

OXFORD ECONOMICS

Economic Benefits from Air Transport in the Caribbean 2009



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A note on the data reported in the report

Unless otherwise stated, the numbers reported in this report relate to the calendar year 2009.

Oxford Economics 2011

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Facts & figures

The economic benefits of aviation in the Caribbean

Air transport to and from Antigua and Barbuda, the Bahamas, Bermuda, Cuba, the Netherlands Antilles, the Dominican Republic, Grenada, Haiti, the US Virgin Islands, Jamaica, Saint Lucia, Trinidad and Tobago and Saint Kitts and Nevis (hereafter referred to collectively as the Caribbean) creates three distinct types of economic benefit. Typically, studies such as this focus on the 'economic footprint' of the industry, measured by its contribution to GDP, jobs and tax revenues generated by the sector and its supply chain. But the economic value created by the industry is more than that. The principal benefits are created for the customer, the passenger or shipper using the air transport service. In addition, the connections created between cities and markets represent an important infrastructure asset that generates benefits, in the case of the Caribbean, primarily through enabling the development of their tourism sectors.

1. Aviation's economic footprint

Contribution to GDP in the Caribbean

The aviation sector contributes \$2.5 billion (1.4%) to GDP in the Caribbean region. This total comprises:

- \$1.3 billion directly contributed through the output of the aviation sector (airlines, airports and ground services);
- \$0.7 billion indirectly contributed through the aviation sector's supply chain; and
- \$0.6 billion contributed through the spending by the employees of the aviation sector and its supply chain.

Major employer

The aviation sector supports 112,000 (0.8%) jobs in the Caribbean region. This total comprises:

- 44,000 jobs directly supported by the aviation sector;
- 38,000 jobs indirectly supported through the aviation sector's supply chain; and
- 30,000 jobs supported through the spending by the employees of the aviation sector and its supply chain.

Tourism

Through the catalytic effects of tourism, the aviation sector facilitates further benefits to the economies of the Caribbean¹, in the region of \$12.4 billion (7.3%) of GDP and 843,000 (5.7%) jobs. This total comprises:

- \$4.7 billion and 313,000 jobs directly supported in the tourism sector;
- \$5.3 billion and 350,000 jobs indirectly supported through the tourism sector's supply chain; and
- \$2.4 billion and 180,000 jobs supported through the spending by the employees of the tourism sector and its supply chain.

¹ Due to data restrictions we were unable to estimate the catalytic impact of tourism for Bermuda. As such, when figures are reported as a proportion of GDP/employment they refer to the relevant aggregate for the countries for which we were able to estimate.

High productivity jobs

The average air transport services employee in the Caribbean generates \$43,200 in GVA annually, which is over 3.5 times more productive than the average employee in the region.

This report describes these channels in more detail.

Section 1 examines the way in which the aviation sector acts as an enabler of long-term economic growth through connectivity, which helps to boost the catalytic effects of both tourism and trade.

Section 2 analyses the economic footprint of the aviation sector - the airlines and the ground-based infrastructure - to quantify the value of its output and the jobs it supports in the Caribbean.

1 Enabling long-term economic growth

1.1 Connectivity

The air transport network has been called the Real World Wide Web². Chart 1.1 gives an idea of how extensive the air transport network is for the Caribbean. In 2010 there were 297 routes connecting the Caribbean Islands to urban agglomerations around the globe. On average there were 1.2 outbound flights per day along these routes. A total of 63 of these routes were connecting the Caribbean Islands to cities of more than 10 million inhabitants, with an average of 1.4 outbound flights available to passengers.

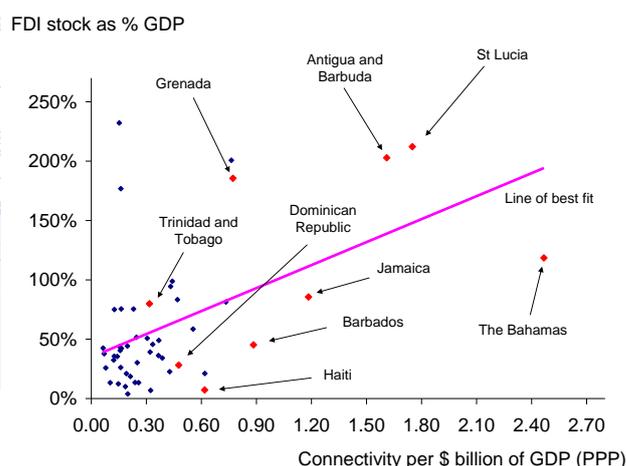
Frequencies are higher to the most economically important destinations. For example, passengers benefited from 4.7 outbound flights per day from Bahamas Lynden Pindling to Hartsfield-Jackson Atlanta International Airport, and from 2.2 flights from Havana to Madrid Barajas International Airport, providing high speed access for business and leisure purposes throughout the day.

Chart 1.1: Connectivity, 2010



Source : IATA

Chart 1.2: Foreign direct investment and connectivity³



Source : IATA, Oxford Economics

These linkages represent the ‘connectivity’ of the Caribbean with major cities and markets around the world. Connectivity reflects the range, frequency of service, the economic importance of destinations and the number of onward connections available through each country’s aviation network. Improvements in connectivity achieved in recent decades has brought benefits to users of air transport services by: reducing time spent in transit, increasing the frequency of service, allowing for shorter waiting times and better targeting of departure and arrival times; and improving the quality of service, such as reliability, punctuality and quality of the travel experience.

A number of these city-pair connections have point-to-point services, where passenger flow density is sufficient to make the economics work. However, many of the city-pair connections that make up the Caribbean’s connectivity to overseas markets can only be served by airlines aggregating flows from a number of origins through a hub airport in order to generate a sufficiently dense flow of passengers.

² ‘Aviation – The Real World Wide Web’, by Oxford Economics. Available at <http://www.oxfordeconomics.com/samples/airbus.pdf>

³ Due to data restrictions, figures are reported for those Caribbean Islands for which data is available.

Improvements in connectivity have been accompanied by a steady fall in the cost of air transport services. The cost of air transport services, in real terms, has fallen by around 1% a year over the past 40 years, contributing to the rapid expansion in the volume of trade seen over this period⁴. Air transport has also steadily become more competitive relative to other modes of transport. For example, it is estimated that its relative cost has been falling by around 2.5% a year since the 1990s⁵. As its relative cost has fallen, air shipments have become increasingly important for international trade.

Apart from the benefits to direct users of air transport services, the largest economic benefit of increased connectivity comes through its impact on the long term performance of the wider economy. For the Caribbean, this has been most apparent through the development of their tourism sectors.

Improved connectivity can also enhance an economy's performance by making it easier for firms to invest outside their home country, which is known as foreign direct investment (FDI). Improved connectivity may favour inward investment as increased passenger traffic and trade that accompanies improved connectivity can lead to a more favourable environment for foreign firms to operate in. Chart 1.2 plots the total value of FDI built up in individual countries in relation to their GDP against an index of connectivity (produced by IATA), that measures the availability of flights, weighted by the importance of each of the destinations served. The chart shows that countries with higher connectivity (measured relative to their GDP), are in general more successful at attracting foreign direct investment. This is emphasised by the upward sloping line that confirms the statistical relationship between greater connectivity and greater FDI.

1.2 Catalytic effects – tourism

Air transport lies at the heart of global business and tourism. Through its speed, convenience and affordability, air transport has expanded the possibilities of world travel for tourists and business travellers alike, allowing an ever greater number of people to experience diversity of geography, climate, culture and markets.

Tourism, predominantly for leisure purposes, makes a significant contribution to the economies of each country within the Caribbean, with foreign visitors spending nearly \$15.9 billion in the region in 2009⁶. Almost 68% of these tourists travelled by air, implying that foreign visitors arriving by air spent approximately \$10.8 billion⁷.

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry directly employed 313,000 people and supported indirectly through its supply chain a further 350,000 jobs. A further 180,000 people were supported through the household spending of those people directly and indirectly employed by the travel and tourism sector.

Through the spending of those foreign visitors who travelled by air, the travel and tourism industry directly contributed \$4.7 billion to the economy of the Caribbean region (GDP), \$5.3 billion indirectly through the output it supports down its supply chain and a further \$2.4 billion through the induced effects of consumer spending.

⁴ See Swan (2007), 'Misunderstandings about Airline Growth', *Journal of Air Transport Management*, 13, 3-8, and Baier and Bergstrand (2001), 'The growth of world trade: tariffs, transport costs and income similarity', *Journal of International Economics*, 53:1, 1-27.

⁵ See Hummels (2007), 'Transportation Costs and International Trade in the Second Era of Globalisation', *Journal of Economic Perspectives*, 21.3, Summer.

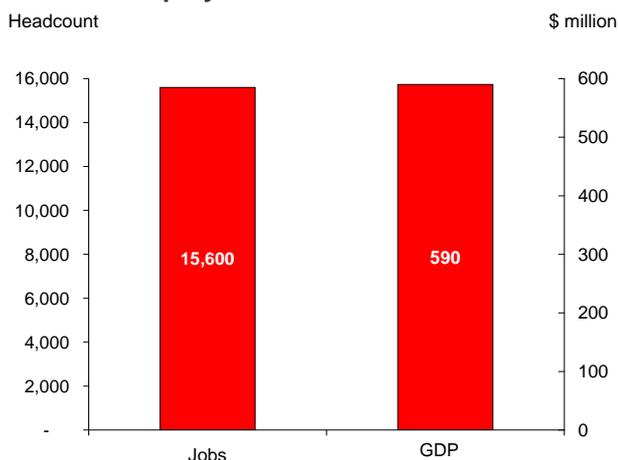
⁶ Based on IMF statistics

⁷ Includes foreign visitors arriving on both domestic and foreign carriers. Figures exclude Bermuda

1.2.1 The Bahamas

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$590 million to the economy of the Bahamas (8.2% of total GDP) and supported around 15,600 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

Chart 1.3: Travel and tourism’s contribution to GDP and Employment in the Bahamas

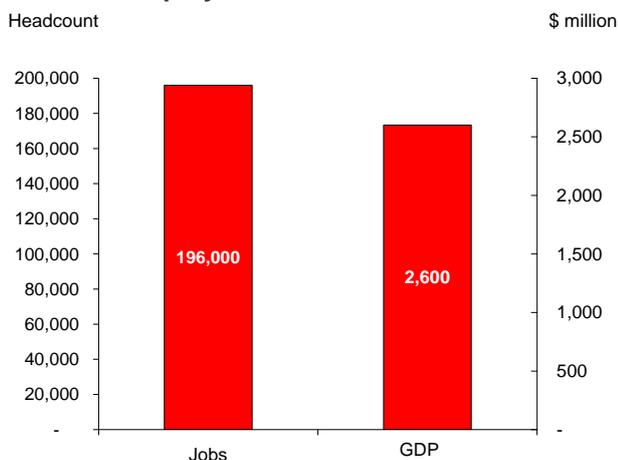


Source : Oxford Economics

1.2.2 Cuba

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$2.6 billion to the economy of Cuba (4.3% of total GDP) and supported around 196,000 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

Chart 1.4: Travel and tourism’s contribution to GDP and Employment in Cuba

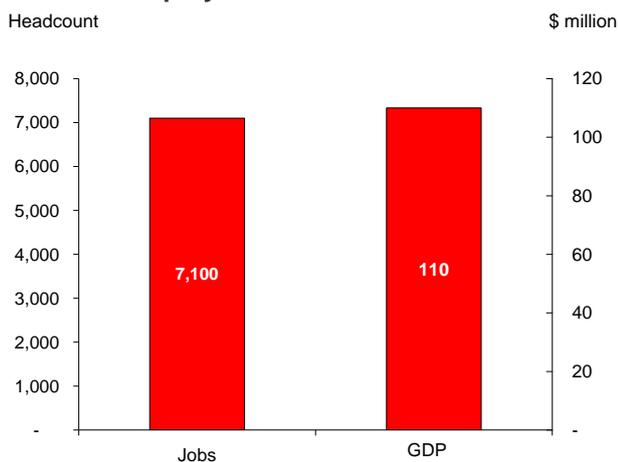


Source : Oxford Economics

1.2.3 Grenada

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$110 million to the economy of Grenada (17.1% of total GDP) and supported around 7,100 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

Chart 1.5: Travel and tourism's contribution to GDP and Employment in Grenada

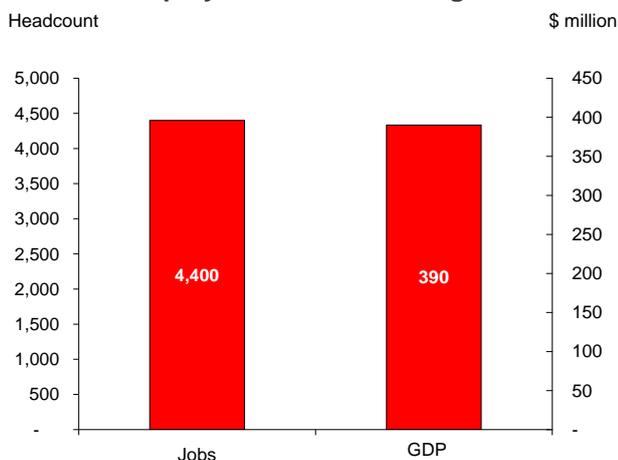


Source : Oxford Economics

1.2.4 The US Virgin Islands

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$390 million to the economy of the US Virgin Islands (7.9% of total GDP) and supported around 4,400 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

Chart 1.6: Travel and tourism's contribution to GDP and Employment in the US Virgin Islands

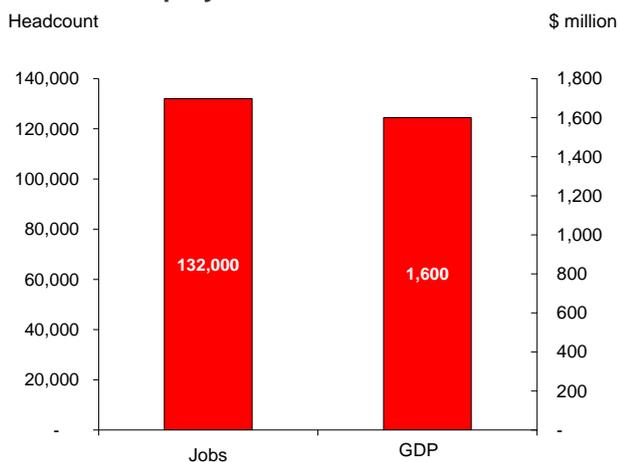


Source : Oxford Economics

1.2.5 Jamaica

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$1,600 million to the Jamaican economy (12.8% of total GDP) and supported around 132,000 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

Chart 1.7: Travel and tourism's contribution to GDP and Employment in Jamaica

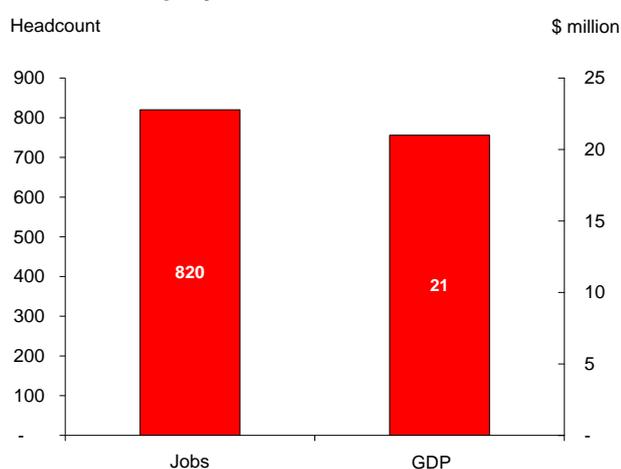


Source : Oxford Economics

1.2.6 Saint Kitts and Nevis

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$21 million to the economy of St Kitts and Nevis (4.1% of total GDP) and supported around 820 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

Chart 1.8: Travel and tourism's contribution to GDP and Employment in Saint Kitts and Nevis

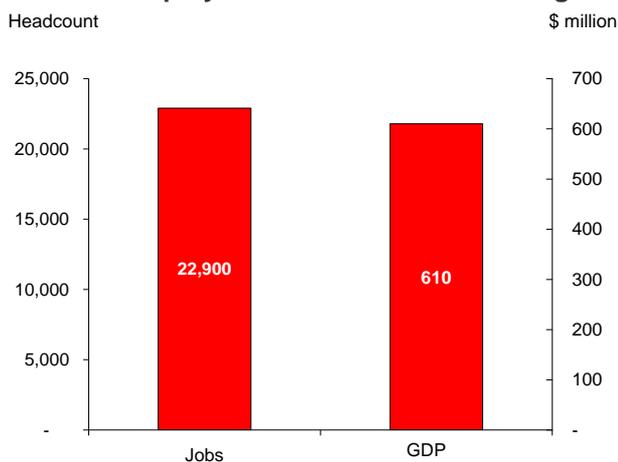


Source : Oxford Economics

1.2.7 Trinidad and Tobago

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$610 million to the economy of Trinidad and Tobago (2.9% of total GDP) and supported around 22,900 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

Chart 1.9: Travel and tourism's contribution to GDP and Employment in Trinidad and Tobago

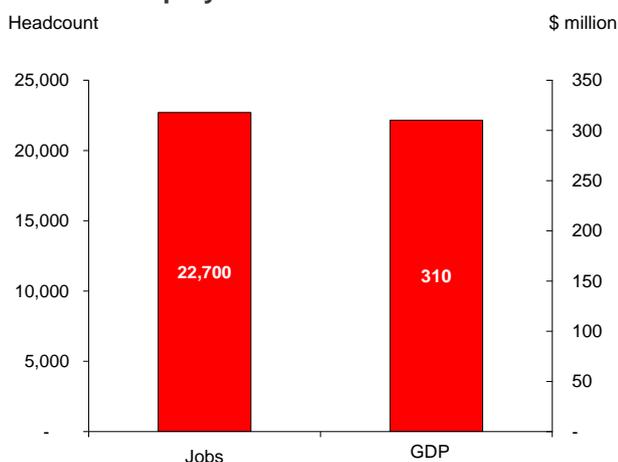


Source : Oxford Economics

1.2.8 Saint Lucia

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$310 million to the economy of Saint Lucia (32.5% of total GDP) and supported around 22,700 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

Chart 1.10: Travel and tourism's contribution to GDP and Employment in Saint Lucia

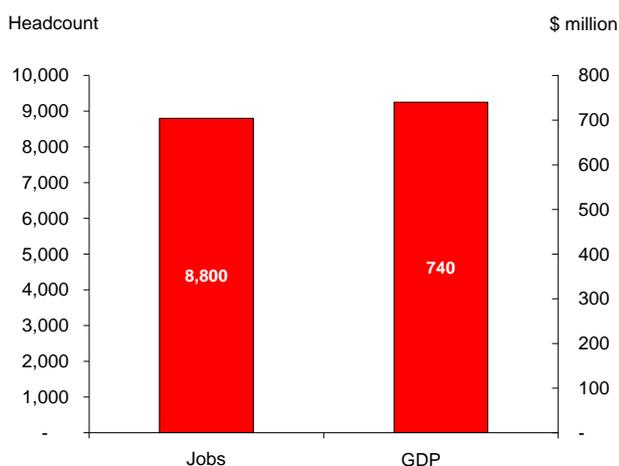


Source : Oxford Economics

1.2.9 The Netherlands Antilles⁸

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$740 million to the economy of the Netherlands Antilles (18.8% of total GDP) and supported around 8,800 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

Chart 1.11: Travel and tourism's contribution to GDP and Employment in the Netherlands Antilles



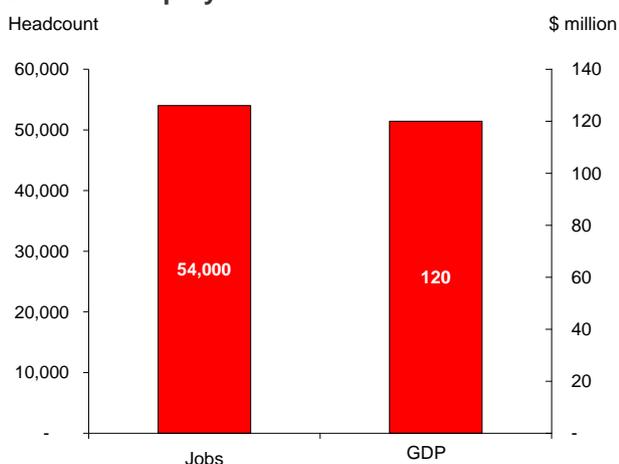
Source : Oxford Economics

1.2.10 Haiti

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$120 million to the economy of Haiti (1.8% of total GDP) and supported around 54,000 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

⁸ Netherlands Antilles as at 2009, including Bonaire, Curaçao, St. Maarten, Saba and St. Eustatius, but excluding Aruba. The Netherlands Antilles was later dissolved in October 2010.

Chart 1.12: Travel and tourism’s contribution to GDP and Employment in Haiti

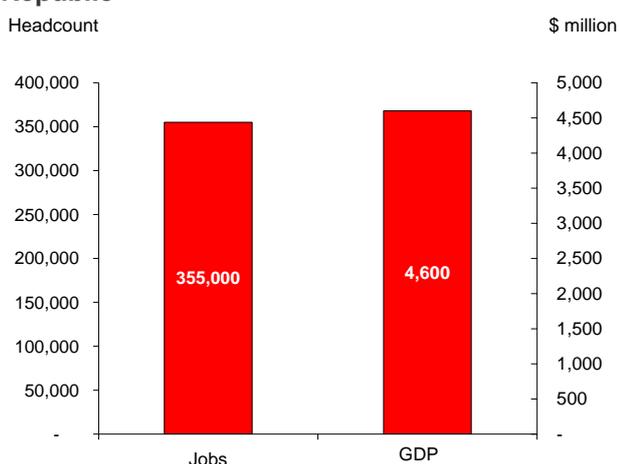


Source : Oxford Economics

1.2.11 The Dominican Republic

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$4,600 million to the economy of the Dominican Republic (9.9% of total GDP) and supported around 355,000 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

Chart 1.13: Travel and tourism’s contribution to GDP and Employment in the Dominican Republic

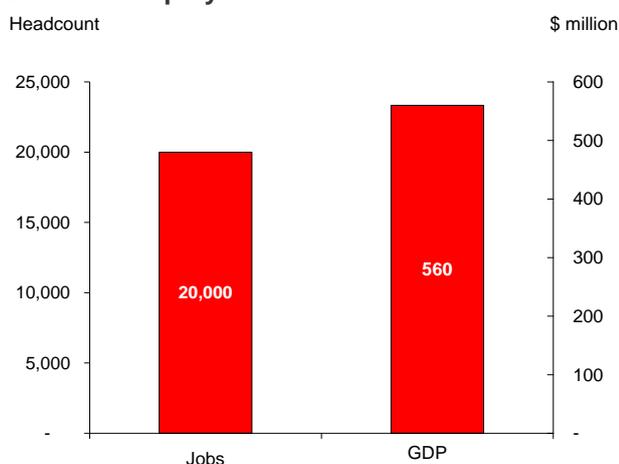


Source : Oxford Economics

1.2.12 Barbados

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$560 million to the Barbadian economy (15.3% of total GDP) and supported around 20,000 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

Chart 1.14: Travel and tourism’s contribution to GDP and Employment in the Barbados

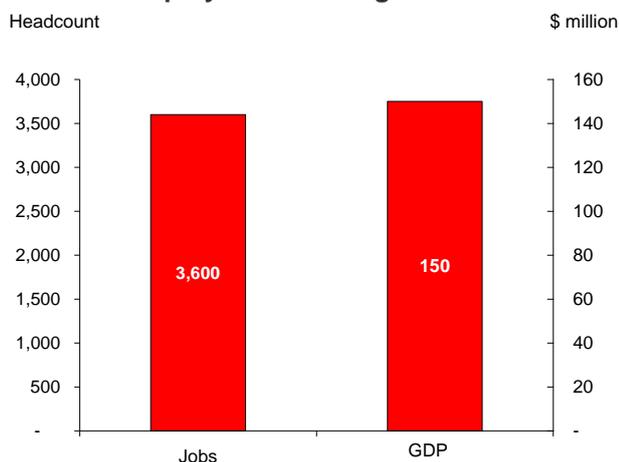


Source : Oxford Economics

1.2.13 Antigua and Barbuda

When only considering the contribution linked to the spending of foreign visitors arriving by air, Oxford Economics estimates that in 2009 the travel and tourism industry contributed approximately \$150 million to the economy of Antigua and Barbuda (13.1% of total GDP) and supported around 3,600 jobs. In addition to the direct impact of the industry, these figures include both the indirect and induced impacts of its locally-based supply chain and the household spending of those employed both directly and indirectly.

Chart 1.15: Travel and tourism’s contribution to GDP and Employment in Antigua and Barbuda



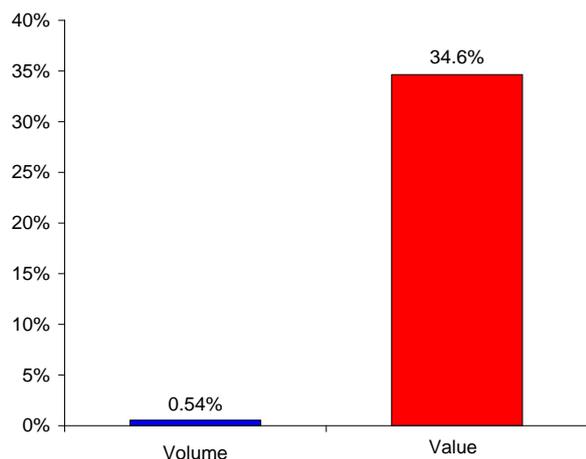
Source : Oxford Economics

1.3 Catalytic effects – trade

Compared to other modes of transport, air freight is fast and reliable over great distances. However, these benefits come with a cost attached. Consequently, it is mostly used to deliver goods that are light, compact, perishable, time sensitive or that have a high unit value.

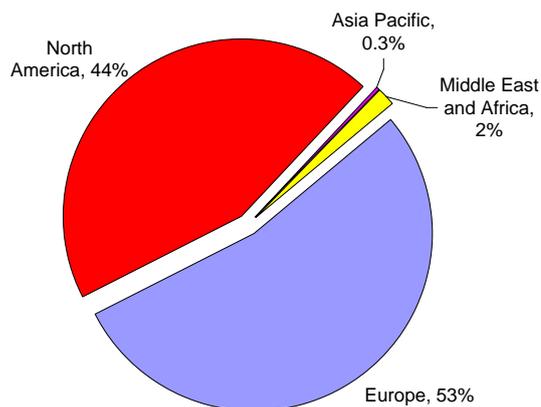
These key characteristics of air freight are most apparent in the data on the modes of transport used in world trade. For example, data on the weight (volume) and value of goods carried by air, sea and land transport is available for global trade. While air accounts for just 0.5% of the tonnage of global trade (Chart 1.16), air freight makes up 34.6% of the value of global trade.

Chart 1.16: Proportion global trade transported by air



Source : The Colography Group¹⁰, Oxford Economics

Chart 1.17: Regional distribution air freight (tonnes)⁹



Source : IATA, Oxford Economics

As with passenger services, air freight operations make up an essential part of the global transport network. Air freight's global reach is clearly illustrated from Chart 1.17. Measured in terms of tonnage carried to and from the Caribbean, 53% of trade is linked with Europe and 44% of trade is with the North American region. Trade with the Middle East and Africa accounts for 2% of air freight, with the residual linked with the Asia Pacific region.

⁹ Based on statistics for Antigua and Barbuda, Barbados, Cuba, the Dominican Republic, Haiti, Jamaica, the Netherlands Antilles, Grenada, Saint Lucia and Trinidad and Tobago.

¹⁰ 'Global Cargo Market Projections for 2006', The Colography Group, Inc. (2005)

2 Economic footprint

Sections 1 and 2 have looked at the benefits of air transport services for its customers, and the longer-term benefits that accrue through increasing connectivity. In this section we turn to the domestic resources that the aviation sector currently deploys to deliver its services, together with the domestic goods and services consumed by the workers who depend on the sector for their employment. We call the value added and jobs supported by this economic activity the aviation sector's 'economic footprint'.

The resources deployed by the aviation sector are measured by its Gross Value Added (GVA). GVA is calculated either as the output created by the sector less the cost of purchased inputs (net output measure), or by the sum of profits and wages (before tax) generated from the sector's economic activity (income measure). The two approaches are equivalent. Using either approach, by adding the GVA of all firms in the economy, one derives an estimate for the economy's overall output (GDP)¹¹. We refer to this as the sector's direct contribution to GDP.

From this direct contribution, the sector's economic footprint is calculated by adding to it the output (and jobs) supported through two other channels, which we refer to as the indirect and the induced contributions. The indirect contribution measures the resources deployed by the aviation sector through using domestically produced goods and services produced by other firms – i.e. the resources used through its supply chain. The GVA generated through the indirect and direct channels supports jobs both in the aviation sector and in its supply chain. The workers whose employment depends on this activity in turn spend their wages on goods and services. The induced contribution is the value of the domestic goods and services purchased by this workforce. Taken together, these three channels give the aviation sector's economic footprint in terms of GVA and jobs.

The aviation sector contributes to the economy in two other ways. Through the taxes levied on GVA (recall that it is equal to the sum of profits and wages), the aviation sector supports the public finances, and the public services that depend on them. Second, through its investment and its use of advanced technology, the aviation sector generates more GVA per employee than the economy as a whole, raising the overall productivity of the economy. These issues are discussed at the end of this section.

2.1 The aviation sector and its economic footprint

The sector is comprised of two distinct types of activity:

- **Airlines** transporting people and freight.
- **Ground-based infrastructure** that includes the airport facilities, the services provided for passengers on-site at airports, such as baggage handling, ticketing and retail and catering services, together with essential services provided off-site, such as air navigation and air regulation.

The aviation sector supports GDP and the employment in the Caribbean through four distinct channels. These channels are:

- **Direct** – the output and employment of the firms in the aviation sector.

¹¹ It is only true to an approximation that GVA is equal to the sum of profit and wages, or that the sum of GVA across firms equals GDP. The difference in each case, however, is small enough for us to proceed as if the equalities do in fact hold. The differences are explained in the Annex to this report.

- **Indirect** – the output and employment supported through the aviation sector’s Caribbean based supply chain.
- **Induced** – employment and output supported by the spending of those directly or indirectly employed in the aviation sector.
- **Catalytic** – spillover benefits associated with the aviation sector. Some of these include the activity supported by the spending of foreign visitors travelling to the Caribbean via air, and the level of trade directly enabled by the transportation of merchandise.

Table 2.1: Aviation’s contribution of output and jobs to the Caribbean¹²

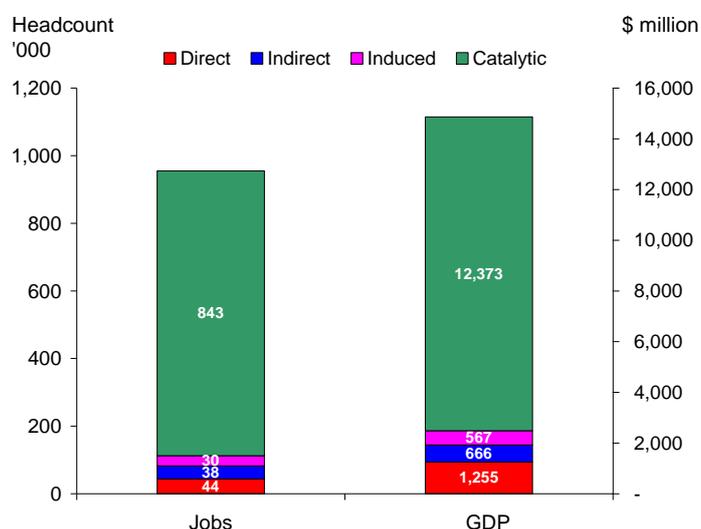
	Direct	Indirect	Induced	Total	% of whole economy
Contribution to GDP (\$ million)					
The Aviation Sector Total	1,255	666	567	2,488	1.4%
Contribution to employment (000s)					
The Aviation Sector Total	44	38	30	112	0.8%
Catalytic (tourism)					
Contribution to GDP (USD million)	4,718	5,268	2,387	12,373	7.3%
Contribution to employment (000s)	313	350	180	843	5.7%

Source : IATA, ACI, Oxford Economics

The table above reports the economic contribution of the airlines and airports for each of the four channels. Contributions are reported both in terms of GDP and employment. In the following pages we look in turn at the aviation sector in each individual country, and describe their economic contribution in more detail.

The way that we build up the aviation sector’s economic footprint is also illustrated in Figure 2.1. The top panel shows the two activities that comprise the aviation sector: air transport services and the airports and ground-based infrastructure. The panel below represents their supply chains with boxes that list the most important inputs purchased by each activity. The third panel from the top describes the induced contribution that comes through the spending by workers of both the aviation sector and its supply chain – represented by the arrows that link this panel with the panels above. The bottom panel, entitled ‘economic footprint’, reports the total GVA, jobs and tax contribution. These totals are the sum of the numbers reported in the panels above.

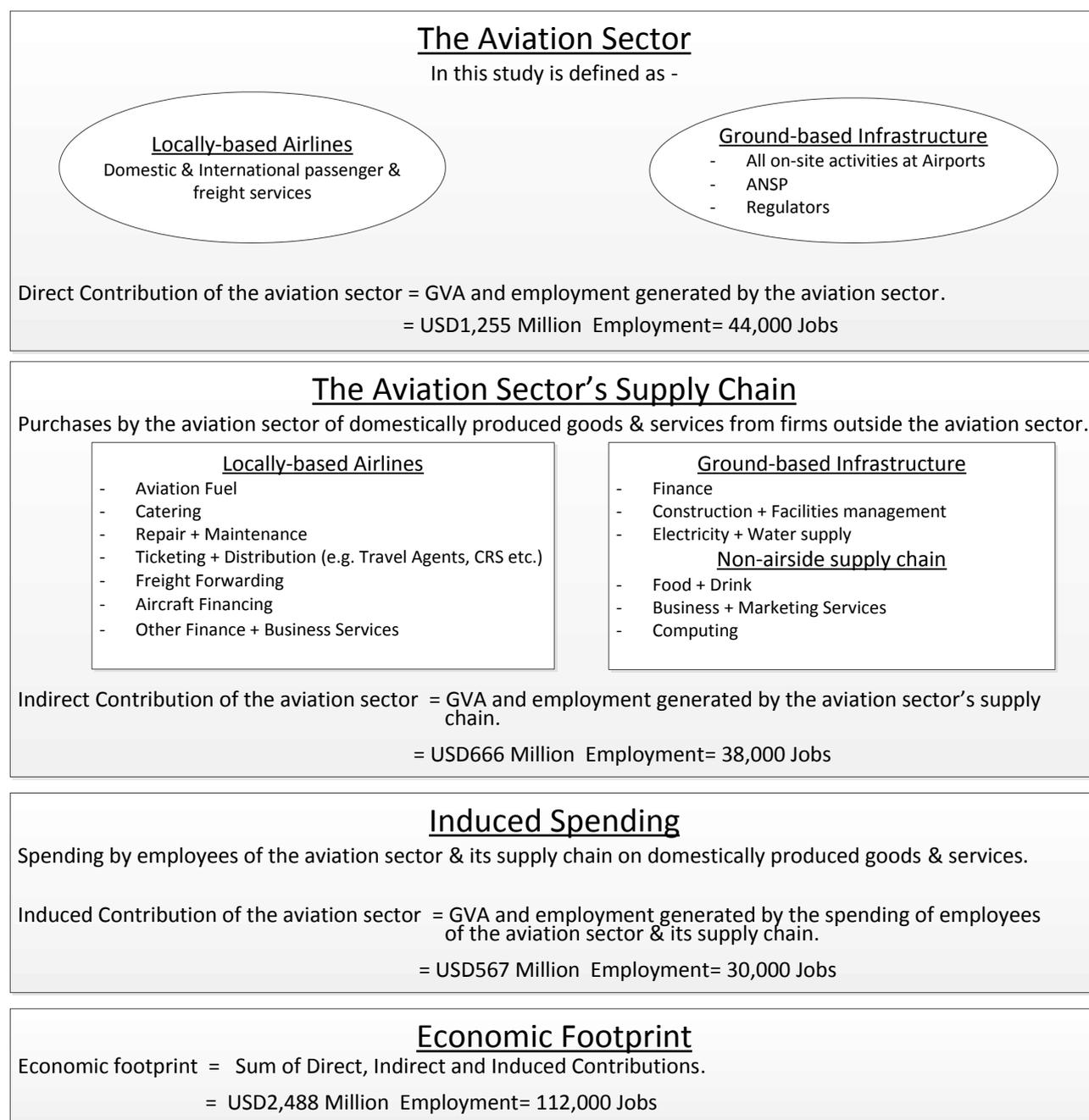
Chart 2.1: Jobs and Output supported by the aviation sector the Caribbean



Source : IATA, ACI, Oxford Economics

¹² Due to a lack of data we were unable to make any adjustment to multipliers to account for intra-regional trade flows. As such the indirect and induced estimates should be viewed as conservative.

Figure 2.1: The aviation sector in the Caribbean¹³



¹³ For a definition of GVA please refer to the Annex

2.1.1 The Bahamas

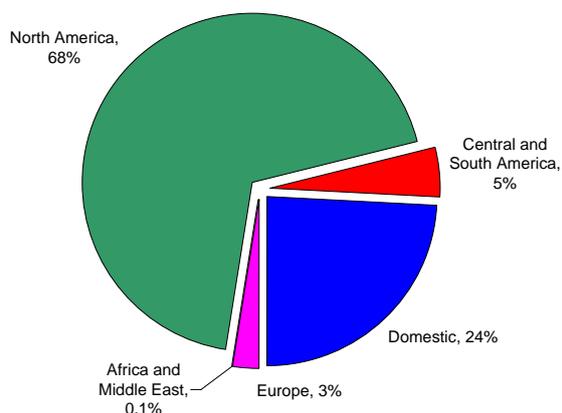
More than 33,600 scheduled international flights depart the Bahamas annually, destined for 28 airports in 9 countries. Domestically, more than 36,000 flights make over 1.7 million seats available to passengers, destined to 17 airports.

Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.2).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at Lynden Pindling International Airport, the main international airport in the Bahamas, which directly serve passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

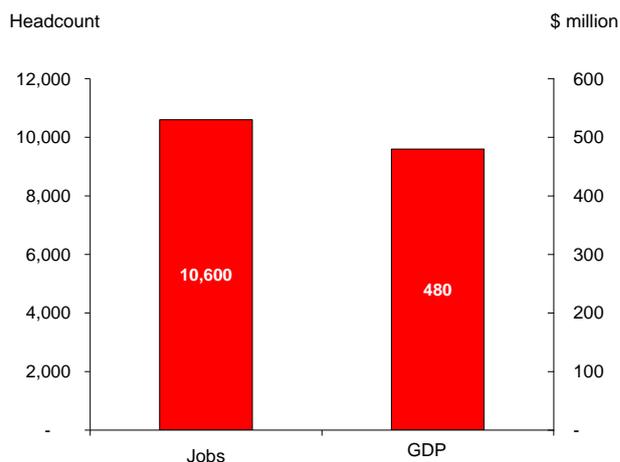
In total, over 3.8 million passengers are handled by airports in the Bahamas.

Chart 2.2: Regional distribution of scheduled passenger trips originating in the Bahamas



Source : IATA

Chart 2.3: Jobs and output supported by the aviation sector in the Bahamas



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$480 million to the economy (6.6% of GDP) and supports around 10,600 jobs in the Bahamas. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

2.1.2 Cuba

More than 12,600 scheduled international flights depart Cuba annually, destined for 38 airports in 28 countries. Domestically, more than 10,600 flights make over 870,000 seats available to passengers, destined to 15 airports.

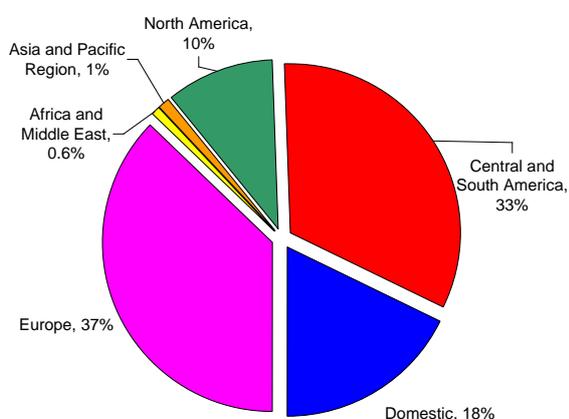
Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and

reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.4).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at José Martí International Airport, the main international airport in Cuba, that directly serve passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

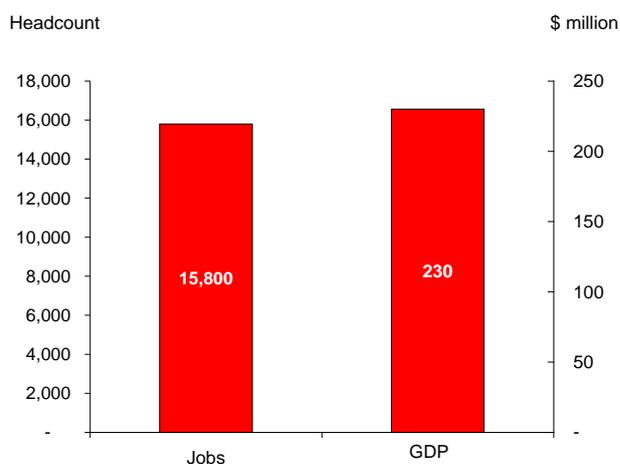
In total approximately 3.1 million passengers and 27,000 tonnes of freight are handled annually by airports in Cuba.

Chart 2.4: Regional distribution of scheduled passenger trips originating in Cuba



Source : IATA

Chart 2.5: Cuban jobs and output supported by the aviation sector



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$230 million to the economy (0.4% of GDP) and supports around 15,800 jobs in Cuba. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

2.1.3 Grenada

More than 4,500 scheduled international flights depart Grenada annually, destined for 8 airports in 5 countries. Domestically, more than 700 flights make over 36,400 seats available to passengers, destined to 2 airports.

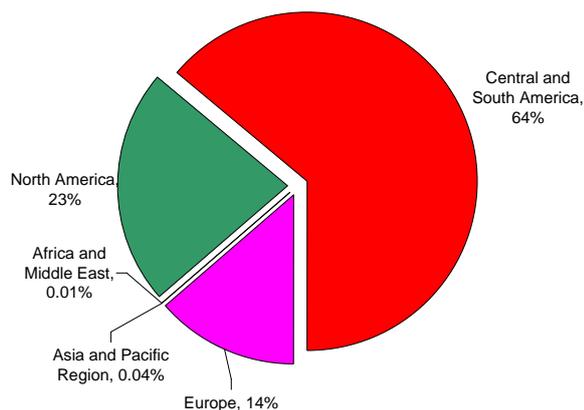
Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.6).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at Maurice Bishop International Airport, the only international airport in Grenada, which directly serve passengers,

such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

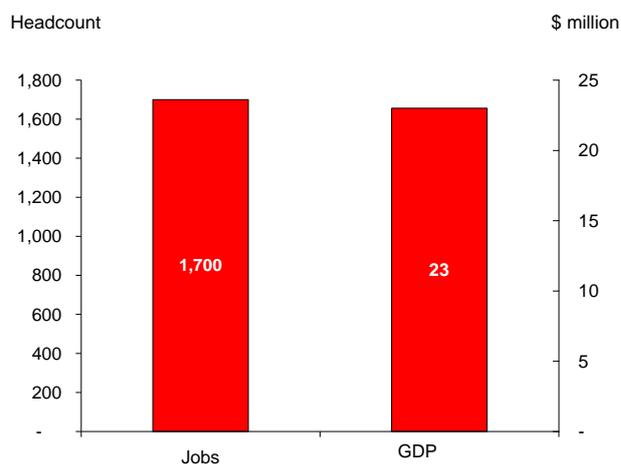
In total approximately 353 thousand passengers and 1,500 tonnes of freight is handled annually at Maurice Bishop International Airport.

Chart 2.6: Regional distribution of scheduled passenger trips originating in Grenada



Source : IATA

Chart 2.7: Jobs and output supported by the aviation sector in Grenada



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$23 million to the economy (3.7% of GDP) and supports around 1,700 jobs in Grenada. Included within these figures are the indirect impacts of the industry's locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

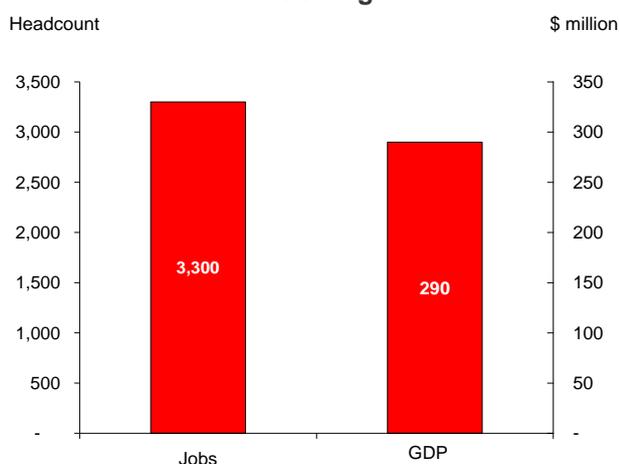
2.1.4 The US Virgin Islands

Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the "Real World Wide Web", offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach.

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at Cyril E. King Airport, the busiest airport in the US Virgin Islands, which directly serve passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

In total approximately 1.7 million passengers are handled annually by airports in the US Virgin Islands.

Chart 2.8: Jobs and output supported by the aviation sector in the US Virgin Islands



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$290 million to the economy (5.8% of GDP) and supports around 3,300 jobs in the US Virgin Islands. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

2.1.5 Jamaica

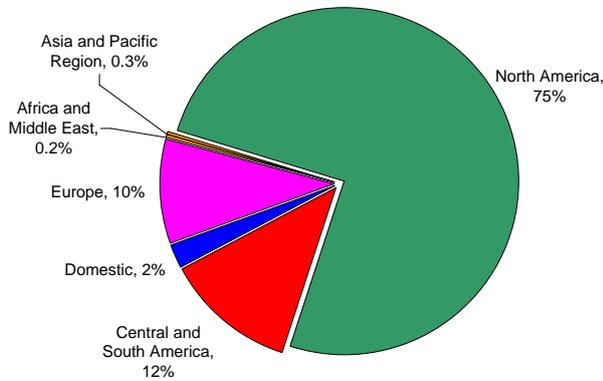
More than 22,600 scheduled international flights depart Jamaica annually, destined for 41 airports in 16 countries. Domestically, more than 1,600 flights make over 237,000 seats available to passengers, destined to 2 airports.

Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.9).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at Sangster International Airport, the main international airport in Jamaica, which directly serve passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

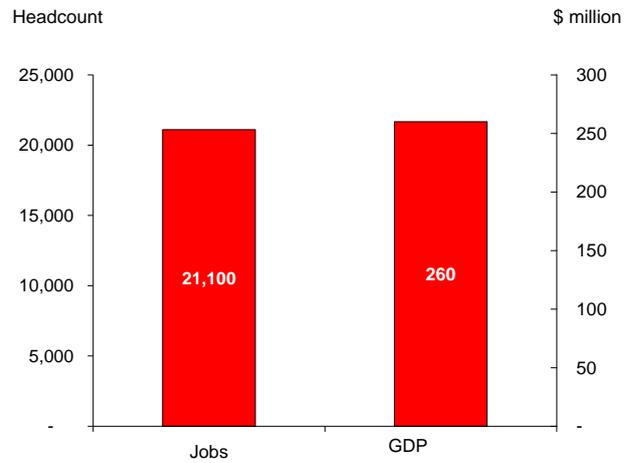
In total approximately 3.9 million passengers and 15,700 tonnes of freight is handled annually at Jamaican Airports.

Chart 2.9: Regional distribution of scheduled passenger trips originating in Jamaica



Source : IATA

Chart 2.10: Jobs and output supported by the aviation sector in Jamaica



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$260 billion to the economy (2.1% of GDP) and supports around 21,100 jobs in Jamaica. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

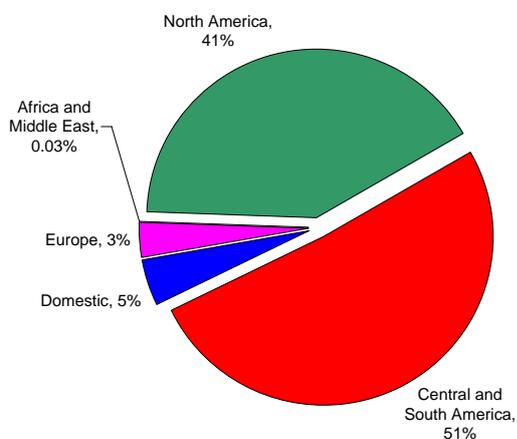
2.1.6 Saint Kitts and Nevis

Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.11).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at Robert L. Bradshaw International Airport, the main international airport in Saint Kitts and Nevis, which directly serve passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

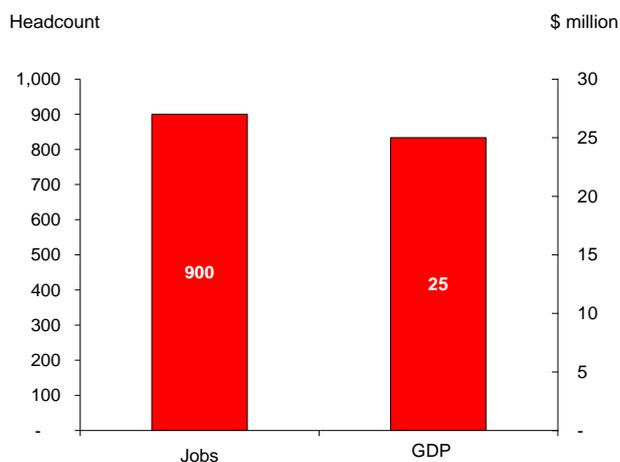
In total approximately 364 thousand passengers are handled annually by airports in Saint Kitts and Nevis.

Chart 2.11: Regional distribution of scheduled passenger trips originating in Saint Kitts and Nevis



Source : IATA

Chart 2.12: Jobs and output supported by the aviation sector in Saint Kitts and Nevis



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$25 million to the economy (4.6% of GDP) and supports around 900 jobs in St Kitts and Nevis. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

2.1.7 Trinidad and Tobago

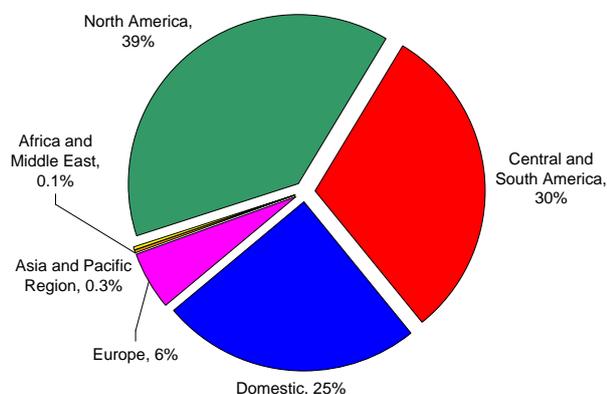
More than 17,800 scheduled international flights depart Trinidad and Tobago annually, destined for 23 airports in 15 countries. Domestically, more than 14,700 flights make over 738,000 seats available to passengers, destined to 2 airports.

Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.13).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at Piarco International Airport, the main international airport in Trinidad and Tobago, that directly serve passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

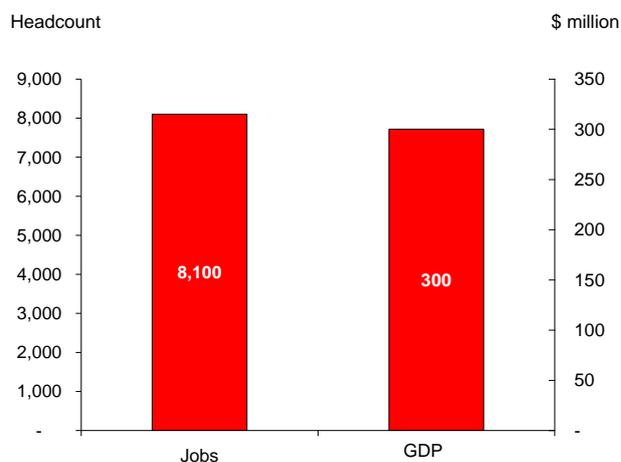
In total approximately 2.4 million passengers are handled annually at airports in Trinidad and Tobago.

Chart 2.13: Regional distribution of scheduled passenger trips originating in Trinidad and Tobago



Source : IATA

Chart 2.14: Jobs and output supported by the aviation sector in Trinidad and Tobago



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$300 million to the economy (1.4% of GDP) and supports around 8,100 jobs in Trinidad and Tobago. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

2.1.8 Saint Lucia

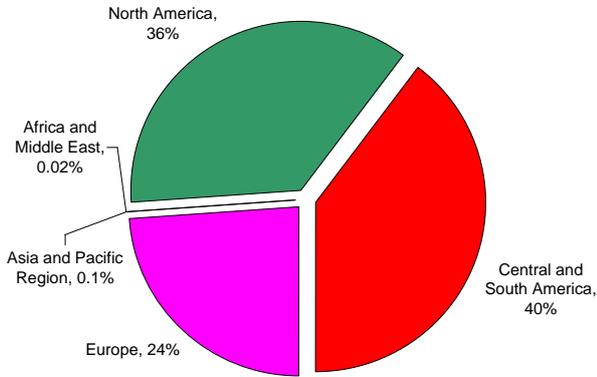
More than 11,800 scheduled international flights depart Saint Lucia annually, destined for 17 airports in 13 countries.

Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.15).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at Hewanorra International Airport, the main international airport in Saint Lucia, which directly serve passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

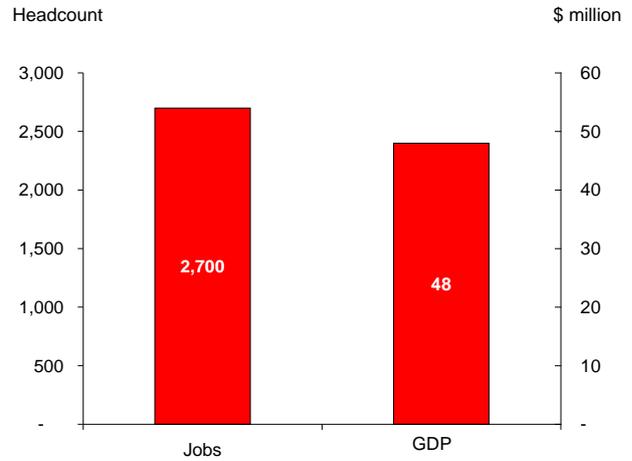
In total approximately 834 thousand passengers and 2,800 tonnes of freight is handled annually at airports in Saint Lucia.

Chart 2.15: Regional distribution of scheduled passenger trips originating in Saint Lucia



Source : IATA

Chart 2.16: Jobs and output supported by the aviation sector in Saint Lucia



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$48 million to the economy (5.1% of GDP) and supports around 2,700 jobs in Saint Lucia. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

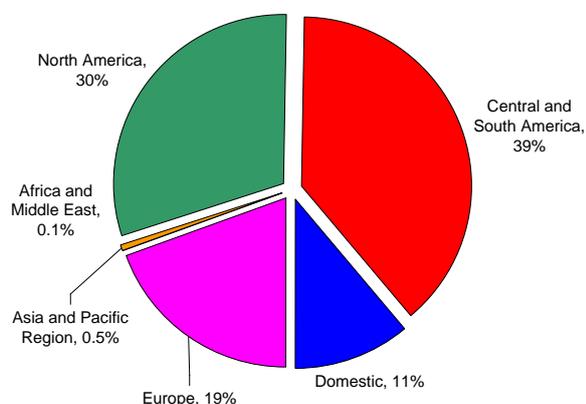
2.1.9 The Netherlands Antilles

Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.17).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at Princess Juliana International Airport, one of the main international airports in the Netherlands Antilles, which directly serve passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

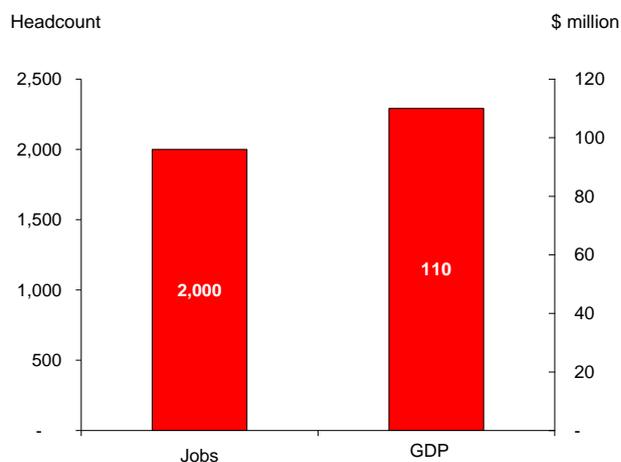
In total approximately 1.6 million passengers and 8,600 tonnes of freight are handled annually at Princess Juliana International Airport.

Chart 2.17: Regional distribution of scheduled passenger trips originating in the Netherlands Antilles



Source : IATA

Chart 2.18: Jobs and output supported by the aviation sector in the Netherlands Antilles



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$110 million to the economy (2.8% of GDP) and supports around 2,000 jobs in the Netherlands Antilles. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

2.1.10 Haiti

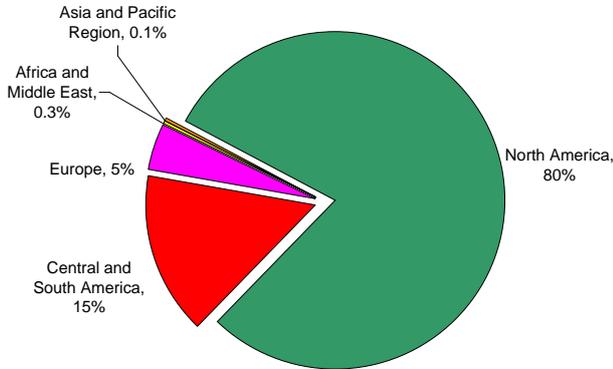
More than 7,300 scheduled international flights depart Haiti annually, destined for 16 airports in 12 countries. Domestically, flights are available to 2 airports.

Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.19).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at Toussaint Louverture International Airport, the main international airport in Haiti, which directly serve passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

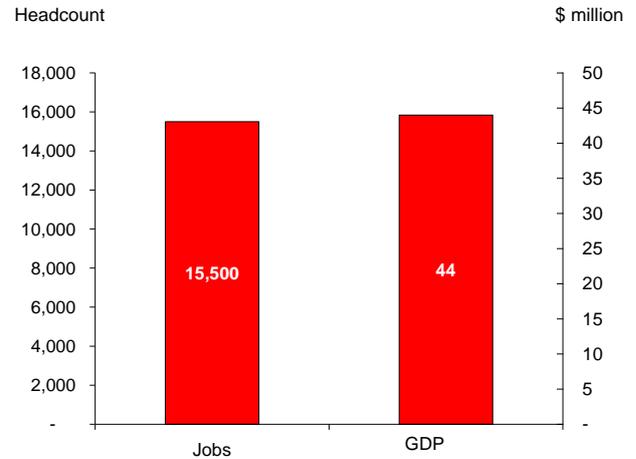
In total approximately 971 thousand passengers are handled annually by airports in Haiti.

Chart 2.19: Regional distribution of scheduled passenger trips originating in Haiti



Source : IATA

Chart 2.20: Jobs and output supported by the aviation sector in Haiti



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$44 million to the economy (0.7% of GDP) and supports around 15,500 jobs in Haiti. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

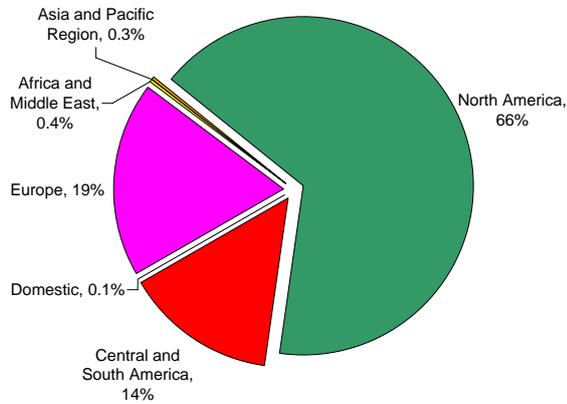
2.1.11 The Dominican Republic

More than 36,500 scheduled international flights depart the Dominican Republic annually, destined for 58 airports in 29 countries. Domestically, flights are available to one of 11 Airports. Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.21).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at Punta Cana International Airport and Las Americas Airport, directly serving passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

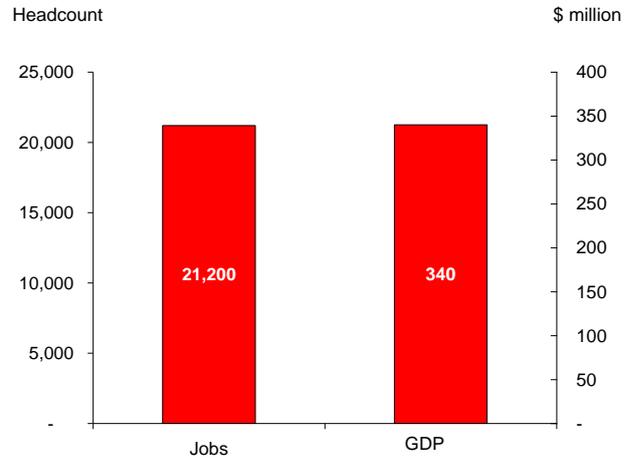
In total approximately 6.2 million passengers are handled annually at airports in the Dominican Republic.

Chart 2.21: Regional distribution of scheduled passenger trips originating in the Dominican Republic



Source : IATA

Chart 2.22: Jobs and output supported by the aviation sector in the Dominican Republic



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$340 million to the economy (0.7% of GDP) and supports around 21,200 jobs in the Dominican Republic. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

2.1.12 Barbados

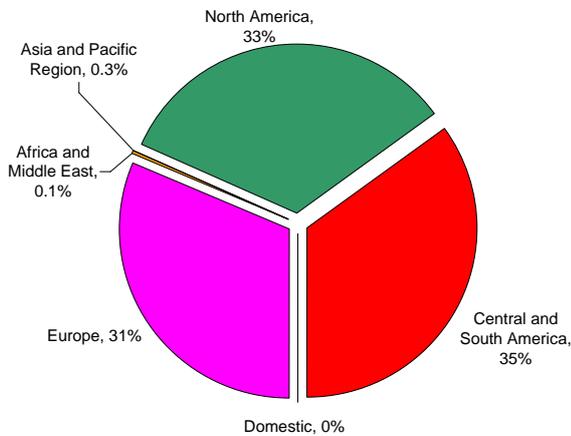
More than 17,000 scheduled international flights depart Barbados annually, destined for 23 airports in 15 countries.

Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.23).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at Grantley Adams International Airport, the only international airport in Barbados, that directly serve passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

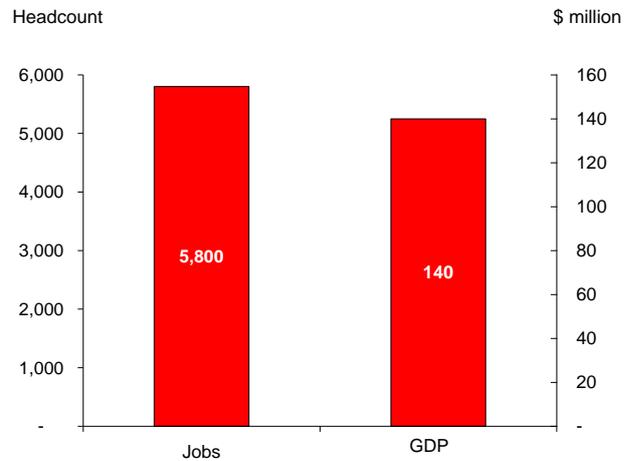
In total approximately 1.5 million passengers and 19,100 tonnes of freight is handled annually at Grantley Adams International Airport.

Chart 2.23: Regional distribution of scheduled passenger trips originating in Barbados



Source : IATA

Chart 2.24: Jobs and output supported by the aviation sector in Barbados



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$140 million to the economy (3.9% of GDP) and supports around 5,800 jobs in Barbados. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

2.1.13 Antigua and Barbuda

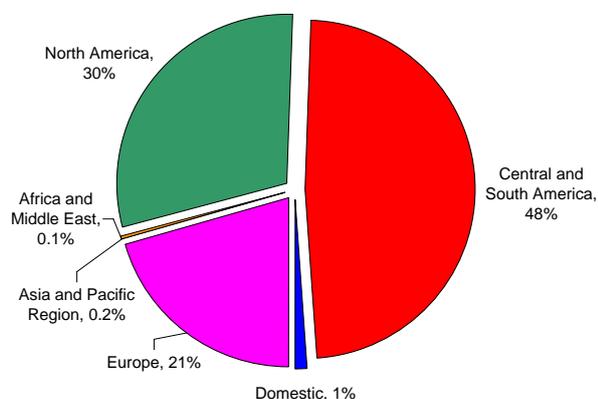
More than 19,800 scheduled international flights depart Antigua and Barbuda annually, destined for 28 airports in 18 countries. Domestically, more than 1,450 flights make over 27,660 seats available to passengers, destined to 2 airports.

Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.25).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at V.C Bird International Airport, the only international airport in Antigua and Barbuda, that directly serve passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

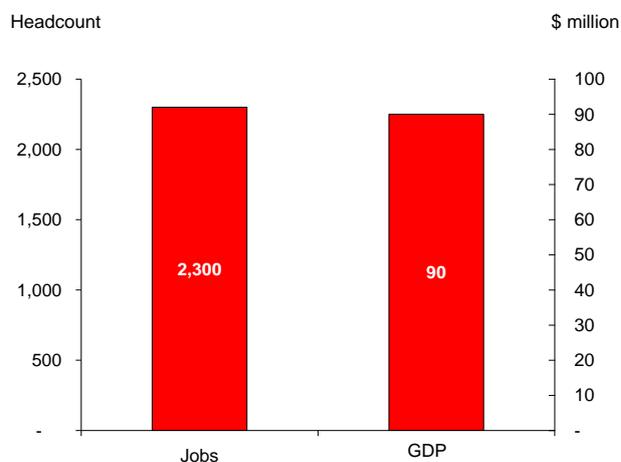
In total approximately 842 thousand passengers are handled annually at V.C Bird International Airport.

Chart 2.25: Regional distribution of scheduled passenger trips originating in Antigua and Barbuda



Source : IATA

Chart 2.26: Jobs and output supported by the aviation sector in Antigua and Barbuda



Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$90 million to the economy (8.0% of GDP) and supports around 2,300 jobs in Antigua and Barbuda. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

2.1.14 Bermuda

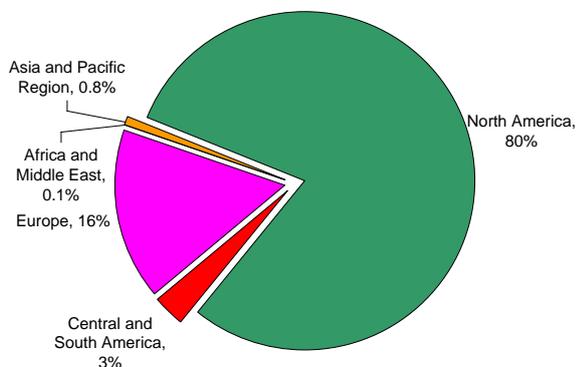
More than 6,000 scheduled international flights depart Bermuda annually, destined for 12 airports in 3 countries.

Among the many reasons that people and businesses use air transport, people rely on it for holidays and visiting friends and family; while businesses use air transport for meeting clients and for the speedy and reliable delivery of mail and goods often over great distances. The air transport network, the “Real World Wide Web”, offers practical, fast and reliable transport across the globe. The regions which travellers fly to and from underline its global reach (see Chart 2.27).

Airlines need ground-based infrastructure to operate. This infrastructure includes the facilities at the L.F Wade International Airport, Bermuda’s only international airport, that directly serve passengers, such as baggage handling, ticketing, retail and catering outlets. Less visible are the essential services which are sometimes provided off-site, such as air navigation and air regulation.

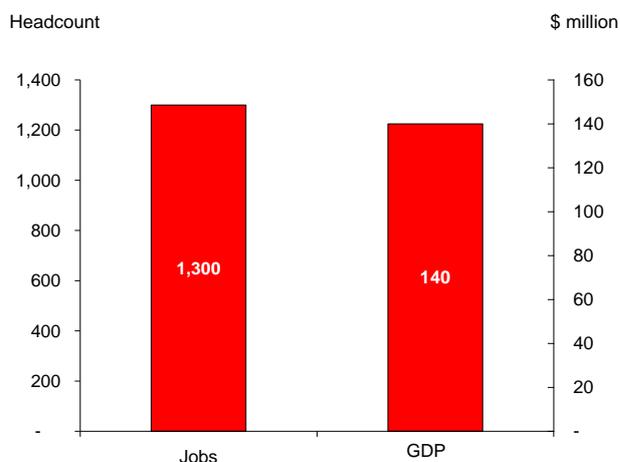
In total approximately 849 thousand passengers and 5,100 tonnes of freight is handled annually at the L.F Wade International Airport.

Chart 2.27: Regional distribution of scheduled passenger trips originating in Bermuda



Source : IATA

Chart 2.28: Jobs and output supported by the aviation sector in Bermuda



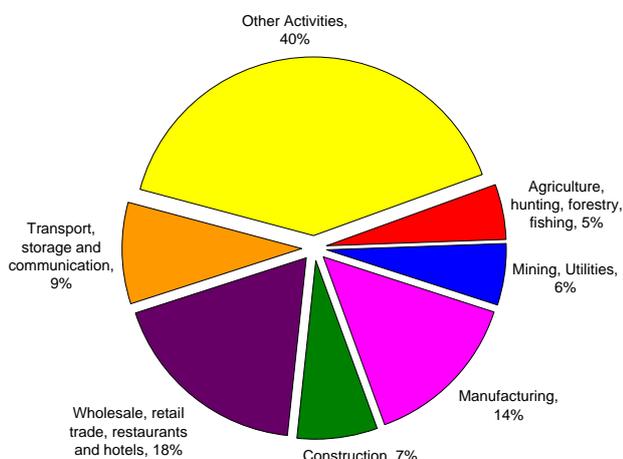
Source : IATA, Oxford Economics

Overall, the aviation sector contributes \$140 million to the economy (2.4% of GDP) and supports around 1,300 jobs in Bermuda. Included within these figures are the indirect impacts of the industry’s locally-based supply chain (including the distribution sector delivering aviation fuel; the catering sector and the construction industry building or maintaining facilities at airports) and the induced impacts generated through the household spending of those employed by the sector and its supply chain.

2.2 Sectoral Breakdown of GDP

The service sector is the primary contributor to economic output in the Caribbean, accounting for over two-thirds of GDP in 2009, split between wholesale and retail trade and restaurants and hotels (18%), transport, storage and communications (9%) and other service activities (40%). The primary sector (agriculture, hunting, forestry and fishing) is relatively small, accounting for just 5% of output, while extraction and utilities generates a further 6%. The remaining 21% of GDP is split between the manufacturing (14%) and construction (7%) industries.

Chart 2.29: Sectoral Breakdown of GDP for the Caribbean in 2009¹⁴



Source : UN

2.3 Productivity

Table 2.3 provides an indication of the productivity of the aviation sector versus the rest of the economy. Measured as GVA per employee in USD, the combined productivity of air transport services in the Caribbean (the airlines and the ground-based infrastructure excluding retail and catering services at airports and tourism) is estimated to be \$43,200. This is over 3.5 times higher than that for the average productivity for the region as a whole (\$11,900). This high level of productivity implies that were the resources currently employed in the aviation sector redeployed elsewhere in the economy, then this would be accompanied by a fall in overall output and income. For example, if productivity in the aviation sector was the same as the average productivity for the economy as a whole, then the level of GDP in the Caribbean would be around 0.4% lower than it is (about \$731 million in current prices).

Table 2.3: Relative Productivity of the Aviation Sector

	Productivity (GVA per employee)
Air transport services	\$43,200
Caribbean Economy	\$11,900

Source: IATA, ACI, Oxford Economics

¹⁴ Due to lack of data this decomposition excludes the US Virgin Islands.

3 Conclusion

This study has described and quantified a number of channels through which aviation in the Caribbean generates important economic benefits for its customers and the wider economy.

Studies of this kind usually focus on the 'economic footprint' of the industry, the GDP and jobs supported by the industry and its supply chain. We provide the latest estimates for these metrics. But the economic value created by the industry is more than that. It is not just jobs that are threatened if government policies are badly designed. The welfare of voting citizens and the effectiveness of infrastructure critical to the country's long-term success are also at risk.

The study has also shown what a critical asset the air transport network is in the Caribbean, to business and the wider economy. Connectivity between cities and markets boosts productivity and provides a key infrastructure on which modern globalized businesses depend. Many of these city-pair connections are dependent on hub airports through which to generate the traffic density necessary to sustain them. All airlines supplying services at Caribbean airports contribute to generating these wider economic benefits, primarily through boosting the tourism sector. These 'supply-side' benefits are hard to measure but are easily illustrated by the experience of the volcanic ash cloud, which closed much of European airspace for a week in early 2010. Travellers were stranded. Globalized supply chains and just-in-time manufacturing processes came to a halt.

More readily measured is the 'economic footprint' supported, mostly, by the activities of national airlines. Domestic-based airlines were responsible for carrying approximately 26% of passengers. The wages, profits and tax revenues created by these airlines flows through the domestic economy, generating multiplier effects on national income or GDP. The economic benefits for the Caribbean created by non-domestic airlines are to be found in customer welfare and in the part these airlines play in providing the connectivity infrastructure between the Caribbean and overseas cities and markets.

Aviation has a significant footprint in the Caribbean, supporting 1.4% of GDP and 112,000 jobs or 0.8% of the regional workforce. Moreover, for the countries where estimation was possible, the catalytic effect of aviation-supported tourism generates an additional \$12.4 billion (7.3% of GDP) and 843,000 jobs.

Also significant is the fact that these are high productivity jobs. The annual value added (or GVA) by each employee in air transport services in the Caribbean is \$43,200, over 3.5 times higher than the average of \$11,900.

All together these points demonstrate that aviation provides significant economic benefits to the economies of the Caribbean and its citizens, some of which are unique and essential to the operation of modern economies.

Annex: Our methods

Connectivity Index

The connectivity index is a measure of the quality of a country's air transport network that reflects both the volume of passenger traffic and the importance of the destinations served. For every destination country for which there are direct services, an estimate of total passenger seat capacity is derived from data on the frequencies of service and the available seats per flight. From this underlying data, an index is constructed by attaching a weight to each destination. This weight reflects the relative importance of the destination in the global air transport network, measured by the number of seats available for passengers from that airport relative to Atlanta, the largest airport. The connectivity index will therefore have a higher value, the more destinations are served, the higher the frequency of services, the larger the number of available seats per flight and the greater the relative importance of the destinations served.

Benefits to tourism

In quantifying the benefits from Travel & Tourism (T&T) we were seeking to capture the spending by tourists and businesses on accommodation, food etc outside of their airfare (which forms part of our estimate of the direct calculation). In doing this we relied heavily on the Oxford Economics Travel & Tourism model prepared on behalf of the World Travel & Tourism Council (WTTC) which simulates Tourism Satellite Account (TSA) data across over 180 countries. From the model we obtained an estimate of the level of value-added created by foreign visitors, and assigned a share of this to the aviation industry based on the share of foreign visitor arrivals travelling by air. We then used coefficients within the model to divide this between T&T providers (direct) and their supply chain (indirect). Finally, we attributed a share of the total induced effect to the aviation industry by dividing our estimates of aviation-related direct and indirect GDP by total T&T direct and indirect GDP. It should be noted that this is a gross measure of the benefit from tourism and therefore does not account for the spending which is effectively "lost" when domestic residents travel abroad by air.

Economic footprint

In Section 3 we report the contribution that the aviation sector makes to the economy. The contribution is measured in terms of the value of the sector's output and the number of people it employs. For each measure, the contribution is built up from three components: direct, indirect, and induced.

The direct output component is measured by Gross Value Added (GVA). GVA is measured either as the firm or industry sales revenue less purchases from other companies, or equivalently, as the sum of employee compensation and gross operating surplus, measured before the deduction of depreciation, interest charges and taxation. In this report we treat gross operating surplus as equivalent to gross operating profit, however, the two concepts differ slightly with the former including income from land and a technical adjustment for the change in stock valuation. GVA differs from Gross Domestic Product (GDP) in the price used to value goods and services. GVA is measured at producer prices that reflect the price at the 'factory gate' together with cost of distribution. GDP is measured at market prices that reflect the price paid by the consumer. The two prices differ by the taxes less subsidies levied on the goods or services.

The indirect output component is measured using an Input-Output table that reports how industries use the output of other industries in the process of production, and how their final output is used, e.g. in final domestic consumption, changes in stocks or exports. For many countries, Input-Output tables are available as part of the national accounts. As Input-Output tables describe how an industry uses the output of other

industries as inputs in the production of its goods or service, they describe its full supply chain – its direct suppliers, those industries that supply its direct suppliers, and so on. This is reported as the indirect output component.

The Input-Output table reports how much of final output is sold in the domestic economy. Using similar methods as that used to derive the indirect output component, the Input-Output table can be used to estimate how much spending on completed goods (known as final domestic consumption) is supported through the employees of the industry and its full supply chain. This is reported as the induced output component. Based on analysis at Oxford Economics, the ratio of induced output to the sum of direct and indirect output is capped at 30%. The three output components – direct, indirect, and induced – are converted to their respective employment components, using an estimate for the average labour productivity (GVA per employee) for the economy.

Exchange rates

For the purposes of presenting consolidated figures in USD, the following 2009 annual average exchange rates have been applied where appropriate:

BSD-USD: 1.00	TTD-USD: 6.32	ANG-USD: 1.79	JMD-USD 87.89
HTG-USD: 41.20	DOP-USD: 36.03	CUC-USD: 1.00	BBD-USD: 2.00
XCD-USD: 2.70			

Passenger and freight volumes

Passenger and freight traffic is accounted for in different ways across the industry supply chain, depending on the focus of the operator and the purpose of analysis. For example, airlines generally count the number of passengers who board their aircraft, whereas airports often count the number of passengers arriving or departing their airport – which in some cases can lead to totals significantly larger than those reported by airlines, despite referring to the same inherent volume of passengers. The table below outlines the main passenger and freight volumes referred to in this report. In particular, it shows how the numbers used in the calculation of consumer benefit and the economic footprint were derived.

Caribbean Islands	Domestic passengers (A)	International passengers (B)	Total passengers 2009 (C)	Number of passengers carried by National carriers (D)	Freight Tonnes 2009 (E)
Antigua and Barbuda	18,715	823,174	841,889	318,776	-
Bahamas	926,109	2,899,308	3,825,417	506,011	-
Barbados	-	1,490,693	1,490,693	-	19,091
Bermuda	-	848,718	848,718	-	5,142
Bonaire	-	-	-	-	414
Cuba	546,121	2,532,693	3,078,814	1,122,352	27,339
Curacao	-	-	-	168,975	-
Dominican Republic	8,143	6,189,742	6,197,885	35,763	-
Grenada and St Vincent	-	352,875	352,875	-	1,526
Haiti	-	971,418	971,418	-	-
Jamaica	84,640	3,845,897	3,930,537	2,110,910	15,732
Saint Kitts and Nevis	16,832	347,093	363,925	-	-
Saint Lucia	-	833,953	833,953	-	2,792
St Maarten	-	-	1,625,964	191,106	8,620
Trinidad & Tobago	614,572	1,824,410	2,438,982	1,480,456	-
US Virgin Islands	152,309	1,617,008	1,769,317	166,649	-

Passenger measure (Thousands)		Use in report	Source
A	Number of passengers on aircraft flying within the Island	Airline Domestic passenger traffic associated with the Island market.	PaxIS
B	Number of passengers on aircraft flying to and from the Island	Airline International passenger traffic associated with the Island market.	PaxIS
C	Number of passengers on aircraft flying to, from and within the Island	Overall indicator of airline passenger traffic associated with the Island market.	PaxIS
D	Passengers carried by National registered airlines	Overall indicator of passenger output 'performed' by airlines in the scope of the economic footprint analysis in Section 3 of this report	PaxIS
Freight measure (Tonnes)		Use in report	Source
E	Tonnes of freight carried on aircraft flying to, from and within the Island	Overall indicator of freight loaded and unloaded at airports in the Island.	ACI

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