown in one continent and sent to market in another, the GHG emissions resulting from this long-distance transport may be offset by lower comparative emissions at certain other stages of its life-cycle. Thus a vegetable that thrives naturally in an African climate might be grown in Europe under hot-house conditions, but this would result in considerably greater net emissions than those that result from the 'food miles' of transporting the fresh vegetable between continents. Thus, it is often wrong to assume, or to claim unambiguously, that food that has been air-freighted is always more damaging to the global environment.

As yet, the cumulative evidence to allow fair comparisons between alternative production locations for specific foodstuffs is not well developed. This is partly due to the challenges involved in measuring all aspects of the life cycle affecting emissions. For example, can we accurately assess the environmental effects of agricultural practices over time? Changes in soil, the rotation or switching of crops and the ever-changing climate will all impact the global carbon cycle. The magnitude of GHG emissions from soil, for example, depends on an extremely diverse range of biological, chemical, physical and management variables; this makes measurement or

prediction of the net GHG budget for agricultural soils extremely difficult, though some estimates[37] suggest that changes in land use emitted around half as much GHG as burning fossil fuels between 1850 and 1990.

The use of fertilisers to increase crop yields, or just to make growth possible, has been more clearly linked to higher GHG emissions. Indeed the initial production of the fertilisers requires significant amounts of energy, while chemical interactions also result from the mixture of fertilisers with the soil itself. Nitrogen-based fertilisers stimulate the natural production of nitrous oxide, a more powerful GHG than carbon dioxide. Thus, locations that are well suited to particular types of crop and require less use of fertiliser – or none at all – will therefore generate lower emissions in this part of the production cycle.

Emission patterns are highly complex. The research illustrates a number of ways in which different carbon emitting activities interact to provide an overall carbon footprint. An important implication of these findings is that geographic location alone is a poor proxy for emissions; favourable production conditions may more than offset a disadvantage in transport. For example, Kenyan-produced roses sold in Europe are associated with considerably lower emissions[38] than roses produced in the Netherlands, despite being air freighted to market. Airfreight is one carbon 'hot spot' in the supply chain, but it is dwarfed by the use of heated greenhouses. The complexity of carbon emissions discredits simplistic but intuitively appealing concepts such as food miles and buy-local campaigns. There is no scientific support for the notion that these concepts can offer much in terms of climate change mitigation.[39]

Energy inputs vary throughout other points of the production and distribution process according to location. Production in northern climates may require heating and lighting – as with vegetables grown in hothouses or animals kept indoors through the winter. A wider, all-encompassing view takes into account the GHG emissions generated in the manufacture of the equipment used in the production, storage and distribution of food, and by the range of people employed in the various steps of the food chain. For example, housing a group of African migrant workers through a European winter while they tend hothouse flowers will result in significantly more GHG emissions than would result from the same group of workers growing the same produce in their more temperate homelands. Thus, agriculture in relatively poor countries, where carbon emissions per person are low, and where farming employs manpower rather than machines, will reduce the count of GHG emissions embedded in the production process.

Given the lack of locally grown fruit and vegetables in many countries during the winter months, storage is another easily overlooked aspect of the life cycle of food. Energy is required to keep products from their time of harvest until their release to the consumer. British apples sold in the UK in spring will likely have generated more GHG during the storage time of the life cycle than apples arriving directly from the southern hemisphere harvest. Freshness may also have an impact, reducing waste both before arrival at the shops or in the home. Not only is waste a cost in monetary terms, it also represents a waste in terms of GHG emissions that are embedded in the production process and emissions released as the waste rots.

Transport is the most visible source of GHG emissions related to food, hence the high levels of interest and debate that 'food miles' have generated. Clearly, food that travels shorter distances, by the most efficient form of transport in terms of GHG emissions, will score best on this section of the total GHG budget for food products. Yet focus on transport obscures the wide variation in the levels of impact in other parts of the life cycle. Despite high levels of transport emissions, a production location far from market may still be the best available choice if it scores well across other parts of the life cycle.

[37] Testing the assertion that 'local food is best': the challenges of an evidence-based approach, Edward-Jones et al, Trends in Food Science & Technology 19 (2008).

[38] 6,000 kilogrammes of CO_2 compared with 35,000 kilogrammes of CO_2 for roses produced in the Netherlands.

[39] Carbon labelling and poor country exports, Paul Brenton, Gareth Edwards Jones, and Michael Friis Jensen, World Bank, PREM Notes, No 4 July 2008

6.2 Evidence

While estimates should be treated with caution, the available figures illustrate surprising differences between the inherent GHG emissions of products sold in the UK, but produced elsewhere, and those produced locally. For example, the life cycle measurement of CO_2 emissions for New Zealand lamb is estimated[40] to be roughly one-quarter the level for the equivalent UK product: this favourable discrepancy reflects differences in farming environments and production methods, while taking into account the CO_2 emissions involved in transport to the UK. The main differences between New Zealand and UK production methods relate to use of fuel, nitrogen-based fertilisers, and concentrate feed. It is calculated that nitrogen-based fertilisers used in the UK equate to 807kg of CO_2 emissions per tonne of carcass, compared with 90kg of CO_2 in New Zealand. For concentrate feed, the equivalent figures for the UK are 458 kg of CO_2, but zero for New Zealand.

Cutting emissions efficiently

From an economic point of view the most efficient route to lower total GHG emissions is to reduce those emissions in activities where the knock-on effects on living standards and economic welfare are least harmful. This would suggest the reduction of emissions that are most easily curbed in terms of cost, and which have the least impact on the availability and price of products for consumers. Thus, where alternative products or alternative processes are readily available, the cost to the economy of reducing GHG emissions will be relatively small. For other products, for which no suitable alternatives are feasible, the impact on economic welfare for an equivalent reduction will be high. An economically efficient scheme for reducing GHG emissions will therefore provide incentives to eliminate those emissions that can be avoided with the smallest impact on welfare. At the same time, we must recognise that GHG emissions can be reduced less easily in activities where curbs would have major economic effects.

Total elimination of GHG emissions from aviation is not an economically or politically viable proposition, given the boost that aviation provides to living standards around the world; these emissions must be viewed as a small part of the price we pay for prosperity, and growth and a fair and equitable sharing of the planet's resources.

[40] Food Miles – Comparative Energy/Emissions Performance of New Zealand's Agriculture Industry, Caroline Saunders, Andrew Barber, Greg Taylor, University of Lincoln, July 2006

Fair distribution of carbon allocations worldwide

Air-freighted fresh produce offers clear benefits to Western consumers, but it also provides one of the few routes to improved living standards, health and life-expectancy for rural populations in poorer countries. For these populations even small improvements to living standards and economic welfare should weigh significantly in the cost/benefit analysis of the emissions involved. Moreover, large discrepancies occur in per-capita GHG emissions between the developed and the developing world. It has been estimated[41] that, while global carbon emissions per capita are close to 3.6 tonnes per annum, the UK figure is as high as 9.2 tonnes. For the continent of Africa average per capita carbon emissions are only 1 tonne, and are as low as 0.2 tonnes for Kenya, and 0.1 tonnes for Uganda.

To improve living standards, life expectancy and development across Africa and other poor parts of the world it is reasonable to expect that per capita emissions attributable to these economies will inevitably rise, even as per capita emissions for the developed world are curtailed. In this sense, the population of these African economies can be seen to possess unused allocations of carbon, while the populations of the developed economies are now in carbon credit. Equity across the world requires a sustainable international shift toward a fairer balance.

6.3 Socio-economic impact of fresh produce from Africa

Many poor areas of Africa are well adapted to growing fresh produce that is in demand in Europe. Such areas have many advantages over alternative locations. These include a year round growing season, soils that require only traditional fertilisers such as cow dung and plentiful low-cost labour. Air transportation allows these advantages to be fully realised and provides a route to development that would otherwise be closed.

Supplying fresh vegetable products provides one of the few channels by which rich consumers in the UK and Europe interact economically with the more poverty stricken parts of Africa. For example, it has been estimated[42] that over one million people in rural Africa are supported by fresh fruit and vegetable exports to the UK. This involves an estimated 50-60,000 small-scale producers and a similar number of employees on larger farms. As a result, taking into account families and local suppliers, as many as 1-1.5 million livelihoods may depend in part on the supply chain that links production on African soil to consumption in the UK. This trade with the UK alone injects an estimated £200 million into rural economies in Africa each year, but these benefits to poorer parts of Africa only account for a very small part (0.2%) of the UK's carbon emissions.

41 Fair miles? The concept of 'food miles' through a sustainable development lens, James MacGregor and Bill Vorley, iied, October 2006

42 Fair miles? The concept of 'food miles' through a sustainable development lens, James MacGregor and Bill Vorley, iied, October 2006

"Many are from the Akamba tribe (Kenya), former cattle herders who took up (bean) farming half a century ago when their over-grazed hills started turning to desert. Today their land is lush and productive." *Buying local and fair trade don't mix, Fred Pearce, Daily Telegraph, 20th July 2007*

Case Study — Blue Skies: A life line for African farmers

Ernest Abloh is the Chief Agronomist at Blue Skies Ghana, an organisation dedicated to the development of sustainable agriculture. Abloh's team provides training and support for over 150 farmers, 78 of whom are small-holder organic farmers. Blue Skies' fresh-cut fruit factory employs 1,700 people and, through wages alone, injects over £2 million into the local community every year. The company accounts for around 1% of Ghana's total exports.

"We help all our farmers to reach the strict standards as required by European partners – these include EurepGAP for good agricultural practice, Fairtrade, LEAF (Linking Environment and Farming) and, of course, the Soil Association's prestigious Organic Standard. It is our aim for the foreseeable future to continue to increase our number of organic farmers, which is something that the Soil Association has supported us with from the beginning."

The possible air-freight ban and the threat to trade

However, Blue Skies recently faced the prospect of a ban of their organic fruit by the UK Soil Association because they have to use air-freight it to get it to western supermarkets while it is still fresh.

The Soil Association eventually dropped the proposal, but Blue Skies feel that the damage could already been done by focusing only on air-freight and by not looking at the wider issue.

Abloh[43] stresses the importance of protecting the environment, but he asks that the debate be shaped in a wider, more objective context than has been done previously: "We believe that looking after the environment is paramount to our future. Changing weather patterns are already affecting our pineapple yields, so we must continue to do all that we can to change and adapt and we ask that the people of Europe do the same. We also ask that the people of Europe tackle the issue of climate change sensibly. Thanks to the information we receive by exporting to Europe, we now know all about carbon footprints; we also know that the combined carbon footprint of all our farmers is practically nil!"

"If this is all about the environment," he adds, "then the impact of our trade on global warming should be evaluated in a fair context by taking into account the entire ecological footprint of a product and not just focusing on one stage. To define a product's environmental impact according to just one stage of its production is misleading and does not offer our customers any realistic solution to tackling the problem of climate change."

Moderating the debate on air miles

As Abloh acknowledges, it is crucial that the environmental impact of food production and consumption is reduced, just as it is crucial that the developed world supports the growth of poor countries' economies. The current 5% growth of African economies is due partly to agricultural exports sent around the globe by successful companies like Blue Skies. This is now being threatened by the absence of a balanced debate about the wider economic, social, and environmental implications of the food chain that connects African farmers to western consumers.

[43] Source: Department for International Development, http://www.dfid.gov.uk/casestudies/files/africa/ghana-ernest.asp

"A decision to ban will not only have consequences for the poor farmers in Africa, but could also change the way our customers approach the issue of the environment by giving credence to misleading claims rather than taking into account the hard science," Abloh explains.

"There is now a golden opportunity to tackle climate change by dealing with this issue in the right way. We therefore call upon our friends in Europe to work together to find a better and fairer way to address the environmental, social and economic impact of the food we eat, so as to ensure a brighter future for us all."

Case Study – Why Africa's faraway hills are often greener

Miles better?[44] How European perceptions of food miles threaten Kenyan futures

In the fruit and vegetable section of a London supermarket, an ethically minded shopper pauses, caught in the classic consumer's dilemma. Despite the season, mange-tout are on the shelves. But they're Kenyan. A purchase would support developing world farmers, but what about those food miles and the carbon cost of transporting the mange-tout? Moving on through stacked aisles of fresh-food choices, the shopper is torn: would it be more ethical to buy something local and seasonal instead?

Thousands of miles away a plane flies over the patchwork of plots where produce destined for European consumers is grown. Virginia Wangira, a tiny lady in her sixties, hurries in the early morning light between the rows of climbing pea plants to where members of her family are tenderly pinching the succulent mange-tout pods from the parent plants and gently placing them in numbered plastic buckets. "I have built a good business out of this crop. Now life is better," she says.

Buyers want quality and quantity so Virginia and 200 other farmers in the village of Kinangop in the Aberdare range of hills in Kenya formed a growers' group under the leadership of Russell Ng'ang'a. Chairman Ng'ang'a, who combines farming with teaching English literature at a nearby boarding girls school, is increasingly concerned that shoppers may pass over their vegetables due to concerns about pollution from air-freighted produce. "It's so very unfortunate, all these worries about food miles", he sighs. "For three years we've worked hard to meet all the high standards the European consumer demands: we built grading sheds and stores for our agrochemicals and set up record-keeping for complete traceability. Emissions of carbon dioxide should be reduced by other means than stopping altogether our produce."

Growing export-quality produce is tough. When hot winds blow up from the rift valley below, the pods shrivel. A sudden dive in temperature in the cool season and the pods are ruined by the cold. There is also the occasional march of invading insects to contend with. And sometimes much larger feet. Under cover of night, families of wild elephants emerge from the high forest to forage in the patchwork of plots for the just-ripe vegetables. Their plundering and blundering can often leave a trail of broken fence and pea vines for farmers to repair in the morning.

A fierce determination to improve and constant attention to detail has meant the smallholder farms – numbering more than 500,000 – have succeeded where large farms failed. Indeed, economic analysis confirms that export horticulture in Kenya has become a powerful engine for rural economic growth.

[44] Source: Developments Magazine, The Department of International Developments, http://www.developments.org.uk/articles/miles-better/

In Kirinyaga, a farming community in another exporting area, the crop of choice is a different temperate vegetable: green beans. The area is a mosaic of green smallholder plots between lush groves of bananas and maize. By nine each morning, Edwin Mgenge – the exporter's representative in the village – is weaving his way along the right-angling paths between the plots of French beans into which he has ordered the harvest. "The great thing here is that young people can leave education with a future in the field," he says. This is why he reacts to news about the food mile furore with dismay. "These villages produce hardly any pollution," he reasons. "They use hand tools in the fields and use very little electricity in the home. But, because of rich country pollution, Europeans think food miles are bad! Where is their heart?"

It is not just the revenue that would be sorely missed, should the market for Kenyan produce nosedive. Maina Kanene, a green bean farmer, pauses from checking his crop for telltale signs of insect attack or disease to explain how much his training and acquired expertise has helped: "Growing for export has taught me so much about good agricultural practice, which I now use for all my crops."

Increasingly worried by the food miles backlash, Kenya's small-scale farmers have been reassured by recent reports that – even with air travel – the carbon footprint of their produce is lower than many crops grown in Europe. Now they live in hope that the consumer in Europe takes note of these findings. Of course, consumers may also wonder why a country like Kenya, where hunger is not unknown, is feeding Europeans rather than its own people. But Lydia Njuguna, an agronomist with the Kenya Horticultural Development Programme, describes how it is common for each farm – often comprising less than an acre – to grow more than a dozen crops. She explains that the plots of produce for export are rotated with carrots, cabbages, maize and potatoes, all for Kenyan consumption. "What do Europeans want? To see us all stay in poverty? To come to Europe looking for jobs? I don't think so. The beans and snowpeas we export to Europe are high value so the farmers can at last earn more and be able to invest in better lives and further developments. It's important that we get away from just subsistence agriculture."

"More than two-thirds of all people surviving on less than US$1 a day live and work in rural areas, either as small holder farmers or as agricultural workers."– Lydia Njuguna, Kenya Horticultural Development Programme.[45]

[45] Developments Magazine, The Department of International Developments, http://www.developments.org.uk/articles/miles-better/

By late morning bicycles stacked with crates of freshly picked beans weave between potholes on rutted red roads, headed for grading sheds. There the produce is grouped and sorted for the exporter's daily truck run to the packhouses. Today's pickings will be on a flight bound for Europe by nightfall. Virginia, Russell, and Maina, along with all the other smallholder exporters of Kenya, are at one end of a very long food chain. They are deeply concerned that unbalanced and ill-informed concerns about food miles could destroy the chain that sustains them. Which is not to say that Kenyan farmers aren't worried about climate change: on the contrary, they know from long and painful experience that they are the ones who will be on the frontline of any drought caused by rising global temperatures. But they are desperate that shoppers should understand the real price of not buying air-freighted fresh vegetables.

Case Study – How switching to local produce hits the poor hardest

In a 2008 survey the European Commission[46] found that 21% of European consumers have bought locally-produced products or groceries for environmental reasons. The proportions in the UK (30%) and Germany (29%) were well above this average. Moreover, 75% of consumers reported that they would be prepared to pay a "little bit more" for environment-friendly products, with higher than average figures recorded in the UK, France and Germany. A separate survey[47] found that 56% of UK consumers were aware of the term 'food miles'. The data makes it likely, therefore, that a shift of consumer preferences is currently under way, based on the somewhat flawed concept of food miles.

This shift in consumer preferences has significant social and economic consequences for current suppliers of fresh foods transported from a distance to the European marketplace. Using data available from the Global Trade Analysis Project (GTAP), a recent research paper from the NZIER[48] seeks to evaluate how these changes in preferences will affect fresh produce suppliers around the world. The results show significant downturns in economic welfare in New Zealand and sub-Saharan Africa. New Zealand experiences the largest welfare drop, relative to GDP, due to a substantial switch within the UK towards domestic food because of an aversion to food miles. New Zealand and Malawi would also suffer if German shoppers shun produce shipped over long distances, while Madagascar has been particularly exposed by similarly shifting preferences within the French market. Other countries, such as Kenya, are also likely to suffer from consumer resistance to food miles, but are not separately identifiable in the database used for the study.

In their case studies[49] of how a ban on the air freighting of organic produce would impact Kenya and Ghana, the International Trade Centre (ITC) showed that without the fresh food trade:

- Workers, particularly women, risked a decline in living standards, as many people who lost their jobs would probably be forced to sell their assets, as alternative job opportunities are scarce and, where available, pay about half of what workers can earn producing and processing organic food.
- Communities might lose educational opportunities, as without the export income the children or extended family members of smallholders and other workers might not be able to attend fee-paying schools (in Kenya this includes all government secondary schools). Family income from organic export enterprises pays for the education of an average of two extended family members.
- There are likely to be fewer opportunities for other local work. Smallholders and other workers will no longer be able to afford to pay local workers for agricultural and domestic services.

[46] Attitudes of European citizens towards the environment, Special EuroBarometer report, number 295, March 2008.

[47] Market analysis: food miles and sustainability trends in the UK, Report to New Zealand Trade and Enterprise, December 2007, Fishburn Hedges

[48] Distance isn't dead – an empirical evaluation of food miles-based preference changes, NZIER Working Paper 01/09 February 2009

[49] The Economic Impact of a Ban on Imports of Airfreighted Organic Products to the UK, International Trade Centre, UNCTAD/WTO, 2007

7. Morocco's Vision 2010: How airborne tourists bring jobs and development

The London columnist AA Gill recently observed: "For most of the world, airports are the portals of hope and advancement and anticipation and amazing good luck." Certainly none of Morocco's growing number of inbound tourists who observed emigrants from that country going in the opposite direction – or returning home on holiday – would disagree.

"There are no small journeys or little emotions in Third World airports," Gill concluded. But Morocco is changing and in the past year a traveller passing through Fès, or Casablanca, or Agadir airports was as likely to witness an emigrant returning home to take up work in the tourist trade, or even a member of one of the world's most prominent rock bands wandering through the arrivals gate.

In 2001 the Moroccan government announced Vision 2010 in an effort to capitalise on the country's tourism potential. As a tourist destination, Morocco offers the convenience and climate of southern Spain at significantly lower prices. Vision 2010 aims to create a dynamic sector that will in turn be a lynchpin in stimulating economic growth and utilizing unemployed or underemployed resources. The scheme seeks to address the long-term problems of poverty and unemployment facing Moroccan society. An official report suggests that job creation needs to double to 400,000 a year over the next 20 years if mass unemployment and the accompanying threat of political and social instability are to be avoided.

A key part of Vision 2010 involves the liberalisation of aviation. The Blue Sky initiative aims to synchronize an increase in the carrying capacity of flights to and from Morocco with an expansion in bed capacity. This has resulted in the entry of a number of tourist-focused, low-cost airlines on routes to Moroccan destinations. Point-to-point services now link European cities with the six regional destinations identified by Vision 2010 – Fès, Casablanca, Agadir, Tangier, Tétouan, and Ouarzazate/Zagora.

This increase in high-quality, tourist accommodation alongside increased accessibility offered by the aviation industry has resulted in a sharp rise in the number of tourist 'bed-nights' spent in Morocco. The economic impact has been dramatic: tourism now employs 1.8 million people in Morocco, accounts for 16% of GDP, or US$12.5 billion, and over one-third for foreign-currency earnings.

The scope of Vision 2010 is nationwide, aiming to avoid a narrow focus on developing coastal resorts only. Nearly 20% of the plan's new bed capacity targets inland centres. This is a focused effort to capitalise on Morocco's rich cultural heritage. For example, refurbishment of the run-down Fès El Bali – the largest medina in Morocco and a UN World Heritage Site – aims to restore and revive this authentic, traditional treasure. This will help preserve an ancient way of life, and to nurture its rich culture and art.

The Vision 2010 plan also recognises that individual initiatives must strike the right balance between economic opportunities and the preservation of the natural environment. To achieve sustainability, Moroccan authorities have imposed national regulations based on the international standards of the eco-label for tourism facilities, the Clef Verte, or Green Key. Moroccan developers are legally bound to observe this international baseline and will also be subject to an extended set of criteria reflecting local conditions in Morocco.

The Clef Verte criteria encompass three main areas: environmental management, communication and training, and technical criteria. Businesses are encouraged to accept environmental responsibility in areas such as safety training for staff, the proper management of energy and water consumption and the safe, efficient use of chemicals. Evaluation of the impact of Vision 2010 developments to date indicates a low environmental impact. Certainly, the impact is much lower than alternative growth strategies with an emphasis on industrial development, with its potential for higher emissions and increased toxic wastes.

In human terms too, Vision 2010 has benefited many, even beyond those directly employed in tourism. Morocco has experienced years of out-migration. As a result, remittances from migrants form a crucial source of foreign exchange that bolsters domestic living standards. The advent of more and cheaper air services provides spin-off benefits to émigrés visiting friends and relatives at home. This greater connectivity also helps maintain family and social ties and in turn strengthens long-term remittance flows.

8. Ecotourism: Borneo, Costa Rica, Rwanda and Namibia

Ecotourism: beating a two-way path to sustainability

How increased tourism in the world's protected wildernesses can protect wildlife and boost conservation

Ecotourism has proven one of the most effective ways to bridge the gap between the need for conservation and the need for local livelihoods for indigenous people. The attraction of international visitors with an interest in conservation – and a will to help – has trained a light on several of the world's most delicate and endangered ecosystems. Not only are locals encouraged to invest their energies in the stewardship of the natural attraction that now provides their livelihood, but the visiting ecotourist is encouraged to help – both practically and financially – to secure the long-term future of the natural site or species.

In the absence of infrastructure in such locations where ecotourism works, the aviation industry must often take the first steps to bring in ecotourists: the building of an airport provides international access and spurs the building of supporting infrastructure. Without aviation many ecotourism localities would remain inaccessible to international visitors.

By thus encouraging ecotourism, aviation plays a critical role in the generation of income that supports conservation and wildlife habitats. The benefits of this increased income are multiplied when travellers to ecotourist locations spread awareness of ecological and environmental issues in the host economy and in many cases, also raise awareness back home.

8.1 How ecotourism in Borneo has helped save unique orangutan habitat

The rich variety of Borneo's geography – from beautiful beaches to rainforests – has long attracted the best and the worst of mankind's activities. This now makes Borneo home to an amazing range of endangered species and plants. These include orangutans, rhinos, clouded leopards, sun bears, Bornean gibbons, pygmy elephants and several species of wild orchids. Such flora and fauna are declining under new stresses on the landscape from human development. Humans too face change. Over the last 50 years the indigenous populations of the Lower Kinabatangan in Borneo have seen drastic changes in their livelihoods. Around 90% of their traditional forest resources have been lost, replaced by large-scale agricultural plantations owned by outside companies. Local people are thus forced to seek alternatives to a traditional, once sustainable, forest life. Without alternatives, many face the temptations of illegal activities for quick profit, such as illicit hunting or logging.

In the rainforests of Lower Kinabatangan, the threat of logging casts its shadow over important orangutan habitat. To alleviate the pressure on these last remaining rainforests, KOPEL the Community Ecotourism Co-operative of the Bata Puteh Community, developed a plan known as the Model Ecologically Sustainable Community Conservation and Tourism Initiative (MESCOT) to provide livelihoods for indigenous workers, while also protecting the rainforest and its rich biodiversity. The Initiative generates incomes by treating the forests as a valuable resource to be sustained and preserved. Additionally, by attracting visitors and tourists who gain an appreciation for the area and its challenges, support for the conservation of forest resources and orangutan habitat is generated in ever-widening circles.

Community ecotourism activities began in earnest in the year 2000 and for the last seven years the communities have worked with volunteers from the UK charity Raleigh to develop the necessary infrastructure and facilities to support their plan. Arrivals have slowly increased since that time. In 2006 MESCOT moved into its new base – Tungog Rainforest Eco Camp.

MESCOT has always recognised the connection between habitat restoration work and tourism, and has encouraged and developed volunteer activities for visitors. For example, in the eight months to August 2007, MESCOT's volunteer and ecotourism programme attracted 900 ecotourists staying 1,975 nights. A large number participate directly in forest habitat restoration, or contribute financially to these programmes. MESCOT hopes to foster and expand such activities through the Tungog Rainforest Eco Camp project.

This community owned and run 'jungle camp' is designed to cater for a minimal number of visitors with a keen interest in conservation, who are open to new experiences, such as gravity and solar powered water-systems, zero air conditioning, and sharing forest foods and local traditions with indigenous hosts. It is also hoped that they will make a contribution, either financial or manual, towards the conservation of the surrounding forests and the endangered habitats of the Lower Kinabatangan.

Tour companies are a key aspect of MESCOT's long-term, self-funding efforts. One of the key companies supporting this project is Intrepid Travel, which has organised small groups of ecotourists on a weekly basis, for more than six years. Another company, Outlook Expeditions, has organised school groups for the last three years. All such tour companies are vetted by MESCOT to ensure their practices are conducive to 'responsible tourism.'

8.2 How Costa Rica's ecotoursim is a key source of foreign exchange

Costa Rica is a good example of the potential of ecotourism to generate foreign exchange, employment, and progress in conservation. At the same time, the Costa Rican experience illustrates the challenges ahead for those countries in the initial stages of their push toward ecotourism. The country started its promotion of ecotourism at the beginning of the 1980s as a way of reversing the devastating effects of deforestation.

Costa Rica's tourist industry has now become a major source of foreign exchange, and provides the resources needed to maintain the country's national parks. The rapid development of the tourism industry is reflected in a number of indicators. Between 1988 and 2007 international tourism spending increased six-fold, to US$2 billion, with nearly 1.9 million international visitors.

Most of these come from the developed world – with North Americans making up nearly half the total of arrivals and the EU accounting for a further one in seven tourists. This focus on developed world tourists underpins the relatively high spend per tourist of US$1,000 per trip (2007). In terms of economic impact it is estimated that in 2005, tourism contributed 7.9% of Costa Rica's GDP, 22.3% of foreign exchange earnings and supported over 13% of all jobs.

Ecotourism, built on Costa Rica's famed biodiversity, is a key driving force behind this growth. In 2006, 54% of international tourists visited national parks or other protected areas, with European tourists visiting three sites on average.

In recent years the Costa Rican government's efforts have concentrated on education and training, particularly of local residents, and on improvements in regulation and evaluation of tourist activities. In 1998 the government implemented an evaluation system under the name of the Certificate for Sustainable Tourism (CST). The introduction of the scheme was partly in response to criticism surrounding the misuse of the concept of 'eco' or 'sustainable' by certain tourist firms. Such labels, it was alleged, were meaningless in areas where excessive building, combined with high tourist

traffic through the protected areas, was threatening wildlife.[50] The programme aimed to assess the degree to which businesses in the tourist sector actually complied with the promotion of environmental and social sustainability.

Similar eco-rating or tourism certificate schemes have now been introduced in New Zealand, Australia, the Dominican Republic, Haiti, Jamaica and, more recently, in Kenya (ESOK, 2002).[51] Such schemes help to improve the environmental and social contribution of each country's tourism industry[50] and to ensure the compliance of developers with agreed-upon environmental aims.

The CST seeks to classify and certify each tourist firm according to the degree to which its activities comply with a model of sustainability. To this end, certain basic aspects are assessed: the interaction between the firm and its surrounding natural habitat; the firm's management policies and infrastructure; and the company's interaction with clients and local communities. The CST provides a system of sustainability levels on a scale of 0-to-5, with 5 indicating that the company is considered as outstanding in terms of sustainability. The scheme includes a series of incentives that translate into benefits for firms in proportion to their rating (e.g. international and national publicity and promotion, training support, participation in world tourism fairs and events).

Although the CST originally focused on the hotels sector, it is now expanding to cover other main components of the tourism industry, such as tour operators, transportation and restaurants. After overcoming initial resistance from some important players in the tourism industry, the programme has earned widespread support and is now a model for similar schemes in the rest of Central and South America.

50 Ecotourism & Certification: Setting Standards in Practice, edited by Martha Honey, 2002

51 Ecotourism Society of Kenya, June-December 2003

8.3 Rwanda's ecotourism effect: mountain gorilla numbers on the upswing

First revealed to the outside world 100 years ago, the endangered population of mountain gorillas inhabiting the volcanic highlands on the borders of Rwanda, the Congo and Uganda has grown over the last 30 years. This recovery has occurred despite the wars and social upheavals that have blighted these nations at different points in that period. In 1978 Bill Weber, a leading conservationist, counted a population of mountain gorillas in Rwanda of 262. The latest estimates are closer to 400.

Airborne tourism has been a central part of this story. On the basis of their study of the mountain gorilla ecology and the socio-economic context for conservation in the late 1970s, Weber and his wife Amy Vedder, helped to establish a programme of gorilla tourism as a way of generating revenue and employment for local people and helping protect the gorillas and their habitat.

The unique mountain gorillas are a strong draw for nature tourists, with cost acting as little deterrent to those that want to spend an hour watching these primates in their natural habitat. This tourism underwrites the conservation of the mountain gorillas. Without it, human population pressures would destroy important habitat for the gorillas, and poaching for bush meat would go unrestrained.

In 1989 gorilla tourism drew 7,000 visitors to Rwanda's Volcano National Park, providing Rwanda with much needed foreign exchange. With the advent of war and genocide, this tourism disappeared in the mid-1990s. Yet even in the depths of the chaos park rangers and local conservationists continued efforts to protect the gorillas. In the aftermath of the civil war, refugees were eventually persuaded to leave the national park, human latrines were cleaned up, and sick gorillas were darted, injected with antibiotics, and protected against measles with human vaccines provided by UNICEF.

Now gorilla tourism to Rwanda is flourishing once again. Visitor numbers of approximately 20,000 are expected this year, with virtually all tourists arriving in Rwanda or other parts of Africa by air. A permit to make the one-to-four-hour trek into the forest along with eight other visitors, accompanied by local guides costs US$500. Booking at least nine months in advance is now advised. In recognition of the efforts that Rwanda is making to marry nature tourism with gorilla conservation, the new Sabyinyo Silverback Lodge made it onto the prestigious Condé Naste Traveller list of Hot Hotels in May 2008.

This revival in Rwanda contrasts starkly with the absence of visitors across the border in the Congo where another civil war eliminates all possibilities of attracting tourists. While it is difficult to assess exactly how gorillas in this area of the Congo are faring, the low value put on conservation in the absence of tourism is illustrated by the slaughter of seven endangered mountain gorillas in Virunga National Park in 2007. With its unique biological and geological diversity, Virunga has traditionally been seen as the crown jewel of African parks: yet this killing of endangered animals was carried out in a climate of lawlessness in which the perpetrators felt free to commit their crimes with impunity. In the absence of any rule of law, it was the publication of the photos of journalist Brent Stirton that brought the case to light internationally. The subsequent outcry against the killing of the Virunga gorillas, and the arrest of the crime's suspected mastermind, has served as a reminder of how such dark deeds can only continue in the absence of committed, conservation-minded people in such ecological hotspots.

8.4 How Namibia's rich diversity of wildlife supports tourism

Namibia's tourism sector has risen very strongly in recent years, with the number of international tourist arrivals up to 930,000 in 2007 compared with 502,000 ten years before. The largest national groups of visitors are from Angola and South Africa which together account for about half the total. But a significant number of visitors come from Europe (20% of the total), with about three-quarters arriving by air.

Many of the international visitors are attracted to Namibia by the rich diversity of its wildlife. The country boasts 21 national parks and protected recreation areas. Varieties of game include more than 20 antelope species, and large mammals such as elephant, rhino, giraffe and lion abound. Namibia hosts the largest cheetah population in the world, more than a third of the world's endangered black rhino population, and 95% of the desert-adapted sub-species (Diceros bicornis ssp. bicornis). A 2003 visitor survey showed that about 50% of visitors named 'game viewing' and/or 'nature and landscape tourism' as activities undertaken during their stay in Namibia.

Tourism has thus become a significant sector of the Namibian economy, contributing directly and indirectly 14.2% to GDP and supporting 18.7% of the country's jobs in 2006, according to the World Travel and Tourism Council (WTTC). Equivalent estimates of the contribution of nature-based tourism to overall tourism are not available. Various studies have estimated the contribution at between 65% and 75%.

Moreover, a large share of these revenues accrues in particular to communities that provide tourist accommodation. The United Nations Development Programme (UNDP) estimates that while N$52 million (US$6.9 million) were spent by tourists in Namibian Wildlife Resorts accommodations in 2003, the total spend on accommodation by these tourists whilst in Namibia was between N$417 million and N$830 million (US$55 million and US$110 million), i.e. between about ten and twenty times as much. In a country where unemployment hovers around 30%, diffusing the benefits of tourism through the country is essential. This has been made possible by a public policy decision to devolve the rights and responsibilities for wildlife management and tourism to many of Namibia's most marginalised and poorest communities. Communal conservancies now account

for over 14% of Namibia's land surface. Combined with state-owned protected areas, and private land dedicated to wildlife, as much as 40% of Namibia's land now serves wildlife and nature conservation. As a result, wildlife populations in Namibia have increased dramatically in the last decade.

8.5 How Namibia's tourism contributes to conservation

Namibia's ecosystem is extremely rich, yet equally fragile. The Global Environment Facility described the current balance as follows:

Namibia is one of the driest countries in sub-Saharan Africa, with much of its surface area receiving less than 250mm of precipitation per year. Its harsh climatic conditions, poor soils, limited natural resource base and fragile environment are constraints in the quest for sustainable development. High rainfall variability, regular droughts and high temperatures make the country vulnerable to land degradation through anthropogenic influence. Over 65% of the land in Namibia is classified as being of moderate to very high risk of degradation. Desertification is an imminent threat to the country, and to the subsistence of the poor, given the fact that over 90% of the land is arid and 70% of the population is dependent on subsistence farming. Despite this, Namibia possesses a remarkable variety of habitats and ecosystems, ranging from deserts with less than 10 mm of rainfall per year to subtropical wetlands and savannas receiving over 600 mm of precipitation. Four major terrestrial biomes are recognised in Namibia, the classification being based on both vegetation types and climate. These are desert, Nama Karoo, Succulent Karoo, tree and shrub savannah. On a finer scale 28 different vegetation types are recorded. Many of them are wholly unique to Namibia or to this part of the African continent.

While Namibia's wildlife attracts tourists to the country, the benefits run both ways with tourists contributing to the preservation of wildlife. Recognising this, Namibia government has set up a single entity to manage both aspects under the Ministry of Environment and Tourism. The Ministry states that its tourism objective is to develop a sustainable and responsible industry.

International organisations also support this assessment. For instance, the UNDP is currently funding a major project aiming at strengthening the protected area network. In its assessment of the feasibility of the project, the UNDP found that the revenues generated by nature-based tourism more than offset the cost of maintaining the protected areas. The UNDP estimates that protected-areas tourism generated revenues of between N$1.2 billion and N$2.3 billion (US$160 million and US$300 million), which contributed between N$550 million and N$1.1 billion to GDP (US$73 million and US$146 million). By comparison, the costs of the protected land system were estimated at less than N$120 million (US$16 million). The UNDP recommended increased spending on the management of the protected areas, which would attract more tourists, and thereby increase revenues from tourism. Under relatively conservative assumptions about the additional number of tourists attracted due to better management, the returns to investment would be positive and potentially large. The project is now under way.

Another example of Namibia's responsible approach to a sustainable environment, which encourages tourism, is the Millennium Challenge Account (MCA) agreement signed with the United States government. The country obtained a US$67 million grant for the tourism sector, including over US$40 million investment in national park infrastructure. The government estimates that this investment will generate around 6,500 new jobs. Moreover, decision-makers stress that the long-term preservation of Namibia's ecosystems will result in increased opportunities for younger Namibians in the form of attractive livelihoods in the conservation sector.

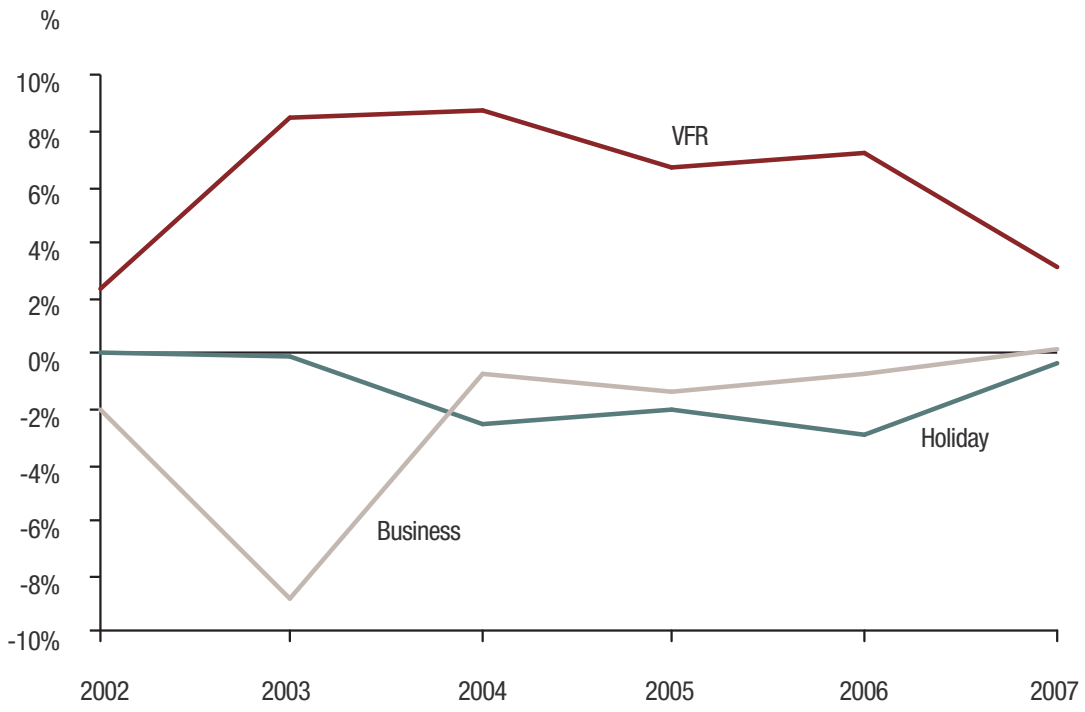
9. How aviation enhances global social networks

Research conducted by the Civil Aviation Authority (CAA) has shown that 'Visiting Friends and Relatives' (VFR) is the strongest component of the growing international passenger traffic at UK airports.[52]

Whereas VFR represents one-quarter of international traffic at UK airports, it accounts for half the growth in international passengers. Between 2001 and 2007, international passengers grew by one-third, whereas international VFR traffic increased by two-thirds.

[52] Source: Civil Aviation Authority, 24th of November 2008. CCA website visited on 1st of December 2008. (http://www.caa.co.uk/docs/5/ERG_In_Focus_VFR_November_2008.pdf)

Chart 9.1 Growth in international traffic at UK airports by purpose of visit



Source: International Passenger Survey and Oxford Economics

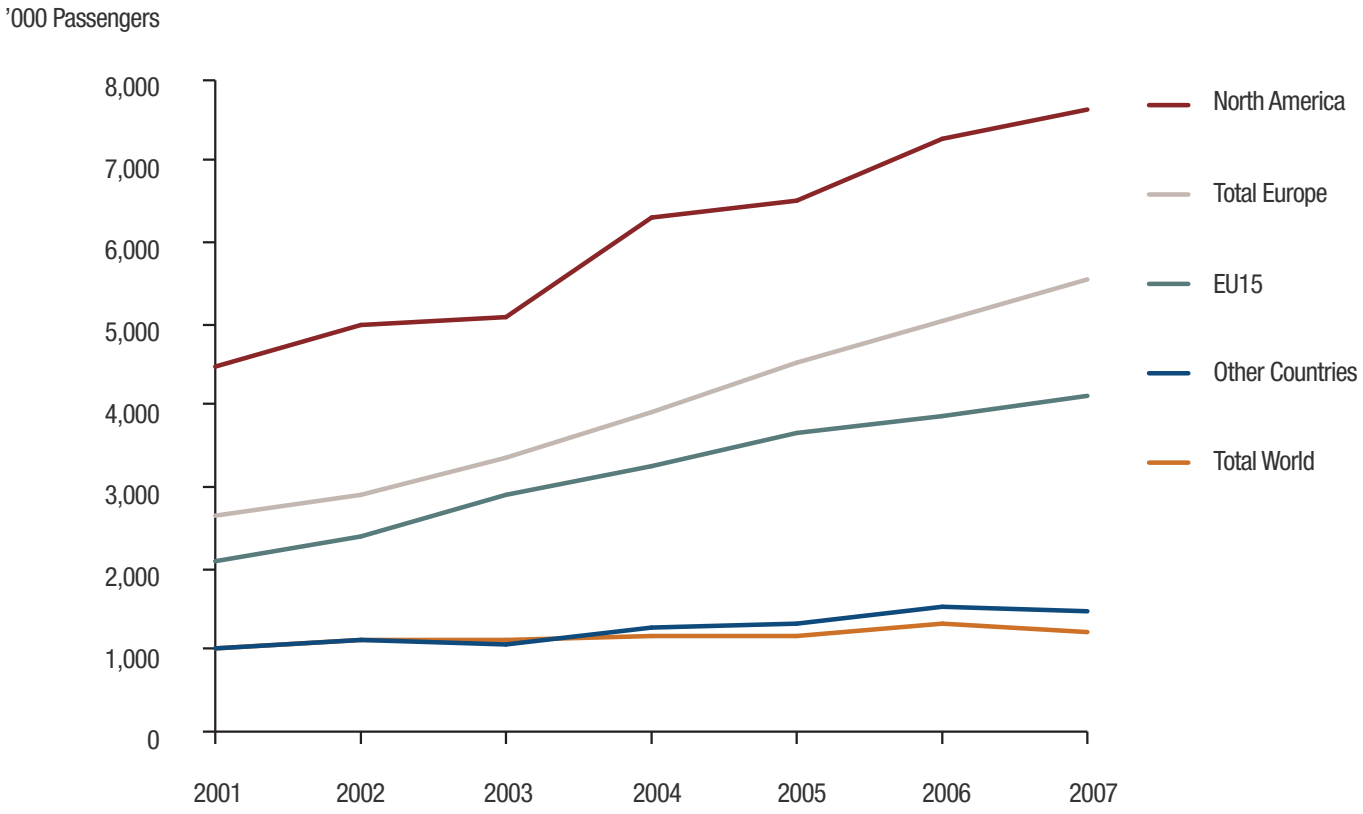
9.1 Where do VFR passengers in the UK fly from and to?

The European contribution to VFR has grown, indicating how increasing numbers of European citizens have chosen to live, work, or study in a different country.

Although 55% of international VFR passengers were flying to or from the EU, they accounted for 65% of the growth in all VFR passengers between 2001 and 2007.

The main traffic of VFR passengers to and from the UK involves travellers from United States, Spain, Ireland, Germany, Italy and France, in this order. However, whereas the United States accounted for only 2% of the growth in traffic between 2001 and 2007, Spain, with an additional 1.8 million passengers during that period, and Germany, Italy and France with about 1 million new passengers, each accounted for more than a third of the growth in traffic. The flow of passengers from new EU member states (the 12 countries that joined the EU since 2004) has grown from 3% of the traffic in VFR in 2001 to 11% in 2007.

Chart 9.2 Growth in VFR Passengers by origin/destination



9.2 Social aspects of VFR travel

Increasing VFR travel is a reflection of the closer relationships developing between EU countries, both from an individual perspective and at a country level. The free movement of goods and people across the EU has accelerated the development of social and economic networks that will have long-lasting effects, and that bring benefits to both the host and originating countries in the form of increased social and economic integration. For instance, labour mobility, a key contributor to long-term economic performance, is enhanced by air travel as it allows migrants to return home more often and enables friends and family to visit from the home country. In addition, when migrants return to their home country, they have established new social or familial networks in their host country, which will be more easily maintained via air travel. Therefore, the demand for air travel is not confined to current migrants; former migrants also create demand even after they have returned home, as the social networks they established in the host country remain.

Migrant flows between the UK and the rest of the EU have increased significantly between 2001 and 2007. Whereas the outflow of emigrants from the UK to certain countries (mainly Spain, Ireland, France and Germany) outweighs the inflow of migrants from these countries, new EU member states have much higher net inflows into the UK.

Labour mobility is beneficial for both the host and the home country. The host country benefits from labour inputs with skills that may not otherwise be readily available, such as foreign languages, specific skills, technological, cultural or knowledge transfers. Likewise, the home country may benefit in various forms whilst the migrant is away (e.g. in the form of remittances sent home to their family), and upon the return of the migrant who brings new skills and capital to his home country and possibly a network of business contacts.

There is also a life-enriching cultural and social component which is ubiquitous and mutually complementary in these types of social networks. For example, people from northern Europe may retire to warmer and cheaper countries in southern Europe while maintaining close ties to their social networks in their home countries; young people may broaden their career and social perspectives by working abroad; or students might gain mind-broadening experience by studying abroad and enriching their 'life skills'.

In short, aviation acts a catalyst for the development of these trans-national social networks, which in turn, drives demand for air travel.

Additionally, a social-cohesion or social fairness argument might be made in favour of widespread and equitable accessibility to air travel. VFR travel is typically cheaper than international holiday tourism, as visitors incur little or no accommodation costs, so that the cost of the holiday is close to the cost of the flight. As air fares have generally gone down over the past decades – for instance, the cost of air transport for UK passengers has fallen by about 7% in real terms in the ten years to 2007, and international social networks have flourished, VFR has provided the opportunity to a segment of the society to travel that previously could not afford to do so. For instance, CAA survey data show that VFR passengers differ from other types of leisure travel:

- they tend to be younger (the 25-44 age group is the largest amongst VFR passengers, versus 45-64 for leisure passengers)
- their income tends to be lower – whereas only 27% of international holiday passengers have an income under £28,750, 41% of international VFR passengers have household incomes below that figure.

9.3 Travelling students

Universities in the United States and Europe attract many foreign students each year. For most air travel is the only practical means of travelling between home and their place of study. In particular there has been a sharp growth in students from the emerging economies studying in universities in developed countries. Most of these students will take the benefits of their education back home at the end of their studies, adding to the local pool of highly educated talent that is crucial to productivity growth and economic development. The networks they develop when studying abroad are likely to provide them with life-long contacts in a range of countries, contributing to both global social cohesion and the development of trade.

The number of foreign students in the United States[53] has grown by 21% since the beginning of the decade, totalling over 620,000 in 2007-08, and generating fee income for universities of over US$10 billion per annum. Growth in numbers has been particularly strong from India (73%), China (35%) and South Korea (51%), with these three Asian countries accounting for almost 40% of foreign students in the United States.

[53] Institute of International Education - http://opendoors.iienetwork.org/?p=131533

Table 9.1 Growth in international student numbers in the United States: top ten origins

	2007/08 student numbers	% growth 1999/00 to 2007/08
India	94,563	73%
China	81,127	35%
South Korea	69,124	51%
Japan	33,974	-27%
Canada	29,051	15%
Taiwan	29,001	2%
Mexico	14,837	39%
Turkey	12,030	10%
Saudi Arabia	9,873	n/a
Thailand	9,004	-20%
World	**623,805**	**21%**

10. A depressed region elevated by the tailwinds of aviation

In an area left behind by the closure of traditional 20th century manufacturing industries, a forward-looking aviation policy has made the Brussels South-Charleroi Airport a vital hub for tourists, business people, and scientists and researchers whose companies have been attracted to an adjacent science park.

Increased investment in road and rail transport has also widened the horizons of local businesses. The airport's transport links have attracted multinationals and university-linked research units, bringing new skills to the region. The airport has been a principal driver behind the regeneration of a region which had suffered a long economic decline.

The Brussels South-Charleroi Airport (BSCA) is located near the town of Charleroi (46 km. south of Brussels), in the Belgian province of Hainault. This province is part of the French-speaking region of Wallonia, one of the three administrative divisions of the Belgian State.

The arrondisement of Charleroi is located in one of the most densely populated regions in Europe, with 5 million inhabitants within one-hour drive, and 15 million inhabitants within a two-hour drive (see Chart 10.1).

The main European capitals are easily accessible from Charleroi both by road and by rail:

- Brussels: 60 km.
- Antwerp (2nd largest port in Europe and 6th in the world): 110 km.
- Rotterdam (largest port in Europe and 2nd in the world): 210 km.
- Paris: 290 km. (with high-speed rail connecting in Brussels or Lille).
- Amsterdam: 260 km (with high-speed rail connecting in Brussels).
- Luxembourg: 190 km.
- Köln: 210 km (with high-speed rail connecting in Liege or Brussels).
- Frankfurt: 400 km. (with high speed rail connecting in Liege or Brussels).

10.1 Charleroi – hit hard by industrial change

The economy of the region of Wallonia traditionally focused on heavy industry such as mining, ironworks and steelmaking. However, during the 1950s and 1960s, Belgian heavy industry began to lose competitiveness, a trend that intensified in the 1970s, ending with the closure of the coal industries, and the restructuring of the ironworks in the region. This resulted in a massive loss of employment and population during the 1980s and 1990s, with unemployment peaking at more than 30% in the province of Hainault by 1997, considerably higher than the Belgian average, placing Charleroi and its hinterland among the most deprived regions in Western Europe. In 2007, unemployment in the Hainault province was still above 12% (against over 10% in Wallonia, and 7% in Belgium).

To tackle the challenge of economic restructuring, the Walloon government developed a strategy to attract investment into the region in the early 1990s. This focused on the partial privatisation and conversion of the existing Gosselies airport (mainly used for charter and private flights with no regular scheduled flights), into an international airport, to compete with Belgium's main airport at Zaventem, near Brussels. Substantial benefits, including reduced landing fees, were offered to companies locating in Charleroi.

The real impulse to growth came in 2001, when a low cost carrier decided to establish its main base of operations in continental Europe in Charleroi, opening routes to seven new destinations, pushing that year's number of passengers to 800,000.

By 2008, 26 destinations were served from the newly named Brussels South-Charleroi Airport (BSCA), and passenger numbers were estimated to be close to 3 million. The growth in passenger numbers at the BSCA has been among the highest for a regional airport in Europe.

Further growth is expected. The airport has been extended and a new terminal building able to accommodate 5 million passengers was opened in January 2008 at an estimated cost of 140 million, leaving adjacent space for future expansion.

10.2 The airport as a catalyst for economic growth

The airport now employs around 4,000 people directly and indirectly in the arrondisement of Charleroi, based on 2007 passenger numbers, equivalent to 3% of the labour force of the city. In addition, the investments realised in the recent expansion of the airport have had a strong impact on local businesses, which have undertaken a significant part of the work on the project.

Moreover, the airport has acted as an important catalyst for economic regeneration and growth in the region. The Aeropole alone has created a further 2,500 jobs.

Therefore, what started as small regional airport with one low-cost carrier, has now achieved a critical mass of passengers encouraging the opening of new routes and airlines. This has, in turn, encouraged companies to locate nearby to benefit from the transport links offered by the airport, and has acted as a catalyst for growth in a deprived region.

L'Aéropole Science Park

Several companies specialising in aerospace industry had been previously located around the old Gosselies Airport, notably SABCA and SONACA. Other companies specialising in agricultural technology were also located in the Charleroi region.

The emergence of the BSCA brought an opportunity to open L'Aéropole, a business incubator and science park next to the airport, after several research centres from the Université Libre de Bruxelles (ULB) decided to locate there.

A number of key factors have now attracted several international companies, including GlaxoSmithKline and Caterpillar, to the site. These include: the presence of the airport, proximity to main markets, low rents, facilities offered by the Walloon Government and routes to European destinations such as London, Milan, Rome, Madrid and Dublin.

In turn, the presence of these multinational companies has acted as a magnet for other companies. These have located in the Aéropole to benefit from the transport links and the interaction with the companies already established there. The Aéropole has since been transformed into a cluster of aerospace, biotechnology and medical research industries, attracting a pool of highly qualified labour and successfully reversing the fortunes of a deprived area in the industrial heartland of Europe.

There are now more than 110 companies located in the Aéropole, employing 2,500 people in various research centres (almost 2% of the Charleroi labour force). This is creating a cycle of investment as company openings make the business park increasingly attractive to new businesses. The investment in the science park also underpins the development of the airport, as the growing number of businesses creates demand for new destinations, which in turn translates into an increased attractiveness of the Aéropole as a business location.

The impact on existing companies in the Charleroi and Hainault region

The effect of the airport on existing companies in the Charleroi area has also been very positive. Though only seven routes were offered in 2003, a survey of business leaders provided a very positive view of the benefits flowing from the airport. These benefits are likely to have multiplied significantly now that the airport offers 26 destinations. For example, 60% of those surveyed thought that the airport had a strongly positive effect in attracting business to the region, whereas 30% thought it had a positive effect.

Furthermore, 36% of the companies surveyed said that their activities were related to the presence of the airport in one form or another.

Aside from the direct economic activity generated by the airport per se, including the direct, indirect and induced effects, the airport has strengthened the competitive position of Charleroi and the province of Hainault in a number of ways:

- Internationalisation of the businesses of Charleroi: the presence of the airport has fostered trade links between businesses in the region and companies abroad. The relocation of international (and Flemish-based) companies to Charleroi has opened up new possibilities for the internationalisation of local companies and has reduced 'mental barriers' in relation to developing businesses abroad and north of the Belgian linguistic frontier.
- The establishment of Charleroi airport has had a positive effect on the image of the region in the rest of Belgium and abroad.
- The jobs created at the airport have provided opportunities for new skills and training, such as language training (mainly Dutch and English), in order to accommodate the increasing number of foreign-language and Flemish speaking passengers. This is of particular relevance in a former coalmining region, with a high incidence of long-term unemployment, and a low economic activity rate among the working-age population. This has also helped redress the mismatch between available local skills and the requirements of the labour market.

10.3 Tourism

Although only 17% of the passengers travelling through Brussels South Charleroi Airport stay in Wallonia, those who do spend on average 211 per person (2003), with a further 25 spent at the airport. Moreover, the number of tourist arrivals in the

Hainault province has increased substantially in recent years. In the five years between 2002 and 2007 visitor numbers to Hainault have risen by nearly 120,000 or 60%. In comparison, the number of arrivals in Belgium as a whole and Wallonia have grown by 4% and 8% respectively.

The transit of passengers through Wallonia has opened up the possibility of realising the largely untapped potential of Wallonia as a tourist destination. These include natural attractions such as Les Ardennes, famous for its wooded hills extending through Belgium, northern France and Luxembourg.

11. Boom time for Bangalore: How an airport helped realise the potential of India's 'silicon valley'

The opening scene of this year's Best Picture Oscar-winner, set in India, takes place, appropriately, on an airport runway. Slumdog Millionaire looks at life through the eyes of a boy desperate to escape the slums of Mumbai; his first act of defiance is to sneak over the airport wall to play cricket on the runway's wide, open spaces and to dream of future glories.

Although the Indian actors stole the show, the movie was a truly international enterprise, a successful combination of multinational investment, a British director, and raw, local talent. The success of the movie may have taken the world by surprise, but such collaboration has long been the recipe for the stunning growth of India's booming economy.

Availability of air services is one of the key factors identified by investors and investment promotion bodies in determining the location of business projects in India, particularly those involving service-related activities or high-value to weight products. Indian economic growth in the 1980s and early 1990s was hamstrung by a constraining lack of air passenger and aviation cargo services. Despite a well-educated workforce, investment dollars and pounds flew elsewhere as manufacturers and exporters were unable to rely on timely deliveries of components and finished goods.

The city-region of Bangalore is one of India's critical growth areas. India's third biggest metropolis is home to over 5 million people, with an economy that has been growing at over 10% per annum. Bangalore has earned the title of the 'silicon valley' of India because of the cluster of domestic and foreign IT companies located in the city, estimated to contribute 33% of India's US$32 billion in IT exports in 2006-07. This success has resulted in the growing affluence of the city. Though home to under 0.5% of India's population, Bangalore boasts nearly 3% of those earning over US$6,600 (2006), with over a third of the city's households achieving this level of income. By contrast over three-quarters of the Indian population live on just 50 US cents per day. Around 83% of the households in Bangalore were able to watch Slumdog Millionaire's triumph at the Oscars on their own television sets, compared with a national average of around 50%.

With the wide range of international companies operating from Bangalore, international and domestic air-links are a crucial ingredient in growing the city's infrastructure at a pace that matches the needs of its burgeoning ecosystem of high-tech firms. Construction of a new international airport began in July 2005, with flights finally commencing nearly three years later, in May 2008. The new airport was originally planned to accommodate 3.5 million passengers a year, but with the liberalisation of air services and the demand for travel to and from Bangalore, this capacity was increased to 12 million passengers per annum. The new airport serves a total of twenty-one Asian, Middle East and European destinations with scheduled cargo flights. The airport development is also driving investment towards related infrastructure in the city-region. The lack of infrastructure in Bangalore, like many other parts of India, has been a constant and critical constraint on growth and living standards.

Today, the people of Bangalore are the beneficiaries of an economic miracle: a boom brought about by increased overseas investment combined with an educated, motivated workforce, which has realised the full potential of India's 'silicon valley'.

As well as offering employment opportunities for well-educated staff, international companies, are mindful of supporting the local community in a variety of other ways. For example, the Yahoo! Employee Foundation, India has set up a school for underprivileged children, helping to ensure that the benefits of India's integration into the world economy feeds through to some of the poorest children in Bangalore.

12. Southern Africa's global gateway

12.1 Background

The Dube TradePort (DTP) is a strategic and critical infrastructure investment which aims to serve as a major catalyst for economic growth in KwaZulu-Natal and South Africa. The development demonstrates the central role given to improved air services in the drive for sustainable economic growth, widened development options and greater prosperity.

The creation of a new airport will be integral to efforts to improve production processes, stimulate foreign trade and direct investment, natural habitat preservation, and tourism.

KwaZulu-Natal has the second largest provincial economy in South Africa after Gauteng. With a total area of 94,000 square kilometres, KwaZulu-Natal is the country's third smallest province, taking up 7.7% of South Africa's land area. It is home to the largest share (20.6%) of the total population among the Provinces – an estimated 9.9 million people. It contributes 16.5% of South Africa's GDP.[54]

Called the garden province, KwaZulu-Natal stretches along the east coast of South Africa from Port Edward in the South to Swaziland and Mozambique in the north. The provincial capital is Pietermaritzburg and the main cities and towns are Durban, Ulundi, Eshowe, Newcastle and Richards Bay.

Due to reliable rainfall and fertile soils, the region's agricultural sector has become very productive, and is known for its specialisation in several types of farming.

KwaZulu-Natal's manufacturing sector is the second largest in the country, after Gauteng province. It is a key sector in the provincial economy accounting for 20% of provincial employment. The three largest manufacturing industries are pulp and paper products (19%), chemicals and petrochemicals (17%), and food and beverages (16%), while the vehicle-manufacturing industry has created a considerable multiplier effect in component and service providers. The automotive leather industry has grown rapidly, with exports significantly increasing foreign-exchange earnings. Overall the manufacturing sector is geared for export, with nearly a third of South Africa's manufactured exports produced in KwaZulu-Natal.

Some of the serious economic challenges for KwaZulu-Natal remain persistent high unemployment (around 30%), poverty, large wealth disparities, and a high incidence of HIV/AIDS.

12.2 DTP ambitions[55]

Key development objectives for the DTP include:

- The introduction of new inter-continental air services.
- The enablement of new export supply chains, including high-value manufacturing.
- The strengthening of the perishable goods and tourism sectors.
- The establishment of an electronic trading platform.
- The stimulation of private sector investment.

[54] KwaZulu-Natal – Economic Overview, Sharon Davis, http://sharondavis.co.za/content/view/56/32/

[55] The Dube Tradeport, A platform for economic development http://www.dubetradeport.co.za/Documents/Publications/2005Nov21/Dube%20TradePort%20-%20Business%20Case.pdf

12.3 King Shaka International airport

A new fully-integrated international passenger and freight airport is to be constructed as part of the overall DTP development initiative. The primary objective of the international airport is to provide for direct long-haul flights to and from Durban and to accommodate KwaZulu-Natal's rapidly expanding domestic passenger business. Over and above tourism benefits, direct long-haul flights will greatly assist the further growth and development of local and national export industry. The project schedule aims to have the airport operational in time for the 2010 soccer World Cup.

The initial development, which is designed to accommodate the latest New Generation Large Aircraft (NGLA, including the A380 Airbus), will have the capacity to handle six million passengers per annum, as well as scope for significant future expansion The plans are to raise this capacity to 7.5 million passengers per annum by 2015 and more than 25 million passengers by 2060.

12.4 Trade – a key component

The Trade Zone, which will be linked to the airport's air freight component, will provide dedicated space for the passage of high-value goods through KwaZulu-Natal. It will also provide a platform to actively support and generate new investment in the full range of air freight-related businesses and associated services. By providing state-of-the-art air-freight handling facilities, comprising a cargo terminal and a perishables centre, the Trade Zone is seeking to attract industries, such as motor components, electronics, clothing and textiles, perishables, and value-added logistics, which are critically dependent on specialised and dedicated air cargo that guarantees timely delivery. The Trade Zone will be capable of handling 100,000 tons of cargo per annum from its launch in 2010, and will be linked to a Trade Zone precinct.

This multi-modal logistics platform is designed to assist in creating economic opportunities for both manufacturing and service-based businesses that require quick access to air cargo and passenger services, and particularly those conducting their business within global value chains. It is also expected that 'spin-off' commercial property and service developments will be stimulated in the vicinity of the DTP as a result of the step-change in the area's economic vitality.

12.5 Opportunities for local farmers of fresh produce

The plans also include an integrated agricultural export zone. This will include land and facilities for the cultivation and export of high-value farming products, providing opportunities for exporters of high-yield, time-sensitive, air-freighted horticultural produce. Pre-harvest and post-harvest facilities required by on-site producers and local growers are also planned.

Further facilities include a wholesale fresh produce market, pack-houses, a training centre and buildings for administration, research and associated activities. The agri-zone will comprise production infrastructure, such as greenhouses, shade nets, and open-field farming, as well as postharvest and value-adding facilities that will ensure an uninterrupted cold-chain process from producer to importer. Trading, in the form of retail markets, wholesale fresh produce markets, and nurseries, will also be supported.

Potential tenants of agricultural land within the agri-zone include local farmers, emerging growers and co-operatives and international horticultural companies with the ability to manage large-scale ventures with links into key international markets. The agri-zone will also work with private- and public-sector organisations to help established and emerging farmers in the province of KwaZulu-Natal to become successful exporters of perishable products. This agri-zone will provide agricultural technology, airfreight capacity, and support services to commercial farmers.

The focus of the agri-zone will be on the output of high-value, low-weight produce, which satisfies consumers' demand for freshness. The produce should be harvested, sorted, packed, and transported within a 24-hour or 48-hour period, in order to increase shelf life, and guarantee freshness. Produce will include fresh flowers, fresh herbs, baby vegetables, lettuce, granadillas and value-added products, such as prepared salads.

12.6 Enabling tourism to flourish

Since the transition to democracy in 1994, South Africans have become aware of the potential for tourism to play a meaningful role in their country's economic development. The government has identified tourism as one of five economic growth sectors on which to focus its efforts to support investment and facilitate growth. The period of strong growth since 1990 has fundamentally changed the face of the tourism industry in South Africa. With a small domestic market and less than 1 million annual foreign arrivals in the two decades before 1990, South Africa has grown into a destination that welcomed more than nine million visitors by 2007.

Despite its attractions, KwaZulu-Natal sees only a small percentage of airborne international tourists arriving directly in the province. In 2007 only 0.6% of the 2.5 million international arrivals by air to South Africa entered via Durban International Airport. KwaZulu-Natal lies third behind Western Cape and Guateng provinces in numbers of foreign visitors. Approximately 1.4 million foreign visitors came to KwaZulu-Natal in 2006. Of these, approximately 527,000 were air arrivals. In terms of the activities they engaged in while they were in KwaZulu-Natal, 68% of air departure visitors went to natural attractions, and 61% of them engaged in some or other sort of activity related to wildlife. A further 21% enjoyed activities related to adventure, often activities undertaken in protected or wilderness areas, and a substantial proportion – 73% – engaged in beach-related activities.[56]

With considerable scope to attract more tourists to KwaZulu-Natal, the building of King Shaka International Airport at DTP, and the potential it offers for direct flights from key markets, is a central part of the strategy to grow the importance of tourism to KwaZulu-Natal Province. The aim is to build visitor numbers by establishing scheduled flights on sustainable routes to a small group of target markets. Route selection will be based on a combination of passenger and freight demand, and is expected to include the United Kingdom, an additional European destination and Dubai. In addition, seasonal charters may form part of the solution provided by the new airport.

[56] KwaZulu-Natal Tourism Authority, www.tourism-kzn.org/

DTP studies have estimated that five million passengers will be making use of the King Shaka Airport by 2018-19, growing to over 8 million by 2032-33 (over 11 million in a high growth scenario).

The total socio-economic impact of the DTP has been calculated as follows:[57]

Table 12.1 DTP economic impact

	Low case scenario	High case scenario
Employment (new sustainable jobs)		
National	164,800	269,203
KZN	150,043	244,205
Increased contribution to GDP US$bn		
National	4.1	6.9
KZN	2.7	4.5
Increased fixed investment US$bn		
National	1.3	2.3
Increased tax revenue US$bn		
National	0.7	1.5

Source: Global Insight & Oxford Economics

In addition to these impacts on employment and GDP the DTP will have significant catalytic benefits in terms of Black economic empowerment, competitiveness and skills development.

Black economic empowerment: DTP's empowerment strategy has set criteria for direct local economic empowerment ownership rising from a minimum of 30%; increasing to 51% after 8 years and a foreign partner will be required to address Black economic empowerment ownership in the event it established a subsidiary in South Africa.

Over and above the gains in **competitiveness** through increased efficiency introduced by the DTP project in the transport sector, there are also potential gains to be obtained by achieving lower prices as a result of increased efficiencies in the transport sector on a national level.

The DTP project will also make a positive contribution to **skills development** in a number of sectors, including construction (in the early phases of the project), tourism, the wholesale and retail sector, and agriculture. Technology transfer will likely take place in the agricultural, aluminium and electronics sectors.

As well as these economic benefits that flow from developing the tourism market, some wider benefits in terms of health have resulted. As described in more detail in chapter 13, steps to control or eradicate malaria have been stepped up as part of the effort to boost tourism to KwaZulu-Natal. These efforts have already resulted in significant progress and are a major benefit to the local population.

[56] Global Insight: Dube TradePort, Project scenarios: Macro & Socio Economic Impact Assessment

13. Hopes for a healthier future: How campaigns against malaria will bring airborne tourism to Africa

Ever since King John II of Portugal named the southern tip of Africa the Cape of Good Hope, many of the grandest hopes for the continent have been poisoned by a tiny insect. The female Anopheles mosquito, transmitter of malaria, first thwarted many of the early Europeans who ventured inland, north of South Africa's temperate climate. In the 21st century, the threat of the disease she carries still has the capacity to staunch flows of overseas investment, which many regions rely on as the lifeblood of a healthy economy.

The area of Northern KwaZulu-Natal is no exception. The potential of this area for tourism development has long been recognised. But the prevalence of malaria, until recently, has blighted many of its hopes for development.

This is a national problem for South Africa: the World Health Organisation (WHO) reports that the annual economic growth of countries with high malaria transmission is historically lower than that of countries where the disease is absent. The presence of malaria deters investment in all industries, with obvious impacts to travel and tourism and the benefits they bring.

One of the key issues in improving tourism in areas such as Northern KwaZulu-Natal is not only the prevention of malaria, but also the diffusion of education about the disease and its prevention. Dr. Brian Sharp, Chairman of the Regional Malaria Control Commission, says that there is increasing evidence that malaria control is a positive precursor to development. The situation prior to malaria control initiatives in South Africa supports this view, given its well documented effects on tourism and agricultural development in the 1930s. The Regional Malaria Control Commission was set up in 1999 to promote economic growth and investment in the three countries – Swaziland, Mozambique and South Africa.

Research shows that high rates of malaria in the Lubombo area, along with other malarial hotspots in the region, are one of the major causes of ongoing underdevelopment and poverty. Some estimates suggest that treatment costs for small farmers in parts of Africa equate to 5-13% of household expenditures, while costs in terms of output losses may be in excess of 1% of GDP.

In 1999, 30,000 cases of malaria were recorded in South Africa. In that year ministers of tourism and health from Swaziland, Mozambique and South Africa met to launch a programme to combat malaria. They recognised the disease as a direct threat not only to human life but also to economic development.

The presence of tourism ministers was significant. The general protocol on the Lubombo Spatial Development Initiative (LSDI) was signed in July 1999, targeting tourism as the main industry to lead growth in the region.

The South African government has led by example, encouraging investment in the LSDI area with the announcement of eight new tourism projects in December 2003. These were worth R430 million (US$57 million) and aim to transform Lake St Lucia into an international tourist destination. This move was designed to demonstrate confidence in the area's potential, but also in the belief that malaria is no longer a major threat. The challenge is to now to convince tourists.

The LSDI malaria programme has already achieved several of its goals: a significant decrease in the disease; major strides in malaria control capacity; the creation of a regional malaria monitoring system; and improving perceptions of its tourism industry.

The South African border areas most influenced by the LSDI malaria programme are Komatipoort District in Mpumalanga and Ingwavuma District in KwaZulu-Natal. Initially parasite prevalence surveys were conducted in KwaZulu-Natal. By 2001, these parasite prevalence rates had dropped to below 5%. Malaria incidence rates reduced from the 1999-2000 baseline year to 2006-07 by 99%. Although the scale of the disease differs in the different localities, the disease trends are similar. Significant reductions were made in these border regions once malaria control interventions had been implemented in adjacent areas in Mozambique. Since 2002-03 the number of cases decreased markedly and has remained low ever since.

The tourism component of the project has been successfully completed. The vastly improved malaria data has given real optimism and is increasingly influencing tourism policy. SA Tourism is using the 'Malaria Free' campaign to enhance its international marketing strategy.

It is hoped that South Africa has almost reached the day when the country's trade and tourism prospects will be freed of the curse of malaria. South Africa's natural resources make it an ideal destination for many international visitors. Its competitive tourism advantages are many: accessible wildlife, varied ecosystems, impressive scenery, unspoiled wilderness, diverse cultures, temperate sunny climate, and the absence of 'jet lag' from Europe. In addition, the KwaZulu Natal region boasts unique archaeological sites and battlefields, the availability of excellent conference, exhibition and sporting facilities.

To take advantage of such attractions, the building of King Shaka International Airport at DTP, and the potential it offers for direct flights from key markets, is a central part of the strategy to increase the flow of tourists to a region. The FIFA World Cup in 2010 provides a major incentive to have construction complete and the airport operational.

The KwaZulu Natal region now believes it has taken large strides to guarantee all its visitors immunity from the airborne disease which has plagued progress for so long in Africa.

Extracted from Effects of Malaria on Tourism Tourism KwaZulu-Natal Occasional Paper No. 21, August 2004 and http://www.malaria.org.za/lsdi/home.html (Lumbobo Spatial Development Initiative) and Seven Years Of Regional Malaria Control Collaboration – Mozambique, South Africa, and Swaziland Brian L. Sharp et al, The American Society of Tropical Medicine and Hygiene, 2007

14. Taxing times: Air transport and taxation

In times of recession, governments must strategise wisely about who and what to tax; decision makers must balance the political obligation of funding promised policies with the fiscal imperative of stimulating flagging economies. The air transport industry has long been a major generator of tax revenues. These include taxes on fuel for domestic flights, ticket taxes, specific taxes, like the UK's air passenger tax, and user charges typically related to airport departures and arrivals. In addition, through its contribution to economic efficiency and raising economic output in other sectors, aviation helps raise the overall tax capacity of the economy. Finally, the industry pays, or generates general corporate, employment and income taxes, both directly and through its supply chain.

According to an Air Transport Association (ATA) survey, taxes levied on aviation exceeded US$14 billion in 2004 in the US, corresponding to 25% of a typical airfare. The equivalent figure for the European Union comes to an annual total of US$7.3 billion, equivalent to an estimated 14-15% of passenger revenues for airlines on all routes within Europe.[58]

14.1 A wide range of taxes & charges levied

Across a wide range of countries aviation fuel for domestic flights is subject to taxation, and in the United States these taxes vary from state to state. A recent nternational Monetary Fund (IMF) report,[59] shows that tax rates vary markedly and are particularly high in percentage terms (above 80%) in Japan and the Netherlands and substantial (around 40%) in a number of emerging nations.

Ticket based taxes, on both passengers and cargo, and departure and other trip-related charges are also widespread. For example, domestic air travel is quite widely subject to value added tax (VAT) in both high-income and emerging countries. Some countries have departure and/or arrival taxes only on foreigners, and some only on domestic residents or citizens, while some differentiate charges by traveller class. In some high-income countries these charges are substantial.

Data from the United States shows the combination of ticket taxes and user fees can represent a significant portion of the price paid by the consumer. Moreover this burden has a regressive impact. As many of the taxes and fees are for a fixed monetary value, a larger proportion of a low ticket price goes to meeting this burden than for higher priced tickets.

58 Sourced from IATA – http://www.iata.org/whatwedo/airport-ans/charges/taxation.htm

59 "Indirect Taxes on International Aviation", IMF Working Paper, 2006

Table 14.1 US ticket taxes & fees[60]

Nonstop round trip – include maximum passenger facility charges					
Total Ticket Price	**$100.00**	**$200.00**	**$300.00**	**$400.00**	**$500.00**
Base (Airline) Fare	73.49	166.51	259.53	352.56	445.58
Federal Ticket Tax	5.51	12.49	19.47	26.44	33.42
Federal Flight Segment Tax	7	7	7	7	7
Federal Security Surcharge	5	5	5	5	5
Airport PFC*	9	9	9	9	9
Total Taxes and Fees	**$26.51**	**$33.49**	**$40.47**	**$47.44**	**$54.42**
Taxes as % of Ticket	**26.5%**	**16.7%**	**13.5%**	**11.9%**	**10.9%**

Double-connection round trip – include maximum passenger facility charges					
Total Ticket Price	**$100.00**	**$200.00**	**$300.00**	**$400.00**	**$500.00**
Base (Airline) Fare	47.44	140.47	233.49	326.51	419.53
Federal Ticket Tax	3.56	10.53	17.51	24.49	31.47
Federal Flight Segment Tax	21	21	21	21	21
Federal Security Surcharge	10	10	10	10	10
Airport PFC*	18	18	18	18	18
Total Taxes and Fees	**$52.56**	**$59.53**	**$65.51**	**$73.49**	**$80.47**
Taxes as % of Ticket	**52.6%**	**29.8%**	**22.2%**	**18.4%**	**16.1%**

Source: Air Transport Association

[60] As at 1st January 2008

14.2 Tax and economic efficiency

From the point of view of economic efficiency it is not just the level of taxation borne by an industry that is important but also the extent to which taxes distort choices that would otherwise have been made. In this sense an efficient tax system is one that has little impact on the decisions that consumers make. Analysis in the Unites States[61] and the data for Germany, France and the UK,[62] suggest that the incidence of taxation varies considerably among different forms of transport. This suggests that tax systems and their impact on aviation are likely to distort consumer choice, leading to loss of productivity and economic output.

14.3 International comparisons

While no comprehensive cross-country data on the contribution that aviation makes to the public purse is available, some calculations[63] have been made for France, Germany and the UK which provide a high-level view of the specific taxes, subsidies and infrastructure-related costs and charges on different modes of transport in 1998 and 2003. This burden includes taxes or other charges levied on transport fares – for example air passenger duty in the UK and VAT payments on rail fares. However, because of difficulties in obtaining the data, corporate taxes paid by private sector transport operators, taxes paid by employees and those generated by support industries in aviation's supply chain are not included. And, as user charges often bear little resemblance to the actual cost of the infrastructure used in transportation, the data take account of infrastructure costs, net of depreciation, to calculate the extent to which user charges reflect actual costs and the extent to which they are a transfer from transport to the public sector.

On this basis aviation made net payments of 0.7-0.8 billion in each of the three countries in 1998. On a per journey or per kilometre travelled basis this translates into a higher payment than other forms of public transport and in relation to the number of journeys the net contribution made by aviation is thought to have increased between 1998 and 2003 in Germany and France and remained static in the UK.

Calculations for the UK,[64] that take account of income taxes, social security contributions paid by employees and employers and corporate taxes for airlines and airports estimate that the industry bore about 0.8% of the total UK tax burden in 2004-05. However this estimate understates the total tax contribution of aviation as it was not possible to include property taxes, insurance premium taxes, VAT paid on sales at airport shops or on spending elsewhere by households who derive income from the aviation industry, or tax paid by workers in the industry supply chain.

61 The Taxation Of Air Transportation, Kenneth J. Button, George Mason University, 2005

62 Aviation Taxes and Charges, IATA Economics Briefing No 2, November 2005

63 Aviation Taxes and Charges, IATA Economics Briefing No 02, November 2005

64 The Economic Contribution of the Aviation Industry in the UK, Oxford Economic Forecasting, 2006

Glossary: Part IV

The channels of economic and social impacts

The channels through which the air transport industry makes a contribution to the world economy are multiple and complex. In order to obtain some quantitative estimates, it is helpful to differentiate the following economic impacts:

Direct impacts – employment and activity in the air transport industry itself.

Indirect impacts – employment and activity of suppliers to the air transport industry such as aviation fuel suppliers, construction companies that build airport facilities, suppliers of sub-components used in aircraft, manufacturers of goods sold in airport retail outlets and a wide variety of business services (IT, accountancy etc.).

Induced impacts – the spending of those directly or indirectly employed in the air transport sector supports jobs in industries such as retail outlets, companies producing consumer goods and a range of service industries.

This classification and methodology has become standard in estimations of the economic contributions of a given sector and is the framework we have used in previous studies of the economic contributions of the aviation sector.[64] This has the advantage of being comprehensive and robust.

The direct, indirect and induced effects are best quantified at a point in time. In this report, we provide estimates of these impacts in 2007. There are also a number of economic and social catalytic impacts of the air transport industry which enhance the functioning of other industries and have an impact on living standards and societies in general over a number of years. These wider benefits include:

Trade: offering companies access to wider geographical markets, thereby offering new routes for sustainable growth.

Tourism: a significant source of jobs notably in the developing world; enabling sustainable diversification away from natural resources exploitation.

Investment: access to air transport is a vital factor in companies' decisions to invest in a country or region.

Productivity: by encouraging competition, allowing access to a wider pool of workers, enabling transfers of knowledge and technologies, air transport fosters more efficient business operations.

The wider effects are less easily quantifiable. Moreover, as highlighted in this report, they overlap and complement and amplify each other. But, in order to grasp the wide variety of ways in which the air transport sector contributes to the economy, it is important to consider how these catalytic impacts contribute to higher living standards.

64 For instance, 'The economic and social benefits of air transport 2008', Air Transport Action Group

Chart S1. The global air transport industry and its economic and social impacts

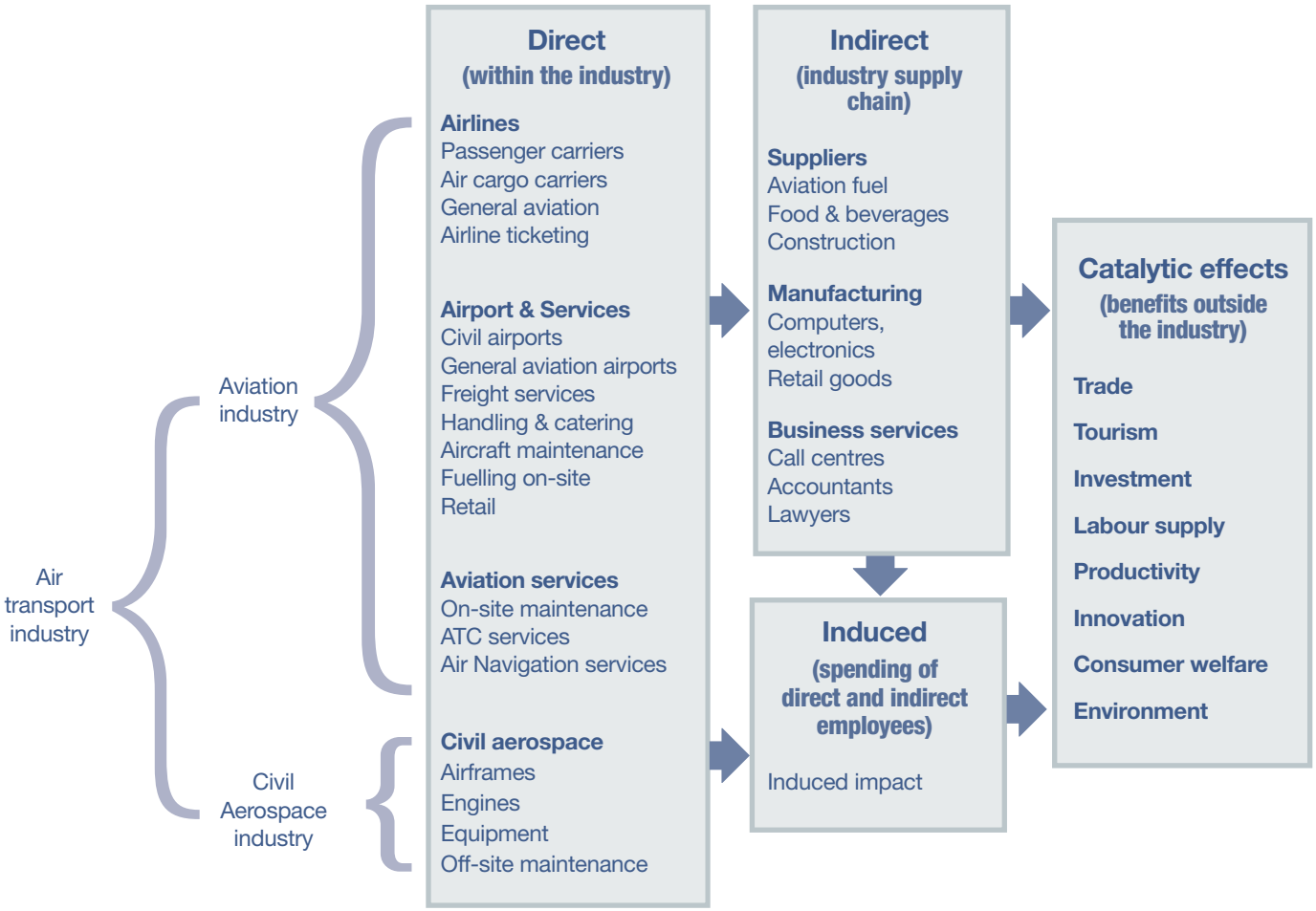


Chart S2. Economic and social catalytic effects of air transport

GDP and living standards

Gross Domestic Product (GDP) is a widely used measure of economic output. For the economy as a whole GDP measures the market value of all the products that enter final consumption. For example, it includes the market value of an automobile produced by an automaker. This value encompasses the 'value added' at each stage of production, so it includes the value-added in the manufacture of the steel or electronics used in producing the car. But this value added is only counted once – in other words GDP does not simply add the output of the steel, electronics and automobile industries together, rather it adds together the extent to which each of these industries add value to the inputs that they use in the production process.

Standard of living is a loosely defined concept that refers to the economic well-being of a household, a region or an economy as a whole. It typically incorporates material comforts, ease of living, and opportunities for personal satisfaction. A good approximation to living standards would be the value of all goods and services consumed per capita, where goods and services are defined broadly to include goods and services that are purchased, those that are produced at home or provided by the government, plus an allowance for the value of leisure time, environmental amenities and good health.

While attempts have been made to construct comprehensive measures of this type, the normal proxy for standard of living is value added per capita, widely referred to as GDP (Gross Domestic Product) or GNP (Gross National Product) per capita. While these measures do not include home production, quality of the environment or public health, it is generally accepted that higher levels of GDP per capita are associated with greater access to these non-market goods and so higher standards of living.

In making comparisons among countries, particularly where there are large differences in the stage of economic development, purchasing power parities (PPP), rather than market exchange rates are often used to convert national currencies to a common basis. By making allowance for the differences in the relative cost of goods and services that are not traded across borders (eg haircuts), PPP based calculations are viewed as a more accurate way to compare living standards.

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