

# OXFORD ECONOMICS

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## The economic impact of Etihad Airways on the US economy

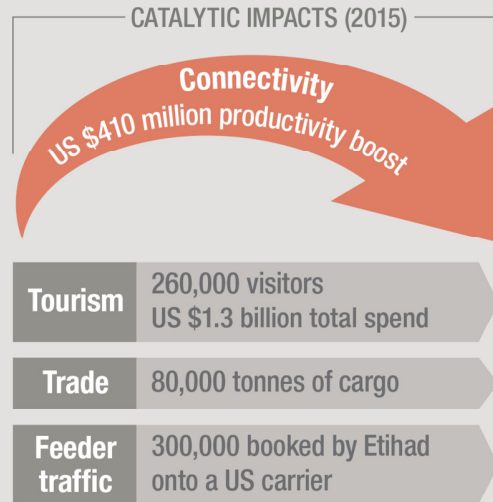
May 2015



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# The economic impact of Etihad Airways on the US economy

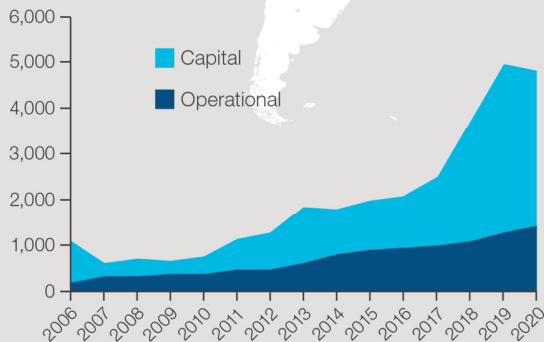


**1.2 million** passengers carried by Etihad to and from the USA (2015)



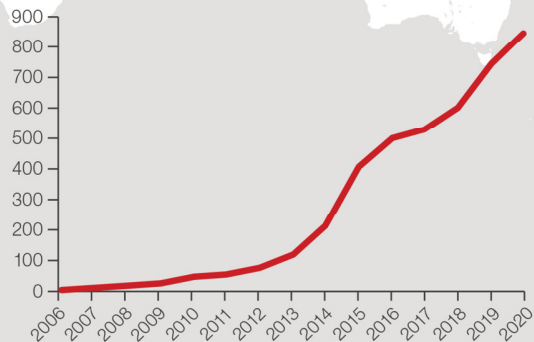
**US\$ GDP footprint**

Million US\$ (2015 prices)



**Connectivity impact on US productivity**

Million US\$ (2015 prices)



Sources: Oxford Economics; Etihad; Diio; OAG

## EXECUTIVE SUMMARY

**Etihad Airways makes a substantial contribution to the global economy offering vital connections across regions and economies.** In this report, Oxford Economics quantifies Etihad's economic impact in the USA from its first flight into New York in 2006 to the six US routes it operates today, serving some 1.2 million passengers in 2015 alone. The report goes on to forecast the airline's growing economic contribution to the USA out to 2020.

This economic impact study sets out to measure Etihad's impact in two stages: the airline's immediate contribution to, or 'footprint' in, the economy of the USA, and the wider catalytic economic impact it generates through what its services allow others to do.

**Etihad's economic footprint in the USA.** Etihad's economic footprint in the US economy can be quantified in terms of its contribution to gross domestic product (GDP) and employment. To do this Oxford Economics has developed a bespoke global economic impact model that maps the complex global supply chains on which Etihad relies. The global impact model is unique in allowing us to quantify the full contribution of Etihad's global activities on the economy of the USA for the first time.<sup>1</sup>

In 2015 Etihad's global operations will make a US \$ 920 million contribution to the US economy and sustain 7,900 jobs.<sup>2</sup> This impact relates both to its operations in the USA itself and to the impact of its global operations on US suppliers, for example, in its partnership with aviation computer technology provider Sabre Airline Solutions. Meanwhile, the airline's investment in aviation-related equipment in 2015, with US suppliers including Boeing, from whom Etihad has ordered over 120 aircraft to date, will add a further US \$ 2.0 billion to GDP and sustain nearly 15,600 US jobs. In total Etihad will contribute over US \$ 2.9 billion to GDP and sustain over 23,400 American jobs in 2015.

Etihad's economic footprint in the USA is growing. As a result, we forecast that by 2020 the contribution of its operations and aviation-related investments to GDP will reach almost US \$ 6.2 billion and sustain 46,200 jobs.

Over the fifteen year period 2006 to 2020, the total impact of Etihad's operational and aircraft-related investment on the US economy therefore sums to US \$ 41 billion on an undiscounted basis.

**\$2.9 bn**

GDP contribution in 2015

*Etihad's operations and capital spending on aviation equipment will contribute US \$ 2.9 billion to the US economy in 2015, and sustain over 23,400 American jobs.*

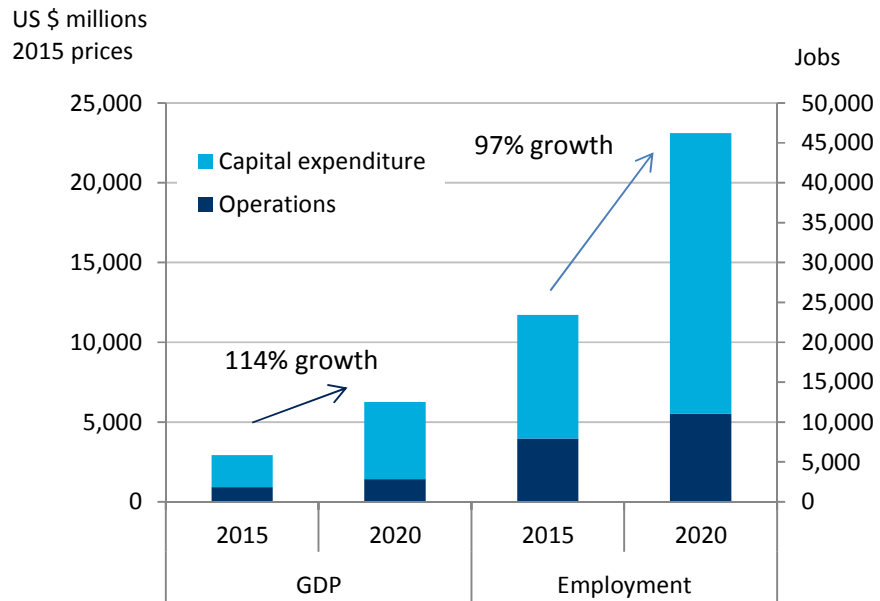
**23,400**

American jobs in 2015

<sup>1</sup> All data shown in tables and charts are the result of modelling by Oxford Economics based on input data from Etihad Airways and Oxford Economics, except where otherwise stated and cited in footnotes.

<sup>2</sup> All US \$ values throughout are expressed in 2015 prices.

**Fig. 1: Etihad’s economic footprint in the USA, 2015 and 2020**

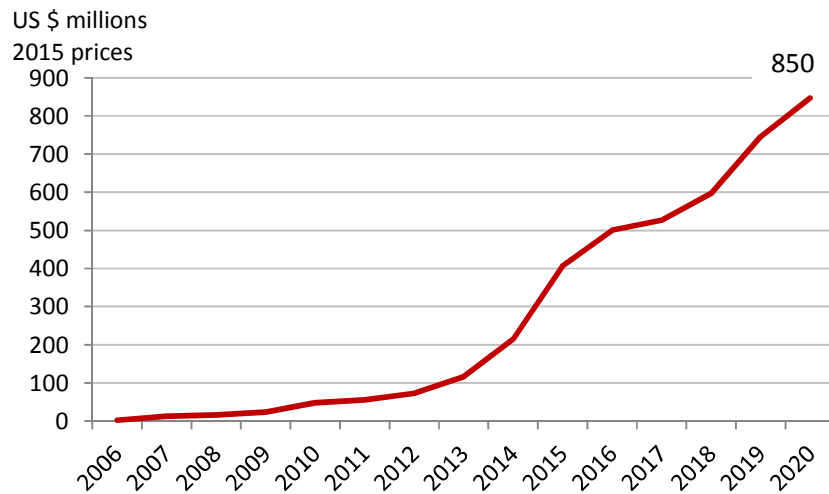


Source: Oxford Economics

**\$410 m**  
Connectivity impact in 2015

*Etihad’s connectivity impact is forecast to more than double over the next five years, from US \$ 410 million in 2015 to reach nearly US \$ 850 million by 2020.*

**Etihad’s catalytic impact on the USA.** Etihad’s economic impact goes well beyond its economic footprint. Catalytic impacts capture the wide-ranging benefits that are created for the US economy through what users of Etihad’s services are enabled to do by the ‘connectivity’ it provides. The airline’s services facilitate business, encourage foreign investment, stimulate tourism and foster trade, consequently raising the productivity and prosperity of the USA. We can calculate and forecast Etihad’s contribution to US connectivity and, by combining this with the latest available research on the association between air connectivity and economic growth, it is possible to identify the scale of the boost Etihad provides to US productivity. We estimate that in 2015 this contribution will reach US \$ 410 million. This connectivity impact is forecast to more than double over the next five years, to reach almost US \$ 850 million by 2020, in no small part due to the growing importance of Abu Dhabi as a gateway airport to the Indian subcontinent and Asia’s other emerging economies.

**Fig. 2: Etihad's connectivity impact on US productivity, 2006-2020**

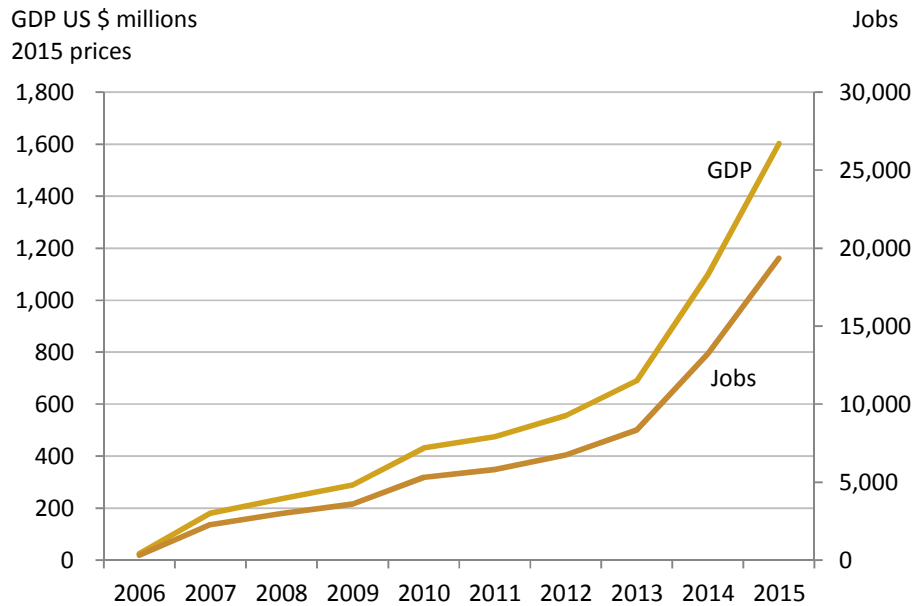
Source: Oxford Economics

Three important specific examples of connectivity impact are the trade, tourism and feeder passengers delivered to US airlines that Etihad enables. We consider each in turn.

**Etihad's trade impact.** Air freight enables efficiencies, innovation and specialization, driving the comparative advantage of US firms. Etihad will carry around 80,000 tonnes of cargo between the USA and the rest of the world in 2015, 57 per cent of this on its dedicated air freight services, delivered in partnership with US supplier, Atlas Air Worldwide – operator of the world's largest fleet of Boeing 747 freighter aircraft.

**The tourism impact facilitated by Etihad.** In 2015 Etihad flights will carry 260,000 international visitors bound for the USA. The vast majority will arrive on an Etihad flight to one of the six US destinations now served by the airline, with the remainder arriving on other carriers having transferred from an Etihad flight elsewhere in the world. Almost nine out of ten of the direct inbound visitors will originate from the Middle East or the Indian subcontinent, illustrating the degree to which Etihad's operations serve new and emerging markets. Through their spending, these visitors will generate a US \$ 1.6 billion contribution to the GDP of the USA in 2015, and sustain 19,400 jobs across the country.

**Fig.3: Etihad's tourism footprint in the USA, 2006-2015**



Source: Oxford Economics

**300,000**

Feeder traffic in 2015

*Around 300,000 passengers booked by Etihad will take a flight on a US-based carrier (either domestically or internationally) as part of their journey in the course of 2015.*

**Etihad brings additional passengers into the US aviation market.** A large number of Etihad's passengers to the USA take more than one flight to reach the country, and for thousands of them the journey does not end there. In fact, it is estimated that this year around 300,000 Etihad passengers will take a flight on a US-based carrier (either domestically or internationally) as part of their journey.<sup>3</sup> This represents a 65 per cent increase on the Etihad feeder traffic to US carriers in 2014.

**Etihad's impact on the economy is substantial and growing fast.** From the contribution to US GDP and employment of its operational and capital spending, to the trade, business, tourism and other economic activity its services enable, Etihad's impact on the economy is considerable and growing fast. As Etihad's global network expands, its US flights will increasingly connect the world's largest economy to Asia's most populous and vibrant ones, providing opportunity and prosperity for millions.

<sup>3</sup> Source: Etihad, this figure refers to bi-directional passenger flows i.e. traffic in both directions on each route.

### INTRODUCING OXFORD ECONOMICS

Headquartered in Oxford, England, Oxford Economics is one of the world's leading providers of global economic analysis, advice and models, and has been at the forefront of high-quality research into the socio-economic impact of the aviation industry for 15 years. Recent work has included:

- **International Air Transport Association (IATA):** Sixty country studies on the importance of the aviation sector. Each study looked at the economic footprint of airports, airlines, ANSP and aircraft manufacturing.
- **Air Transport Action Group (ATAG):** A series of studies on the economic benefits that the aviation industry brings to the world economy. The latest, completed in 2014, analysed the economic impact of airports and the rest of the aviation sector in over seventy countries.
- **Airbus:** An assessment of the global economic and social impact of air transport.
- **Boeing:** A study exploring the employment impact of Boeing's supply chain in Europe. The study quantified the jobs supported through manufacturing and other operations, supply chain spend, wage consumption impacts and the consequential impacts, including purchases of engines, seating and interiors from a range of Boeing-approved suppliers around Europe.
- **Rolls-Royce:** A series of studies looking at the economic contribution of Rolls-Royce to the UK, US, German and global economies, particularly as a result of its R&D in engine manufacture for planes and helicopters, and assessing the economic contribution of key projects to the UK.
- **British Airport Authority (now Heathrow Airport Holdings Ltd):** A study on the economic importance of London Heathrow airport to the UK's countries and regions, investigating three channels through which greater connectivity benefits are achieved: greater exports, tourism and inward foreign direct investment.
- **Air Passenger Forecast Service:** In partnership with IATA, providing annual forecasts of air passenger flows for almost 4,000 routes and 185 major markets over the next 20 years, representing over 90 per cent of all air travel in that time period. Regional flows are included and important rapidly growing new routes are also covered.
- **Transport for London (TfL):** An economic impact study of the proposed London estuary airport. This study measured the economic activity generated by the construction of the new airport hub with a national and local input-output modelling framework. In addition, an assessment was made of the impacts on the local population and labour markets.
- **American, Continental/United and Delta Airlines:** A study for three US airlines on how Air Passenger Duty in the UK could be restructured in a revenue neutral way, while also benefiting the UK's tourism economy.
- **Consortium study:** A study for a consortium of stakeholders including the Austrian Chamber of Commerce (WKO), the Federation of Austrian Industries (IV), Austrian Airlines, and Vienna International Airport to investigate the impact of changes to the structure of the Air Transport Levy on the Austrian economy.
- **Malaysia Airlines:** A study on the contribution it makes to the country's economy.



## INTRODUCING ECONOMIC IMPACT ANALYSIS

The economic impact of a company or industry is measured using a standard means of analysis called an economic impact assessment. This consists of two parts. First, we quantify the three ‘**core**’ channels of impact that comprise the organisation’s ‘*economic footprint*’, comprising:

- **Direct impact**, which relates to the activities of Etihad operating locally within the USA;
- **Indirect impact**, which encapsulates the activity and employment supported in Etihad’s supply chain as a result of its procurement of goods and services; and
- **Induced impact**, comprising the wider economic benefits that arise when employees of Etihad and its supply chain spend their earnings, for example in local retail establishments.

Using these pathways, a picture of Etihad’s economic footprint in the US economy is presented, using two key metrics:

- **GDP**, or more specifically, Etihad’s *gross value added* (GVA) contribution to GDP<sup>i</sup> and
- **Employment**, as the number of people employed, measured on a headcount basis.

Economic impact assessments traditionally only consider the activity that is generated by the operations of a given business or sector but Etihad’s economic footprint extends also to the capital expenditure that it makes on new aircraft and components both within the USA and beyond. This study therefore quantifies **capital** as well as **operational** ‘core’ impacts.

Second, we examine the ‘**catalytic**’ effect the company’s services or products have in boosting economic activity elsewhere in the economy.

The catalytic impact of Etihad represents the wider benefits that governments, consumers, society and other industries derive from the services Etihad provides. For an airline these are primarily captured in the contribution that increased air **connectivity** makes to wider economic potential. A variety of research in recent years has demonstrated how greater air connectivity raises the productivity of an economy, opening up new business opportunities and stimulating innovation. The impact of higher connectivity benefits all parts of the US economy, but three of the most important specific examples of this impact are the tourism, trade and feeder traffic that are facilitated by the activities of the airline. As well as quantifying the overall connectivity impact, we therefore also explore the scale of economic footprint of each of these kinds of catalytic impact.

Drawing on historical data and projections from a wide range of sources, the modelling on which this report is based computes the economic footprint of Etihad from **2006 to 2015**, and then forecasts the airline’s expected impact through **to 2020**. Economic contributions are shown for the whole US economy and split out for the **main routes** into the USA.

Further detail about the economic impact methodology is included in the further **technical appendices** that accompany this report.

## 1. INTRODUCTION

**Etihad Airways makes a substantial contribution to the global economy offering vital connections across regions and economies.** In early 2015, Etihad Airways commissioned Oxford Economics to undertake a comprehensive analysis that explored and quantified its impact in the USA as a key market that benefits from its activities.

**Air transport is a major contributor to global economic prosperity, a large global employer and a source of significant social benefits.** Oxford Economics, in association with the Air Transport Action Group (ATAG), has calculated that aviation supported over 58 million jobs worldwide and contributed US \$ 2.4 trillion to the world economy in 2012.<sup>4</sup> Perhaps even more significant than this is the role aviation plays in connecting countries and people to the global economy – raising their ‘connectivity’. Greater connectivity stimulates exchange of ideas and technology, fosters global competition, underpins international business cooperation and sustains foreign investment. All of these are essential contributors to economic growth. Etihad’s operations across the world play a significant part in raising connectivity, thereby contributing to that growth.

**Etihad’s services to the USA have helped to improve US connectivity since it opened its first route in 2006.** Etihad’s presence in the US market began in 2006 with the introduction of Abu Dhabi (AUH) to New York (JFK), bringing with it a growing economic contribution to US productivity. In 2009 the airline added Chicago O’Hare (ORD) to its destinations, followed by Washington Dulles (IAD) in 2013. During 2014 Etihad doubled the number of services it provides to the USA, adding routes to San Francisco (SFO), Dallas-Fort Worth (DFW) and Los Angeles (LAX).

**Etihad’s services connect the USA to important emerging economies.** Both the Middle East and the Indian subcontinent are rapidly rising regional economies, and Etihad provides vital connections to and from the USA for hundreds of thousands of people each year. In 2015, approximately 1.2 million passengers will travel to or from the USA on one of over 2,300 Etihad Airways flights from Abu Dhabi to one of the six US destinations. In 2015 260,000 inbound passengers on Etihad flights will be non-US visitors (tourist or business travelers). Around 14,000 of these will arrive in the USA on another airline having transferred from an Etihad flight elsewhere in the world. Some 77 per cent of those arriving in the USA on Etihad flights will be transfer passengers,

# 1.2 m

Passengers in 2015

*In 2015, approximately 1.2 million passengers will be carried in or out of the USA on one of over 2,300 Etihad Airways flights from Abu Dhabi to one of the six US destinations it serves.*

<sup>4</sup> Oxford Economics, "Value to the economy", in [www.aviationbenefits.org](http://www.aviationbenefits.org) <<http://aviationbenefits.org/economic-growth/value-to-the-economy/>> [accessed 05 March 2015]

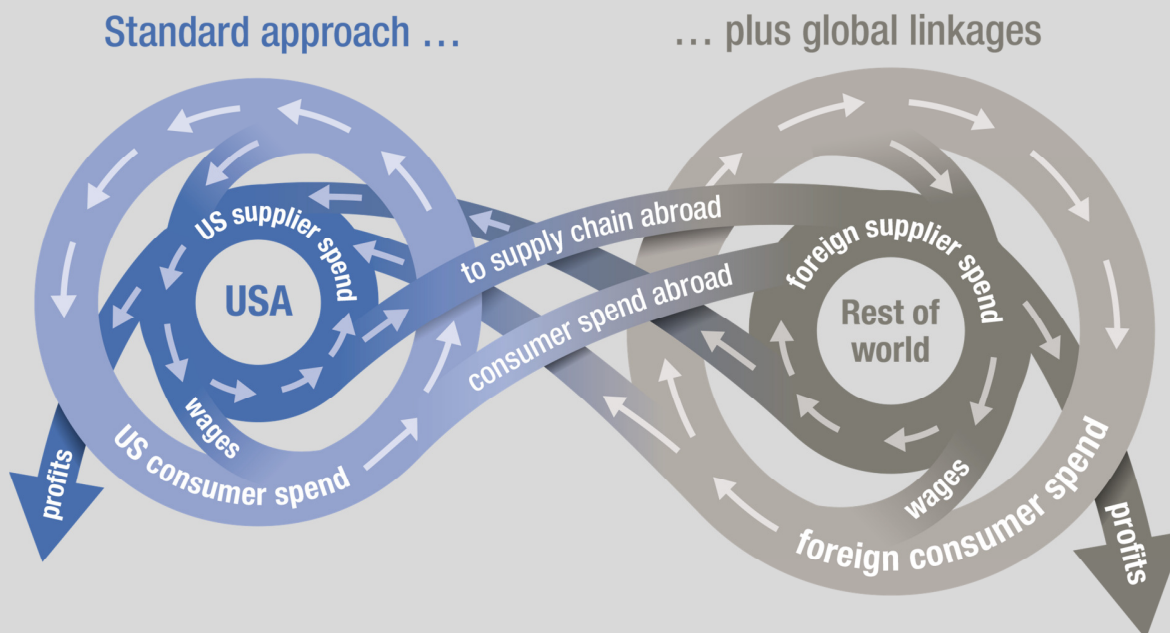
highlighting the importance of the airline and Abu Dhabi in connecting people across the world to US destinations.

**Report structure.** This report first considers the economic footprint of Etihad's global activities in the US economy during the period from 2006 to 2015. It quantifies the operational expenditure and capital investment contributions separately. It then considers the overarching catalytic impact of Etihad on the US economy to date. This is primarily captured by the boost to US productivity that Etihad effects by enhancing US air connectivity. The study goes on to explore the economic footprint of some specific types of catalytic impact facilitated by Etihad, including the contributions of tourism and trade, and the extent to which Etihad feeds US carriers with passengers. Finally, we consider the way in which the economic contribution of Etihad is expected to grow, in the years through to 2020, before looking in more detail at the airline's economic impact broken down by the six routes it currently operates into the USA.

### INTRODUCING OXFORD ECONOMICS' GLOBAL IMPACT MODEL

**Etihad's economic impact can be traced as it ripples across the global economy.** Any time a company makes purchases of intermediate goods or services it stimulates further economic activity in its supply chain. Often these supply chains encompass many sectors across many different countries. Complex supply chains may therefore crisscross the globe, leaving and entering a single country many times, meaning that economic activity in one part of the world can sustain jobs and contribute to GDP in countries that are apparently completely unconnected to the initial purchase. For example, Etihad may buy an aircraft from Airbus. In turn, Airbus may purchase components and services from US suppliers. Therefore, although the initial purchase is outside of the USA, it creates economic activity within the country.

**Fig. 4: Oxford Economics' global impact model**



The vast majority of economic impact assessments look only within a given country, meaning that the economic activity stimulated by, for example Airbus' purchases from US suppliers, goes unaccounted for: it 'leaks' out of the model. This approach can lead to substantial understatement of the company's economic contribution to a country. Oxford Economics' comprehensive model captures the impact of Etihad in these global supply chains. To avoid understating Etihad's contribution to the US economy, this study has developed a global input-output model that enables supply chains to be traced across the global economy. This bespoke model, designed and built by the Oxford Economics modelling team, enables linkages between all sectors and countries to be mapped, indicating where activity takes place and value is created throughout the global supply chain. It draws on the World Input-Output Database, but has been specifically augmented to provide greater geographical detail on key markets.

## 2. ETIHAD'S ECONOMIC IMPACT 2006-2015<sup>5</sup>

This chapter sets out the results of Oxford Economics' modelling of Etihad's economic footprint in the USA from 2006 to 2015 (see page 8). This 'core' economic impact can be described as the sum of the economic activity and employment in the USA supported by Etihad's global operations and its capital spending. We explore each of these in turn.

### 2.1 ETIHAD'S CORE IMPACTS

#### 2.1.1 OPERATIONAL IMPACT

**Etihad's economic footprint in the USA.** Etihad's immediate impact on the US economy can be quantified in terms of its contribution to gross domestic product (GDP)<sup>6</sup> and employment. To do this Oxford Economics has developed a bespoke global economic impact model that maps the complex global supply chains on which Etihad relies. The global impact model is unique in allowing us to quantify the full contribution of Etihad's global activities on the economy of the USA for the first time.

**As Etihad's passenger numbers have increased, so has the impact of both its US and global operations on the USA's economy.** Since Etihad's US services began in 2006, the airline has seen its US workforce and wage bill increase steadily. And as its operations in the USA have increased so has the airline's spend with US-based suppliers. Expenditures including fuel, landing fees, and maintenance costs directly linked to Etihad's US routes account for the majority of all operational spending made with US suppliers in 2015.

At the same time, growth in the operational GDP footprint of Etihad over the past decade reflects more than just the increase in its US operations. US suppliers have benefitted from the expansion of its global operations, purchasing inputs ranging from aircraft to business services.

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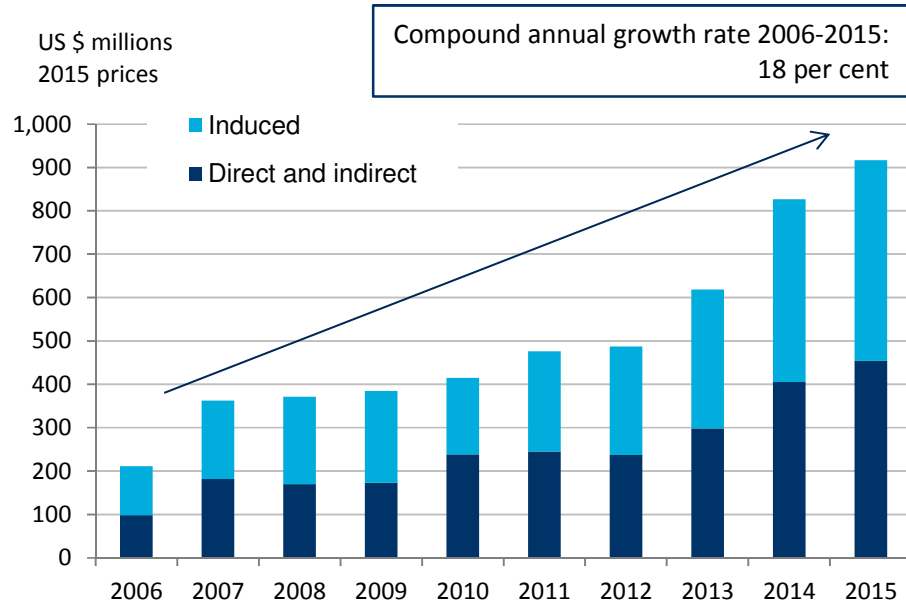
<sup>5</sup> Conducting an economic impact assessment is data intensive, particularly when a range of years and geographies are considered. To ease this process, the modelling and wider analysis contained in this report draws heavily on historical and forecast data provided by Etihad, major aircraft manufacturers, national statistics agencies, the World Input-Output Database, and Oxford Economics' own macroeconomic projections. Other sources include: OAG, Diio, and Eurostat.

<sup>6</sup> GDP is the main summary indicator of economic activity in the US economy. Gross value added (GVA) measures the value of goods and services at 'basic prices', i.e. the value to the businesses concerned, net of the taxes on sales, such as VAT. It is also known as 'gross domestic product at basic prices'. It therefore differs a little from 'headline' gross domestic product – 'GDP at market prices' – which is based on values including those taxes.

**\$920 m**  
GDP contribution in 2015

*The operational impact of Etihad in 2015 is expected to be worth US \$ 920 million to the US economy; 38 per cent of which will stem from its activities elsewhere in the world but influencing the US economy.*

**Fig. 5: Contribution to US GDP of Etihad’s global operations, 2006-2015**



Source: Oxford Economics

**In 2015 Etihad’s operational contribution to GDP is expected to be worth US \$ 920 million to the US economy.<sup>7</sup> This comprises:**

- US \$ 450 million in direct and indirect supply chain impacts; and
- US \$ 460 million in induced impact, as employees of Etihad and its supply chain spend their wages on consumer goods and services.<sup>8</sup>

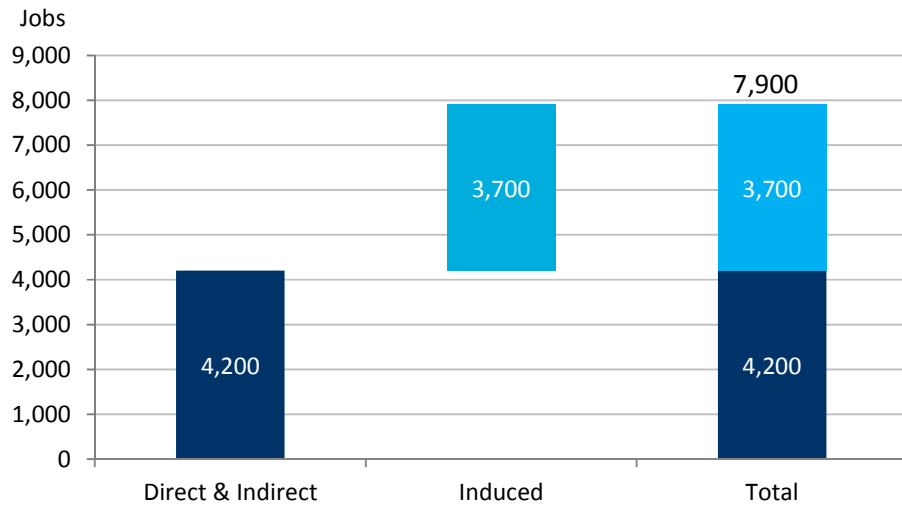
**Etihad’s global operations are estimated to sustain 7,900 US jobs in 2015.** This number has grown rapidly over the past decade. It comprises:

- 4,200 direct and indirect jobs in the US, that is employees of Etihad in the US and within the supply-chain created by Etihad’s US and wider global economic activity; and
- 3,700 induced jobs sustained by direct and supply chain employees – both in the US and abroad - spending their wages on US goods and services, for example, in retail.

<sup>7</sup> All US \$ values are in 2015 prices throughout.

<sup>8</sup> Totals may not sum due to rounding.

**Fig. 6: Contribution to US employment of Etihad’s operations in 2015**



Source: Oxford Economics

**7,900 jobs**  
Sustained in 2015

*Etihad’s operations will sustain 7,900 jobs in the US economy in 2015; 36 per cent represents US jobs that have been created because of the company’s activities elsewhere in the world*

Etihad’s global operations have a sizable impact in the USA. Over a third of Etihad’s total contribution to US GDP in 2015 stems from the company’s activities elsewhere in the world. The same is true for the employment Etihad’s operations sustain in the USA.

**The impact of Etihad’s operations is distributed widely throughout the US economy.** US businesses supporting the air transport sector – undertaking activities ranging from operating airports and providing fuel, to selling air tickets – are the major beneficiaries of Etihad’s operational spending in the USA. In 2015 these companies will account for 51 per cent (US \$ 220 million) of the airline’s operational supply chain contribution to US GDP. They also account for over half (2,200 jobs) of the indirect employment supported by Etihad in the USA. A further 21 per cent of the indirect GDP contribution and 20 per cent of indirect employment is located in the business services sector (including legal, consultancy, advertising and recruitment firms).

**2.1.2 CAPITAL IMPACT**

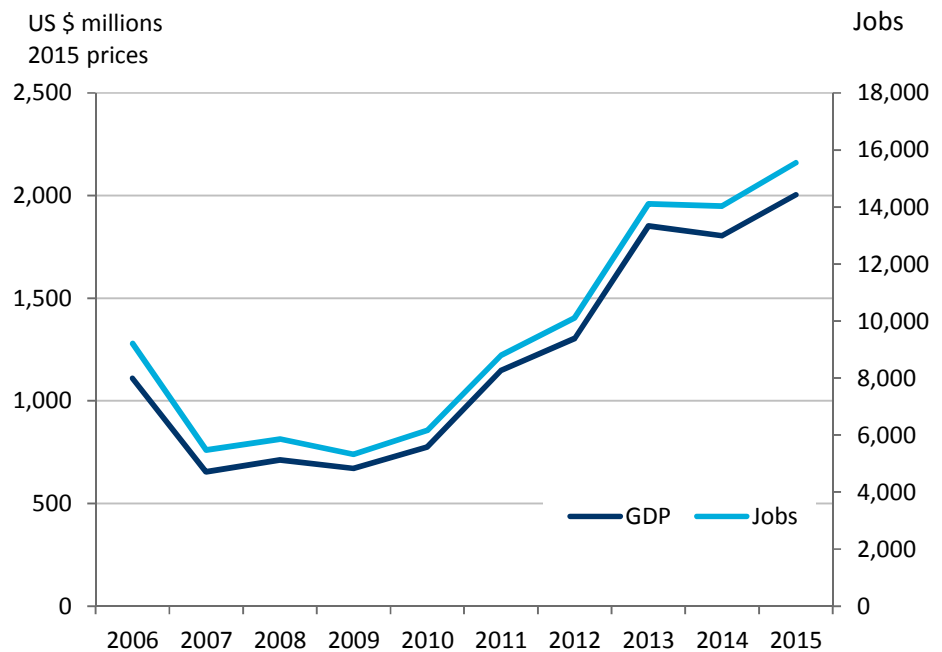
**US suppliers form a substantial proportion of Etihad’s aircraft and aviation equipment-related capital purchases.** By purchasing large numbers of aircraft and their associated products - engines, simulators, flight entertainment systems and cabin interiors - Etihad supports considerable activity. As home to Boeing and other high-tech manufacturing firms, the USA plays a prominent role in supplying aircraft to Etihad, and thousands of US jobs depend on this. In turn, the contracting of firms such as GE and Pratt & Whitney to deliver engines and other component parts supports activity in these companies and their suppliers.

All across this supply chain there are further induced impacts as US employees make consumer purchases of goods and services.<sup>9</sup>

But it isn't simply Etihad's capital spending with Boeing and related US suppliers that drives its impact in the USA: the supply chains of Airbus, as well as related non-US suppliers reach deep into the USA, creating a substantial GDP contribution and thousands of US jobs. Firms which provide key components, also feature in the supply chains of both Boeing and Airbus that are supported by the capital purchases that Etihad makes outside of the USA. These indirect contributions to the US economy are captured and quantified by our global impact model.

Capital expenditure, much more so than operational expenditure, varies year-by-year. The historical pattern for Etihad has nonetheless been of steady growth through to 2015. Figure 7 displays the economic impact of Etihad's capital spending in terms of both contribution to GDP and employment.

**Fig 7: Economic impact of Etihad's capital expenditure in the USA, 2006-2015**



Source: Oxford Economics

<sup>9</sup> As with the assessment of the operational impacts of Etihad, this analysis presents the impact of Etihad's investment in gross terms. Due to its hypothetical nature there is no consideration of potential displacement effects – investment elsewhere in the economy that does not occur because of the investment made by Etihad.



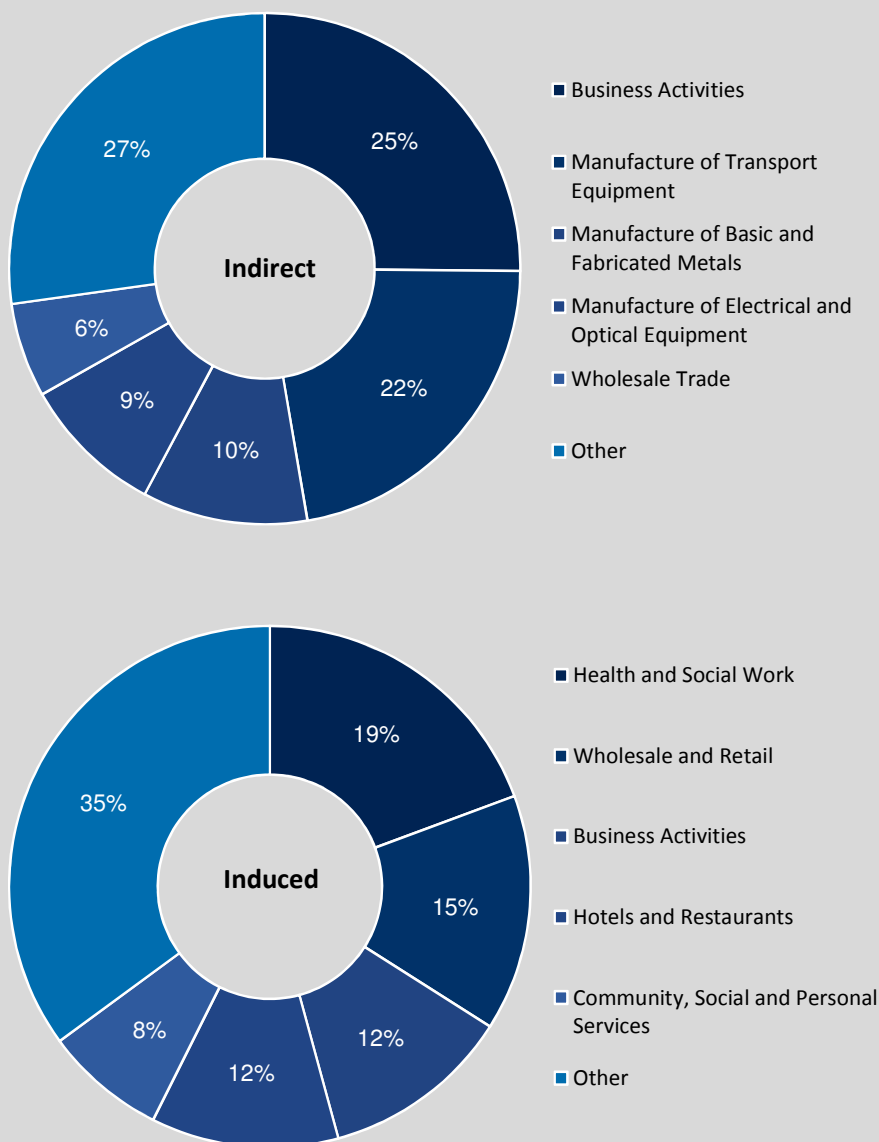
**Etihad's capital expenditure will sustain a US \$ 2.0 billion contribution to GDP in 2015 and sustain 15,500 jobs within the US economy.** This is comprised of:

- US \$ 1.4 billion in direct and indirect supply chain impact, sustaining 9,800 jobs; and
- US \$ 650 million in induced impact as employees spend their wages on consumer goods and services, sustaining a further 5,800 US jobs.

**ETIHAD'S ECONOMIC IMPACT IN DIFFERENT SECTORS OF THE US ECONOMY**

**Both manufacturing and business services sectors benefit significantly from Etihad's capital expenditure.** While manufacturing sectors account for the majority of the indirect impact in the USA of Etihad's global capital spending, the single sector benefiting the most from the airline's capital supply chain is business services. These suppliers - which include those providing computer services, legal, recruitment and management consultancy - account for nearly a fifth of the total indirect GDP and a quarter of indirect employment supported in the USA.

**Fig. 8: Sectoral breakdowns of indirect and induced employment impact in 2015**



Source: Oxford Economics

**2.2 ETIHAD’S CATALYTIC IMPACTS**

**2.2.1 OVERALL CATALYTIC IMPACT**

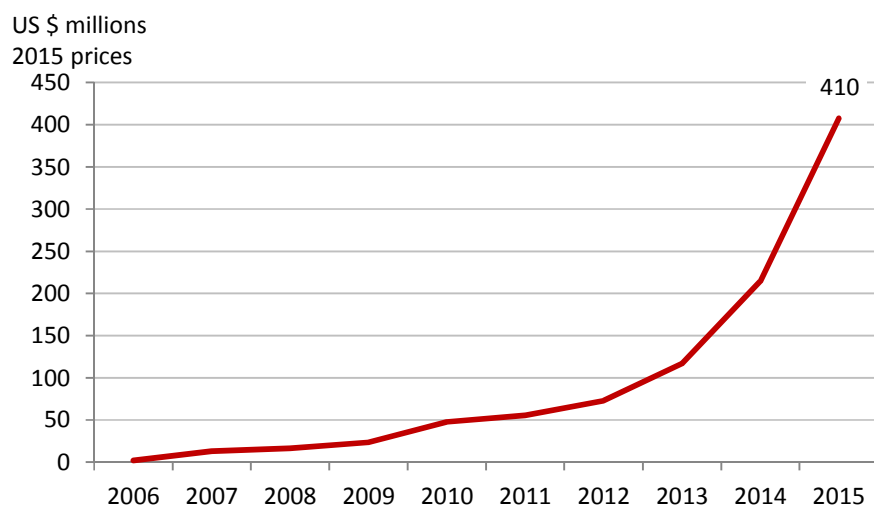
The economic impact of an airline goes far beyond its operational and capital expenditure footprint. The services Etihad offers facilitate a wide range of economic activity elsewhere in the USA and global economy – enabling business interaction, foreign investment, tourism and trade, among other things, all of which feed into understanding Etihad’s full economic impact in the USA.

**Etihad’s activities enhance US connectivity.** The overall catalytic impact generated by Etihad on the US economy can be best understood in terms of the difference that the airline’s activities make to US ‘air connectivity’. Connectivity is a measure of the aviation linkages a country has with major cities and markets around the world. The level of US connectivity reflects the number of passenger seats available on flights out of US airports and the economic salience of the destinations they serve. The implication of this is that a new service that connects the USA to a global airport hub has substantially greater catalytic impact on the USA than an equivalent capacity flight destined for a small city offering few onward connections to elsewhere in the world. Drawing on research by InterVISTAS that relates the impact of a change in a country’s air connectivity to its economic productivity, it is possible to estimate the productivity boost that Etihad generates for the US economy.<sup>10</sup>

**\$410 m**  
 Boost to US productivity  
 in 2015

*Etihad’s contribution to US air connectivity in 2015 will boost the productivity of the US economy by some US \$ 410 million.*

**Fig. 9: The contribution of Etihad to air connectivity, 2006-2015**



Source: Oxford Economics/InterVISTAS

<sup>10</sup> InterVISTAS for ACI, *Economic Impact of European Airports; a Critical Catalyst to Economic Growth* (Bath: InterVISTAS, 2015).

**We estimate that Etihad's contribution to US air connectivity in 2015 will boost US productivity by some US \$ 410 million.** This represents a sharp increase compared to 2014 as the impact of the first full year of operation for three of its six routes begins to be felt. In 2015, Etihad's overall catalytic boost to GDP will be equivalent to some 3,400 jobs in the USA.

## THE CATALYTIC IMPACT OF AIR CONNECTIVITY

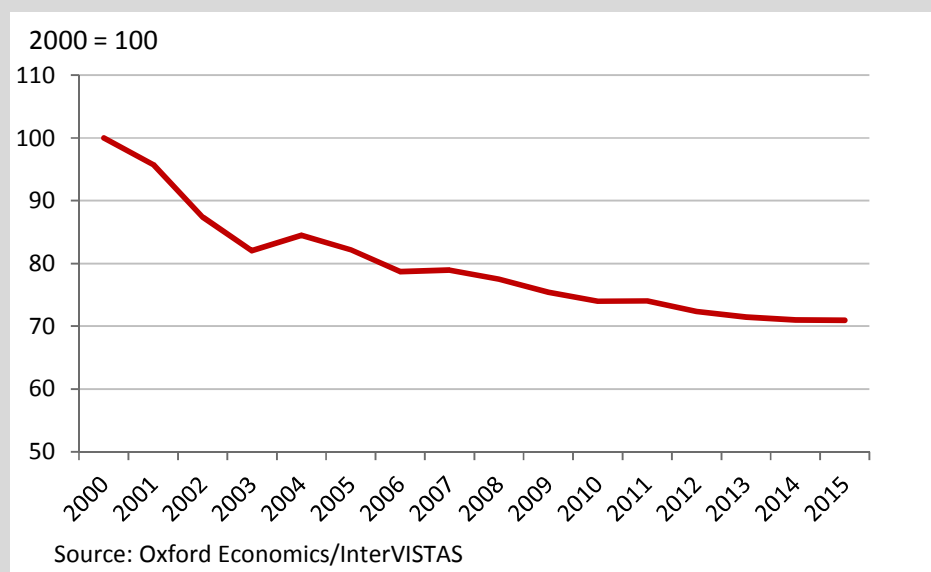
**Air connectivity boosts economic growth.** Air connectivity matters because greater integration to the global economy boosts local economic growth in a number of inter-related ways. It acts to open up new markets and fosters international trade; encourages domestic and foreign investment; raises competition thus improving domestic business efficiency; stimulates the tourism economy; and facilitates the exchange of ideas and technology across the world. All of these things encourage innovation, raising the productivity of the local economy, and hence boost GDP and national prosperity.

**Etihad's services enhance US connectivity boosting the country's productivity.** Connectivity in the air transport network is a critical asset for a prosperous and vibrant economy. It represents one of the key infrastructures upon which modern globalised businesses depend, thereby supporting long-term sustainable economic growth. All airlines flying into the USA contribute to the country's connectivity and therefore the economic benefits that result.

Etihad's worldwide network connects passengers flying to and from some of the most rapidly growing and under-served emerging markets - particularly the Indian subcontinent and the Middle East - onto the US-bound flights both of Etihad and other airlines. Etihad's worldwide services therefore provide critical linkages as part of the USA's air transport infrastructure.

The USA's IATA connectivity index reading compares unfavourably to a number of major global destinations. Indeed US connectivity relative to GDP has been falling since 2000. Without the additional flights and routes provided by Etihad's expansion of US operations over the past decade, this position would undoubtedly have worsened still further.

**Fig. 10: US connectivity relative to GDP, 2000-2015**



Further explanation for how we quantify connectivity is included in the technical appendices.

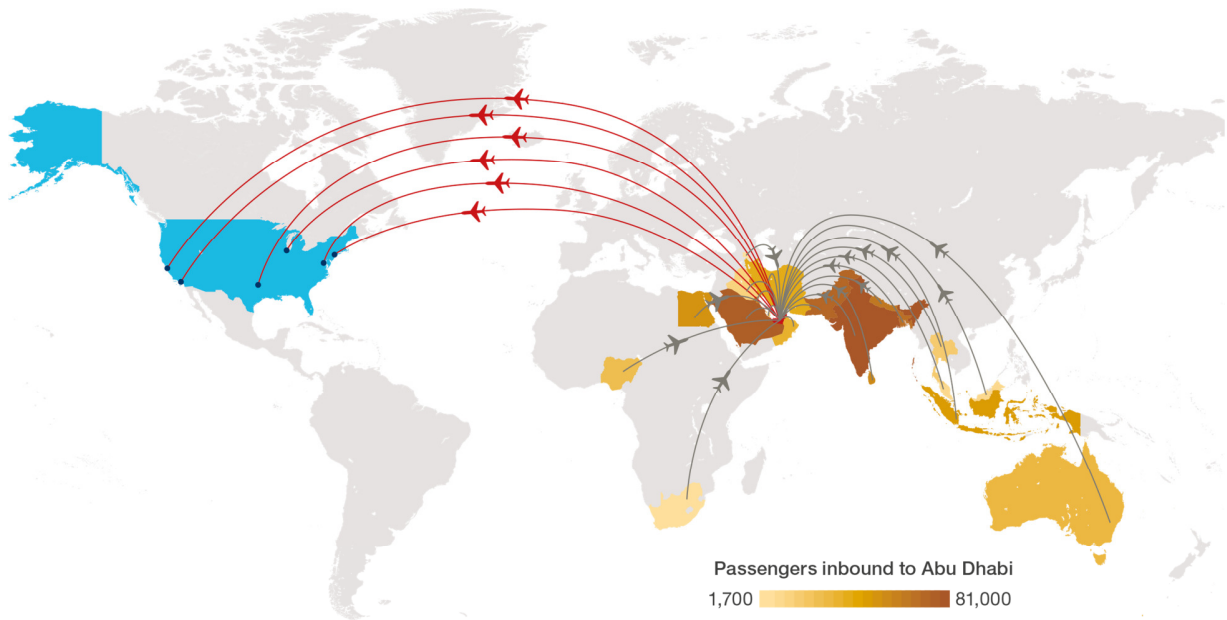
**2.2.2 OTHER CATALYTIC IMPACTS**

**TOURISM IMPACT**

As well as quantifying Etihad’s overarching catalytic impact as measured by its connectivity contribution to the US economy, it is possible to estimate the scale of Etihad-facilitated tourism, trade and feeder traffic as specific examples of how greater connectivity reshapes the US economy.

**Air transport lies at the heart of global tourism and business travel.** Through its speed, convenience and affordability, air transport has expanded the possibilities of world travel for tourists and business travelers alike, allowing an ever greater number of people to experience diversity of geography, climate, culture and markets. Tourism is a major industry in the US economy, with foreign visitors spending approximately US \$ 150 billion in the USA each year. With over 40 per cent of international tourists travelling by air globally, the global aviation network is the nerve system of the international tourism industry on which millions of jobs depend.

**Fig. 11: Etihad connections into Abu Dhabi and on to the USA, 2015 (top 20 by origin of tourist arrivals to the USA)**



**Etihad’s services to the USA act as a critical facilitator for the domestic tourism industry.** In 2015 Etihad flights will carry 260,000 international visitors (tourists and business travelers) bound for the USA.<sup>11</sup> The vast majority will arrive on an Etihad flight to one of six US destinations currently served by the airline, either on a direct flight from Abu Dhabi or as a transfer passenger through that airport. Around 14,000 of these visitors will arrive in the USA having transferred from an Etihad flight elsewhere in the world onto another carrier’s US inbound service.

Oxford Economics’ sophisticated tourism spending forecasts allow us to identify the spending of inbound visitors to the USA by country of origin. Our analysis suggests that in 2015, international visitors carried by Etihad on all or part of their journey to the USA will spend a total of US \$ 1.3 billion – an average of US \$ 4,900 per visitor.

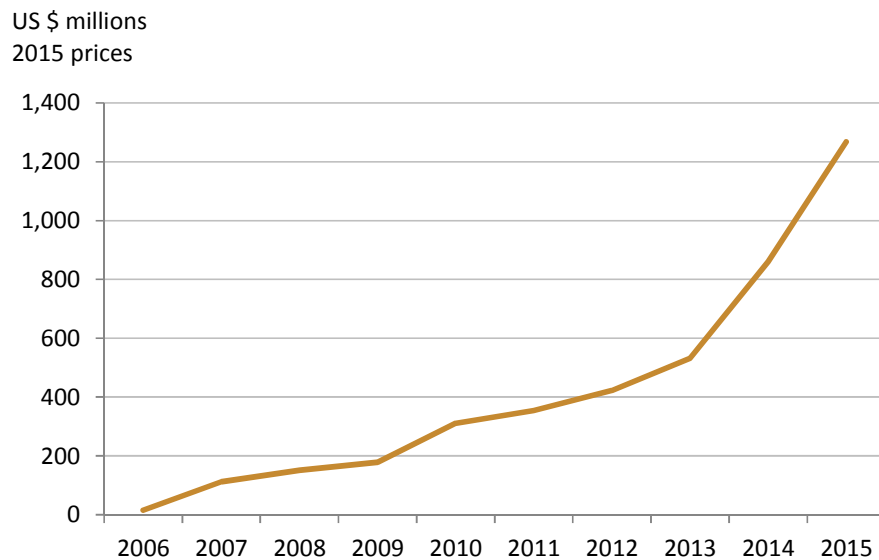
**\$1.3 bn**

Visitor spend in 2015

*In 2015, international visitors carried by Etihad on all or part of their journey to the USA will spend a total of US \$ 1.3 billion - an average of US \$ 4,900 per visitor.*

For business travelers the economic benefits are, of course, more wide-ranging than simply their spending while in the country. There is a close link between business travel and the trade impact described below. Air transport encourages international business ties by linking firms to potential customers and suppliers. For instance, a survey of City of London companies found that almost three quarters of companies reported that air services were ‘critical’ or ‘very important’ for meeting clients and service providers.<sup>12</sup>

**Fig. 12: Tourism spending in the USA of arrivals on Etihad flights, 2006-2015**



Source: Oxford Economics

<sup>11</sup> We include foreign business visitors in the foreign ‘tourist’ count for the purposes of this analysis.

<sup>12</sup> York Aviation, *Aviation Services and the City* (London: City of London, 2008).

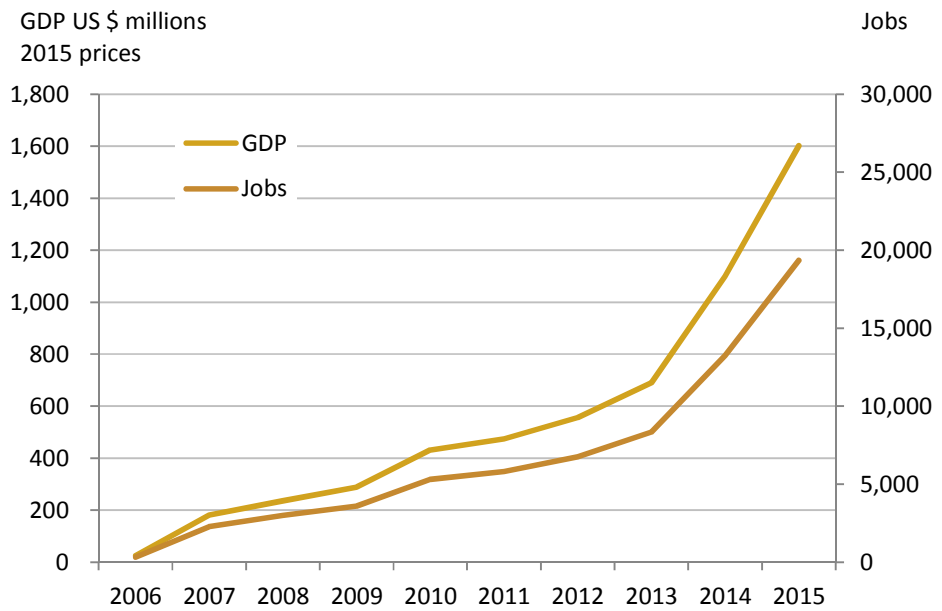
19,400

Jobs supported in 2015

*In 2015 the economic footprint of Etihad's visitor arrivals will be an estimated US \$ 1.6 billion contribution to the GDP of the USA, and some 19,400 jobs across the country.*

**The economic footprint of Etihad-facilitated visitor spending in the USA is substantial.** The impact that these arrivals make through their spending within the USA and the jobs that this expenditure supports can be quantified in a similar way to Etihad's core operational and capital spending impact. In quantifying the benefits from visitor arrivals we seek to capture the spending by tourists and business people on accommodation, food, recreation and other activities beyond their airfare (which forms part of our estimate of the direct calculation of Etihad). The numbers represent the economic activity and jobs that are facilitated by Etihad within the US economy, rather than directly attributable to it. In 2015 the economic footprint of Etihad's visitor arrivals will be an estimated US \$ 1.6 billion contribution to the GDP of the USA, and some 19,400 jobs across the country. This represents a snapshot of Etihad's growing contribution to tourism in the USA.

**Fig. 13: GDP and employment facilitated by visitors arriving via Etihad**



Source: Oxford Economics



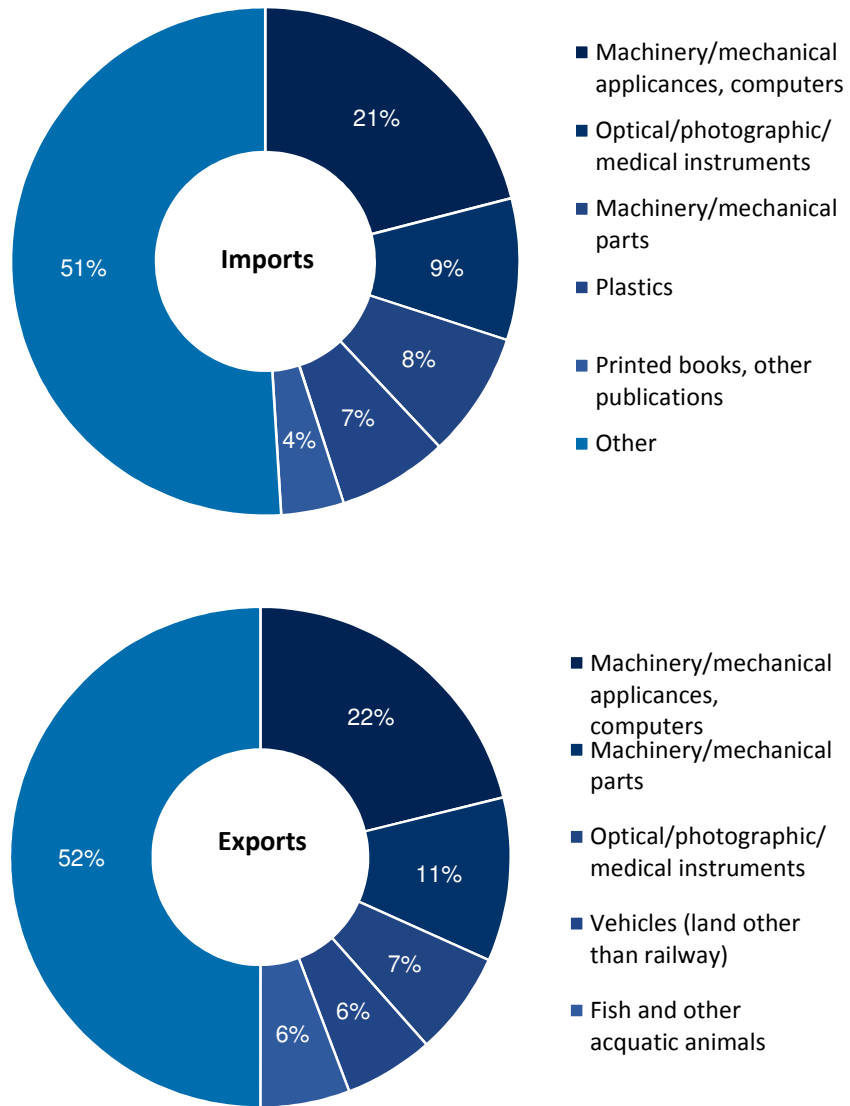
### **TRADE IMPACT**

**Etihad's dedicated freight services, to and from the USA, act as an enabler of trade.** Etihad flights play a role in enhancing trade into and out of the USA, and facilitating the globalization of trade more generally. The scale of this trade activity can be measured in terms of the quantity of goods carried.

**Etihad will carry 80,000 tonnes of cargo between the USA and the rest of the world in 2015.** Approximately 57 per cent of the total will be carried on Etihad Cargo's dedicated freight services, with the rest carried as bellyhold cargo in Etihad's passenger planes.

**Air freight carried by Etihad consists of high-value, perishable and 'just-in-time' products in line with the global picture.** Figure 14 illustrates the most important kinds of product carried by air between the USA and the EU28 in volume terms in 2014, and is indicative of the pattern of Etihad-carried freight. Machinery, mechanical equipment and precision instruments – typically high value and essential for high-tech engineering - are the most significant items carried. Time sensitive products such as fish and publications also feature highly. Echoing this, analysis of UN bi-lateral trade data of US cargo routes served by Etihad, combined with EU data on the likelihood of products being transported by air, suggests that the major products carried by Etihad to the USA is consistent with the pattern observed elsewhere in the world.

**Fig. 14: Total imports and exports carried by air between Europe and USA, 2014<sup>13</sup>**



Source: Eurostat

<sup>13</sup> Not specific to Etihad.

### **FEEDER TRAFFIC IMPACT**

In addition to the tourism and trade impact of Etihad's activities, a further important impact relates to the passengers that the airline feeds to other carriers, as passengers book through Etihad onto the onward flights of other airlines.

**Etihad brings passengers into the US aviation market.** While a large number of Etihad's passengers to the USA take more than one flight to reach the country, for thousands of them the journey does not end there. In fact it is estimated that around 300,000 Etihad passengers will take a flight on a US-based carrier (either domestically or internationally) as part of their journey in the course of 2015.<sup>14</sup> This represents a 65 per cent increase on the Etihad feeder traffic to US carriers in 2014.

With Etihad serving ultimate destinations and origins primarily in the Middle East and the Indian subcontinent, these represent new customers for the US aviation industry, who may not have arrived in the country but for the global network Etihad provides.

These passengers have a positive impact on the US economy. Those who take a domestic flight will spend money at their final destination in the USA, boosting the tourism industry and its supply chains. To the extent that these flights are domestic, the impact of these passengers is captured in the tourism calculations presented above. However, onward international flights will further contribute to the US economy via the US airlines in ways that are additional to those reported elsewhere in this paper.

# 300,000

Feeder passengers, 2015

*Around 300,000 Etihad passengers will take a flight on a US-based carrier (either domestically or internationally) as part of their journey in the course of 2015.*

<sup>14</sup> Source: Etihad, this figure refers to bi-directional passenger flows i.e. traffic in both directions on each route.

### 3. FORECASTING ETIHAD'S IMPACT 2016-2020

#### 3.1 FORECASTING CORE IMPACTS

As has been shown, across a whole range of measures, the impact of Etihad on the USA has been rising as the airline expanded its services in terms of breadth and frequency. In this chapter we turn to the future, and report the results of Oxford Economics' forecast of Etihad's contribution in the USA in terms of its core operational and capital expenditure, as well as its catalytic impact through to the end of the decade. Network evolution will generate a greater operational footprint and more employment in the USA. Equally, changes in patterns of capital expenditure across Etihad's global activities are poised to provide a big boost to the US high-tech manufacturing sector in the coming years.

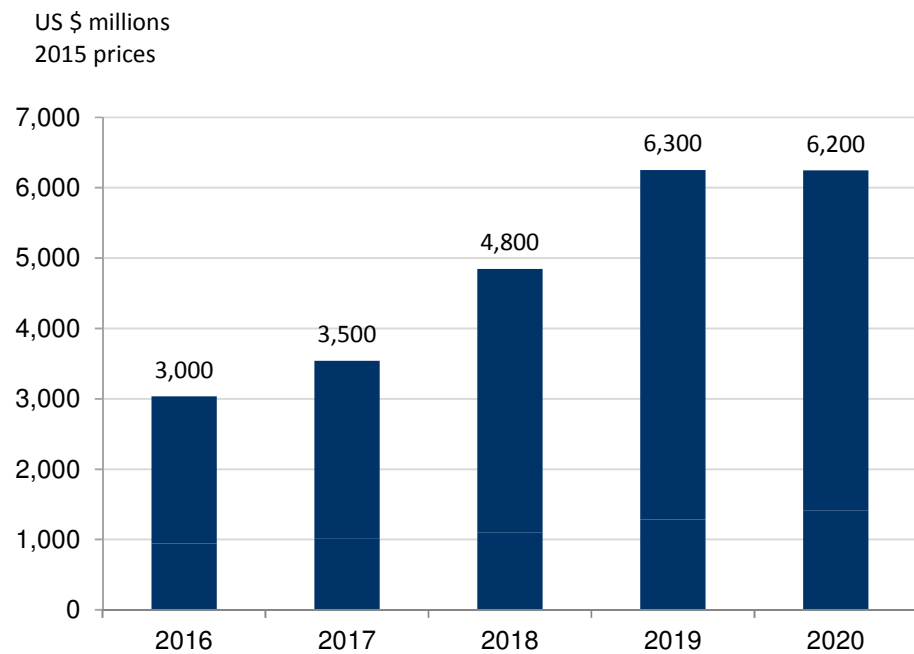
**Etihad's operational footprint is set to increase.** By 2020 Etihad's operational economic footprint will total a US \$ 1.4 billion contribution to GDP, sustaining over 11,000 jobs. This comprises:

- US \$ 710 million direct and indirect GDP impact, sustaining 5,800 jobs; and
- US \$ 710 million induced GDP impact, sustaining 5,300 jobs.<sup>15</sup>

**\$1.4 bn**  
GDP in 2020

*By 2020 Etihad's operational economic footprint will total a US \$ 1.4 billion contribution to GDP, sustaining over 11,000 jobs.*

**Fig. 15: The core economic impact of Etihad in the USA, GDP, 2016-2020**



Source: Oxford Economics

<sup>15</sup> These figures do not add to the 11,000 total due to rounding.

**A burgeoning aircraft order book.** Changes in patterns of capital expenditure across its global activities also affect the economic footprint of Etihad in the USA through to 2020. The economic footprint associated with Etihad’s aircraft and aviation equipment orders around the globe peaks in 2019, making a US \$ 4.8 billion contribution to GDP in 2020 and sustaining some 35,200 US jobs.

**Total core economic footprint.** By the end of the decade, therefore, Etihad’s total core economic footprint in the USA is set to grow to a GDP contribution of US \$ 6.2 billion, sustaining over 46,200 American jobs.

### 3.2 FORECASTING CATALYTIC IMPACTS

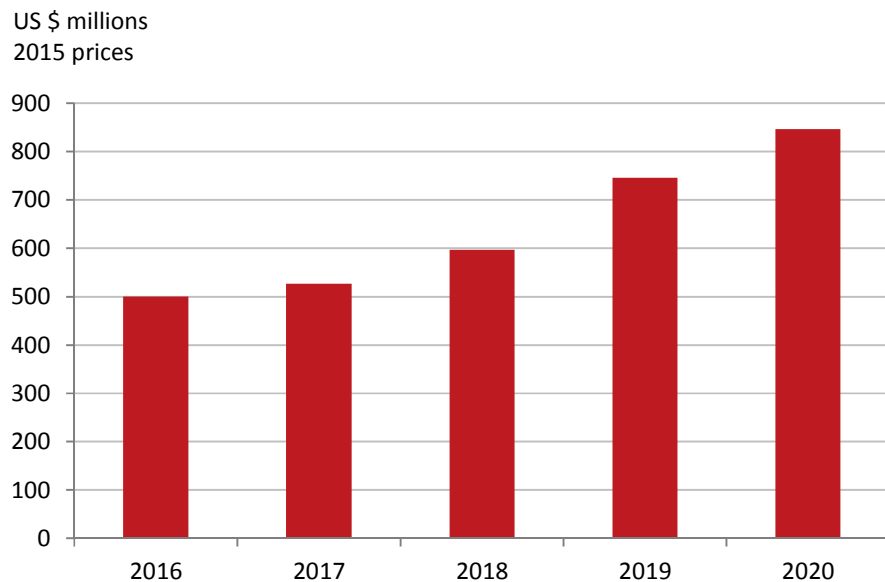
#### 3.2.1 FORECASTING OVERALL CATALYTIC IMPACT

**A growing boost to US economic productivity.** Etihad’s contribution to US connectivity is set to accelerate in the years ahead. Based on the airline’s future plans, we have been able to forecast their likely contribution to US air connectivity and hence to US economic productivity. By 2020 Etihad is forecast to provide a boost to the productivity of the US economy that reaches US \$ 850 million. This is economic activity that it is estimated would not exist without the air connectivity that Etihad will, by then, be providing the USA. This additional activity will be associated with some 6,400 US jobs.

**\$850 m**  
Boost to productivity in 2020

*By 2020 Etihad is forecast to provide a boost to the productivity of the US economy that will reach US \$ 850 million of GDP.*

**Fig. 16: Etihad’s connectivity impact, 2016-2020**

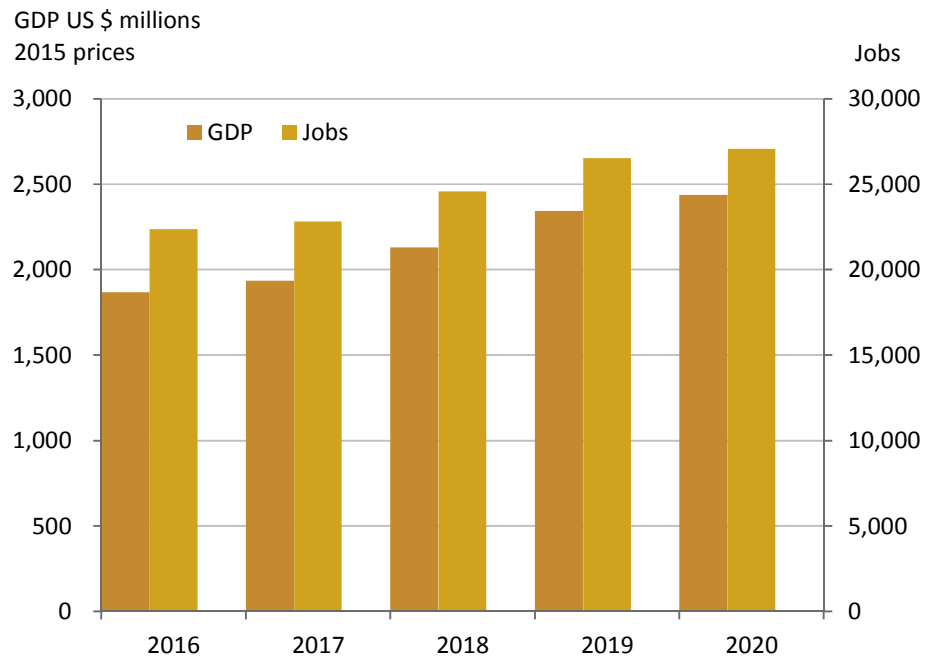


Source: Oxford Economics/InterVISTAS

### 3.2.2 FORECASTING OTHER CATALYTIC IMPACTS

**By 2020 Etihad will facilitate a greater tourism contribution in USA.** The visitors arriving in the USA on Etihad flights will bring tourism expenditure totaling US \$ 1.9 billion or around US \$ 5,000 per arrival. By 2020 Etihad's tourism-related economic footprint is projected to exceed a GDP contribution of US \$ 2.4 billion, enabling more than 27,000 jobs related to the tourism economy and its supply chain.

**Fig. 17: Economic footprint of tourism facilitated by Etihad, 2016 and 2020**



Source: Oxford Economics

**Delivering new customers to US carriers.** As Etihad's global network continues to grow, the airline is set to become an increasingly important link between the emerging markets of the Middle East and the Indian subcontinent, as we have already seen. But as well as providing air connectivity to these regions that has been lacking in the past, Etihad services will feed growing numbers of passengers onto US-based carriers.

## 4. ETIHAD'S ECONOMIC IMPACT BY ROUTE

To this point Etihad's impact on the USA has been considered only as a whole, yet it is possible to explore how each of its US routes contribute to the airline's footprint in the USA. This chapter quantifies the operational and catalytic impact of each Etihad route on the USA.<sup>16</sup>

### 4.1 ETIHAD'S OPERATIONAL IMPACT BY ROUTE, 2006-2015

**The operational impact of any of Etihad's US routes is determined by the value of the US supply chain spending associated with it.** For the most part these can be estimated in line with a given route's share of passengers travelling to and from the USA.

However, there are some areas of spending – such as corporate overheads, aircraft leasing and financing costs – that are linked to Etihad's network as a whole and not to any one route. The existence of US routes plays some part in the level of spending that is required, as, for instance, flying these routes means that more corporate activities take place and so corporate overhead costs increase. Therefore, one way in which these costs can be attributed to each route is through allocation determined by a given route's share of the total passengers travelling throughout Etihad's worldwide network.

On the basis of the attribution rules above, the six US routes contribute over US \$ 40 million to GDP and sustain 400 jobs.

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<sup>16</sup> We do not allocate economic activity associated with capital spending since this is not related directly to one or other route into the USA. For example, the economic impact associated with Etihad's investment in aircraft that will fly routes all over the world, but which are manufactured in the USA, cannot readily be attributed to any one route.

**4.2 ETIHAD’S CATALYTIC IMPACT BY ROUTE, 2006-2015**

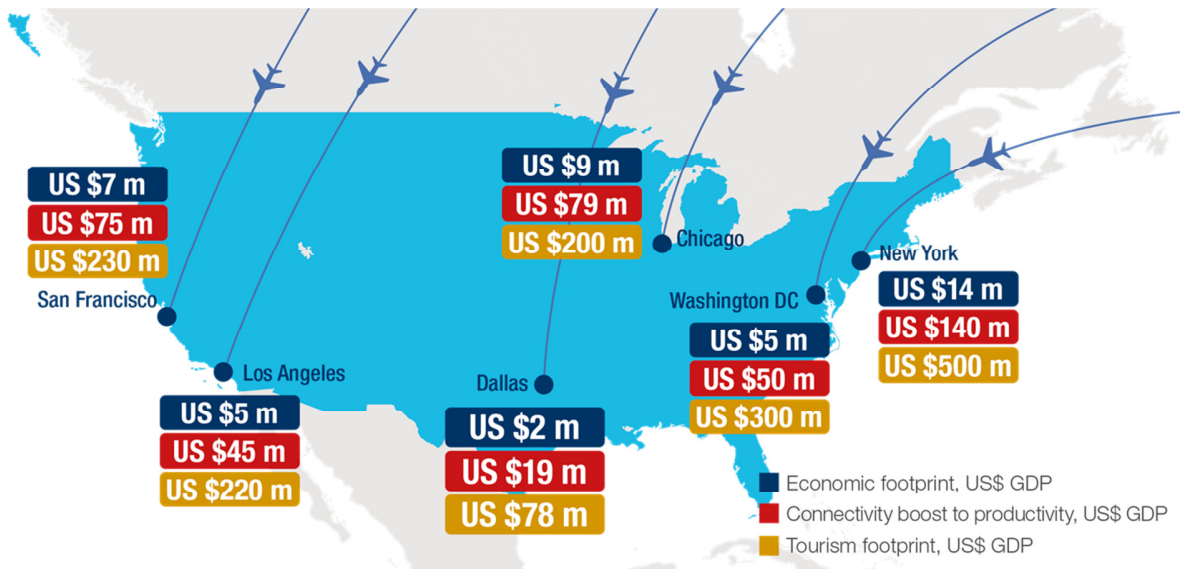
**Every route that Etihad operates to the USA boosts Etihad’s connectivity impact on the country.** Therefore, we are able to quantify the growth-enhancing impact of Etihad’s connectivity contribution among its six US routes. This gives an indication of the relative importance of each route in terms of the boost it gives to US productivity.

The Abu Dhabi to New York route has the largest impact, adding US \$ 140 million to the productivity of the US economy. This portion of US GDP is associated with 1,200 jobs across the economy. The next most valuable contribution to connectivity is related to the route into Chicago O’Hare, adding US \$ 79 million to the productivity of the economy. This portion of US GDP is associated with 700 US jobs.

As with the core operational economic contribution of Etihad and with connectivity impacts, we are able to allocate the economic contribution facilitated by the spending of visitors arriving on Etihad flights according to their destination airport. Doing so demonstrates how each route contributes to the tourism impact facilitated Etihad in the USA.

The Abu Dhabi to New York route has the largest impact with 84,000 visitors arriving on this service, facilitating a US \$ 500 million contribution to GDP and 6,000 jobs in the US economy. This is followed by Chicago, San Francisco, Los Angeles and Washington Dulles.

**Fig. 18: Economic impact of Etihad by route into the USA, 2015**





### **4.3 FORECASTING ETIHAD'S IMPACT BY ROUTE, 2016-2020**

On current forecasts, the operational impact of most of Etihad's existing routes into the US will hold steady over the forecast period, with the contribution of the biggest single route – Abu Dhabi to New York - growing from US \$ 14 million in 2015 to US \$ 16 million by 2020.

The overall catalytic impact that enhanced connectivity provides to US productivity can also be attributed to different Etihad routes according to the forecast seat capacity on each route and the projected growth in importance of Abu Dhabi to the global aviation network. For instance, the connectivity boost to US productivity provided by the Abu Dhabi to New York route is expected to grow from US \$ 140 million to US \$ 275 million by 2020. This portion of GDP is expected to be associated with 2,100 jobs.

It is also possible to measure the tourism impact facilitated by Etihad on each of its routes. The increasing number of visitors arriving at each destination translates into a growing tourism impact attributable to each route. Indeed, by 2020 the tourism impact facilitated by the Abu Dhabi to New York route is projected to grow from US \$ 500 million in 2015 to US \$ 690 million in 2020, supporting an additional 7,700 jobs.

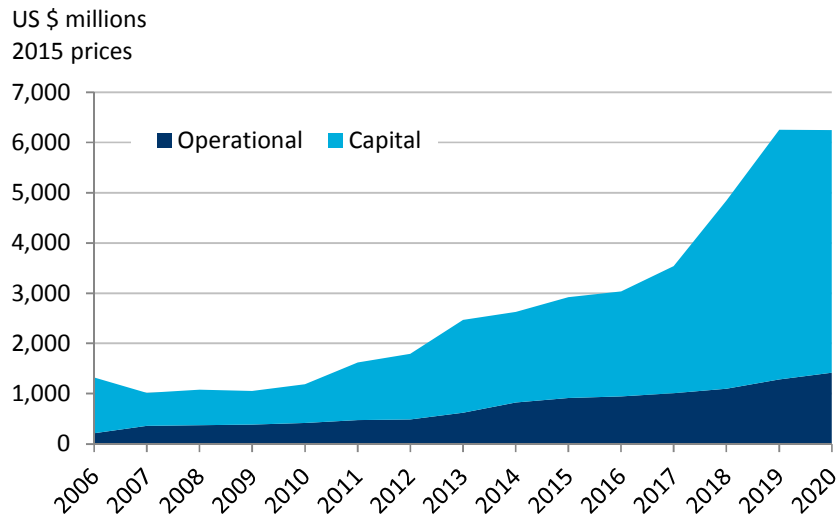
## 5. CONCLUSION

This study has quantified the economic impact of Etihad on the USA in terms of both the core contribution stimulated by its activities and the wider economic benefits its services enable for others. With six unique routes linking the USA to the Middle East and beyond, in 2015 Etihad’s economic footprint in the USA is expected to amount to a GDP contribution of US \$ 2.9 billion and some 23,400 US jobs. After twelve years of growth in its worldwide network, the air connectivity Etihad creates is estimated to boost the productivity of the US economy by US \$ 410 million.

**Growth in Etihad’s economic footprint in the USA has been considerable since it opened its first direct route into New York in 2006.** But our forecasts show that its biggest contribution to the US economy lies ahead. On the back of a large expansion of aircraft-related expenditure and a rising operational impact, Etihad’s economic footprint in the USA is set to reach US \$ 6.2 billion by the start of the next decade and contribute 46,200 jobs, many of them in advanced manufacturing.

Over the fifteen year period 2006 to 2020, the total impact of Etihad’s operational and aircraft-related investment on the US economy therefore sums to US \$ 41 billion on an undiscounted basis.

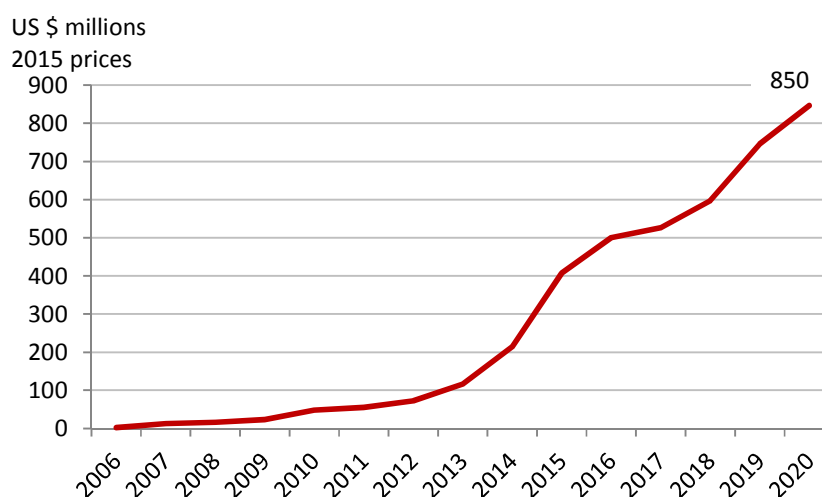
**Fig. 19: The core economic impact of Etihad in the USA, GDP, 2006-2020**



Source: Oxford Economics

**Etihad's wider catalytic impact on the USA is also growing quickly.** Providing increasing connectivity, linking the country to a rapidly-growing global hub airport in Abu Dhabi, means that Etihad is providing the US economy with an increasing level of global air connectivity. It is estimated that the catalytic boost to the productivity of the US economy this creates will grow from a negligible level in 2006 to almost US \$ 850 million by the start of the next decade.

**Fig. 20: The connectivity impact of Etihad in the USA, GDP, 2006-2020**



Source: Oxford Economics

**Tourism is a crucial way in which Etihad's connectivity benefits the USA.** The network connections Etihad provides make the USA a viable tourist destination for millions of people for whom the trip was perhaps prohibitively expensive or inconvenient before. Their spending supports substantial economic activity in the USA, and this contribution is forecast to increase over the next five years, growing to US \$ 2.4 billion and sustaining over 27,000 American jobs.

**All elements of Etihad's contribution to the US economy are therefore substantial.** From its core contribution to the GDP and employment of the USA, to the trade, business, tourism and other economic activity its services enable, Etihad's impact on the economy is considerable and growing fast. As Etihad's global network expands, its US flights will increasingly connect the world's largest economy to Asia's most populous and vibrant ones, providing opportunity and prosperity for millions.

## 6. TECHNICAL APPENDIX

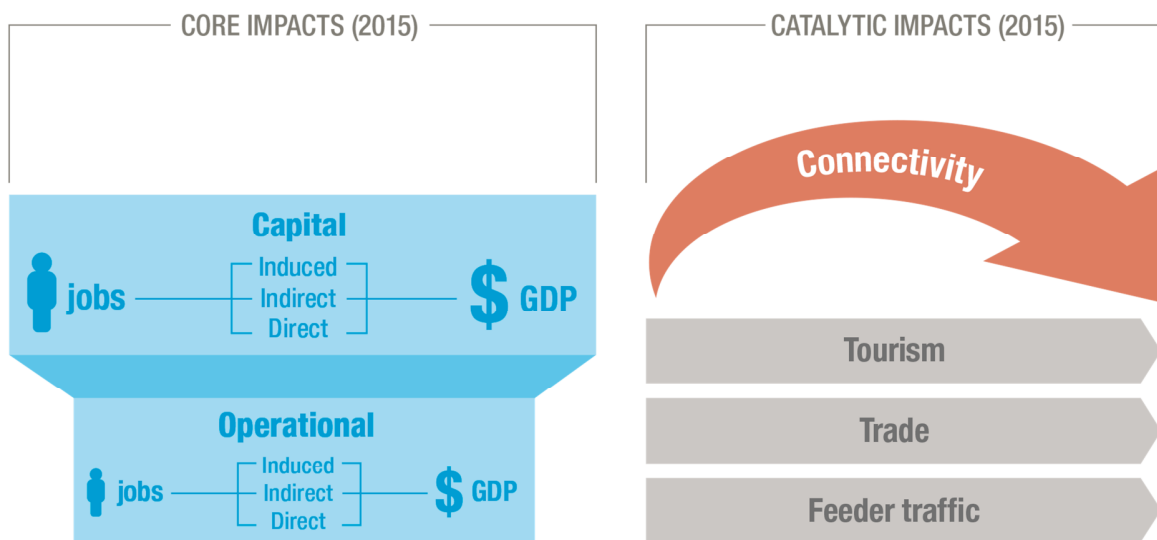
### 6.1 METHODOLOGICAL OVERVIEW

In early 2015 Oxford Economics was commissioned by Etihad to undertake a comprehensive analysis to quantify its economic impact, in Etihad’s home country – Abu Dhabi – and in six key markets, and five other major global economies. This document presents detail of the methodological approach used to calculate the economic impact of Etihad Airways on the US economy as a part of that global study.

#### 6.1.1 MEASURING ETIHAD’S ECONOMIC IMPACT IN THE USA

The study measures the economic impact of Etihad using a standard means of analysis called an economic impact assessment. This consists of two parts. First we quantify the three ‘core’ channels of impact that comprise the organisation’s ‘economic footprint’. Second we examine the ‘catalytic’ effect that the company’s services or products have in boosting economic activity elsewhere in the economy, as well as examining specific examples of the kind of catalytic impacts that are facilitated, namely tourism, trade and feeder traffic onto US carriers.

**Fig. 21: Channels of economic impact**



The remaining sections of this document describe the approaches employed to calculate the core and catalytic impact of Etihad in the USA. First, however, the scope and data requirements of the study are discussed.

### **6.1.2 TIMEFRAME OF THE ANALYSIS – 2006 TO 2020**

Etihad's economic impact is calculated from the start of its operation in the USA, in 2006, and forecast out to 2020. Drawing on historical data and projections from a wide range of sources, the modelling on which this report is based computes the economic footprint of Etihad from 2006 to 2015, and then forecasts the airline's anticipated impact in the years from 2016 through to 2020.

### **6.1.3 DATA SOURCES USED**

Conducting an economic impact assessment is data intensive, particularly when a range of years and geographies are considered. To ease this process, the modelling and wider analysis contained in this report draws heavily on historical and forecast data provided by Etihad, major aircraft manufacturers, national statistics agencies, the World Input-Output Database, and Oxford Economics' own macroeconomic projections. Other sources include: OAG, Diio, and Eurostat.

## **6.2 CALCULATING ETIHAD'S CORE IMPACT**

Etihad's core economic impact comprises the activity supported by its operations and its capital spending on aviation equipment. The same impact methodology is used to calculate each of these impacts.

This section of the appendix explains in detail how the methodology is applied to calculate the impact of the airline's operations, before highlighting any differences when estimating the impact of Etihad's capital spending. But first, we present a short introduction to economic impact assessments.

### **6.2.1 INTRODUCTION TO ECONOMIC IMPACT ASSESSMENTS**

#### **THE CHANNELS OF IMPACT**

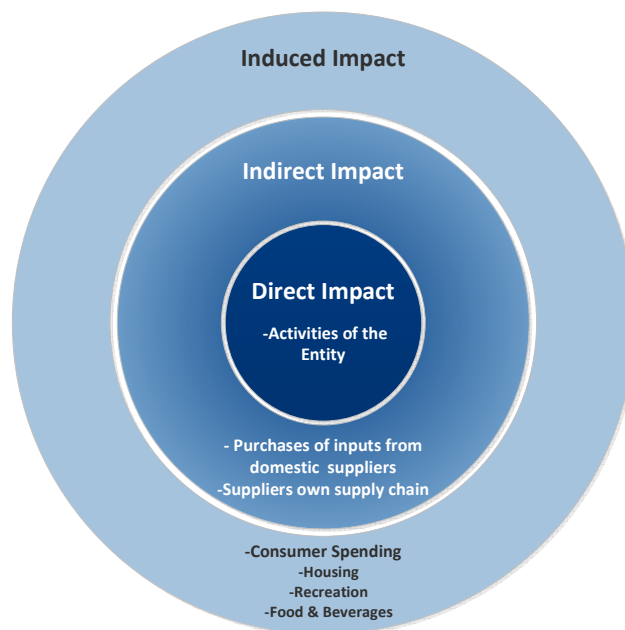
To capture the full extent of an entity's economic impact it is necessary to consider all of the means by which it interacts with the rest of the economy. Typically when assessing the economic contribution of an entity three main channels of impact are analysed:

- At the core of any economic impact assessment is the *direct effect*. This is the impact generated by the entity itself.
- The second channel of impact focuses on how an entity interacts with other businesses in the economy. The entity's *indirect effect* is the

activity that is supported elsewhere in the economy as a result of its procurement of inputs of goods and services for use in producing its own output. This expenditure creates activity along the entity’s supply chain.

- The final channel of impact is known as the *induced effect*, and captures the activity that is stimulated by the consumer spending of the individuals employed by the entity and in its supply chain. These purchases take place predominantly in the sectors that supply consumer goods and services, such as retail and leisure outlets. By supporting this expenditure – through the payment of wages – the entity is inducing additional economic activity in these businesses. It also creates demand for goods and services along the retailers’ and leisure outlets’ domestic supply chains.

**Fig. 22: The channels of economic impact**



Brought together the individual channels present a complete picture of the economic impact of the entity as it ripples from the direct effect out through the rest of economy. The total impact of the entity is the summation of the three effects.

**MEASURING IMPACT**

To effectively quantify economic impact it is necessary to evaluate the contribution an entity makes in the same terms used to measure the size of the economy. Therefore, impact assessments typically focus on two different

metrics: gross value added contribution to Gross Domestic Product (GDP) and employment.

The first of these metrics - gross value added contribution to GDP - is a measure of net output. Three different approaches are available to calculate the gross value added contribution to GDP of a business: the production (or output) approach, income approach and expenditure approach. United Nations Statistics Division<sup>17</sup> (UNSD) clearly defines the different methodologies:

*“The production approach [...] measures GDP as the difference between the value of output less the value of goods and services used in producing these outputs in an accounting period”.*

*“The income approach measures GDP as the sum of the factor incomes generated to the economy [wages, salaries and bonuses payable to employees, taxes on production, and operating surplus for the producers]”.*

*“The expenditure approach measures the final uses of the produced output as the sum of final consumption, gross capital formation and exports less imports”.*

Whatever approach is used, gross value added measures the contribution to the economy of each individual producer. When aggregated across all firms, gross value added sums to GDP.<sup>18</sup> GDP is one of the main summary indicators of a country's economic performance. References to economic growth (or when the economy enters recession) typically relate to the rate of change of GDP.

Employment is the second metric by which the economic contribution of a firm can be measured. It can be defined in three ways: headcount, full-time equivalent or job-years. A headcount employment measure corresponds to the number of people employed, irrespective of whether employment is full- or part-time. The full-time equivalent measure of employment takes into account that some individuals may be employed on a part-time basis and adjusts the headcount employment figure for hours worked. The final measure, job-years measures the number of years of employment that are supported. One job that lasts for one year or two that last for six months each both equate to one job-year. This study applied the headcount employment measure.

### **GROSS VERSUS NET ECONOMIC IMPACT STUDIES**

The total contribution of an entity to an economy is the sum of all three channels of economic impact. The results are usually presented on a gross basis

<sup>17</sup> United Nations Statistics Division, "Links between business accounting and national accounting" (Handbook of National Accounting, 2000).

<sup>18</sup> The link between GVA and GDP can be defined as GVA plus taxes on products less subsidies on products equals GDP.

rather than a net basis. The difference is whether account is taken of what the resources used up - in the operation of the firm, its supply chain and through staff spending - could alternatively have been deployed to do. So a gross study ignores the alternative uses, whilst a net study estimates the impact created by the firms in excess of that if the resources were used in their second most effective use. Taking a net approach is more complex and controversial as it is necessary to estimate what the resources would alternatively be used to do. For that reason this study follows a gross approach.

### **6.2.2 MEASURING ETIHAD'S OPERATIONAL IMPACT**

#### **CALCULATING THE DIRECT IMPACT OF ETIHAD**

The direct value-added contribution Etihad makes to an economy is the sum of its profits (expressed in terms of earnings before interest payments, taxation, depreciation and amortisation) and the payments of wages and salaries it makes to its employees. These data were provided by Etihad on a global and geographical basis. It is important to note that as Etihad – along with other airlines – consolidates its profits in its home country, its direct impact in all other geographies is equal to its wage spending.

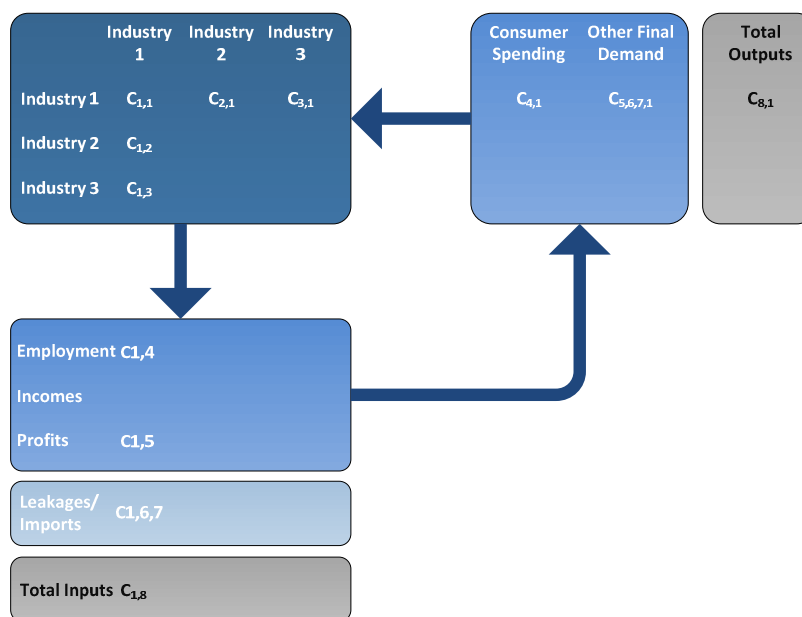
#### **CALCULATING THE WIDER ECONOMIC IMPACTS**

Typically, an economic impact assessment focuses on estimating an entity's wider (indirect and induced) impact on a specific country. To do so it uses an input-output model of that particular country.

An input-output model gives a snapshot of an economy at any point in time. The model shows the major spending flows from "final demand" (incorporating consumer spending, government spending, investment, and exports to the rest of the world); intermediate spending patterns (the purchases that each sector makes from every other sector – the supply chains in other words); how much of that spending stays within the economy; and the distribution of income between employment incomes and other income (mainly profits). In essence an input-output model is a table which shows who buys what from whom in the economy.



**Fig. 23: A simple Input-Output model**



A crucial weakness of using an input-output model for a single country is that any imports are treated as leakage and lost from the model. This can lead to understating the economic impact of an entity.

The first way of understating impact occurs as a single country input-output model ignores that supply chains reach across many countries, and may often enter a country multiple times. For example, an insurance firm in the USA may use an Indian company to operate its call centres. In turn, the call centre company may use computers produced in the USA using components sourced from China. The initial purchase creates an economic footprint at each of these stages. But in a single country input-output model considering, in this example, the economic impact of the insurance company on the USA the purchase of call centre services in India is reported as a leakage. And the subsequent supply chain will not be considered for the model, even though it re-enters the USA at a later stage. Consequently, the impact assessment fails to attribute the activity supported in the US computer company to the insurance company.

To avoid understating Etihad’s global impact, this study employs a global input-output model that enables supply chains to be traced across countries. The model uses the global input-output developed by the World Input-Output Database (WIOD) as its foundation<sup>19</sup>. The WIOD provides time-series of world

<sup>19</sup> M P Timmer et al., "An Illustrated User Guide to the World Input-Output Database: the Case of Global Automotive Production", *Review of International Economics*, 2015.

input-output tables for forty countries<sup>20</sup> worldwide and a model for the rest-of-the-world, covering the period from 1995 to 2011.

Oxford Economics augmented the WIOD model by first including the domestic input-output models for the additional geographies covered in this study. Published input-output models were used for Switzerland<sup>21</sup> and South Africa<sup>22</sup>. But for the other geographies (Abu Dhabi, Serbia, the Seychelles, rest of Africa and rest of world) no published input-output models exist. In these cases Oxford Economics created estimated domestic input-output models, a process that incorporated four distinct steps.

The first step was to identify a country from which an input-output model for each geography could be estimated. Choosing the correct country on which to base the estimation is important, as the estimated input-output model will exhibit some of the same characteristics as the base country. Therefore, countries with similar industrial structures and levels of economic development were chosen. For Abu Dhabi the base country was the UAE, and an input-output model previously developed by Oxford Economics. For Serbia, the input-output model of Romania published by WIOD was chosen. The input-output model of Mauritius, published by Statistics Mauritius, was used for the Seychelles<sup>23</sup>. Finally, the WIOD estimation of the domestic input-output model of the rest of world<sup>24</sup> was used as a base for generating the input-output models for the rest of Africa and rest of world.

The second stage of estimating each geography's input-output table was to develop a coefficients table using input-output models for the base countries and the system based on the location-quotient method developed by Flegg *et al.*<sup>25</sup> In this table each cell was expressed as a proportion of that industry's output, for example any values in the agriculture column were expressed as a proportion of agricultural output, and so on for each different sector.

Following the Flegg *et al.* approach, the coefficients table was adjusted to develop a new input-output model for each geography using two steps:

<sup>20</sup> The countries included are the EU 27, Australia, Brazil, Canada, China, India, Indonesia, Japan, South Korea, Mexico, Russia, Taiwan, Turkey and the USA.

<sup>21</sup> Sourced from the OECD Structural Analysis Database.

<sup>22</sup> Statistics South Africa, "Input-output tables for South Africa, 2010 and 2011" (Report No. 04-04-02, Statistics South Africa, 2014).

<sup>23</sup> Available at <http://statsmauritius.govmu.org/English/StatsbySubj/Pages/Investment.aspx#iot>

<sup>24</sup> The WIOD definition of rest of world differs to that used by Oxford Economics. For the WIOD it incorporates all countries except the 40 presented individually in the WIOD model. For Oxford Economics, Abu Dhabi, Serbia, the Seychelles, Switzerland and rest of Africa are also excluded.

<sup>25</sup> Flegg, Webber and Elliott, "On the appropriate use of location quotients in generating regional input-output models", *Regional Studies*, 1995: 547-61.

- The *Size Effect* adjusted the coefficients matrix for each sector to take into account the differences between the absolute size of a sector in the base country and the geography in the study; and,
- The *Scale Effect* then adjusted the coefficients matrix according to the size of each sector relative to the rest of the economy.

These adjustments ensured that differences between industrial linkages in the two geographies are captured.

The output of these adjustments was a ‘first-cut’ input-output model for each geography. To finalise the models, the first-cut models were then scaled to meet published data on sector output, GVA, compensation of employees, imports, exports, household spending, government spending, gross capital formation in in each geography. These data were drawn from national statistics agencies for Abu Dhabi, Serbia and the Seychelles. Corresponding data were calculated for the rest of Africa and rest of world using data published by the United Nations’ National Accounts Main Aggregates Database.<sup>26</sup>

Incorporating the additional geographies in the global input-output model requires not only the inclusion of domestic input-output models for each geography, but also estimates of how these geographies link to the rest of the global economy. As each of the geographies are incorporated within rest of world within the WIOD, an overview of the total linkages is presented in the original WIOD model. For example, if the WIOD model suggests that agriculture in the rest of the world imports US \$ 10 million of basic metals from Australia, the sum of all imports of basic metals from Australia to the agricultural sectors in the additional geographies must equal US \$10 million. The key is how this US \$ 10 million is distributed between the additional geographies.

To allocate all imports and exports Oxford Economics relied on two known figures. The first was the total number of imports and exports by each sector in each geography, calculated in the domestic input-output models. The second is the distribution of imports and exports by trading partner for each geography, taken from data published by the IMF and collated by Oxford Economics’ Global Trade Service. These two pieces of data enabled Oxford Economics to estimate how each of the additional geographies linked to the rest of the global economy, and estimate a global input-output model larger than that published by WIOD.

Once finalised, the global input-output model was used to generate industry multipliers by using the Leontief system.<sup>27</sup> Under the Leontief system industry multipliers are calculated through a series of manipulations of the input-output

<sup>26</sup> Available at <http://unstats.un.org/unsd/snaama/Introduction.asp>

<sup>27</sup> Wassily Leontief, *Input-output economics* (New York: Oxford University Press, 1986).

matrix. The first of these manipulations was the creation of a base coefficients matrix (A matrix) for global economy. The second manipulation was the creation of an identity matrix (I matrix), within which all values were zero except for when the consuming country and industry (columns) and the producing country and industry (rows) are the same; these cells were given a value of 1. The third stage of the manipulation was the subtraction of the A matrix from the I matrix. The final stage was the inversion of the matrix produced in the third stage.

The result of these manipulations was a matrix in which the values represent the individual cross-multipliers for each industry, showing the impact on each producing industry (row) of an increase in 1 unit of output in a consuming industry (column). The total multiplier for each consuming industry is the sum of the multipliers in the relevant column. In other words, the total multiplier for each industry represents the strength of its supply chain.

### **USING THE INPUT-OUTPUT MODEL TO CALCULATE WIDER ECONOMIC IMPACTS**

The input-output model represents a powerful tool for modelling Etihad's contribution to the global economy. Using the model enables the calculation of the indirect and induced impacts. To do so it is necessary to identify the expenditure the airline makes with suppliers based around the world.

Etihad provided data on the different type of expenditures it makes, and where it makes them. Using the input-output model it is possible to disaggregate and align this spending to the industrial sectors in each geography from which inputs were sourced. By allocating all spending to the relevant industries, the purchases of inputs can be entered into the input-output model. The model is then used to calculate the subsequent supply chain purchases that occur within the global economy (through the use of supply chain multipliers). The summation of these purchases represents the total expenditure that is generated by Etihad's procurement. To calculate the indirect contribution to GDP, the total expenditure effect is divided by sector-level gross value-added to gross output ratios taken from the input-output model.

The employment supported as a result of the indirect contribution to GDP is estimated by dividing the value-added indirect impact by sector-level labour productivity data obtained from WIOD, national statistical agencies and forecast by the Oxford Economics Global Macroeconomic model.

The calculation of the induced impact – the activity supported by the wage-financed spending of people employed directly or indirectly by Etihad – is a two-step process. The total induced effect is the sum of both calculation stages.

The first step involves estimating the induced impact that is generated by people employed in the supply chain. To generate this result, the modelling

used for calculating the indirect impact outlined above is extended to incorporate the income multipliers in the economy. This gives the induced expenditure impact, which is translated into value-added, employment and tax revenue impacts using the same process as used for the indirect impact.

The second stage of the estimation of the induced impact is quantifying the effect of the spending of those employed by Etihad. Using the input-output model, the wages paid to these employees can be allocated to countries and sectors in a manner that reflects the spending profile of the average household in each country where Etihad has employees. Using this profile, the total expenditure effects on the economy can be calculated using the income multipliers in the model. This expenditure is then translated into value-added and employment impacts using the same process as used for the indirect impact.

### **6.2.3 MEASURING ETIHAD'S CAPITAL IMPACT**

Etihad's economic footprint extends far beyond its operations; most significantly it includes the impact of its capital expenditure on aviation equipment. Aviation is a capital intensive sector that invests heavily in aircraft systems and other advanced technology. By purchasing aircraft and their components, Etihad supports considerable activity in the USA. In order to capture the full extent of Etihad's impact on the USA this study includes the capital spending that the airline makes on new aircraft and components both within the USA and beyond.

Data on capital expenditure were provided by Etihad. These data were used in two ways to estimate the global impact of this spending. In contact with Airbus and Boeing, Oxford Economics translated the spending on aircraft by Etihad into profits and wages for manufactures, and subsequent the supply chain purchases each made throughout the world. These data were inputted into the global input-output model in the same manner as Etihad's operational expenditures, and the global economic impact was calculated. Oxford Economics then allocated this spending to the transport equipment manufacture sector and used the supply chain and consumer spending multiplier to estimate their global economic impact.

The total economic impact of Etihad's spending on aircraft related capital items is the sum of both approaches.

### **6.2.4 MEASURING IMPACT BY ROUTE INTO THE USA**

Economic contributions made by Etihad are shown for the whole US economy and split out for the main direct routes into the USA. By the end of 2014, Etihad operated six direct routes from Abu Dhabi into the USA: New York (JFK);

Washington Dulles (IAD); San Francisco (SFO); Chicago O'Hare (ORD); Los Angeles (LAX) and Dallas Fort Worth (DFW). For the route-specific footprint of Etihad's operations, as well as for the route-specific connectivity and tourism contribution, we are able to allocate the impact that is associated with each route, in terms of GDP and employment. We do not allocate economic activity associated with capital spending, since these are not related directly to any one route into the USA. For example, the economic impact associated with Etihad's investment in aircraft that will fly routes all over the world, but which are manufactured in the USA, cannot readily be attributed to any one route.

### 6.3 CAPTURING THE CATALYTIC IMPACT OF ETIHAD

Quantifying the catalytic benefits that arise from an airline's services is not straightforward. The benefits of a strong air transport infrastructure stem from its role in boosting competition, promoting international trade, facilitating tourism and encouraging inward investment. Each of these is a specific example of the catalytic impacts that Etihad's service have on the US economy. But trying to quantify an airline's overall catalytic contribution to an economy is difficult because many of these beneficial effects take time to appear and are hard to measure individually. Rather, to put an overall estimate on Etihad's catalytic contribution to the USA requires us to disentangle connectivity's overall contribution to long-term growth from the many of other factors that affect an economy's performance by looking at how the national economies of countries with faster-growing air connectivity perform relative to ones with slower-growing networks.<sup>28</sup>

#### 6.3.1 MEASURING CONNECTIVITY

A number of studies in recent years have attempted to quantify the overall catalytic impact of aviation on GDP growth. A January 2015 econometric analysis by InterVISTAS has deployed the most recent available data on European connectivity to isolate and quantify its relationship to economic growth, while controlling for other factors that may have an impact of GDP (such as education levels, research and development investment, capital

<sup>28</sup> This issue is reflected in the wide range of estimates that studies have reached for connectivity's impact on long-run growth. Three studies undertaken in 2005 and 2006 provide estimates of the impact that connectivity can have on long-run level of productivity (and hence GDP). The mechanisms through which connectivity generates this economic benefit are those described in Section 3.2. These studies suggest that a 10% increase in connectivity (relative to GDP) will raise the level of productivity in the economy by a little under 0.5% in the long run, with there being a fair degree of uncertainty around this average estimate. A much wider 2006 study, based on a cross-country statistical analysis of connectivity and productivity, derived a lower estimate of 0.07% for the elasticity between connectivity and long-run productivity.

spending, and institutional and regulatory factors).<sup>29</sup> The research subsequently found that a 10 per cent increase in the ratio of connectivity to GDP was associated with an increase in GDP per capita of 0.5 per cent.

The InterVISTAS study used a definition of air connectivity developed by IATA, which measures the number of seats available from an airport or country weighted by the importance of the destinations served. The weights reflect how “connected” each destination is in terms of potential onward connections and are approximated by the total number of passengers at each destination airport relative to Atlanta (the world’s largest airport). Services to major hubs will therefore provide a greater boost to overall connectivity than flights to smaller airports. For example, a flight to London Heathrow will have a larger weight (and therefore a bigger impact on US connectivity) than a flight to Athens International Airport given the same number of seats.

Oxford Economics applied the IATA methodology to estimate 1993-2014 connectivity by making use of historical data on seats available on flights out of the USA by airport destination from the Department of Transport (DoT) and Diio.<sup>30</sup> The destinations were weighted using ACI data on total passengers for each airport, and consistent with the IATA method the weights were estimated relative to Atlanta.

To project connectivity to 2020 the historical relationship between connectivity and total passengers was first analysed. This analysis revealed that historically connectivity has grown less rapidly than passengers, mainly due to seat growth lagging behind passenger growth. That is increasing passenger volumes have, to a significant extent, been met by filling up existing spare seat capacity (i.e. load factors have increased) rather than by increasing seat numbers. However, this trend in spare capacity/load factors has become progressively more difficult to maintain, meaning passengers and seats (and hence connectivity) have moved more in line with one another in recent years. Extrapolating this relationship forward enabled our calculations to reflect the changing nature of the relationship between passenger and connectivity growth. The second step was to project US passenger numbers using the ACI passenger traffic forecasts. These passenger forecasts combined with the relationship between passengers and connectivity then allowed us to project connectivity to 2020.

The 0.5 per cent figure in the InterVISTAS study refers to the relationship between 1) the ratio of connectivity to GDP; and 2) GDP per capita. The interpretation of the result is that a 10 per cent increase in connectivity (relative to GDP) leads to an increase in GDP per capita of 0.5 per cent. As the

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<sup>29</sup> InterVISTAS for ACI, *Economic Impact of European Airports; a Critical Catalyst to Economic Growth* (Bath: InterVISTAS, 2015), xiii.

<sup>30</sup> Diio Traffic Analyser

relationship is in growths an appropriate base year must be chosen from which to estimate connectivity impacts. For the relevant year of analysis (e.g. 2014) the connectivity figure would be the growth in connectivity (relative to GDP) since the base year. Correspondingly, the GDP impact (via the 0.5 per cent relationship) would be the growth in GDP per capita since the base year attributable to connectivity effects. In other words the impact is the additional GDP since the base year associated with the increase in connectivity that occurred over the relevant period.

In the InterVISTAS study 1993 was selected as the base year for Europe as it marked the start of a liberalized EU aviation market and the growth of low-cost carriers. The estimated GDP impacts on the EU therefore captured the connectivity changes that have taken place since 1993. As noted by InterVISTAS this could be considered a conservative estimate as it does not account for potential connectivity benefits that may have built up pre-1993. Following InterVISTAS we have taken 1993 to be the base year for the US connectivity calculations. This means our estimates should capture the major air liberalization developments that have occurred since the early 1990s. However, as mentioned it may be a conservative estimate as the process of air liberalization in the USA began in the late 1970s.

Given the base year of 1993, growth in US connectivity (relative to GDP) from 1993-2020 was first estimated. The 0.5% elasticity was then applied to obtain the estimated growth in GDP per capita (since 1993) attributable to air connectivity at the national level for each year from 2006-2020. The GDP per capita effect was converted to total GDP by applying population levels in the relevant year. The same calculation was performed using a connectivity index which excluded the growth from Etihad's flights (connectivity growth being lower without Etihad). The difference with the national figure (including Etihad) then gave the impact of Etihad to national GDP through connectivity effects.

### **6.3.2 TOURISM IMPACTS**

The approach employed to estimate the tourism impact of Etihad involved three main steps. Firstly, US foreign arrivals carried on Etihad by true origin were estimated from 2006-2020. "True origin" being the country in which arrivals started their journey, which is not necessarily the same as the departure point of the Etihad flight used.

The second step then applied historical and projected figures on spending per arrival by origin country/region from Oxford Economics' Tourism Decision Metrics (TDM). This gave total US tourism spending by origin country reliant on Etihad from 2006-2020.



The final step then converted the tourism spend into GDP and employment impacts. This was achieved by breaking down total tourism spending into specific tourism products (e.g. accommodation) using data from the National Travel and Tourism Office. The products were then allocated to industry sectors consistent with the Global IO Model. The Global IO Model then produced direct, indirect and induced GDP/employment impacts resulting from tourism spending, in line with the methodology adopted in the economic footprint analysis.

The estimates of US visitor arrivals attributable to Etihad utilise two datasets. The first is Etihad's historical and projected local/transfer passengers by route; and the second is OAG's Traffic Analyser, which provides data on the true origins and destinations of Etihad passenger bookings and details of airport connection points. The essence of the approach was to use the OAG data to establish the true origins and destinations of passengers flying on each Etihad route. This allowed the identification of those Etihad passengers who are travelling to the USA and their true origins. US resident travellers on these routes, who by definition do not contribute to tourism impacts, were then identified using information on the point of sale for the booking. The pattern of origins and destinations of Etihad passengers by route was obtained from 2014 OAG data.

The approach was applied at a disaggregate level to take account of the different types of Etihad passengers that could arrive into the USA. This consisted of local (direct) and transfer passengers, with each further by route.

1. Local (direct passengers) – existing (2014) Etihad routes

Historical and future local passenger numbers on the six current US routes were provided by Etihad. OAG data on the point of purchase for these passengers in 2014 was utilised to split passengers into foreign and US resident travellers.

2. Transfer passengers – existing (2014) Etihad routes

This group consists of Etihad transfer passengers on existing Etihad routes who travel to the USA. Two sub-groups of passengers were identified within this group – those who arrived into the USA on an Etihad flight to one of six destinations in 2014; and those who arrived on another airline but had an earlier leg on Etihad. Those arriving on an Etihad flight were over 90 per cent of this passenger group.

To estimate those arriving on an Etihad flight OAG data was used to identify the true origins and destinations of passengers on each Etihad US route in 2014. Combined with information on country of ticket purchase this gave an estimate of US foreign arrivals on each Etihad US route for 2014 by country origin. This

was then taken back to 2006 and projected to 2020 using growth in the number of transfer passengers on the relevant US route.

A similar approach was adopted for those Etihad transfer passengers arriving into the USA on another airline. In this case, to take the estimates back to 2006 and forward to 2020, growth in total transfer traffic on existing routes excluding US routes was used.

## 7. FURTHER INFORMATION

Separate technical appendices accompany this report.

All data shown in tables and charts are the result of modelling by Oxford Economics based on input data from Etihad Airways and Oxford Economics, except where otherwise stated and cited in footnotes.

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