Economic impact of IAG in the UK

Report

May 2023

pwc

Foreword

IAG asked PwC to independently assess the impact of their operations on the economies of the United Kingdom, Spain, Ireland, and the European Union as a whole. Specifically, PwC were asked to assess the contribution IAG makes through its supply chain, the domestic and global connectivity enabled by its airlines' operations, and the economic contribution generated by this connectivity.

At PwC our purpose is to build trust in society and solve important problems. To this end, economic impact assessments such as these are important, in that they provide a more holistic view of the value created by firms than financial reporting does alone. Total impact modelling considers not only the value created directly by a firm, but the wider value to the economy generated by its entire supply chain. These metrics therefore help leaders and policymakers make decisions that benefit society as a whole.

We are delighted to present this UK economic impact assessment, focusing on the domestic contribution of IAG's activities to the UK economy. IAG's operations contributed £10.9bn to the UK economy in 2019, and supported 97,000 jobs. The catalytic impact of the tourism and business travel its airlines facilitate additionally contributed £7.2bn, and a further 105,000 jobs.

Additionally, IAG's cargo operations carried approximately 429,000 metric tonnes of cargo in 2019, reaching 136 countries; this represented 23% of UK air freight and is typically made up of the transport of high value goods.

Looking to the future, IAG's focus on sustainability and innovation means it is well positioned to continue growing its contribution to the UK economy, whilst taking steps to minimise the environmental impact of its activities. IAG was the first airline group to commit to net zero carbon emissions by 2050, and has also committed to net zero Scope 3 emissions by 2030. Its investment in new technologies such as sustainable aviation fuel and hydrogen-powered flight contribute to its strategy to achieve these objectives.

It has been a pleasure to work with IAG and its operating companies, visiting their sites, meeting their staff, and learning about their logistical operations and innovations. We trust you will enjoy exploring our findings in this report.

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Executive Summary

Figure 1: Key findings on IAG's contribution to the UK economy

IAG's activities contributed

£10.9bn to the UK economy in 2019

£5.4bn	£3.3bn	£2.2bn
Direct	**Indirect**	**Induced**

For every £1 spent by IAG in the UK, £2.22 of gross value added is generated throughout the UK's wider economy

IAG supported approximately

97,000 UK jobs in 2019

27,000	46,000	24,000
Direct employment FTE	**Indirect employment FTE**	**Induced employment FTE**

The tourist and business activities catalysed by IAG's flights contributed

£7.2bn to the UK economy in 2019

£3.5bn	£2.0bn	£1.7bn
Direct	**Indirect**	**Induced**

These activities additionally supported 105,000 UK jobs

c.58,000	c.28,000	c.18,000
Direct employment FTE	**Indirect employment FTE**	**Induced employment FTE**

Purpose of this report

IAG has commissioned PwC to conduct this economic impact assessment of IAG's activities in the UK. In it we analyse the contribution IAG makes to the UK economy, both in terms of traditional economic measures such as its contribution to GVA (gross value added) and jobs, and the catalytic economic benefits resulting from the connectivity enabled by its airlines, supporting trade, business activities, and tourism spending. In addition, we assess how IAG is supporting the decarbonisation of the aviation industry and driving innovation within the sector.

We have also completed companion reports on the impact of IAG's activities in the economies of Spain, Republic of Ireland and across the whole of the European Union which address these same topics in these geographies.

We used data provided by IAG to identify how the business activities of IAG and its airlines provide economic value, and we quantify this impact using recognised techniques. The data used in this report is from 2019 due to the large impact of the Covid-19 pandemic on air travel globally between 2020-2022. Whilst air travel is recovering strongly to the pre-pandemic level (with passenger numbers in the industry as a whole expected in 2023 to reach 86% of the 2019 peak) there is not a full year of data available from IAG at the time of writing.

Therefore, we consider 2019 to be the most representative year of data to indicate the economic value which IAG creates.

Key findings

IAG supports approximately 97,000 jobs in the UK and contributes £10.9bn to UK GVA. IAG supports a significant supply chain across the aviation sector and beyond, consisting of businesses in the UK and abroad, including thousands of small and medium sized companies. The tourism and business travel to the UK facilitated by IAG's airlines drives a further catalytic impact on the economy supporting an additional 100,000 jobs and £7.2bn of GVA in the UK.

As an airline group IAG provides economic and social benefits to the UK by enabling global and domestic connectivity in the movement of people and goods. British Airways (BA) is the most flown IAG airline in the UK and has been flying customers and goods from and around the UK for over 100 years. BA's Heathrow hub facilitates the movement of goods and people from the UK around the world efficiently, even when direct routes would not be feasible, thereby increasing the connectedness of Britain. IAG's other airlines, Aer Lingus, Iberia and Iberia Express, LEVEL, and Vueling add to its global reach. Flying 334 routes and directly connecting the UK to 81 countries, IAG's airlines play a critical role in connecting the UK with the world. This connectivity supports business activities and inbound tourist spending which bring value to the UK economy. IAG's airlines also facilitate trade, particularly of high value goods by using large bellyhold capacity on long-haul passenger flights. Additionally, IAG has a strong domestic presence, flying 13 routes within the UK which supports connectivity and economic growth across the nations and regions.

This report also identifies some of the broader contributions that IAG makes which will support the future of the UK economy. Firstly, the future of aviation will need to be more sustainable. IAG has been an industry leader in the decarbonisation of aviation, committing to net zero emissions by 2050 and investing in new technologies and sustainable aviation fuel as part of its transition to meet these targets.

We hope that you enjoy exploring the findings of this report and learning about the many ways in which IAG benefits the UK economy.

We have found that:

- IAG contributes £10.9bn gross value-added to UK GDP, made up of £5.4bn direct, £3.3bn indirect and £2.2bn induced contribution. This means that for every £1 spent by IAG in the UK economy, £2.22 of GVA is supported elsewhere across the economy.
- Through facilitating tourism and business travel, IAG's airlines support an additional £7.2bn of catalytic GVA and c.105,000 FTE jobs across the UK economy. This catalytic effect is particularly strong in hospitality, transport, culture, and recreation. This means that for each passenger who flies with IAG to the UK, there is a catalytic impact of £797 contributed to UK GVA.
- IAG supports c.97,000 FTE jobs across the UK economy made up of c.27,000 direct (industry operations), c.46,000 indirect (supply chain) and c.24,000 induced (resulting from spending by direct and indirect employees) employment. For every direct IAG employee, a further 2.5 FTE jobs are supported in the UK economy.
- Additionally, for every 1,000 passengers flying with IAG to the UK, 11.5 FTE jobs are supported through the catalytic spending of IAG passengers.
- IAG plays a major role in connecting the UK, both domestically and internationally. In 2019 IAG's airlines flew 13 domestic routes between 9 cities, transporting 5.5 million domestic passengers, and connected the UK to 81 countries with 334 international routes. Over 50 million of the total 297 million passengers using UK airports in 2019 travelled using an IAG airline.
- The 'hub-and-spoke' model operated by British Airways is unique in the UK, and plays a major role in connecting regions across the UK to the rest of the world in a way that would not otherwise be economically viable.
- IAG's airlines, including IAG Cargo, transported 428,520 metric tonnes of freight reaching 136 countries in 2019. Air cargo is disproportionately used for high value-added goods contributing to a positive air transport balance of payments.
- IAG is an industry leader in sustainability, setting industry leading targets for decarbonisation, prioritising a sustainability strategy, and investing in the technology needed to fulfil its transition plan and enable it to reach net zero emissions by 2050.
- IAG supports innovation as a means to respond to challenges the aviation industry is facing, with its core innovation platform Hangar 51 helping to support and scale emerging technologies across travel.

Introduction

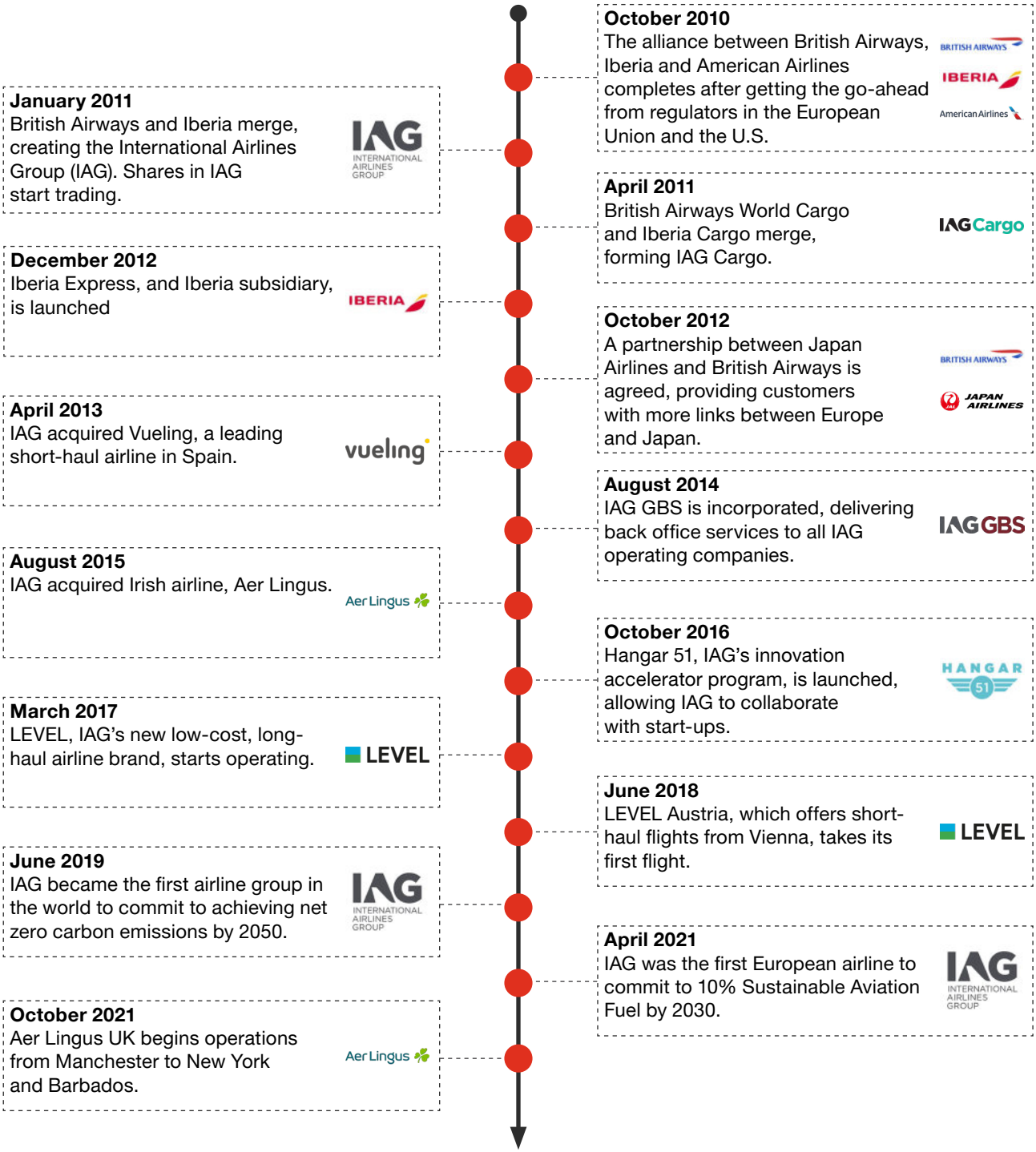
International Airlines Group

Overview

IAG is a global airline group which carried 118 million passengers to 279 destinations internationally in 2019. The group includes major airlines in the UK, Spain and Republic of Ireland: British Airways (including BA CityFlyer), Aer Lingus, Iberia (including Iberia Express), LEVEL, and Vueling. IAG is the group's parent company, and is dual registered on both the London and Spanish Stock Exchanges. Within the group, IAG's airlines maintain their distinctive brands and focus on their customers, the competitive environment and people, while IAG, at the corporate centre, works to drive synergies, and maximise group performance.

History

Launched in 2011, IAG has been increasing its global presence and capabilities over the last 12 years. Timeline of IAG.



Group Structure

IAG, as the corporate entity at the centre of the group, oversees coordination across the group, manages and executes central functions, creates synergies, and fosters collaborative working and the sharing of best practices.

IAG has three overall strategic priorities: strengthening a portfolio of world-class brands; growing global leadership positions; and enhancing IAG's common integrated platform. IAG has five airline brands: two "full service" carriers British Airways and Iberia, two "value" carriers Aer Lingus and Iberia Express and finally two "low cost" carriers, LEVEL and Vueling.

In addition, IAG has central platforms which run cross airline services: IAG Cargo which is the group's cargo division operating a global freight network; IAG Loyalty which manages loyalty products and services including running the Avios loyalty currency; IAG Global Business Services (GBS) which delivers centralised services across procurement, finance and airport operations; and IAG Tech which supports digital and IT across the group. Across IAG businesses there are cross-cutting coordination activities and central functions which are carried out at the group level. The key areas of intra-group coordination are across: fleet, maintenance, repair & overhaul, fuel, network, commercial, and customer. The common central functions at the group level are: investor relations, finance, people, sustainability, corporate affairs, communications, legal, strategy, and merger & acquisitions.

Figure 2: IAG's group structure

IAG's purpose is "to connect people, businesses and countries", which supports its vision to be the world's leading airline group. IAG is Europe's fourth largest airline group by passenger numbers (after Ryanair group, Lufthansa group, and Air France KLM). As of 2019 IAG's airlines flew from 16 airports in the UK, operating a total of 334 routes. IAG's airlines connect the UK to 81 countries, providing 321 routes which carry over 50 million international passengers annually. In 2019 18.6% of the total 297 million passengers using UK airports travelled using an IAG airline. Additional connectivity is provided because IAG and two of its airlines (BA and IB) are part of the oneworld alliance which enables additional connectivity for its passengers.

Report scope

IAG brands in scope of this report are: British Airways, Aer Lingus, Iberia, Iberia Express, Vueling, LEVEL, and IAG Cargo. For our purposes BA CityFlyer data is included in the British Airways analysis, and Iberia Express and LEVEL data is included within Iberia analysis. The format of data received from IAG is such that disaggregation of economic impacts by airline is possible in some but not all parts of our analysis. IAG Loyalty is not included in the scope of this project which concentrates on IAG's contribution from airline operations and associated impacts.

The modelling in this report is based on 2019 data, as this was the last complete year of representative data prior to the pandemic. 2020 and 2021 were abnormal years for the global travel industry due to the Covid-19 pandemic and associated travel restrictions, and a full year of 2022 data was not available at the time of preparing this report. The International Air Transport Association (IATA), the global airline trade association, expects numbers travelling in 2023 to be 86% of the 2019 peak.[1] The most recent data shows that the number of passengers using UK airports in December 2022 was 83% of December 2019 levels.[2] However, it is important to note that IAG's business has moved on in some key ways since 2019. For example, Aer Lingus UK based in Manchester began direct transatlantic services from the city to Barbados in October 2021, followed by New York JFK and Orlando MCO in December. This provides direct, non-stop business and leisure travel options for travellers and holidaymakers to North America and the Caribbean from the North of England. It is also important to note that IAG made approximately 9,000 redundancies in the UK as a result of the global pandemic, however it has since made around 11,500 new hires as demand has grown.

Report structure

In this report we analyse the contribution IAG makes to the UK economy, both in terms of traditional economic measures, and its broader role, such as in enabling connectivity and facilitating innovation. The report structure is as follows:

- Economic impact methodology
- UK Economic Impact
- Connectivity Impact
- Sustainability
- Innovation
- Appendix 1: Technical approach and detailed methodology
- Appendix 2: Additional Data

[1] https://centreforaviation.com/analysis/reports/ryanair-heads-europes-top-20-airline-groups-by-pax-2019-510111

[2] IATA, https://www.iata.org/en/pressroom/2022-releases/2022-12-06-01/

Calculating economic impact

Economic Impact Modelling

Direct, Indirect, and Induced impacts of IAG's UK operations

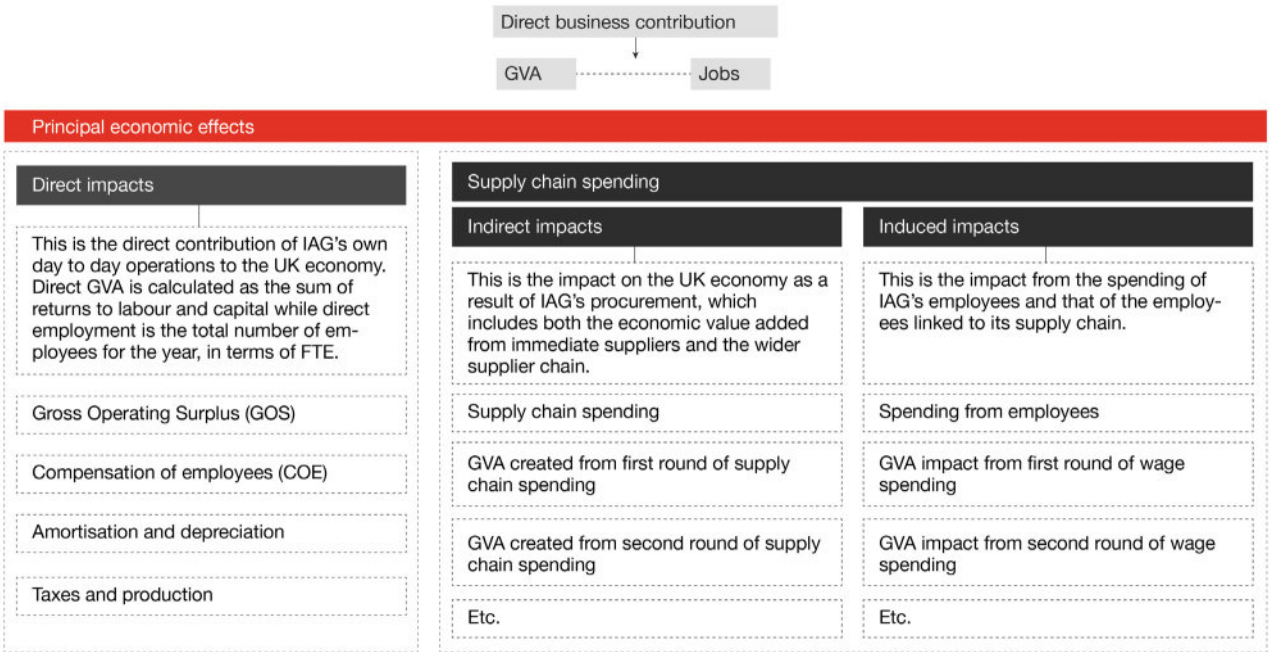
We present IAG's contribution to the UK economy in terms of two key economic indicators:

- **Gross Value Added (GVA)**
  - GVA is the value added produced by an organisation. This is a standard concept used by national statistical authorities, including the ONS, and is the equivalent of contribution to GDP, but with an adjustment to prices so that they don't include final taxes - that is, GDP but at 'basic prices'.
  - GVA encompasses the core, measurable, ways in which organisations such as IAG add value to the economy, including: operating profits; compensation of employees, taxes on production and measurement of depreciation and amortisation (these two account for the capital used by an organisation during the production process).[a]
  - This is equivalent to an industry's output less the value of the intermediate inputs used in the production process.[3]
- **Employment** – Annual full–time equivalent (FTE) jobs supported.

We set out IAG's economic impact across three key components:

- **Direct impact:** This is the contribution of IAG's own day-to-day operations to the UK economy. Direct GVA is calculated as the sum of returns to labour and capital, while direct employment is the total number of employees for the year, in terms of FTE.
- **Indirect impact:** This is the impact on the UK economy as a result of IAG's procurement, which includes both the economic value added from immediate suppliers and the wider supplier chain (for instance, the supplier of the supplier).
- **Induced impact:** This is the impact from the spending of IAG's employees and that of the employees linked to its supply chain.

Figure 3: Breakdown of the direct business contribution made by IAG to the UK economy



[a] GVA includes the consumption of fixed capital, as opposed to net value added (NVA) which excludes the consumption of fixed capital. We have used GVA rather than NVA in this assessment, so that our results can be considered in terms of GDP contribution.

[3] GVA quantifies the same set of economic activities as Gross Domestic Product (GDP) but in terms of factor cost.

We refer to the combination of direct, indirect and induced impacts as the “economic contribution” throughout the report.

Geographies

IAG’s airlines operate globally, but the scope of this report is capturing its economic contribution to the UK economy. We have produced companion reports which capture the economic contribution of IAG to the economies of Spain, Republic of Ireland, and the European Union.

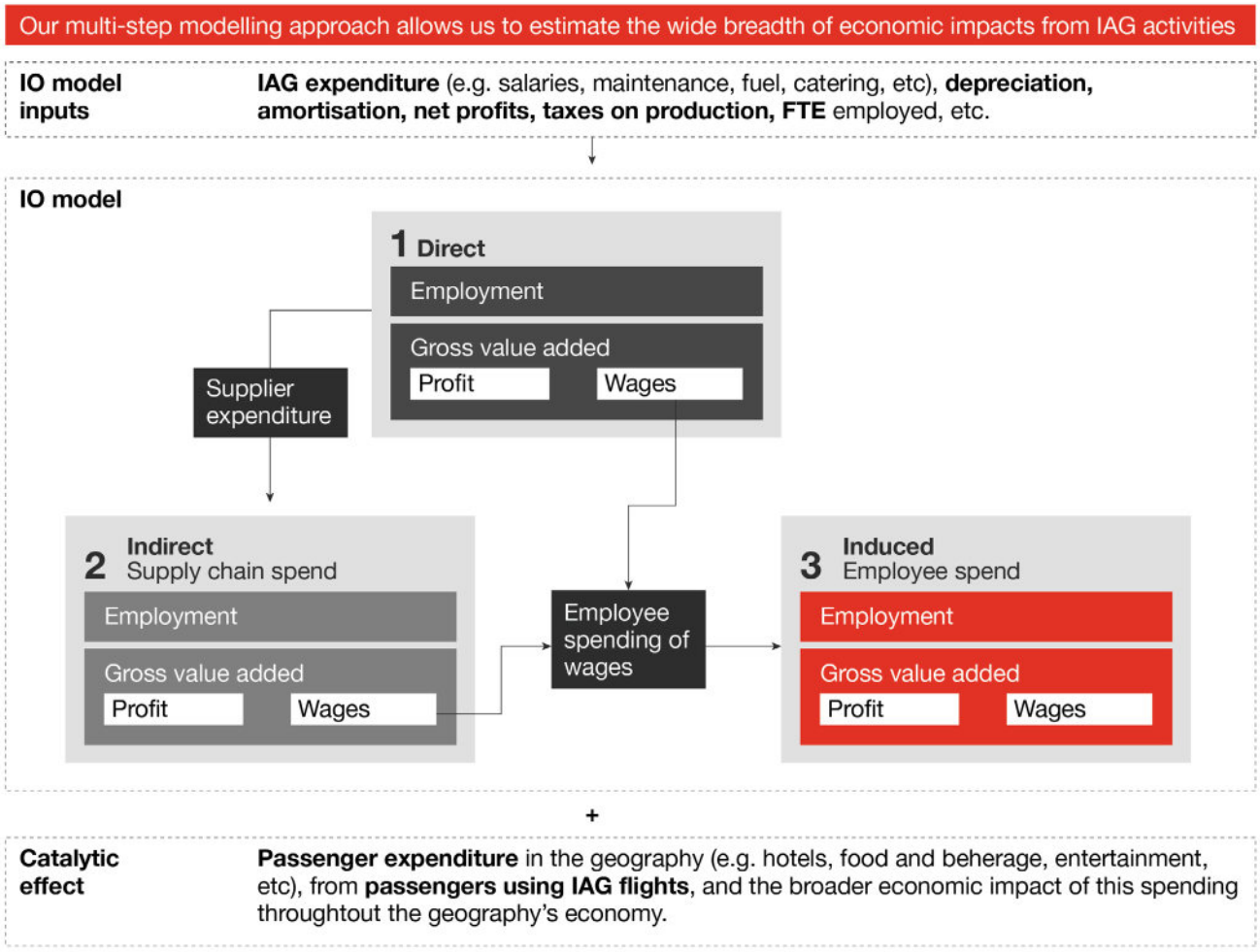
Industries

Our analysis segments the UK economy across 23 industry sectors for each country, chosen to best reflect IAG’s supply chain spending. We used the UK’s Standard Industrial Classification (SIC) codes as the basis for these sectors. We aggregate Division level SIC codes (consistent with the ONS Input Output tables) to a bespoke sectoral configuration, broadly aligned with SIC Section level codes. Sectors defined range from manufacturing to accommodation and food. In our reporting, we show only the biggest sectors impacted and group the remaining sectors into an ‘Other’ category. The nature of this ‘Other’ category differs for GVA and employment impacts.

Modelling approach

Figure 4 illustrates a simplified breakdown of our modelling approach, for IAG operations and catalytic spend. For a more detailed breakdown of our modelling methodology, please see Appendix 1.

Figure 4: Summary of economic impact methodology



UK economic impact

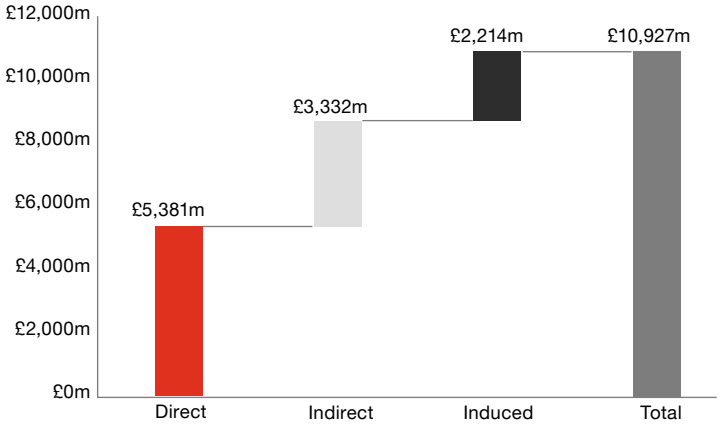
Direct Business Contribution

GVA Contribution

In 2019 IAG contributed £10.927bn to UK Gross Value Added (GVA). This contribution is composed of:

- **£5.4bn** direct contribution - from profits and wages and relevant taxes[4], all generated by IAG in the UK.
- **£3.3bn** indirect impact - through the supply chain purchases made by IAG in the UK, and
- **£2.2bn** induced impact - as IAG enables wage spending in the economy, via its own employees, and employees throughout its supply chain.

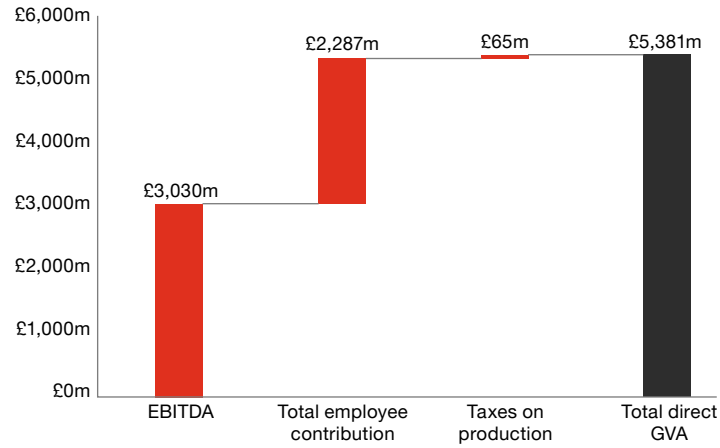
Figure 5: IAG contributed c.£10.9bn GVA in the UK economy through a combination of its direct, indirect and induced impacts in 2019



Direct GVA contribution

IAG's direct contribution comprises £3bn of employee compensation; £2.3bn of earnings before interest, tax, depreciation and amortisation (EBITDA); and £65 million of taxes on production, all associated with the UK.

Figure 6: IAG's direct economic impact was driven by its profitability (£3bn EBITDA) and compensation of employees (£2.3bn), in 2019



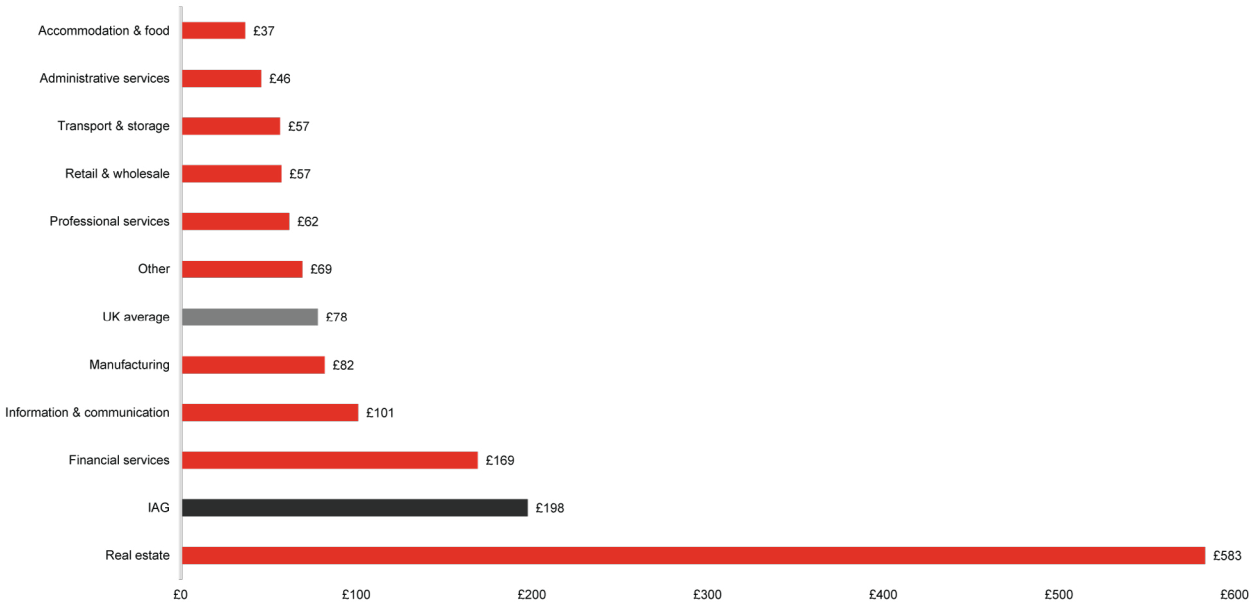
[4] Relevant taxes are any taxes on the production of goods and services, and not taxes on final goods or services sold, or taxes related to employment (such as National Insurance). For IAG, this includes only Business Rates contributions. For an overview of IAG's other tax contributions in the UK, please see the 'Contribution through taxes' section below.

The Direct GVA contribution of a company to national GDP is made up of gross operating surplus (GOS), taxes on production and compensation of employees (COE). Below, we provide a short explanation of each of these concepts, showing IAG's direct impact through each of these channels to the UK economy:

1. **Gross Operating Surplus (GOS):** this concept is broadly equivalent to EBITDA, in a company's financial accounts. For a company that operates across borders, such as IAG, the value of EBITDA associated with the UK economy is equivalent to IAG's taxable income in the UK. In this case, it relates to the income of British Airways Plc, which reported an EBITDAR of £3bn in 2019.[5] We include the EBITDA of British Airways Plc, and not other operating companies for which IAG publicly disclose profitability data, as the direct GVA associated with the UK is the element of IAG's EBITDA taxable in the UK. We include further information related to this in our methodology in Appendix 1.
2. **Compensation of employees (COE):** with respect to IAG, these have two main components: wages and salaries (including benefits in kind and pension contributions) and national insurance contributions from IAG to the UK Government. For 2019, IAG's total employment compensation to employees based in the UK was £2,287m.
3. **Taxes on production:** these are payments levied on the production of IAG's services that cannot be recouped by IAG. It does not include taxes on final sales, such as APD, and for 2019 amounts to £65m for IAG, with respect to the UK.

Overall, the direct GVA of IAG in the UK amounted to £5.4bn in 2019. When compared to the number of IAG employees in the UK, this is a comparatively high value add per worker. For example, Figure 7 displays the GVA per worker for the sectors in our analysis and the UK as a whole. The IAG average GVA of £198,000 per full time equivalent worker is significantly higher than that of the Air Transport industry (£81,000) and the UK average (£78,000); indeed its GVA per worker is second only to the Real Estate and Professional Activities sector. This stems from the relatively high profitability of IAG, and wage levels of its employees, compared to the average of the other UK sectors we have analysed.

Figure 7: IAG has a significantly higher GVA per full time equivalent worker than the UK average (£ '000s)

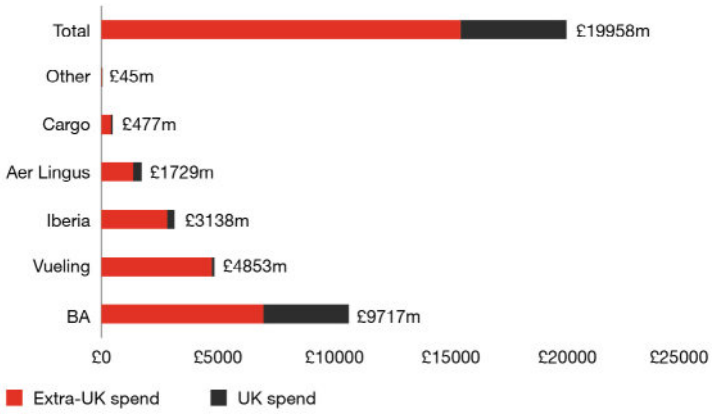


[5] EBITDAR is equivalent to EBITDA, but is also before any deduction for 'rentals'. In the case of IAG, it is most appropriate to use EBITDAR, as rental payments are conceptually associated with amortisation under the 'right to lease' arrangements.

Indirect and Induced GDP contribution

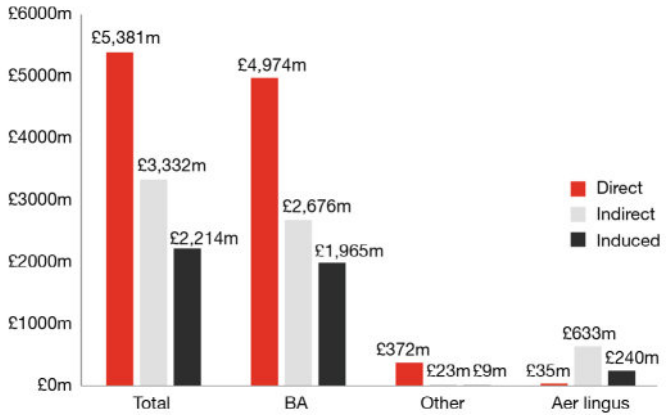
The indirect and induced contributions occur through supply chain and wage spending of IAG. In 2019, IAG's operational and capital expenditure amounted to an equivalent of £20bn. This operational and capital expenditure was through the channels of the different IAG operating companies, as displayed in Figure 8, below.[6]

Figure 8: Almost a quarter of IAG's total operational and capital expenditure was directed to UK suppliers, with a total expenditure of £20bn.



This operational expenditure and capital expenditure has knock-on effects on the GVA of IAG's supply chain, as employees spend their wages and suppliers purchase goods from other UK - based suppliers. Overall, IAG's supply chain (indirect impact) was £3.3bn, as IAG's suppliers contribute towards UK GDP, and the effect reverberates further throughout the supply chain. Moreover, IAG has an overall wage-spend (induced) impact of £2.2bn, as its relatively high proportion of wage spend creates further economic value throughout the UK economy.

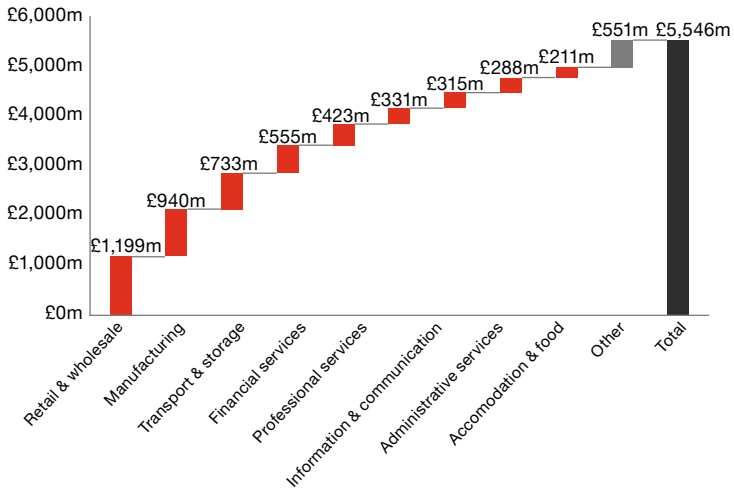
Figure 9: IAG's operational, capital and employment expenditure creates further £3.3bn and £2.2bn of value in the UK economy, through its supply chain and wage-spend impacts, respectively[7]



Through its operations, IAG generates a total GVA of £10.927bn in the UK economy. This can be disaggregated into direct, indirect and induced GVA impacts of £5.381bn, £3.332bn and £2.214bn respectively.

GVA can additionally be disaggregated by airline. British Airways generates 88% of overall IAG GVA in the UK, Aer Lingus 3.9%, Iberia and LEVEL 2.8%, IAGCL 0.9%, Vueling 0.6% and Other 3.7%. It is expected that BA would have the largest impact as the majority of operational expenditure from IAG is incurred by BA, whilst the wage spending of BA in the UK is considerably higher than other IAG airlines.

Figure 10: IAG generated value across a wide range of sectors in the UK economy, with GVA impacts by sector were largest in the wholesale and retail trade sector (c.£1.2bn)



[6] It should be noted that the definitions of operational expenditure and capital expenditure may not align with that in any given financial account, as operational expenditure so defined above does not include compensation of employees (COE), which typically would be included in Financial reporting. COE is accounted for by our model, though we do not display it above.

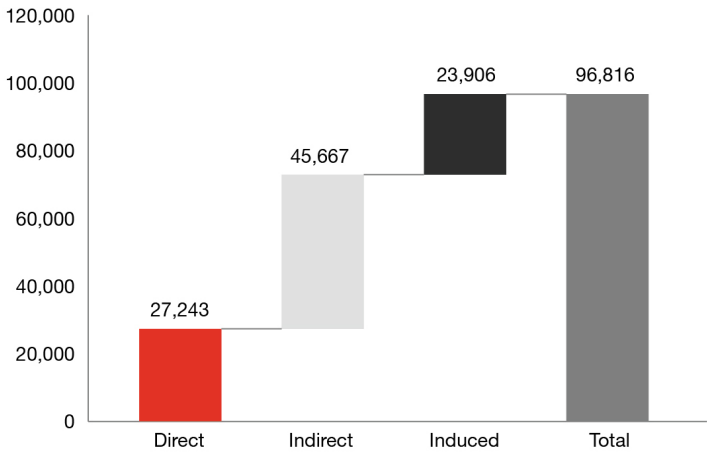
[7] Please note that the 'Other' category in Figure 9 also includes Iberia, IAG Cargo and Vueling.

Indirect and Induced GVA impacts by IAG by sectors in the UK economy

Based on our sectoral classifications, IAG generates the greatest GVA in the wholesale and retail sector, as a result of the supply chain and wage spending impacts.

IAG's impact across these sectors shows a fairly even spread across important sectors in the economy. This is explained by IAG's supply chain activities, which stretch into other sectors such as real estate and administration, e.g. from the spending impact at airports. This in turn generates significant value across a wide variety of sectors, generating positive supply chain impacts. There is a marked impact in the Air Transport, Manufacturing (generally) and the Manufacturing and Repair of Aircraft, specifically. This is unsurprising, given the nature of IAG's business.

Figure 11: IAG supported c.97,000 full time equivalent jobs in the UK economy in 2019



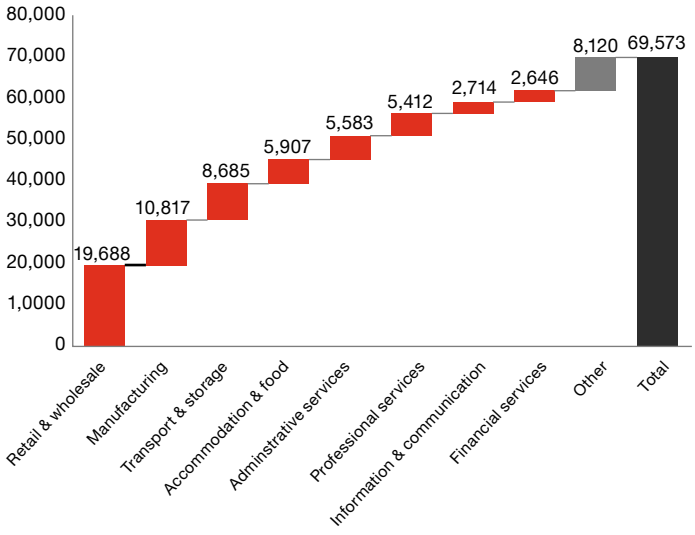
Contribution to employment

In 2019 IAG contributed 96,816 full time equivalent (FTE) jobs to the UK economy. This contribution is comprised of:

- **27,243** direct contribution - IAG's FTE employees within the UK[8]
- **45,667** indirect impact - jobs created through the supply chain purchases made by IAG in the UK, and
- **23,906** induced impact - jobs created throughout the supply chain as IAG triggers wage spending in the economy, via its own employees, and employees throughout its supply chain.

This results in a high employment multiplier of 3.55, so that for every one job supported by IAG in the UK, a further 2.5 jobs are supported in the wider UK economy. This high direct and indirect impact reflects the relatively high levels of operational and capital expenditure within the UK necessitated by IAG's operations, as well as the high relative pay of IAG employees. As with GVA, BA is the IAG airline that contributes the most to direct employment in the UK, accounting for 98% of IAG's total employees in the UK.

Figure 12: IAG supported c.70,000 indirect and induced jobs across a wide range of sectors in the UK economy



[8] It should be noted that IAG employed approximately 40,000 people in the UK in 2019, but not all of these were full time. https://www.iairgroup.com/~/media/Files/I/IAG/documents/IAG%2520Annual%2520report%2520and%2520accounts%25202019.pdf

The sectoral split of jobs supported by IAG in the UK differs from the sectoral split of GVA as a result of the relatively different employment intensities of each sector. The real estate and professional activities sector, the biggest sector according to GVA contribution, is relatively less significant for employment given its low employment intensity.

19,688 jobs are supported in the retail and wholesale sector, with a further 10,817 supported in the manufacturing sector. Accordingly, IAG's activities in the UK support a wide variety of sectors, in different ways, with labour intensive industries benefiting from its supply chain impact.

The number of direct jobs supported by IAG was reduced during the Covid-19 pandemic, as in light of legislative restrictions and reduced demand for air travel IAG made 9,000 UK redundancies. However, IAG has since employed an additional 11,500 people, indicative of the strong recovery in the sector.

The supply chain impact of IAG as a whole compares broadly with that of BA specifically, with the ordering of jobs supported by sector the same for both. This is explained in large part by the substantial weighting of BA in the IAG total in terms of indirect and induced employment impacts.

Contribution through taxes

IAG also supports the UK economy through its contributions to the exchequer, directly paying £543m tax in 2019; its activities additionally facilitated the contribution of £322m of income tax, and £123m National Insurance contributions, resulting from direct employment, and £856m in Air Passenger Duty.[9]

[9] IAG audited Financial Accounts, FY19

Connectivity

This section analyses the connectivity impacts derived from IAG airlines operations on:

- Passenger connectivity and hub effects
- Economic value of connectivity in terms of GVA, employment, and investment
- Catalytic impact derived from tourist expenditure
- Trade and cargo

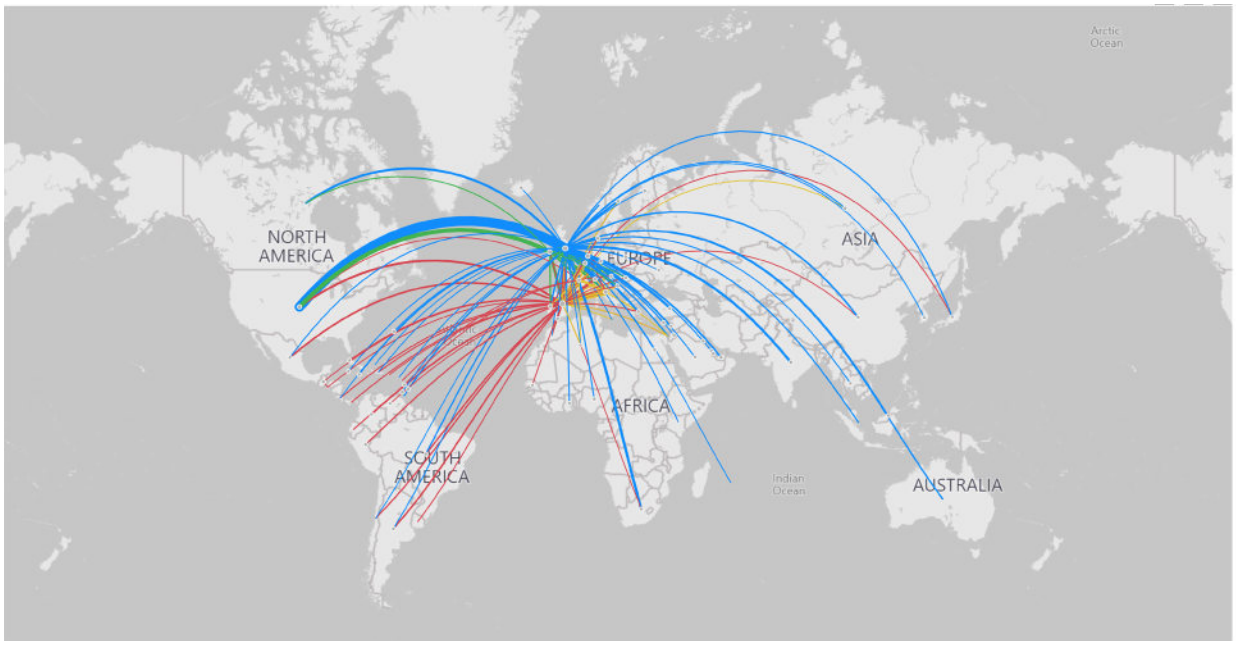
IAG's airlines provide connectivity globally, including within the UK, and between the UK and the world. In this section of the report we set out the global scale of IAG's airlines operations, and specifically the connectivity it provides to the UK. We then identify the economic benefits which are generated in the UK as a result of this connectivity provided by IAG's airlines, including trade, tourism and business impact.

IAG provides a unique platform that enables the group airlines to efficiently fulfil its purpose: to connect people, businesses and countries around the world. The role of the group and its operating airlines is key in enabling social connectivity, including for families, and for social networks that are dispersed across the world. In addition, IAG airlines support business through enabling the freight of goods and making it easier for companies to establish business relationships from in-person meetings. Finally, the group contributes to the social and economic development of many regions around the world by offering frequent connecting flights from a great number of countries as well as committing with social initiatives such as vaccines transportation during Covid-19.

The enabler to achieve IAG's purpose "to connect people, businesses and countries around the world" is the global network that the group has developed. The network allows people and business to move between different countries and continents with a large and adapted offer to all needs through its diversity of airlines, ranging from full service to low cost and the leadership positions of these companies in the markets in which they operate. Each of the airlines operates-independently but has the support of the group to adapt best practices, capital and operational efficiency and therefore, be able to offer a better and more competitive service to its customers.

IAG airlines offer connections all around the world; Figure 19 depicts the routes offered by IAG in 2019, this being the last full year with representative data before the Covid-19 pandemic. IAG airlines connected 101 different countries, carrying 118.7 million passengers across the world in 2019. The airlines together offered 1,076 different routes, 891 of which were international, carrying 90.7 million passengers, and 185 were domestic[10], carrying almost 28 million passengers. Most of the routes have the United Kingdom, Spain or Republic of Ireland as either the origin or/and destination of the flight as these are geographic homes of IAG's airlines.

Figure 19: IAG airlines operated 1,076 routes in 2019, connecting 101 countries around the world with the United Kingdom, Spain and Republic of Ireland



Source: IAG database.[11] Note: Flows are expressed in number of passengers (i.e. a thicker line shows a larger number of passengers)

[10] We refer to domestic routes to all the routes that connect two cities or villages within a country (e.g. Madrid Barajas - Barcelona El Prat or London Heathrow - Manchester would be categorised as domestic routes whereas Madrid Barajas - London Heathrow would be categorised as an international route).

[11] The graphics in this document exclude routes to Russia and Ukraine which were flown in 2019 but have since ceased due to the ongoing conflict.

Description of each of IAG's key airline's operations globally

British Airways (registered in the UK, subsidiaries: BA CityFlyer)

British Airways is the largest airline within IAG, carrying more than 48 million passengers in 2019 and operating 298 routes[12], connecting the UK internally and to the world. British Airways has a hub at London Heathrow, the airport which most of its routes fly to or from, and where British Airways has a 46.5% share of total passengers using the airport. Through its hub-and-spoke model, British Airways connects 9 cities in the UK with 81 countries, with its most popular destinations being New York, Edinburgh, and Glasgow.

Iberia (registered in Spain, subsidiaries: Iberia Express, LEVEL)

Iberia carried more than 24 million passengers in 2019, operating a total of 255 routes within Spain and around the world. The main domestic routes operated in were Madrid - Barcelona and Madrid - Tenerife, while the main international route was Madrid - London Heathrow. Iberia also has a hub-and-spoke operating model, with Madrid Barajas a hub airport that in 2019 connected 29 Spanish cities with 106 cities around the world, with 43% of Iberia's total passengers using this airport. In addition, Iberia is the main airline connecting Spain to the Americas with 54.7% of passengers travelling between Latin America and Spain using Iberia.

Vueling (registered in Spain)

Vueling provides connectivity within Europe, flying between 137 European cities in 2019, carrying 34.5 million passengers across 421 routes. Barcelona is the main route that Vueling flights operate from, involved in 31% of Vueling routes, and from which the most popular destinations were Palma de Mallorca, Paris Orly, and Ibiza. In addition to connecting major cities in Europe, Vueling also flies to countries in the Mediterranean basin and Africa including Morocco, Algeria, Lebanon, Israel, Egypt and Senegal.

Aer Lingus (registered in the Republic of Ireland)

Aer Lingus carried 11.6 million passengers in 2019 and operated a total of 102 routes. More than 83% of the routes connected countries within Europe, with 97% having either the origin or destination in the Republic of Ireland. The most common route by number of passengers was Dublin - London Heathrow, which carried 1.1 million passengers, followed by Dublin - London Gatwick and Dublin - Paris. In 2021 Aer Lingus reinforced its international connectivity network by starting operations from a new hub in Manchester airport, enabling it to offer direct transatlantic connectivity from Manchester to the US and Caribbean.

The number of passengers IAG carries[13] has grown on average 10.9% per annum between 2011 and 2019, with an aggregate growth rate of 130% between 2011 and 2019 due to a combination of organic growth and acquisition. Since the group's creation in 2011 following the merger of British Airways and Iberia, IAG has acquired companies and created new brands to provide more adapted services to their customers. The group's structure allows the different brands to focus their efforts on their addressable markets, customer proposition, cultural identities, commercial strategy and industrial relations.

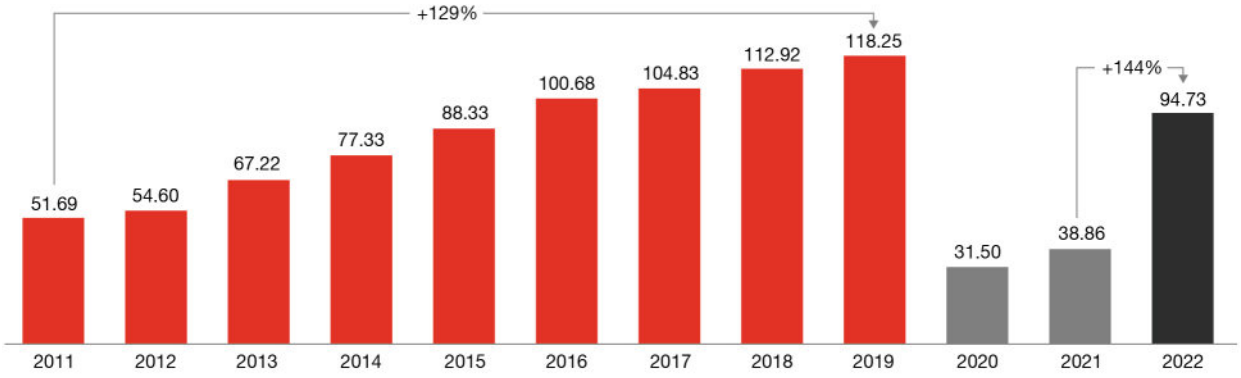
Passenger numbers during the 2020 and 2021 were significantly negatively impacted by travel restrictions associated with the Covid-19 pandemic; however there has been strong growth in passenger numbers during the first three quarters of 2022, reflecting a return to normality in the industry. From 2021 to 2022 IAG's passenger growth was 144%, outperforming the global airline industry.[14]

[12] Source, IAG database

[13] In order to be consistent with the technical literature in this field we note that a passenger is a seat on a plane. Therefore typically a traveller will be a passenger twice - once on their outbound and once on their inbound journey. A traveller is someone who moves between different geographic locations, for any purpose and any duration. A visitor is a traveller who is taking a temporary trip for the purpose of business or leisure. A tourist is a visitor if their trip includes an overnight stay. As we are reporting around air travel, almost all visitors will be staying overnight and therefore are tourists too. For simplicity we will use 'passenger' unless otherwise noted.

[14] IATA. Passenger Demand Recovery Continued in December 2022 & for the Full Year. Press Release No: 4. Date: 6 February 2023, https://www.iata.org/en/pressroom/2023-releases/2023-02-06-02/#:~:text=International%20traffic%20in%202022%20climbed,compared%20to%20the%20prior%20year

Figure 21: IAG airlines carried 118.73 million passengers in 2019, with an aggregate growth of 129% since 2011 and a fast recovery in 2022 from the Covid-19 pandemic



Source: IAG Group (Traffic statistics report)

Besides carrying passengers, IAG contributes to international trade growth through the freight of high value goods mainly using the large bellyhold capacity existing in its long-haul passenger flights operated by British Airways, Iberia and Aer Lingus. IAG Cargo is the goods transport division of IAG Group operating an air freight network, reaching 136 countries[15] and carrying more than 428,520 metric tonnes[16] of freight across the world in 2019.[17] IAG Cargo can operate in every destination reached by IAG operating airlines' network and is used by over 10,000 businesses (clients) to move goods around the world. IAG freights over 23% of total air cargo into and out of the UK.

IAG airlines have different geographical bases, scales, and routes. In terms of number of passengers, British Airways carried 41% of total IAG passengers in 2019, followed by Vueling with 29%, Iberia with 20% and Aer Lingus with 10%. Below is a description of each of the key airline's operations globally.

Figure 17: The UK is the main country of origin[18] for IAG passengers, facilitating connections to 38.6 million passengers within the UK and around the world

Source: IAG, National Statistics Institutes (ONS, INE, CSO)

[15] IAG Cargo uses subcontractors to reach countries where IAG airlines do not have routes.

[16] IAG Cargo has provided data on cargo weight but not regarding cargo value

[17] Bellyhold space refers to the vacant space in the bellyhold of passenger aircrafts that are operated by IAG airlines after the travellers' luggage has been loaded.

[18] The country of origin refers to the place where the passenger takes off initially, the initial departure country of its journey. For instance, a passenger that flies from London Heathrow to Glasgow and comes back to London Heathrow, has its origin in London Heathrow.

[19] Civil Aviation Authority and IAG

[20] OAG. Megahubs Index. 2019.

[21] OAG. Megahubs Index. 2019.https://www.oag.com/reports/megahubs-2019?hsCtaTracking=4a9f7ab4-f84a-4b25-bb00-f6e5d000f5f5%7Cef051829-3bca-4a78-8769-3e3e0f4b8a4e

IAG passengers connectivity in the UK

In 2019 IAG's airlines flew from 16 airports in the UK, operating a total of 334 routes from these airports in 2019. IAG's airlines connect the UK to 81 countries, offering 321 international routes which carry 49.9 million international passengers annually, and 13 domestic routes carrying more than 5 million passengers. Overall, IAG group transported more than 55 million passengers using UK airports, representing 18.6% of total UK passenger movements in 2019.

Heathrow as a hub

Heathrow plays a key role in helping to connect the UK to the world. As noted in this report, through British Airways, IAG operates a hub-and-spoke model in the UK which enables strong connectivity between regions across the UK and many global destinations via a hub at London Heathrow. This is beneficial to both passengers and cargo, because it provides a global network which is easily accessible to people right across the UK. IAG has a very strong presence at Heathrow airport - 38.8 million IAG passengers used Heathrow in 2019, which represented 48% of the total airport's passengers.[19]

London Heathrow is the UK's only hub, and as a result of its operating model in 2019 IAG had almost 50% of the market share at London Heathrow.[20] During this year Heathrow was the world's most internationally connected airport, with over 65,000 international connections possible within a six-hour window on the busiest day of the year.[21] This demonstrates the scope of the connectivity benefits of IAG's hub-and-spoke model. Heathrow also plays a key enabling role for IAG Cargo, with 87.7% of total UK cargo moving through the airport. This scale enables Heathrow to compete with other European hubs such as Amsterdam Schiphol, Paris Charles de Gaulle, and Frankfurt, therefore enabling the UK to compete internationally.

One of the main benefits of this model is the fact it enables passengers from across the UK to book flights from their local airport, with enhanced frequency, to international destinations that would not be economically viable with a point-to-point model. Where there are not sufficient numbers of people wanting to travel directly between two given destinations, an interchanging hub allows for passengers to be aggregated from multiple first leg flights onto a second flight to the destination. This also has a side effect of allowing more frequent connections between destinations and fuller flights, which is environmentally preferable.

This model also supports the economy in regions across the UK and the levelling up agenda by enhancing connectivity within the UK. The nature of this model provides a convenient supply of domestic flights within the UK, connecting all regions of the UK to London within a time period far shorter than possible by road or rail. This convenient connectivity between London and the regions supports economic activity across the UK, by creating time savings and improving productivity. Academic studies have shown that good airline connectivity is crucial in attracting the formation of new firms in an economy, and that this supports local employment.[22] [23] It can additionally be shown that this effect is particularly strong in areas in the immediate proximity of the connected airport.[24]

There is also evidence to suggest a hub-and-spoke model has environmental benefits over point to point. Flying more passengers on fewer (albeit typically larger) aircraft has been shown to reduce total pollutant emissions by nearly 30%, although this is not true for all categories of emissions.[25] British Airways additionally has a significant long-haul leisure operation from Gatwick, and in 2022 launched its EuroFlyer subsidiary, also operating from Gatwick. British Airways, through its regional subsidiary CityFlyer, also has significant operations from London City Airport.

Connecting the UK internationally

In 2019 IAG's airlines operated 321 international routes from 11 UK airports, flying a total of 49.9 million passengers. The key airport for international flights was London Heathrow which operated 49% of the international routes operated by IAG airlines in the UK, followed by Gatwick (26%) and London City (10%). International routes are also flown from Scotland (Edinburgh), Wales (Cardiff), Northern Ireland (Belfast) and Manchester. The routes with the highest number of passengers were flights between London Heathrow and the destinations of Dublin (1.8 million passengers[26]), Madrid (1.7 million passengers[27]) and New York (1.3 million passengers). The network offered by IAG from the UK is extensive, with connections to countries such as the United States, Canada, India, Japan, Australia or Brazil.

[22] Civil Aviation Authority and IAG

[23] OAG. Megahubs Index. 2019.

[24] OAG. Megahubs Index. 2019.https://www.oag.com/reports/megahubs-2019?hsCtaTracking=4a9f7ab4-f84a-4b25-bb00-f6e5d000f5f5%7Cef051829-3bca-4a78-8769-3e3e0f4b8a4e

[25] Brueckner, 2006: https://journals.sagepub.com/doi/abs/10.1080/00420980320000943887journalCode=usja

[26] Bel & Fageda, 2008: https://www.researchgate.net/publication/5213406_Getting_There_Fast_Globalization_Intercontinental_Flights_and_Location_of_Headquarters

[27] Button & Taylor, 2000: https://www.sciencedirect.com/science/article/abs/pii/S0969699700000156

[28] Sun, Wang, and Hang, 2020: https://www.hindawi.com/journals/ddns/2020/3682127/

[29] Including routes operated by British Airways and Aer Lingus.

[30] Including routes operated by British Airways and Iberia.

Figure 22: IAG airlines carried 49.9 million passengers in international flights, with British Airways operating 85% of these flights

Source: IAG database. Note: Flows are expressed in number of passengers

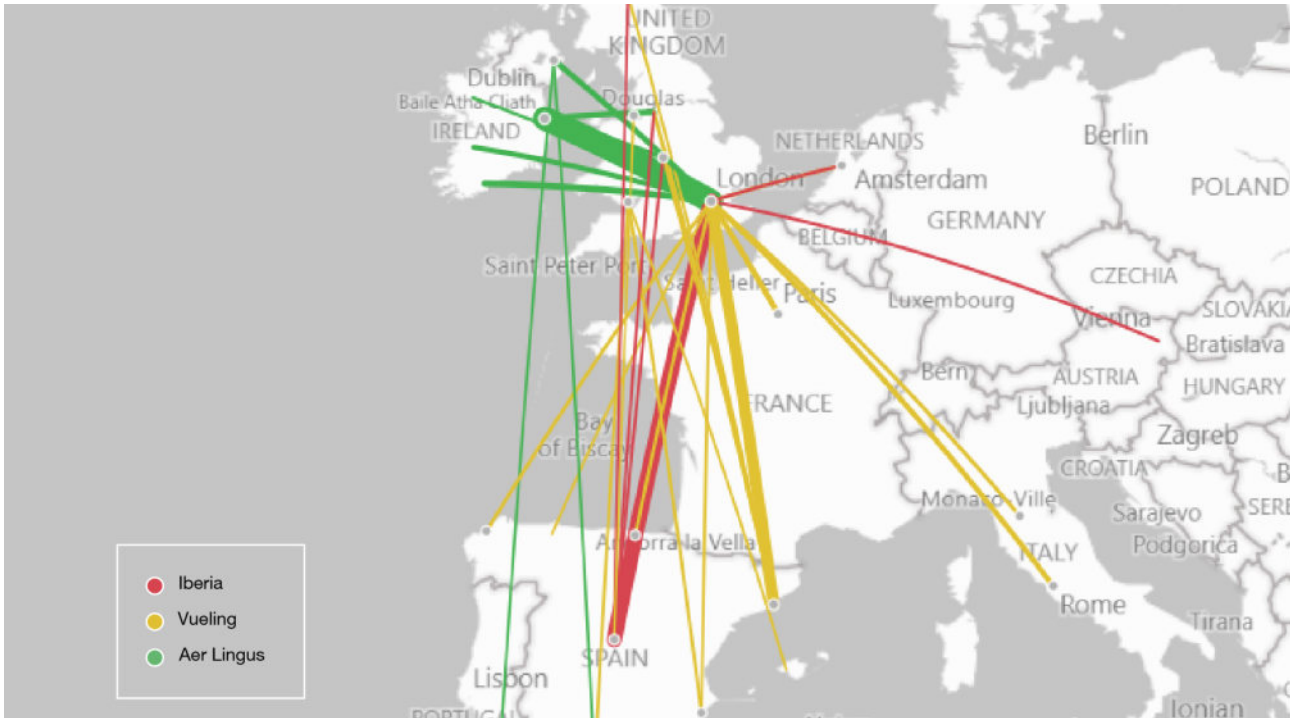
British Airways is a core part of the connectivity IAG provides between the UK and the rest of the world and was the largest IAG airline in the UK by number of passengers and routes in 2019. British Airways operated 298 routes in 2019 (89% of total IAG routes in the UK), of which 285 were international (carrying 42.9m passengers), and 12 were domestic (carrying 5.3m passengers). British Airways operated 85% of all the IAG airline international flights in the UK, with 73% of these flying from BA's Heathrow hub.

In 2019 British Airways flew to 81 countries, and was the main IAG airline for travel between the UK and other European countries, the US and Commonwealth nations. British Airways is the second largest UK airline by number of passengers flown in 2019, representing 31% of UK-based airlines' passengers (1.1bn in 2019, Civil Aviation Authority[28]).

While British Airways' activities make up a large proportion of IAG's activities in the UK, the other IAG airlines provide enhanced connectivity between the British Isles and the rest of the world. Aer Lingus connects the Republic of Ireland with the UK, carrying more than 1 million passengers on its main route between Dublin and London Heathrow in 2019, giving easy access for Irish passengers to Heathrow, which serves as a hub connecting Aer Lingus passengers to the full array of IAG destinations. Aer Lingus also connects Belfast with destinations in Europe including Spain (Malaga) and Portugal (Faro). Moreover, the airline has recently reinforced its services by offering new international routes from Manchester to cities such as New York, Orlando and Barbados. Iberia offers many connections through its Madrid Barajas airport hub, from which the airline operates routes across the world, particularly to Latin America. Finally, Vueling connects the UK with Barcelona, Paris, Rome and other smaller cities in Spain and Italy.

[31] Civil Aviation AuthorityL https://www.caa.co.uk/data-and-analysis/uk-aviation-market/airports/uk-airport-data/uk-airport-data-2019/annual-2019/

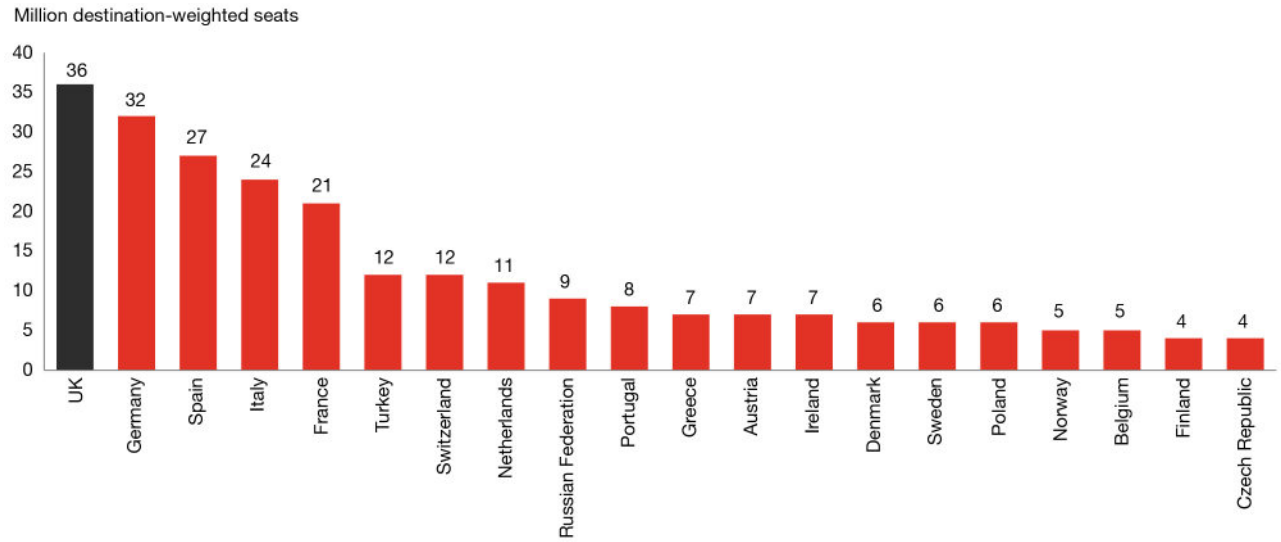
Figure 23: The remaining 15% of IAG international flights to/from the UK were operated by Aer Lingus, Vueling and Iberia, with Dublin, Barcelona and Madrid the main international destinations for these airlines



Source: IAG database. Note: Flows are expressed in number of passengers

As a result of this network the UK was the most connected country in Europe by destination seats, followed by Germany, Spain, Italy and France according to the IATA Connectivity Index, which measures the degree of integration of a country into the global air transport network.[29] Figure 24 shows the top 20 most connected countries in Europe (in terms of international air connectivity) in 2019.

Figure 24: Top 20 most internationally connected countries in Europe in 2019:



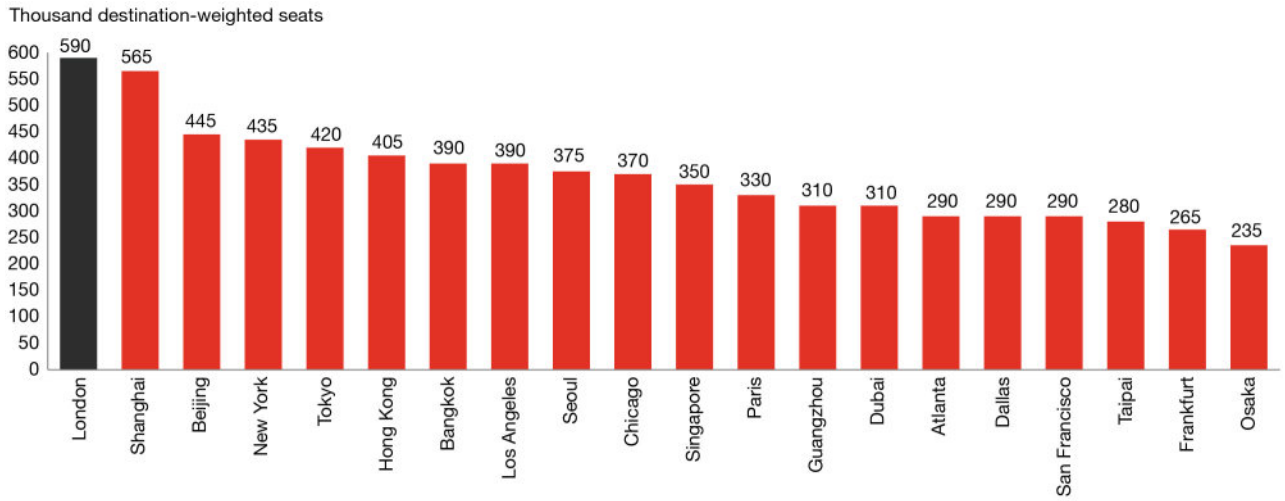
[32] "The connectivity indicator is based on the number of available annual seats to each destination in 2019. The source of available seat capacity is SRS Analyser, a comprehensive database containing passenger and cargo schedules for more than 900 airlines worldwide. The number of available seats to each destination are then weighted by the size of the destination airport (in terms of number of passengers handled at that airport in each year)". IATA. Air Connectivity. Measuring the connections that drive economic growth . 2020. https://www.iata.org/en/iata-repository/publications/economic-reports/air-connectivity-measuring-the-connections-that-drive-economic-growth/

Out of the top 10 Global International Routes in 2019 the only non-Asian Route was New York JFK - London Heathrow, ranking 8th with 3.8 million seats.[30] British Airways, with 1.3 million passengers on the route Heathrow - New York JFK, carries 34% of total passengers on this route.

Within Europe the busiest international route was Dublin - London Heathrow, with 2.3 million passengers in 2020. The fifth and sixth European international routes are connecting LHR with Frankfurt (2.2 million) and Amsterdam (2.1 million) respectively. IAG, with 1.8 million passengers (1.1m by Aer Lingus & 0.7m by British Airways) on the route Heathrow - Dublin, carries 78% of the passengers on this route.

According to the same IATA study, in 2019 London kept its position as the best connected city followed by Shanghai and Beijing.

Figure 25: Top 20 global cities for air connectivity in 2019



Source: IATA

As of 2022, London Heathrow still ranks the top airport in Europe according to the Top 50 Global Megahubs[31], followed by Istanbul in Turkey, and Paris Charles de Gaulle in France, with almost the same number of destinations served as it had in 2019, albeit with fewer connections.

Passengers travel to the UK for a variety of reasons. Out of the total passengers arriving to the UK by air 41% travel for holiday, 33% to visit friends and relatives, 18% for business purposes, and 8% for other reasons.[32]

The strong performance of London in rankings such as the fDi's European Cities and Regions of the Future 2018/19 is supported by the excellent connectivity the city has. According to the report London continues to attract more FDI projects than any other city in Europe due to its talent, infrastructure, and capital.[33]

London ranked number 1 (for the 8th consecutive year) in Global Power City Index 2019[34] comprehensive ranking, and it ranked second, only after Paris, in terms of accessibility; this is driven by categories such as international network (Cities with direct International Flights and International Freight flows), Air Transport capacity (Number of Air passengers and Number of Runaways), Inner-City Transportation (station Density, Public Transport use & Travel Time to Airports) and Transport Comfortability (Commuting Time, Traffic Congestion and Taxi fare).

IAG UK domestic connectivity

IAG's airlines operated 13 domestic routes in the UK (12 by British Airways and 1 by Aer Lingus), connecting all four nations of the UK. Heathrow, which is British Airways' hub, is the origin or destination airport for 4.3 million domestic passengers, accounting for 77% of IAG domestic passengers in the UK. Of the 13 domestic routes, eight of them connect England to Scotland, with the busiest domestic route connecting Heathrow and Edinburgh with approximately 0.9 million passengers annually. British Airways is the main airline of domestic IAG flights in the UK since it carried 5.3 million passengers, a 95% of total IAG domestic passengers in the UK.

[33] OAG. Busiest Routes 2020.April 2020.

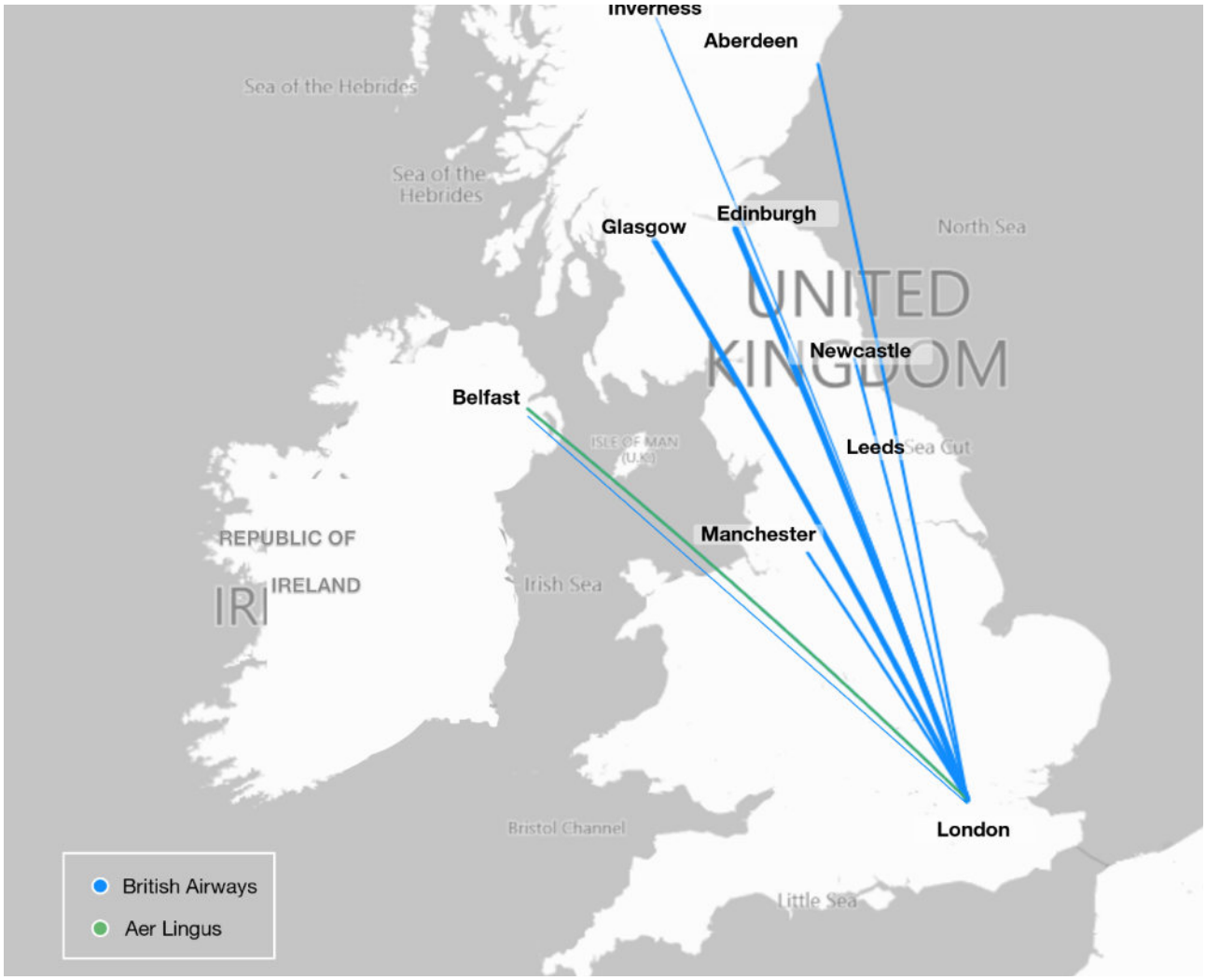
[34] OAG. Megahubs. 2022.

[35] International Passenger Survey (IPS).

[36] London still tops the fDi's European Cities and Regions of the Future 2023.

[37] Global Power City Index. Institute for Urban Studies. 2019. The Mori Memorial Foundation.

Figure 26: British Airways carried 95% of the passengers who flew in UK domestic flights with London connected to 8 different cities in England, Scotland, Wales and Northern Ireland [35] [36]



Source: IAG database. Note: Flows are expressed in number of passengers

In addition to the benefits of these flights for domestic connectivity they also support IAG's hub-and-spoke network to enable passengers (and freight) from across the UK and Republic of Ireland to access IAG's vast network of international flights via London Heathrow.

Economic value of connectivity

The air connectivity which IAG's airlines bring provides economic benefits to the UK economy. Air transport enables key flows such as tourism, trade, investment, and knowledge. Air routes that connect cities contribute to economic growth by boosting the supply side of the economy and facilitating investment flows. Key economic variables which are affected by spillover benefits of air connectivity are:

- GDP
- Employment
- Tourism, including education tourism
- International trade (goods and services)
- Foreign Direct Investment

[38] The routes of London - Isle of Man and London - Jersey are not included as domestic routes since the two destinations are not considered to be part of the United Kingdom, but self-governing British Crown dependencies.

[39] Flights to Leeds Bradford were in operation in 2019, but are not currently on the IAG network.

[40] Higher Education Policy Institute: https://www.hepi.ac.uk/2021/09/09/international-students-are-worth-28-8-billion-to-the-uk/

The UK economy has a strong services focus, with large sectors in finance & insurance, real estate services, professional and technical services, and IT & communication services. Firms operating in these sectors are likely to benefit from the high connectivity provided by IAG transport services. UK universities are globally renowned, with international students making up 20% of all student places, which is worth £28.8bn to the UK economy.[37]

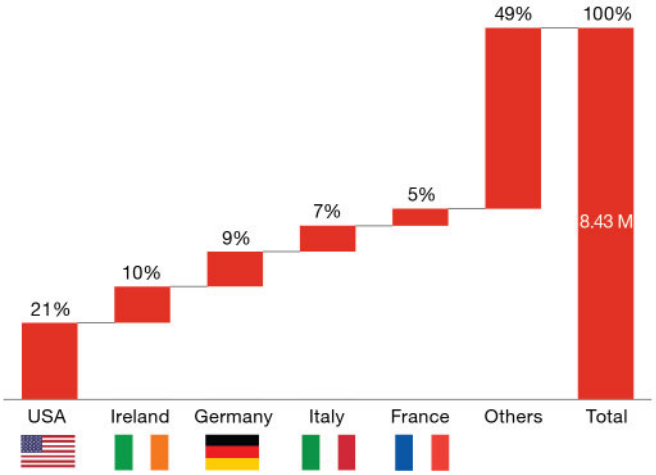
In this section of this report we firstly describe and then quantify the catalytic economic benefit to the UK economy of the passengers brought to the UK by IAG, and then we discuss the importance of IAG's cargo operations for UK trade.

Passenger inflow to the UK by IAG

People from across the globe arrive in the UK for leisure, business, education purposes and personal travel on IAG's airlines. 11.4 million passengers arrived in the UK in 2019 on IAG services. 75% of these were international passengers (8.43 million), with the most common destination they travelled from were the US (1.7m), Republic of Ireland (822,000) and Germany (792,000).

Of the total US passengers arriving in the UK, 44% travelled using IAG airlines; this was 37% for passengers arriving from the Republic of Ireland, 28% for passengers arriving from Italy, 31% of the passengers from Germany, and 24% of the passengers arriving from France.

Figure 27: IAG international passengers to the UK by departing country, 2019

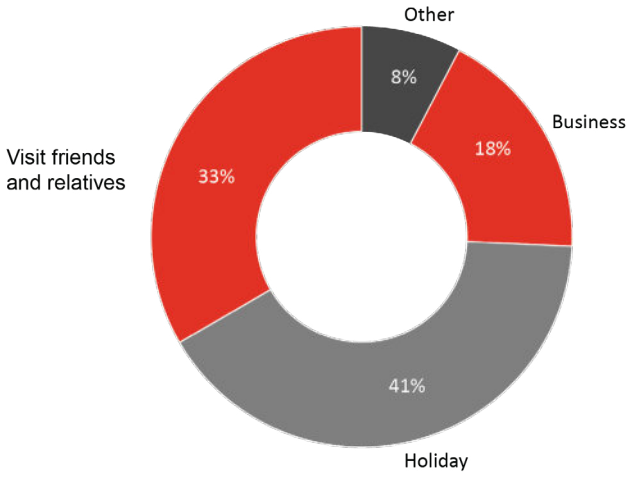


Source: IAG & ONS

Supporting tourism in the UK

IAG passengers make up 18.5% of all airport passengers in the UK (both international and domestic). The arrival of both domestic and international tourists to a city or region has an impact on the local economy derived from the expenditure of visitors on accommodation, transport, restaurants, retail, or other activities. This catalytic impact can be measured in terms of GVA and FTE jobs creation. In the section below we calculate this catalytic impact in terms of the direct, indirect and induced impact of tourists brought to the UK by IAG's airlines.

Figure 28: Air passengers to UK by purpose of travel, 2019



Source: IPS (ONS)

[41] Higher Education Policy Institute: https://www.hepi.ac.uk/2021/09/09/international-students-are-worth-28-8-billion-to-the-uk/

Business travel

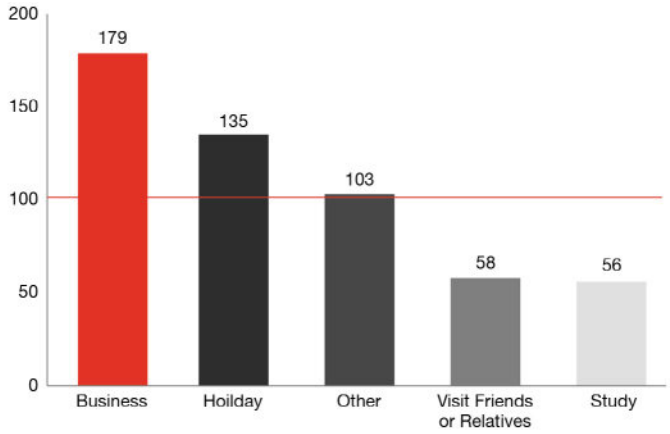
The economic contribution which people travelling to the UK bring depends on their reason for travel. Business passengers have on average a daily expenditure that is 79% higher than leisure passengers. International business passengers made up 21% of the total expenditure of air passengers travelling to the UK (£24.8bn) despite only being responsible for 12% of the total nights spent in the UK (248 million nights), therefore providing a significant element of the catalytic impact of air travel.

Air travel is used by 19% of domestic business travellers and 95% of international business travellers in the UK, with the most common reasons for international business travel being: meetings with clients or potential customers; exhibits or trade shows; conferences; and visiting another part of the company.[b]

Business travel to and within the UK on IAG airlines is particularly supported by British Airways since 26% of passengers flying with British Airways fly for business purposes. The main routes in terms of the number of passengers flying for business purposes on BA in 2019 were connecting London airports[38] to Edinburgh (685,000 passengers), Glasgow (614,000 passengers), Amsterdam (546,000 passengers), New York (383,000 passengers), and Dublin (353,000 passengers).

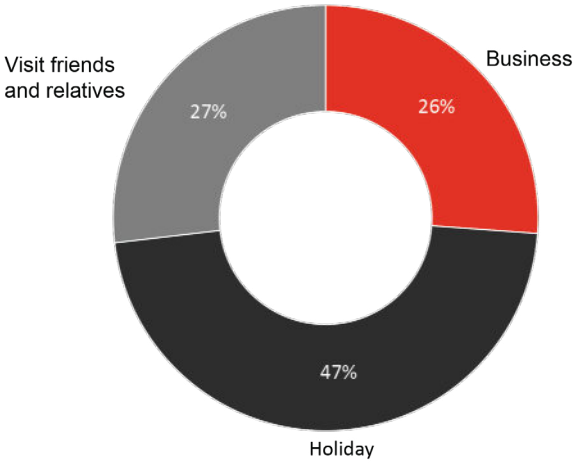
Business travel is returning following the pandemic, with survey data collected by the CBI showing that for all types of meetings (including one-to-ones, team meetings, recruitment meetings and conferences) in-person meetings were preferred over virtual, with advantages in creating and building relationships, and supporting teamwork, innovation and idea-creation.[b]

Figure 29: Daily average expenditure of UK inbound passengers by purpose of travel



Source: ONS (IPS)

Figure 30: Air passengers to the UK, by purpose of travel (British Airways), 2019



Source: IAG

[b] CBI, Understanding the benefits of business travel and in-person meetings: https://media.licdn.com/dms/document/C4E1FAQGdhZV8DBW2GA/feedshare-document-pdf-analyzed/0/1678287290097?e=1683763200&v=beta&t=WoWGT3KprMRxSsTR35WSg7go76_0kslqHqm4YkmPSGg

[42] International Passenger Survey (IPS)

[43] For our purposes 'London Airports' includes Heathrow, City, Luton, Stansted, Gatwick, and Southend.

Figure 31: British Airways flew passengers travelling for business purposes from all around the world to the United Kingdom, and vice versa, facilitating trade, investment and knowledge exchange

Source: IAG database. Note: Line thickness indicates volume of passengers

The extensive global network of flights offered by IAG airlines for business passengers facilitates business opportunities to both UK and international firms, reducing travel times with flexible connections. The largest proportion of business passengers from the UK travel to the US, with the route London Heathrow - New York JFK among the top 10 global routes worldwide.

[44] Other includes ONS categories of Study and Misc.

Figure 32: In Europe, Germany and Italy are the countries with the highest number of passengers travelling for business purposes flying from and to the United Kingdom

Source: IAG database. Note: Line thickness indicates volume of passengers

In the case of Europe the busiest routes by number of business passengers are those connecting London to Germany, Italy, France, Spain, and the Republic of Ireland.

26% of BA passengers are travelling to the UK for business, a share higher than the aviation industry average of 18%. This higher share in passengers travelling for business purposes results in higher expenditure per passenger (see Figure 29), higher economic activity, and also an increased impact in fostering trade and foreign direct investment.

IAG, particularly through its hub-and-spoke model with Heathrow at its centre, facilitates connectivity between all regions of the UK to the rest of the world. This connectivity facilitates a groundswell of economic activity by its business and leisure customers. In the following section we estimate this catalytic impact.

Catalytic impact

In addition to contributing to the UK economy through its operational and capital expenditure as explained in the sections above, IAG plays a key role in catalysing tourism in the UK. In this section we estimate the contribution of this catalytic effect to the UK economy. In doing so, we calculate the GVA and employment generated by tourism and business travel spending by IAG's international and domestic passengers.

The total catalytic impact is the result of:

- A direct impact: the contribution to the economy of the expenditure made by IAG passengers (in restaurants, hotels, etc.).
- An indirect impact: the onward supply chain impact of the business where IAG passengers spend money (e.g. providers of foods and drinks to the restaurants, utilities, etc.), and;
- An induced impact: the contribution to the UK economy resulting from employment supported by IAG passenger expenditure (e.g. rent, transport, groceries, etc.).

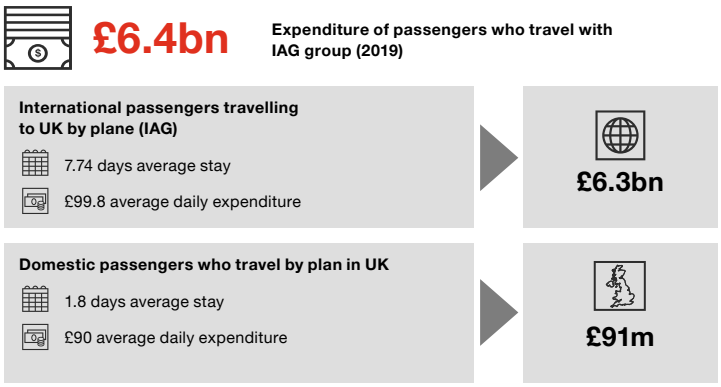
To estimate the catalytic impact, we use the total number of passengers travelling to and within the UK, and compute tourism expenditure per passenger, and the sectoral composition of this expenditure for domestic and international passengers using ONS data. In 2019 the total expenditure for all international passengers (those flying with IAG airlines and those flying with other airlines) was £32.5bn, and for domestic passengers £109.2bn.

Passenger expenditure

Our analysis suggests total expenditure by IAG passengers in the UK economy was c.£6.4bn in 2019. This figure is made up of international passenger expenditure of £6.3bn and domestic passenger expenditure of £91m. Of the total spending by international passengers in the UK, IAG passengers contribute approximately 19%.[39]

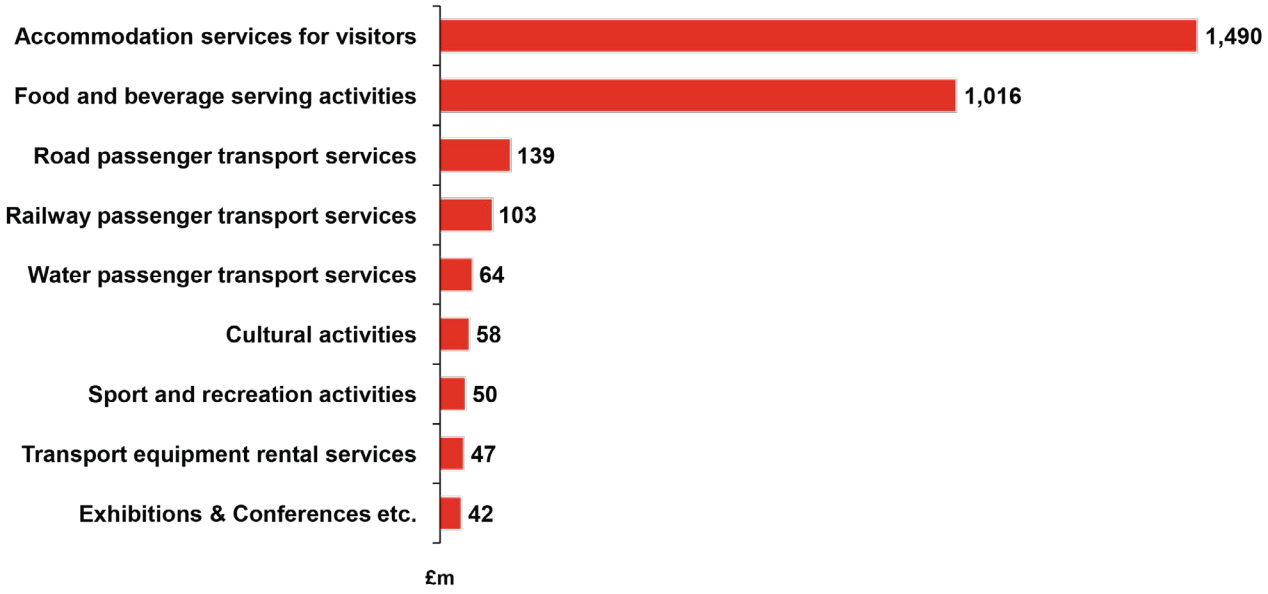
The expenditure of IAG passengers in 2019 was distributed as shown in Figure 34 Accommodation was the main component of expenditure at £1.5bn, followed by food and beverage expenditure of £1.0bn. There is also expenditure related to transport, including on road, railways, and water. Smaller contributions go to a broad range of other sectors, including: clothing and textiles, currency exchange, education, financial, legal and insurance services, food, beverages and tobacco, health services, personal transport, real estate services, rental and leasing services or second home ownership.

Figure 33: Total expenditure in the UK by IAG passengers (domestic and international)



Source: IAG, ONS (IPS and Tourism Satellite Account TSA) and OECD

Figure 34: Distribution of IAG passengers' main expenditures in the UK, 2019 (£m)



Source: IAG, ONS (IPS and Tourism Satellite Account TSA) and OECD

[45] Domestic passenger expenditure has not been included as it is computed only the net spending of the domestic passenger per day (compared to the daily consumption per person in the UK)

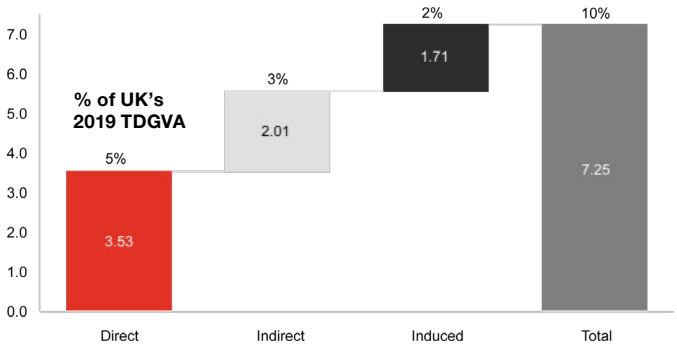
GVA impact

Figure 35 shows the direct, indirect and induced impact on the UK GVA that the expenditure of IAG airlines passengers has. While direct refers to the impact on the business that the passenger spent the money, indirect refers to the impacts on the value chain of the business, and the induces refers to the impact resulting from employees (of the main business & value chain business) expenditure.

Total IAG catalytic effect in the UK was at £7.2bn, equivalent to 10% of UK's Tourism Direct GVA (£73bn) in 2019.[42] This is comprised of:

- **A direct impact of £3.5bn**
  - This is the impact that results from the IAG passengers' total expenditure in the economy.
  - Equivalent to 5% of UK's Tourism direct GVA.
- **An indirect impact of £2.0bn**
  - This is the impact that results from the industry value chain in the recipient sectors of passenger expenditure.
  - Equivalent to 3% of UK's Tourism direct GVA.
- **An induced impact of £1.7bn**
  - This is the impact of the spending by the households that have been impacted directly and indirectly, e.g. hotel employees' expenditures.
  - Equivalent to 2% of UK's Tourism Direct GVA.

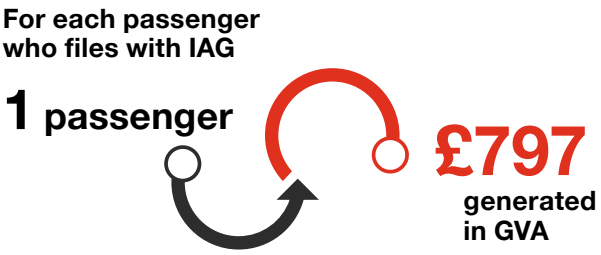
Figure 35: IAG catalytic impact in the UK, GVA 2019 (£bn)



Source: IAG and ONS (IPS)

Figure 36: IAG's GVA multiplier in UK, 2019

For each passenger who flies with IAG to the UK, there is a catalytic impact of £797 to UK GVA.

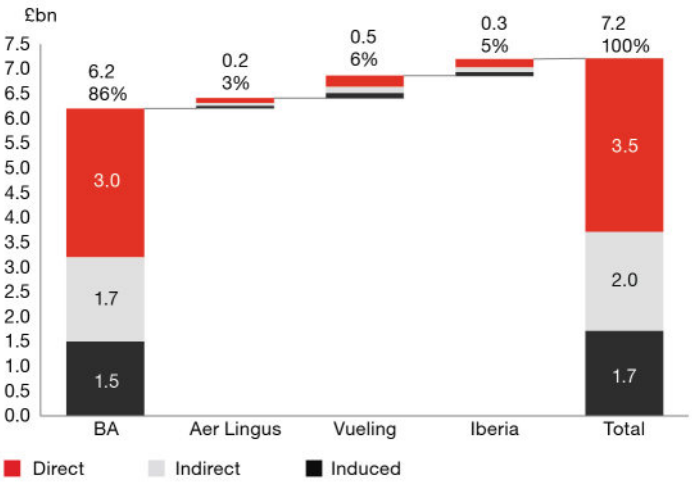


British Airways is responsible for 86% of the total IAG catalytic impact with BA passengers contributing £6.2bn out of the £7.2bn that IAG's passengers contribute to the national GVA. Vueling and Iberia together contribute 11% of the catalytic impact, and the remaining 3% comes from Aer Lingus' passengers.

The catalytic impact benefits a range of sectors across the UK economy. The largest single catalytic contribution is to Accommodation at £890m, followed by Real Estate[43] operations at £860m, and Food and Beverage Service Activities at £640m. The majority of these impacts are direct, i.e. they are directly resultant of IAG passenger spending.

Other, smaller, sectoral impacts, such as that on Financial Services Activities (£430m) have a more substantial indirect and induced impact, representing that these are a result of other industries' supply chains, or expenditure by

Figure 37: Distribution of catalytic impact by airline in UK, 2019



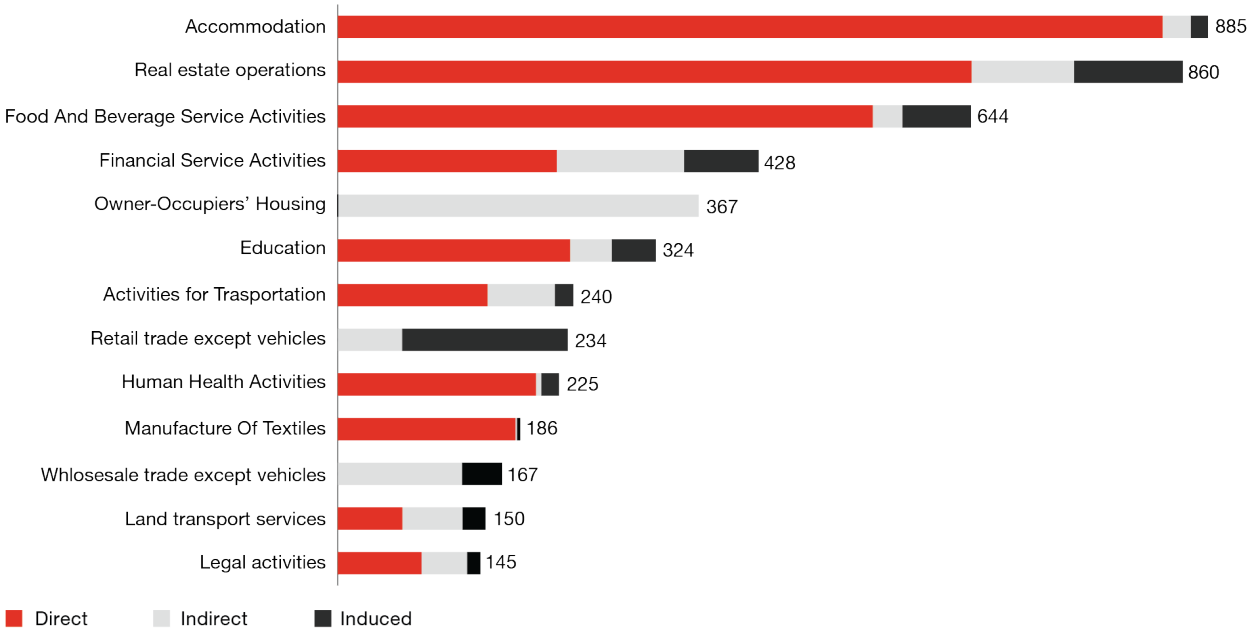
Source: IAG and ONS (IPS)

[46] The UK Tourism Satellite Account (UK-TSA), Tourism Direct Gross Value Added (TDGVA), https://www.ons.gov.uk/economy/nationalaccounts/satelliteaccounts/datasets/uktourismsatelliteaccounttsatables

[47] In 2019 according to ONS data the Real Estate services represented 13.2% of the UK GVA. The expenditure of passengers arriving to the UK in accommodation, restaurants or shops ends up in the real estate sector as

employees by directly impacted industries where that employment is supported by IAG passenger spending. In the extreme case, e.g. Owner-Occupiers' Housing (£367m), the impact is entirely induced, that is, it is the additional domestic expenditure in this category that is resultant of employment that is supported by IAG passenger spending. The 'Other' category captures the economic benefit provided to a range of economic sectors, with the largest in the category being: construction, insurance services, manufacturing, and consultancy services.

Figure 38: Total IAG catalytic impact by sector (£m), UK 2019



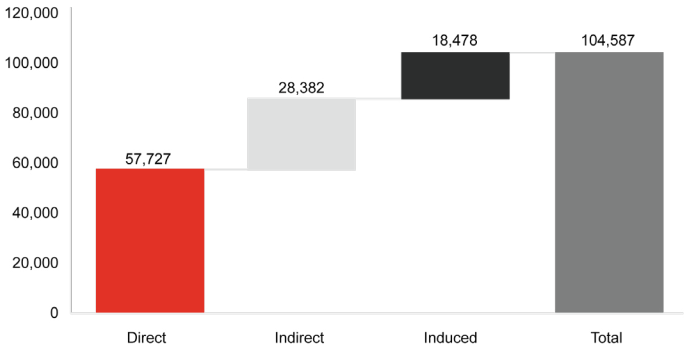
Source: IAG and ONS (IPS)

Jobs impact

IAG's catalytic effect supported approximately 105,000 full-time equivalent (FTE) jobs in the UK in 2019. These FTE jobs are the result of the total expenditure made by passengers in the UK in the sectors described in Figure 39. This is comprised of:

- **c.58,000 FTE jobs directly supported**
  - These are jobs supported by the expenditure of IAG passengers in the UK, e.g. jobs that are created in hotels, restaurants, and transport to provide services.
- **c.28,000 FTE jobs indirectly supported**
  - These are jobs supported by supply chains of the sectors where the passengers spent money, e.g. jobs created in the supply chains of hotels and restaurants.
- **c.18,000 FTE jobs that are induced**
  - These are jobs that are supported by the spending of employees who are employed directly and indirectly, e.g. jobs created by the expenditure of employees who work in retail or hospitality in their day-to-day lives.

Figure 39: Catalytic effect of IAG on employment (FTE) in UK



Source: IAG and ONS (IPS)

This means that for every 1,000 passengers flying with IAG to the UK, 11.5 FTE jobs are supported.

For every 1,000 passengers who fly to the UK with IAG

1,000 passengers

11.5 FTE jobs

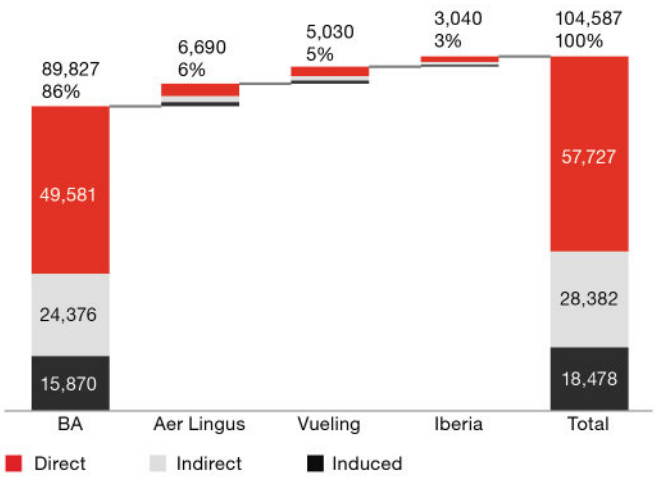
11.5 jobs are supported

86% of the total catalytic impact of IAG's airlines on FTE jobs in the UK comes from British Airways. BA passenger expenditure supports 90,000 of the roughly 105,000 FTE jobs. Aer Lingus passenger expenditure supports c.7,000 FTE jobs, Vueling c.5,000 FTE jobs, and Iberia c.3,000 FTE jobs.

The catalytic impact on employment of IAG passenger spending in the UK is distributed across 40 different sectors, evidencing a broad impact of IAG to UK job creation. The largest sector which benefits from an employment catalytic impact of IAG passenger spending is the provision of accommodation services where c.20,000 FTE jobs are generated. This is followed by Food and Beverage services with c.19,000 FTE jobs, where a higher proportion of these are created through an induced impact. The third and fourth largest sectors in terms of employment impact are education and activities for transport Supporting c.5,500 jobs each.

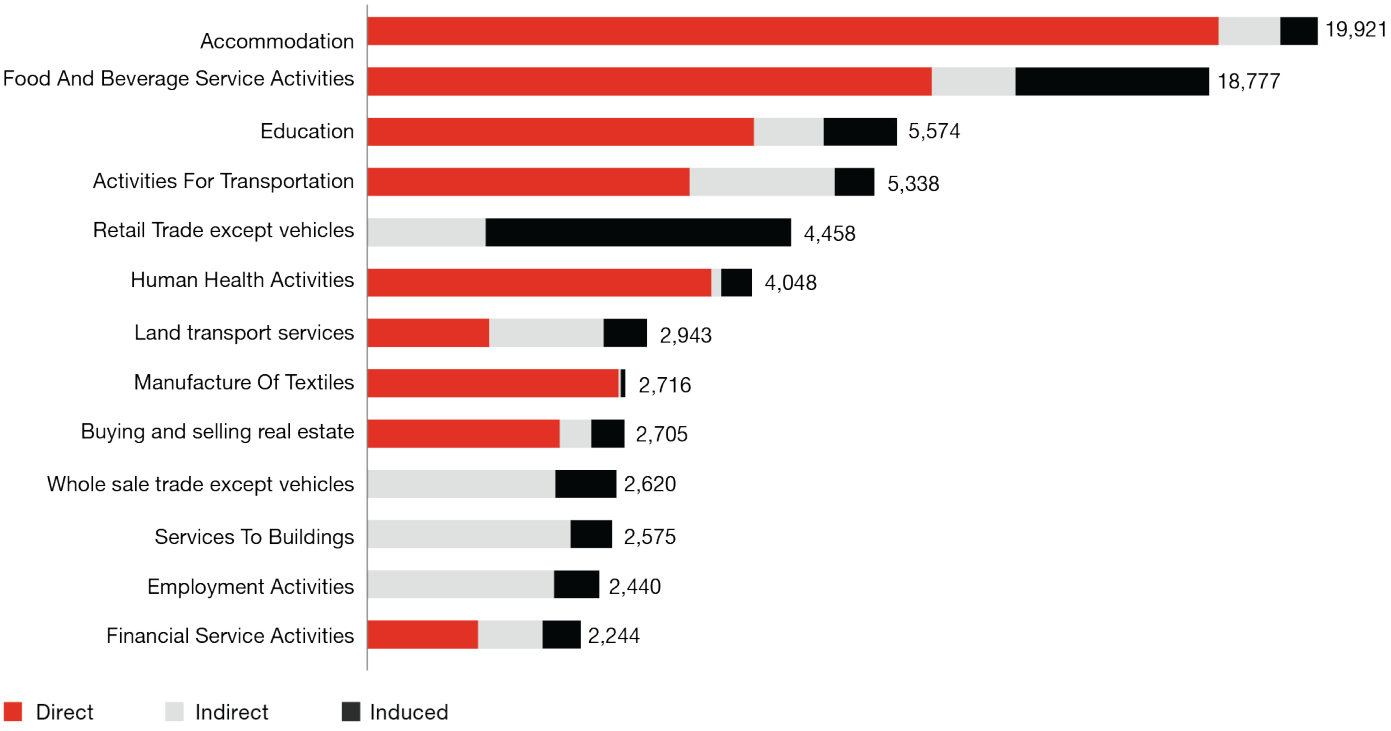
Most of the jobs created are a direct impact, meaning that they directly result from IAG passenger spending. However, there is also evidence of substantial indirect and induced impact on jobs in the UK, particularly wholesale and retail trade. These are jobs supported as a result of spending from IAG passengers flowing through the supply chain to other industries, or spending of IAG employees, and UK households working in the supply chain sectors.

Figure 40: Catalytic effect of IAG on employment (FTE jobs) in UK by airline, 2019



Source: IAG and ONS (IPS)

Figure 41: Catalytic effect on employment (FTE) of tourism resulting from IAG passengers by sectors, UK 2019



Cross-border trade

IAG Cargo operations

IAG Cargo is the cargo division of IAG Group operating (picking up and setting up freight) in 136 countries and transporting more than 428,520 metric tonnes[44] (including transhipments - the transfer of cargo between transport forms) of freight across the world in 2019. In the case of the UK IAG freights over 23% of total cargo and over 32% of total Heathrow cargo.

IAG Cargo's activity contributes to facilitating international trade and access to international supply chains, a major engine of economic growth. Air cargo is a particularly important transportation mode for high added-value products such as power generating machinery, scientific equipment, pharmaceuticals, telecoms, gold[45], and other goods in need of urgent transportation. Despite air cargo representing only 1% of trade by volume of goods shipped, it makes up 41% of total trade by value (49% of exports value and 35% of imports value).[46]

IAG Cargo product offerings[47] include:

- IAG General Cargo, under categories of loose or unitised.[48]
- IAG Cargo Air Mail, to provide services to the world's postal operators. In the the UK, BA has had a long-running partnership with Royal Mail that allowed to enable overnight cargo between London and Scotland (including the Highlands).
- IAG Cargo Constant Fresh designed for temperature sensitive perishable products.
- IAG Cargo Constant Climate designed to transport pharmaceutical goods.

Other IAG Cargo solutions include: Prioritise (express services), Courier, Dangerous groups, General cargo or Live animals and pets.

The majority of demand for air freight is for products that are high value-added, and perishables. Examples of these are pharmaceuticals, fresh products, IT products, energy machinery, and gold.

IAG Cargo operates a forwarder business model where the majority of cargo is transported in the hold of passenger aircraft on long-haul routes as opposed to dedicated freight aircraft using the two large hubs IAG airlines has in London Heathrow and Madrid Barajas as distribution centres. This model allows IAG Cargo to utilise the large number of passenger routes in IAG's network to transport cargo worldwide on frequent flights. IAG Cargo's top five routes by origin and final destination (at the country level) are the US to the UK (45,404 metric tonnes), India to the US (31,519 metric tonnes), the US to India (27,515 metric tonnes), domestic routes in Spain (24,214), and China to the UK (19,189 metric tonnes).

Figure 42: The routes with the largest weight of cargo transported by IAG worldwide in 2019 were between the United Kingdom with the United States, followed by the United States with India

Source: IAG Cargo. Note: Line thickness indicates the weight in terms of metric tonnes.

[48] IAG Cargo has provided data on cargo weight but not cargo value. The methodology used to allocate the cargo transported by IAG has been to select the maximum data recorded by order and route (since it is not possible to discriminate whether cargo is collected or deposited at each airport through which the aircraft passes on a route). With this, we try to get as close as possible to the real data without incurring in overestimation of the cargo transported by IAG.

[49] Source, Her Majesty's Revenue and Customs

[50] Steer (2018) Assessment of the value of air freight services to the UK economy. October 2018.

[51] IAG Cargo only provided data on the metric tonnes, the product offering is the closest approach to know the freighted products

[52] Loose cargo is a single item, and unitised cargo refers to a group of items that are shipped together.

Transporting pharmaceuticals including Covid-19 vaccines

IAG Cargo plays a key role delivering pharmaceuticals such as vaccines around the world due to its Constant Climate service. This is a cold-chain product enabling temperature sensitive pharmaceutical products to take advantage of the speed of being transported as air cargo. This product ensures that the goods are kept at the optimum temperature throughout the time they are in the airport, and is catered for with dedicated facilities at three global hubs:

- **London - Heathrow:** The Constant Climate Centre is a dedicated site for pharmaceutical shipments opened in 2013, and has separate temperature-controlled zones, at 2-8°C and 15-25°C totalling 6,000 square feet.
- **Dublin:** This temperature controlled facility in Ireland offers 2-8°C and 15-25°C zones to enable IAG Cargo and Aer Lingus to serve the Irish market and beyond, providing direct access to destinations in the US and Canada and supporting a growing pharmaceutical market in Ireland.
- **Madrid - Barajas:** In February 2019 IAG Cargo opened a new centre dedicated to its Constant Climate product for transporting time and temperature-sensitive pharmaceutical products, including serving the Latin American market. The facility has two dedicated temperature-controlled chambers for 2-8°C and 15-25°C goods totalling over 900 square metres.

During the Covid-19 pandemic IAG supported delivering this vaccine to millions using these Constant Climate and climate controlled facilities. IAG was able to support the global pandemic response by:

- In 2021 IAG Cargo transported over 19 million doses of Covid-19 vaccines around the world.
- IAG Cargo partnered with UNICEF to support its COVAX programme which was aiming to provide equitable global access to Covid-19 vaccines, delivering four million doses of vaccines to Nigeria.

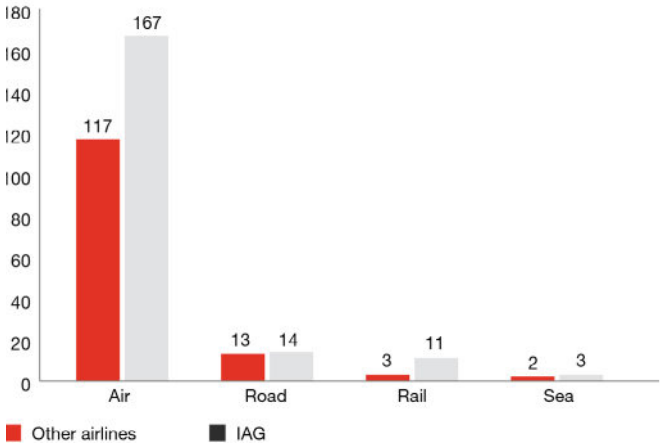
Cargo's impact on UK trade

IATA estimates that a 1% increase in air cargo connectivity[49] is associated with 6% more trade, widening business opportunities for firms and consumer choices.[50]

In 2019 the UK had a negative overall goods & services trade balance of £-66.15bn, consisting of a goods balance deficit of £-148.17bn and a service balance surplus of £82.02bn. The positive service balance is a result of the UK's economy specialisation in high added-value services.[51]

While the general trade balance in the UK has a negative position (the value of imports exceed the value of exports in terms), the air transport trade balance in the UK is in surplus (value of exports is higher than the value of imports); this is driven by the high value added of freight exported to non-EU countries by air. The value of air exports measured by value £/kg is almost 12 times higher than road exports while value of air imports are 9 times higher than road imports.[52] Therefore, air cargo trade supported by IAG's cargo operations has a positive impact on the UK's trade balance.

Figure 42: Average value of the UK imports and exports, 2017 (£/kg)



Source: HM Revenues & Customs

[53] "Air connectivity is a composite measure reflecting the ease of accessing various locations around the world.It is a composite measure reflecting the number and economic importance of the destinations served from a country's major airports and the number of onward connections available from each destination". IATA. Air Connectivity. Measuring the connections that drive economic.

[54] IATA. Air Connectivity. Measuring the connections that drive economic growth.https://www.iata.org/en/iata-repository/publications/economic-reports/air-connectivity-measuring-the-connections-that-drive-economic-growth/

[55] ONS, international trade data, https://www.ons.gov.uk/businessindustryandtrade/internationaltrade

[56] Steer (2018) Assessment of the value of air freight services to the UK economy https://airlinesuk.org/wp-content/uploads/2018/10/Assessment-of-the-value-of-air-freight-services-to-the-UK-economy-Final-Report-v22-Oct-2018-b-SENT.pdf

IAG Cargo operations in the UK

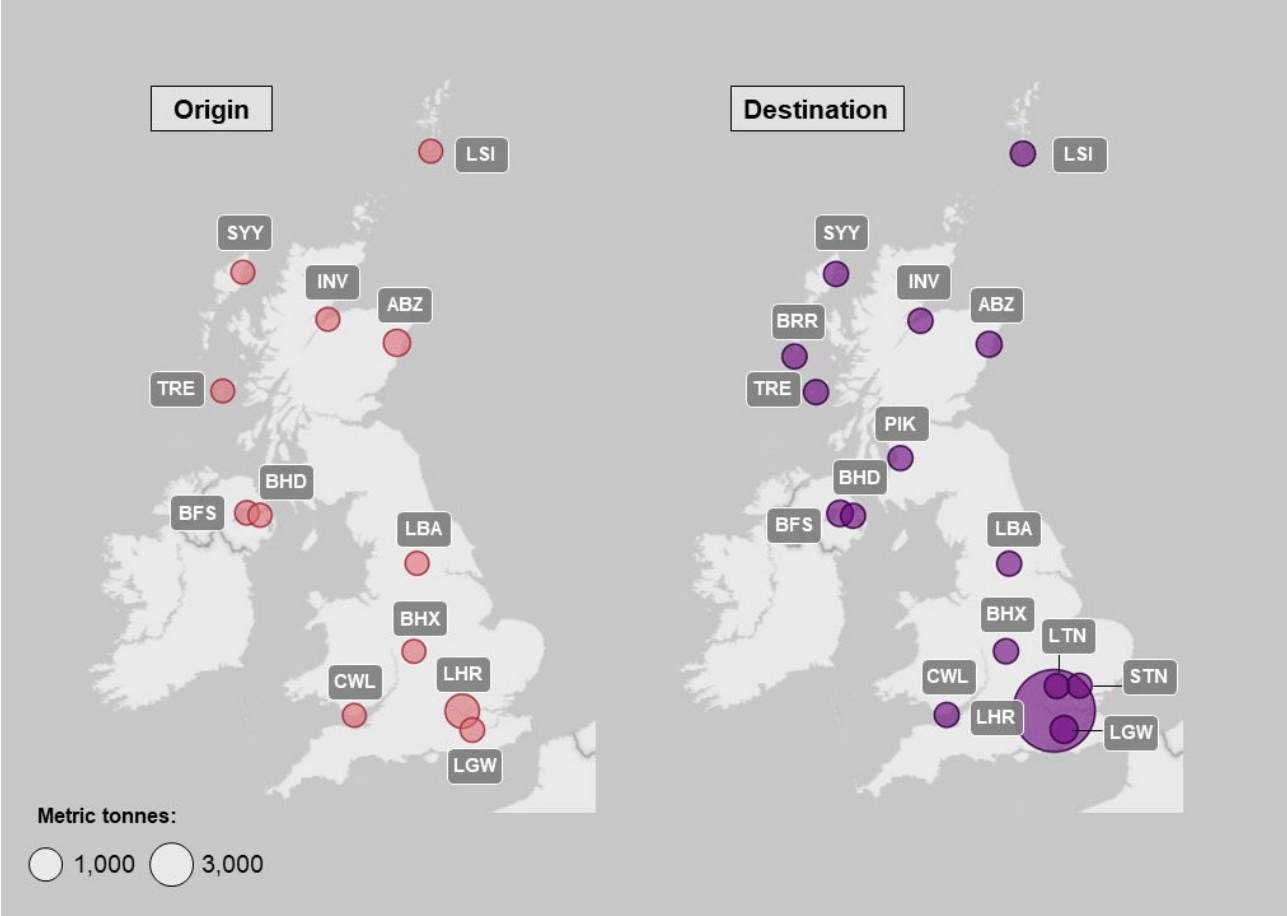
According to the Civil Aviation Authority in 2019, London Heathrow moved 63% of total air freight (1.6 million metric tonnes out of total 2.53 million metric tonnes) in the UK, and 81% of that moved by all London airports. In London Heathrow, British Airways bellyhold cargo makes up almost 95% of the total cargo moved, benefiting from the long haul flight availability.

IAG Cargo in particular contributes to international trade in the UK, handling over 23% of total air cargo in the UK, and over 32% of goods at London Heathrow in 2019. (see Cross-border section for further information on IAG Cargo activity). Heathrow airport was involved in 87,7% of IAG's total cargo movement in the UK, which was approximately 315,000 metric tonnes in 2019.

>23% of total
UK Cargo
Freight by IAG

>32% of total
Heathrow Cargo
Freight by IAG

Figure 43: IAG contributes to United Kingdom connectivity by importing and exporting goods at several airports[53] all around the country. There are 19 locations that receive cargo from IAG, and 14 locations that send cargo through IAG, with London Heathrow the largest in either category.

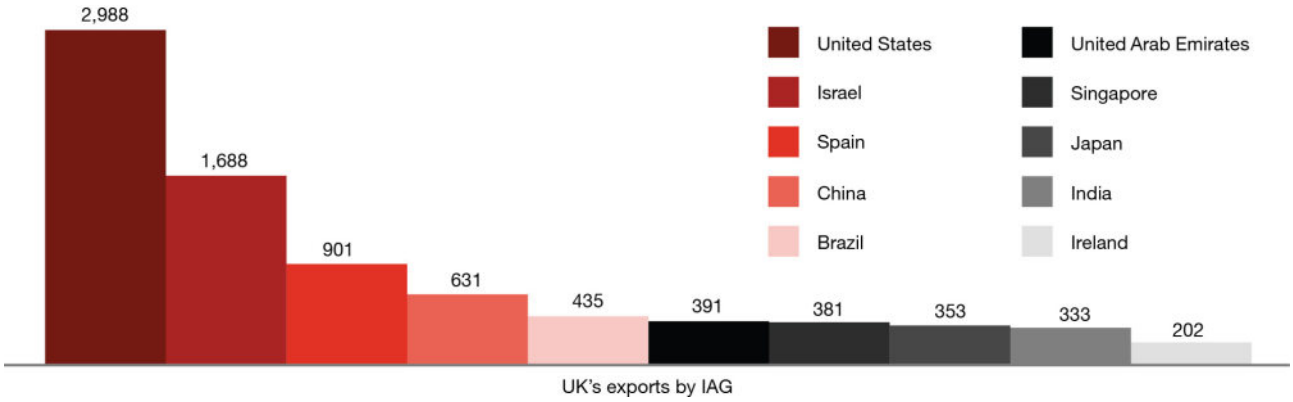


Source: IAG Cargo. Note: The relative size of each bubble denotes kilograms of cargo sent (left) or received (right) by airport

[57] The map has been populated using IAG Cargo data and includes some airports on the network which are served by trucks as bonded freight not by IAG airline capacity.

IAG airlines exported 13,600 metric tonnes from the UK in 2019. The largest destination countries were the United States (2,988 metric tonnes), followed by Israel (1,688 metric tonnes), Spain (901 metric tonnes), and China (631 metric tonnes).

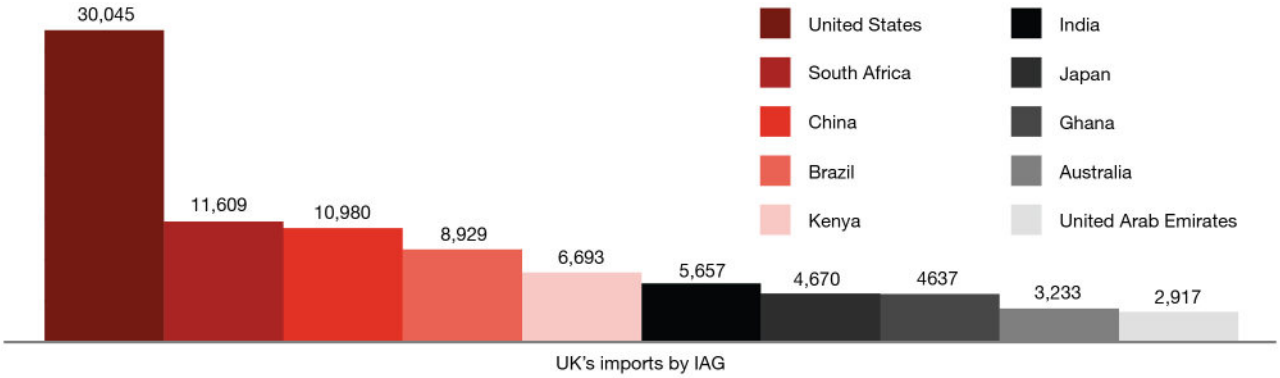
Figure 44: Main destination of UK's exports by IAG, 2019 (metric tonnes)



Source: IAG Cargo

IAG airlines imported 115,311 metric tonnes to the UK in 2019. The largest origin countries for these imports were the United States (30,045 metric tonnes), South Africa (11,609 metric tonnes), China (10,980 metric tonnes), Brazil (8,929 metric tonnes), and Kenya (6,693 metric tonnes).

Figure 45: Main origin of UK's imports by IAG, 2019 (metric tonnes)

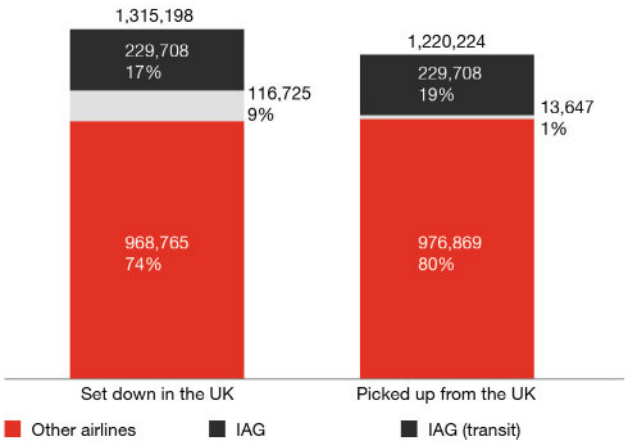


Source: IAG Cargo

Heathrow has a critical role in the functioning of the air cargo in the UK. The airport is the largest air freight location in the United Kingdom, supported by the large number of consolidation centres and freight facilities of forwarders in the surroundings of the airport, aiding product distribution and improving connections to other airports for custom-bonded trucks.

IAG Cargo freighted 26% of total air cargo arriving at the UK airports (as measured by weight), 65% in transit and 35% final set down (Figure 44). For cargo leaving the UK airports, IAG Cargo freighted 20% of this - the vast majority of this cargo is in transit, and a small proportion originating from the UK. More than 66% of IAG goods transportation that goes to Heathrow or leaves from this airport is for transit. Once the freight arrives at Heathrow, it is

Figure 46: IAG cargo in the UK, 2019 (metric tonnes)



Source: Civil Aviation Authority & IAG Cargo

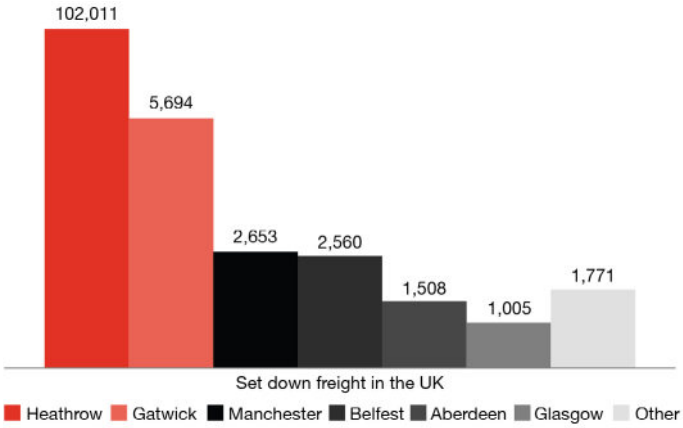
distributed by air, mainly to countries outside the UK, or it is being trucked to other airports (e.g. East Midlands), leading to a symbiotic relationship between the different airports. IAG therefore plays a vital role in the transit in the functioning of global value chains essential to the manufacturing of many products such as cars, cell phones, and other IT equipment.

Of the freight goods one third of products were arriving at Heathrow as their final air freight destination while two thirds had onward transit to other domestic or international airports. This demonstrates the role of Heathrow as a cargo hub which utilises IAG's extensive network of passenger flights for cargo transportation.

Heathrow is the airport where the largest volume of cargo is imported to, with 102,011 metric tonnes arriving ('set down freight') in 2019, followed by Gatwick with 5,694 metric tonnes.

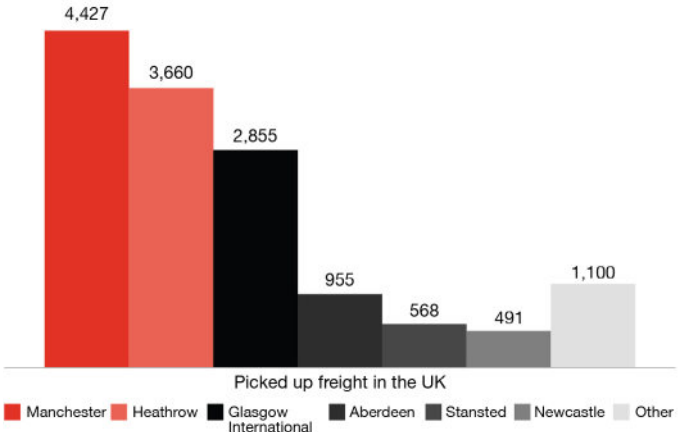
However, Manchester airport had the largest volume of goods exported ('picked up freight') considering only the origin of the product and excluding products in transit, followed by Heathrow and then Glasgow airports. Manchester airport supports the exporting companies located in the area connecting Manchester, and the North West of England as a whole, to the rest of the world through the Heathrow cargo hub.

Figure 47: UK's set down freight by airports. Only final destination, 2019 (metric tonnes)



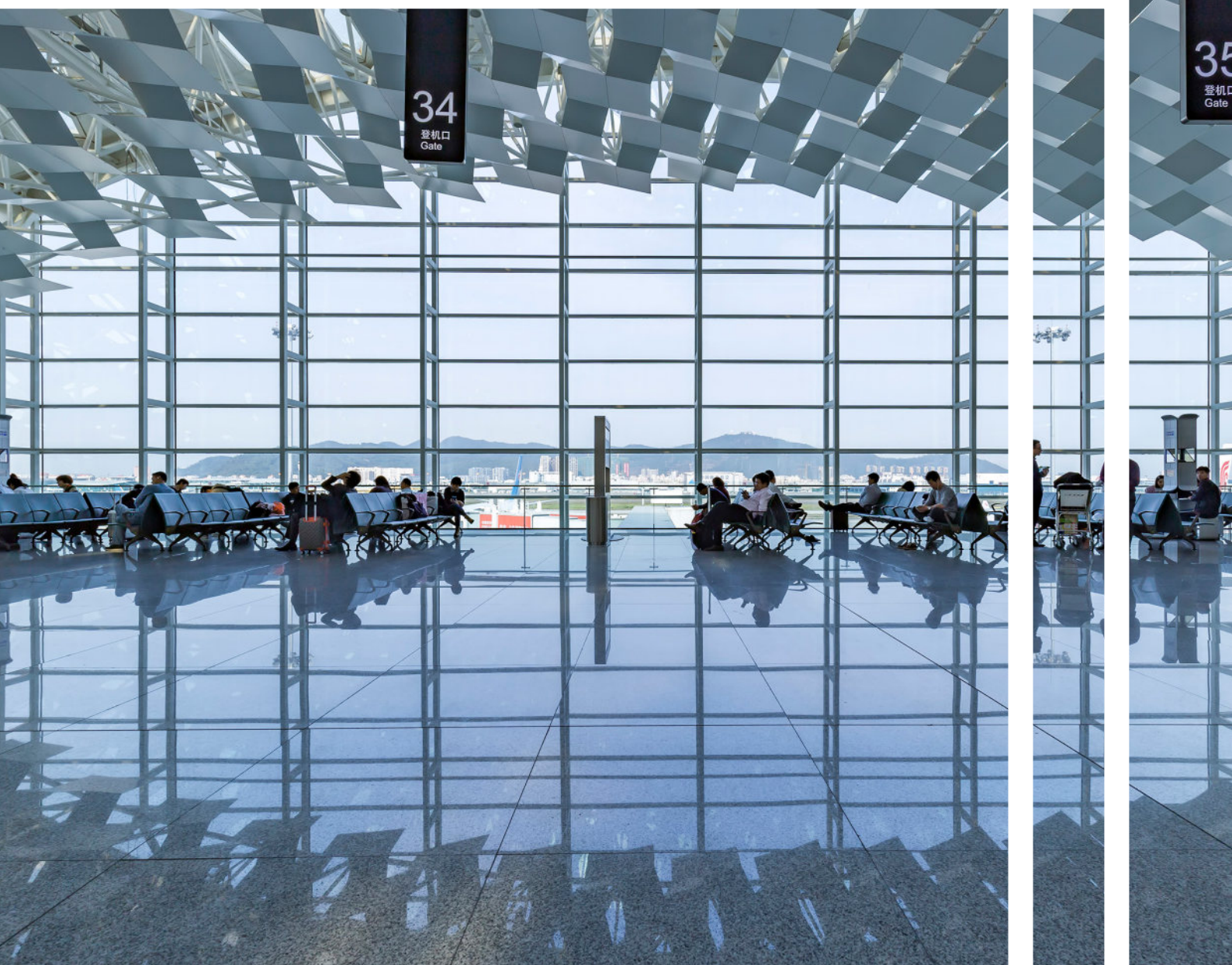
Source: IAG Cargo

Figure 48: UK's picked up freight by origin airport, 2019 (metric tonnes)



Source: IAG Cargo

Sustainability



Aviation's net zero challenge

The aviation industry faces a challenge to decarbonise in order to keep the UK on track to meeting its environmental commitments. The sector is in the process of adapting so that it can continue to provide the economic benefits described in this report, including its contribution to UK GDP, jobs, trade and connectivity, whilst minimising the impact it has on the environment.

Domestic and international aviation accounted for 8% of UK CO2 equivalent emissions in 2019. Passenger levels are rapidly recovering after the Covid-19 pandemic, with the International Air Transport Association (IATA), the global airline trade association, expecting numbers travelling in 2023 to be 86% of the 2019 peak.[54] Forward projections estimate a doubling of passenger numbers by 2040.[55] As a result of this expansion and the carbon intensity of the industry, aviation is forecasted to be a sector with one of the largest residual emissions remaining after technically and economically feasible reductions in the UK by 2050.[56]

Improving the sustainability of the aviation industry is an important component in meeting the UK's commitment to net zero. The UK government reaffirmed its commitment to achieving net zero emissions by 2050 in its 2021 Net Zero Strategy plan to 'build back greener' following the Covid-19 pandemic.[57] The government published its 2022 Jet Zero Strategy[58] aiming to ensure that aviation contributes to a more sustainable future whilst it continues to play a critical role in economic activity. This strategy sets out decarbonisation goals for net zero in 2050, and domestic flights achieving net zero by 2040. These strategies note that these targets can only be achieved through the government working alongside businesses making necessary changes to their operations.

IAG sustainability leadership

IAG's past achievements and future strategy demonstrate that it is committed to making the aviation industry a more sustainable part of the UK economy, and the group will play a central role in the sector's decarbonisation.

IAG has a history of leadership in the aviation industry's progress towards sustainability, including setting precedents for meaningful and challenging targets:

- In 2019 IAG became the first airline group to commit to reaching **net zero carbon emissions by 2050**, meaning it will remove all the direct and indirect emissions associated with IAG operations (such as aircraft fuel and ground facility electricity).
- IAG stretched this target further in 2021 becoming the first airline group to commit to reaching net zero **Scope 3 emissions by 2030**, meaning it will additionally remove all indirect emissions associated with products IAG buys and sells (such as emissions related to aircraft deliveries).
- In 2021 IAG became the first airline group to commit to **10% sustainable aviation fuels (SAF) by 2030**.

Looking forward, IAG's vision is to be one of the world's leading airline groups on sustainability. IAG is a large airline group which understands that its scale supports its ability to influence the sector as a whole, and it takes seriously its ability to play a leadership role in the sector, taking on a variety of leadership positions in industry associations. In the UK this includes roles in the Sustainable Aviation council and Jet Zero Council, and globally IAG representatives are active in IATA's Sustainability and Environmental Advisory Council and working groups. IAG representatives lead sustainability activities within the Oneworld Alliance, including chairing the Environmental and Sustainability Best Practice.

IAG sustainability strategy

In its 2021 Sustainability Report IAG sets out its ambitions and strategies to drive change to create truly sustainable aviation, and meet these targets.[59] IAG has aligned its environmental strategy to its overall strategic priorities, and sets out nine strategic priorities against which its sustainability strategy and progress is tracked. These are:

- Clear and ambitious targets relating to IAG's most material issues.
- Low-carbon transition pathways embedded in business strategy.
- Management incentives aligned to delivering a low-carbon transition plan.
- Leadership in carbon disclosures.
- Accelerating progress in low-carbon technologies including aircraft technology, SAF, carbon offsets and carbon removals.
- Accelerating innovation in low-carbon technology as above.
- Industry leadership in the innovation and deployment of SAF including power-to-liquids.
- Stepping up our social commitments including on diversity, employee engagement and sustainability as a core value.
- Industry leadership in stakeholder engagement and advocacy.

[58] https://www.iata.org/en/pressroom/2022-releases/2022-12-06-01/

[59] https://www.iata.org/en/iata-repository/publications/economic-reports/airline-industry-economic-performance---june-2022---report/

[60] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1095952/jet-zero-strategy.pdf

[61] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

[62] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1095952/jet-zero-strategy.pdf

[63] https://www.iairgroup.com/~/media/Files/I/IAG/documents/sustainability/sustainability-report-2021.pdf

IAG transition plan

IAG has created a Flightpath Net Zero strategy in order to meet its net zero emissions target which it recognises is essential in order to limit global warming below 1.5°C. Its roadmap is a 30 year plan, incorporating short (1-2 year) and medium term (3-5 year) targets to stay on track. The pillars of this roadmap are: new aircraft and operations; Sustainable Aviation Fuels (SAF); market-based measures with offsets; and carbon removals.

BA Better World

BA launched its Better World[60] programme with a focus on people, planet and responsible business in 2021. Some sustainability initiatives and achievements as part of this are:

- On the 15th September 2021 British Airways flight BA1476 from London Heathrow to Glasgow airport was the airline's first passenger flight directly powered by SAF which made up 35% of the fuel, with the remaining emissions from traditional jet fuels offset. This flight demonstrated the progress of the aviation industry in decarbonisation.
- Fuel saving initiatives have been introduced such as: buying lighter seats and trollies for aircraft, changing to single engine taxiing to and from the runway, and introducing fuel dashboards to build insight and help flight crew reduce emissions.
- Improving on-board sustainability by reducing single use plastics across items provided or sold on board and swapping from plastic packaging to more sustainable options.

Supply chain strategy

IAG extended its net zero commitment for 2050 to its supply chain in 2021. IAG is committed to supporting and monitoring its suppliers' performance to ensure that all products and services provided to IAG reach net zero emissions by 2050. IAG Global Business Services (IAG GBS) leads on this mission, and is supported by EcoVadis which provides sustainability ratings to enable IAG to monitor its supply chain.

Sustainable Aviation Fuel (SAF)

IAG has committed to using 10% SAF by 2030 with appropriate government support, and estimates that this will be the equivalent of using 1 million tonnes of sustainable fuel. This commitment is important as IAG's scale is able to support the development, improvement and availability of SAF for the whole sector. IAG is investing $865m[61] in SAF purchasing and investments to support the construction of a waste residue plant in the North East of England. Purchasing SAF and future purchase agreements help to support the financial viability of SAF, in addition to the investments in SAF production capacity that IAG has made. IAG has also been responsible for coordinating the oneworld roadmap to 10% SAF by 2030. The UK's Jet Zero strategy additionally notes that the development of a thriving SAF industry has additional benefits to the UK as it has the potential to provide thousands of green jobs and support fuel security in the UK. Furthermore, this transition to net zero has the potential to benefit parts of the UK which are less well-performing with historically manufacturing and engineering focus.[62]

Innovation in low-carbon technologies is central to IAG's sustainability strategy, and provides a route to meet decarbonisation targets across the group and to drive industry-wide change. The next section of this report focuses on how IAG is supporting innovation in the aviation sector, to support sustainability and other goals.

[64] https://www.britishairways.com/en-gb/information/about-ba/ba-better-world

[65] Including future investments and purchases

[66] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1052706/Levelling_Up_WP_HRES.pdf

Project Speedbird

British Airways is partnering with Nova Pangaea and Lanzajet to turn forestry waste into sustainable aviation fuel. Woody residues from Scotland are turned into water-based ethanol, producing carbon sequestering biochar in the process which removes 750,000 tonnes of CO2 per annum. From that ethanol, alcohol-to-jet technology creates 113 million litres of SAF as well as renewable diesel.

The project will create high-quality jobs in production facilities and refineries in the North East of England, and IAG estimate that it will save importing £1.7bn of fuel and a single Speedbird plant will remove 20 million tonnes of CO2 over its lifetime.

LanzaJet

LanzaJet is a leading sustainable fuels technology company and sustainable fuels producer. British Airways has supported and invested in the company which is currently constructing the world's first ethanol-based alcohol-to-jet sustainable aviation fuel (SAF) production plant. Construction will be completed in 2023 with commission and production beginning in 2024. The plant will produce 10 million gallons of SAF and renewable diesel per year from ethanol, using a range of sustainable, low carbon intensity ethanol, including from waste-based feedstocks.

The technology used will be directly transferable to future developments in the UK where British Airways and LanzaJet are currently in the planning stage of establishing a similar facility to provide locally produced fuel.

Innovation

Importance of innovation to the UK

Across the UK economy there is a renewed focus on the need for business-led innovation. The 2021 UK Innovation Strategy recognises innovation as central to responding to challenges, adapting to new opportunities and delivering growth.[63] Global challenges identified include climate, prosperity and security. The UK Government also sets out in its 'Levelling Up the UK' white paper the need to encourage innovation and drive improved productivity and economic growth across the UK.[64] The aviation sector in particular needs to respond to challenges which directly impact its business, ranging from net zero to cyber security.

IAG's innovation strategy

IAG is investing in solving these business challenges through research and innovation. Innovation is a focus across multiple areas of the business, including accelerated climate tech adoption, customer solutions, and operational efficiency. Innovation within IAG happens both at the level of the group, and individual airlines. IAG supports innovation across a range of areas: sustainability and fuel innovation, airside innovation, new customers and loyalty offerings, and enhanced tech and cyber.

Hangar 51 is IAG's core innovation platform to fund, support and scale emerging technologies. Launched in 2016, its mission is to work with start-ups and scale-ups that can help innovate and transform IAG, as well as the wider travel industry.

Hangar 51 programmes include:

- Accelerator, to scout for and rapidly test new technologies
- Labs, to rapidly prototype new solutions for operational use
- Venture capital, to support the growth of early-stage start-ups
- Incubator, to support the implementation of new technologies within our operations and the commercial development of portfolio companies
- R&D, to horizon scan for new opportunities and technologies to stay at the forefront of innovation relevant to the sector

IAG Tech is the group's internal platform which supports the group to enhance their technology capabilities. IAG Tech works across the group's operating companies and helps to roll out new technologies across the business to embed innovation in practices. This includes implementing new platforms and systems, and delivering initiatives to reduce costs and improve efficiency such as the automation of processes.

[67] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1009577/uk-innovation-strategy.pdf

[68] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1052706/Levelling_Up_WP_HRES.pdf

Emu

Emu Analytics joined IAG's Hangar 51 global accelerator programme and was embedded within IAG to develop innovative digital twin solutions focused on cargo and passenger logistics. As part of this work, BA and IAG Cargo now have access to real-time tools that assist with tactical decision-making; saving fuel, cost and improving overall ground operations.[65]

Innovation in sustainability

Innovation is a central part of IAG's response to the challenge of making the aviation industry more sustainable. Climate technology is supported by IAG through the Hangar 51 platform, which has been scouting for and working with sustainability start-ups since 2019. IAG's engagement with new technologies and support for them will help to bring these technologies to market faster. In turn, these technologies will help IAG in meeting its future sustainability targets and enable it to decarbonise the group and support the industry as a whole becoming more sustainable. The 2022 Jet Zero Strategy notes that the technologies which will be needed to decarbonise aviation are still being developed, making innovation central to the sector's green transition.[66] Creating new jobs and technologies as part of this transition demonstrates how innovation, sustainability and economic output can all be advanced while the sector undergoes these significant changes.

[69] https://www.emu-analytics.com/casestudies/iagcargo

[70] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1095952/jet-zero-strategy.pdf

ZeroAvia

IAG and British Airways were the first airline in the world to invest in Hydrogen powered flight. In 2021 IAG's accelerator programme Hangar 51 accelerated and made an investment into ZeroAvia, an innovator in hydrogen-powered aircraft. They use hydrogen produced from electrolysed water to power a fuel cell which produces electricity for the motor. This partnership is intended to accelerate the development of an aircraft with no CO2 emissions. ZeroAvia subsequently secured investment from three large carriers in the USA and has increased the size of their team in the US and UK.

The company has a research hub in Kemble, Gloucestershire, from where it made the UK's largest hydrogen powered flight in 2023. ZeroAvia has the target of producing hydrogen powered motors for small commercial passenger flights before 2030. IAG continues to back the company to produce larger powertrains that can be used on larger aircraft and contribute to IAG's plan to reach net zero by 2050.[67]

[71] https://mediacentre.britishairways.com/factsheets/details/86/Factsheets-3/217?category=1&pgck=L2ZhY3RzaGVldHM-

Conclusion

IAG makes a significant economic and social contribution to the UK by enabling global connectivity in the movement of people and goods. As the UK flag-carrier, British Airways is the most flown IAG airline in the UK, operating from its Heathrow base in a hub-and-spoke operating model, facilitating the movement of goods and people from the UK around the world.

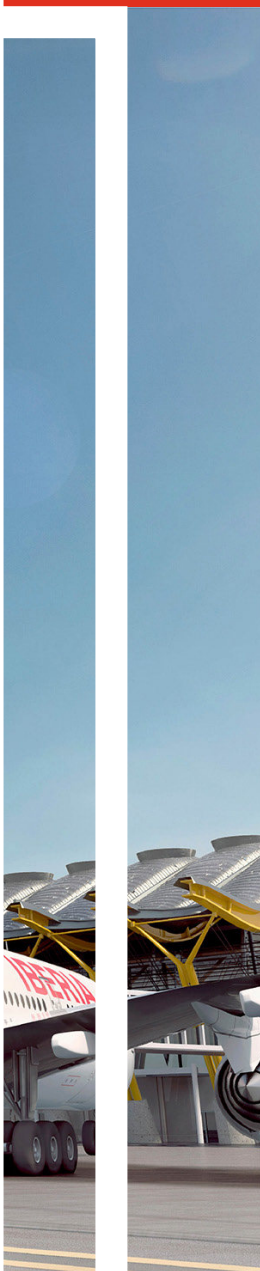
IAG contributes £10.9bn gross value-added to UK GDP, and supports c.97,000 FTE jobs, by its direct, indirect, and induced impacts. For every £1 spent by IAG in the UK economy, £2.22 of GVA is created elsewhere across the economy, and for every direct IAG employee, a further 2.5 FTE jobs are supported in the UK economy. Additionally, through the tourism and business travel its flights facilitate, an additional £7.2bn of catalytic GVA and c.105,000 FTE jobs are supported in the UK.

Additionally, IAG's airlines, including IAG Cargo, transported 428,520 metric tonnes of freight in 2019, reaching 136 countries. Due to the high value of this cargo, this contributes to the UK maintaining a balance of payments surplus on air cargo, supporting Global Britain.

IAG is also an industry leader in sustainability, setting industry leading targets for decarbonisation. It also has a forward-looking approach to innovation, with initiatives such as Hangar 51 helping to support and scale emerging technologies across travel.

IAG's scale in the UK means its operations are a core component of the country's travel infrastructure. The magnitude of its economic footprint in the UK as identified in this report is a reflection of this.

Appendix 1: Technical approach and detailed methodology



Our approach

Step 1: Building the input–output model

We built a bespoke input–output model using the following ONS data:

- The UK's input–output tables
- GVA, employment and consumption data by industry
- National and regional labour productivity levels over time.

Step 2: Applying the model to IAG's operational expenditure

Once constructed, we apply the model to data provided to us by IAG. This data includes:

- Operational expenditure by IAG operating company, supplier, and location. This is matched to proprietary PwC and Companies House data.
- Capital expenditure by IAG operating company, supplier, and location.
- Aggregated employment data, by IAG operating company, pay band, and location. These data are aggregated to FTE equivalents.

Economic Modelling Approach

Measuring economic contribution

We estimated IAG's economic contribution to the UK economy against two indicators:

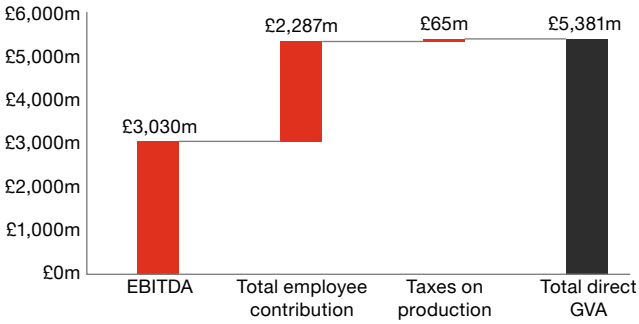
1. Contributions to GDP: measured in terms of Gross Value Added (GVA).
2. Employment: expressed as the number of full time equivalent (FTE) jobs supported.

GVA measures the value that is added by a business or industry sector. It is measured as the difference between the value of goods and services produced and the goods and services used as an input. It is, therefore, the company and sector level equivalent of GDP, and summing all sector–level GVA in an economy produces a measure of that economy's GDP.[68]

The contribution across the indicators are divided into three tiers as shown in Figure 47 below:

- **Direct impact:** This is the impact of IAG's own day to day operations. Direct GVA is calculated as a sum of returns to labour and capital, while direct employment is the total number of employees for the year, in terms of FTE.
- **Indirect impact:** This is the impact on the UK economy as a result of IAG's procurement, this includes both the economic value added from immediate suppliers but also of the wider supplier chain (supplier of the supplier and so on).
- **Induced impact:** This is the impact from the spending of IAG's employees and that of the employees linked to the supply chain.

Figure 49 – IAG's direct economic impact was driven by its profitability (£3bn EBITDA) and compensation of employees (£2.3bn), in 2019



Approach to estimating the direct economic contribution

We use an income approach[69] using data from IAG's financial accounts to calculate its direct contribution to GVA, which is shown below. To calculate the direct employment contribution, we used human resources data.

Approach to estimating indirect and induced economic contribution

We used an input-output model to estimate IAG's indirect and induced contribution to the economy. Input-output modelling enables us to account for how industries interact and relate to one another, by estimating how activity by one company stimulates economic activity elsewhere in the economy.

An input output table provides information on what a typical business in the suppliers sector requires for producing one unit of output. It allows us to trace the typical input requirements through the entire supply chain for production activities in each sector and calculate the total value of production stimulated. An input-output table also provides data on the share of revenue that constitutes profit and wages for each sector. Hence we can apply this ratio to the total production value simulated and estimate the total GVA in the supply chain by sector associated with this.

Additional statistics on employment provide information on the number of individuals that work in any particular sector. As we know the output simulated in each sector, we can estimate the production value to job ratio. We then apply this to the total production value simulated in the supply chain, which allows us to estimate indirect employment, i.e. the number of jobs supported in the supply chain.

These steps are repeated to calculate the induced contribution, with an addition of using wage data to estimate how much production is stimulated in the supply chain that supports the products employees buy, e.g. arts, entertainment and food.

[72] After adjusting for taxes and subsidies on products.

[73] Note: Income approach is a method of calculating GDP, which is based on the idea that all expenditures in an economy should equal total income generated by the production of economic goods and services

We then applied IAG's financial and employment data to the multipliers for each of the key indicators, to estimate the indirect and induced contribution across the UK.

Deriving the Multipliers

We derive Type I, and Type II, multipliers for output, GVA and employment. Type I multipliers account for the direct and indirect impact, while Type II also capture the induced impact. In order to derive the multipliers, we first construct a technical matrix, A, which shows detailed purchases per unit of output by the purchasing firm from the various domestic supplying industries. It is calculated by dividing the entry in each row by the total gross output for its respective column.

Calculating Type I multipliers:

- We use a technical A1 matrix, in which each cell in row i and column j represents the value of industry i's output required to produce a unit of output in industry j.
- In the case of the UK model the technical matrix A1 in a 105 x 105 matrix.

Calculating Type II multipliers

- To calculate Type II multipliers, we also include an additional notional sector, 'endogenous labour'. It involves adding a new row that is composed of the ratio between compensation of employees and total output, and a column that consists of the ratios of private consumption on each industries output to an estimated household income. Hence for the UK and Scotland model the technical matrix A2 becomes:
  - For the UK model a 106 x 106 matrix.

From the A matrices, we then calculate the Leontief matrices.[70] In order to do this we first construct the I - A matrix, where I is an identity matrix with the same dimensions as A.[71]

For Type I multipliers we invert the I - A matrix, excluding the column for private consumption and row for compensation of employees, yielding L1=I - A1-1. This returns a matrix of output multipliers.

To calculate Type I GVA and employment multipliers we take each sectors respective 105 x 1 column vector of output multipliers for L1: (Note 105 x 1 column vector for UK model)

Where i = buying (column) IAG's sector corresponding to the Input Output Table

We then calculated the 1 x 105 row vector of GVA-to-output ratios across the buying sectors:

$$x = \left[\frac{GVA_1}{Output_1} \cdots \frac{GVA_{105}}{Output_{105}}\right]$$

To calculate the GVA effect for each sector we multiply the row vector by the column vector:

$$GVA\ Effect_i = x \cdot l_i$$

The type I GVA multiplier is then calculated as the following:

$$Type\ I\ GVA\ Multiplier\ for\ sector\ i = \frac{GVAEffect_i}{GV\ A_i/O\ utput_i}$$

Repeating the steps above, but instead with a row vector of employment-to-output ratios for each buying sector will yield Type I Employment Multipliers.

$$y = \left[\frac{Employment_1}{Output_1} \cdots \frac{Employment_{92}}{Output_{92}}\right]$$

$$GVA\ Effect_i = y \cdot l_i$$

$$Type\ I\ Employment\ Multiplier\ for\ sector\ i = \frac{Employment\ Effect_i}{Employmen\ t_i/O\ utput_i}$$

For Type II multipliers, we inverted the I - A matrix, including the column for private consumption and row for compensation of employees yielding I2=(I-A2)-1. As explained above the L2 differs from L1because it includes the induced effects in addition to the direct and the indirect effects. The induced effect is a result of the additional spending of employees.

Again, repeating the steps above to calculate the sectoral GVA output ratios, GVA effects and GVA multipliers using I2 instead of I1 will yield Type II GVA multipliers, and similarly for Type II Employment multipliers.

Direct GVA estimation

The process for estimating the direct GVA impact on one country or region for multinational organisations such as IAG is not straightforward. This is because IAG creates value across borders, so it is not immediately obvious how the aggregate value that IAG creates should be attributed. To make the question even more complex, much of IAG's capital is mobile – meaning that the production process itself is mobile. To address these complications in allocating IAG's capital, we follow two principles below which provide the foundation of our estimate of IAG's direct GVA impact in the UK.

Firstly, allocation of GVA from multinational organisations to an area within national boundaries should follow the same principles as that of the National Statistical Authority (NSA) for the UK, the Office for National Statistics (ONS), in tandem with relevant international national accounting standards such as the

[74] Also referred to as the Leontief inverse.

[75] The Identity matrix is a matrix in which all elements along the principal diagonal are 1 and the remaining elements are zero.

[76] The SNA (2008), is accessible here. The ONS refer to the ongoing review of the SNA (2008) as influential in the ONS' development of their own National Accounts, going forwards (System of National Accounts update).

System of National Accounts (2008) (SNA, 2008), published by the United Nations in conjunction with the European Commission, the Organisation for Economic Co-operation and Development, the International Monetary Fund and the World Bank Group.[72]

Secondly, the allocation of GVA from IAG should follow the same principles as used by the ONS in the compilation of the Input - Output tables in their National Accounts, which contain GVA aggregates by industry. This indicates that GVA is equivalent to: Gross Operating Surplus + Compensation of Employees + Taxes on Production. Each of these terms are examined below:

1. **Gross Operating Surplus (GOS):** GOS in its appearance in National Accounts such as the Input Output table is not net of depreciation. This is broadly equivalent to the concept of earnings before interest, taxes, depreciation, and amortisation, as stated in the financial statements. In order to assess IAG's EBITDA relevant to the UK, it must be determined what portion of IAG's profits are relevant to UK activity. The ONS uses taxable profits as the starting point for understanding a company's gross operating surplus. This is informative, as it shows the county in which subsidiaries' profits are booked should be the country against which their GVA is accounted. As such, all EBITDA from IAG subsidiaries that are generated in the UK should be understood as contributing to UK GVA. According to Companies House data, all relevant subsidiaries of British Airways Plc (BA Plc) were registered within the UK, meaning that all aspects of BA Plc relevant to GVA are counted towards UK GVA. This coheres with data from the BA Financial Accounts for 2019, showing a corporation tax contribution based on gross profits for the BA Plc as a whole. The EBITDA for BA Plc in 2019 was recorded as £3,030m.
2. **Compensation of employees (COE):** with respect to IAG, these have two main components: wages and salaries and social insurance contributions payable by employers. Wages and salaries should be understood broadly, including benefits in kind and pension contributions. IAG Financial Accounts for 2019 show a total employee cost of £4,986m in 2019 (using the translation relevant to the income statement (weighted average) of € to £ 1.13. However, we exclude from this 'Other employee costs' which we don't deem relevant to COE as it is defined in national accounting standards, giving a total of £4,302m.

   In order to understand the proportion of this relevant to the UK, we use data on wages and employee numbers by region, provided to us by IAG. After applying this weighting we estimate that £2,287m of this employee cost was spent within the UK.

   Overall, the direct GVA of IAG in the UK is then the sum of the GOS, taxes on production and COE; which in this case is equivalent to £5,381m, as we show in our 'Direct Business Impact' results section.
3. **Taxes on production:** these are defined as 'unrequited payments levied on the production and importation of goods and services, the employment of labour, the ownership and use of buildings or other assets used in production'.[73] We estimate that these were £65m for IAG, with respect to the UK, in 2019.

[77] Supply, Use and Input-Output Tables, Scottish Government: 26 October 2022. Accessible here.

Catalytic impact on the UK economy enabled by IAG's operations

Below, we set out the methodology for estimating the catalytic impact of IAG passengers expenditure on the UK economy.

Step 1: Estimating the number of IAG passengers who are not domiciled in the UK

- IAG supplied us with a total number of passengers by route. However, this data was not disaggregated by direction of travel, so we make the simplifying assumption that a representative aeroplane is equally likely to carry empty seats in either direction, in any given cabin and on any given route. For the subset of IAG flights that are international, we therefore divide the total passenger numbers by 2.
- Calculating inbound factor ratios:
  - The 'inbound factor ratio' calculates for a given international route, the split of passengers between international passengers from a foreign country arriving in the UK compared to the number of UK passengers travelling back to the UK (as an example, in the case of US & UK routes the inbound factor is 45%, meaning that 45% of the passengers on the route are from the US).
  - Using international passenger survey (IPS) data from the ONS we can compute the inbound factor ratio by dividing the number of international passengers between two countries in a route going to the UK (e.g. US residents travelling to the UK by air) by the number of passengers that travel from the UK to the US and the number international passengers from that country travelling to the UK (e.g. UK residents travelling to the US + US residents travelling to the UK by air).
- To obtain the number of international passengers arriving in the UK flying with IAG we multiply the total number of IAG passengers arriving per country by the inbound factor ratio of that particular country.

Step 2: Calculating passenger expenditure

- To compute the expenditure of international passengers:
  - We obtain the share of IAG international passengers by dividing IAG international passengers arriving in the UK by all international passengers arriving by plane into the UK (using ONS IPS data).
  - We multiply the expenditure by sector of international air passengers arriving into the UK by the share of IAG international passengers (also provided by the ONS International Passenger Survey).
- To compute the domestic expenditure of domestic passengers:
  - We multiply the total expenditure of domestic tourists in the UK (ONS) by 2% - the percentage of domestic tourists that travel by plane according to Visit Britain.[74]
  - To estimate the increased rate of the consumption level of a domestic passenger when travelling (compared when not travelling) we divide the daily average expenditure of a domestic passenger by the average daily expenditure of a domestic passenger minus 1.[75]
  - We multiply the amount of the expenditure of domestic tourists travelling by plane by the share of IAG passengers in the air tourism market. We assume that the share of IAG in the UK tourism market is equivalent to the share of IAG in the domestic air tourism market in the UK. We multiply the increase of consumption when travelling domestically (+61%) to obtain the proportion of consumption by domestic tourists which is the result of travelling.
- To estimate the catalytic impact we assign the total expenditure of domestic and international passengers to the 23 different sectors (obtained from ONS) in the Input - Output Table.

In the catalytic effect distribution by industry we include direct impact as we have to estimate the GVA generated by passengers expenditure. In sum, we get expenditure data from ONS to estimate GVA generated by that expenditure.

[78] https://www.visitbritain.org/sites/default/files/vb-corporate/Documents-Library/

[79] PwC estimates that a domestic resident when travelling spends in consumption an additional 61% compared to the consumption when being at home using ONS (IPS) data

Appendix 2: Additional Data

Below are some additional results from that are not included in the main body of the report.

Figure 50: British Airways supported c.58,000 jobs, from supply chain and wage-induced spending, in the UK economy

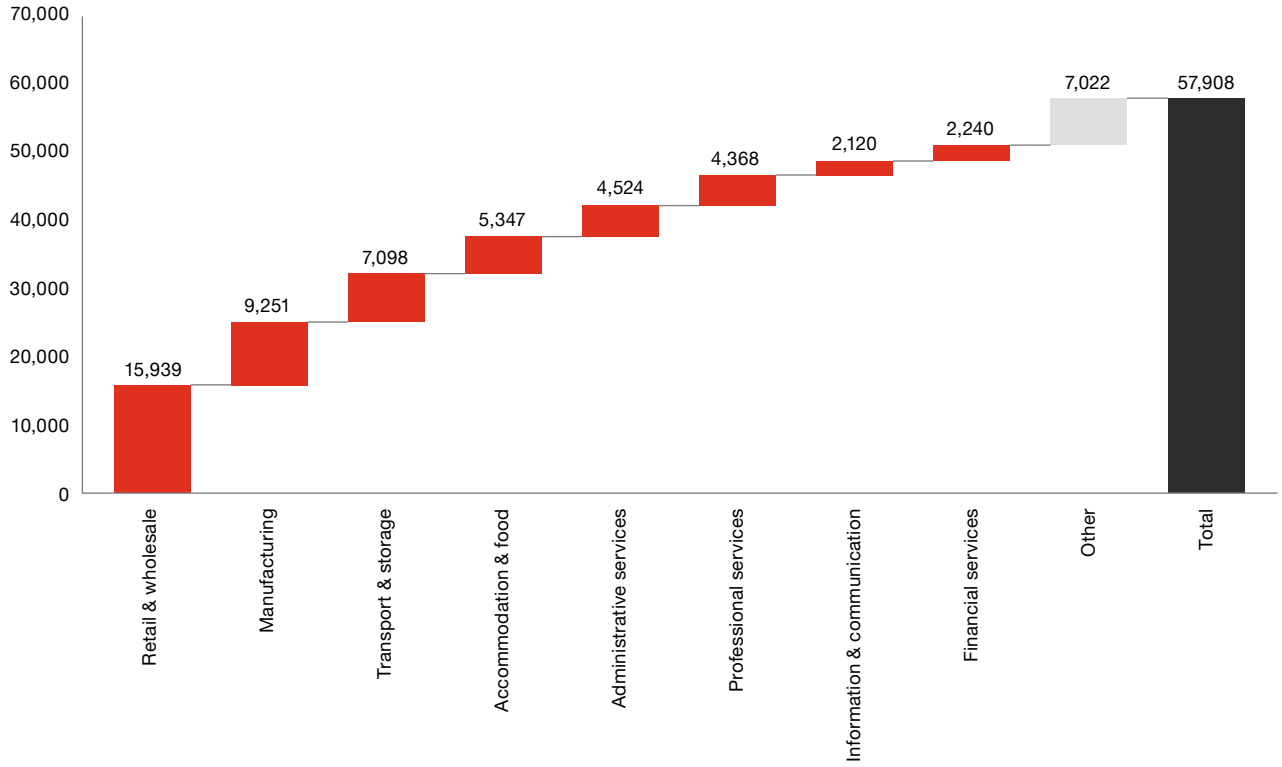


Figure 51: Aer Lingus supported c.5,300 jobs, from supply chain and wage-induced spending, in the UK economy

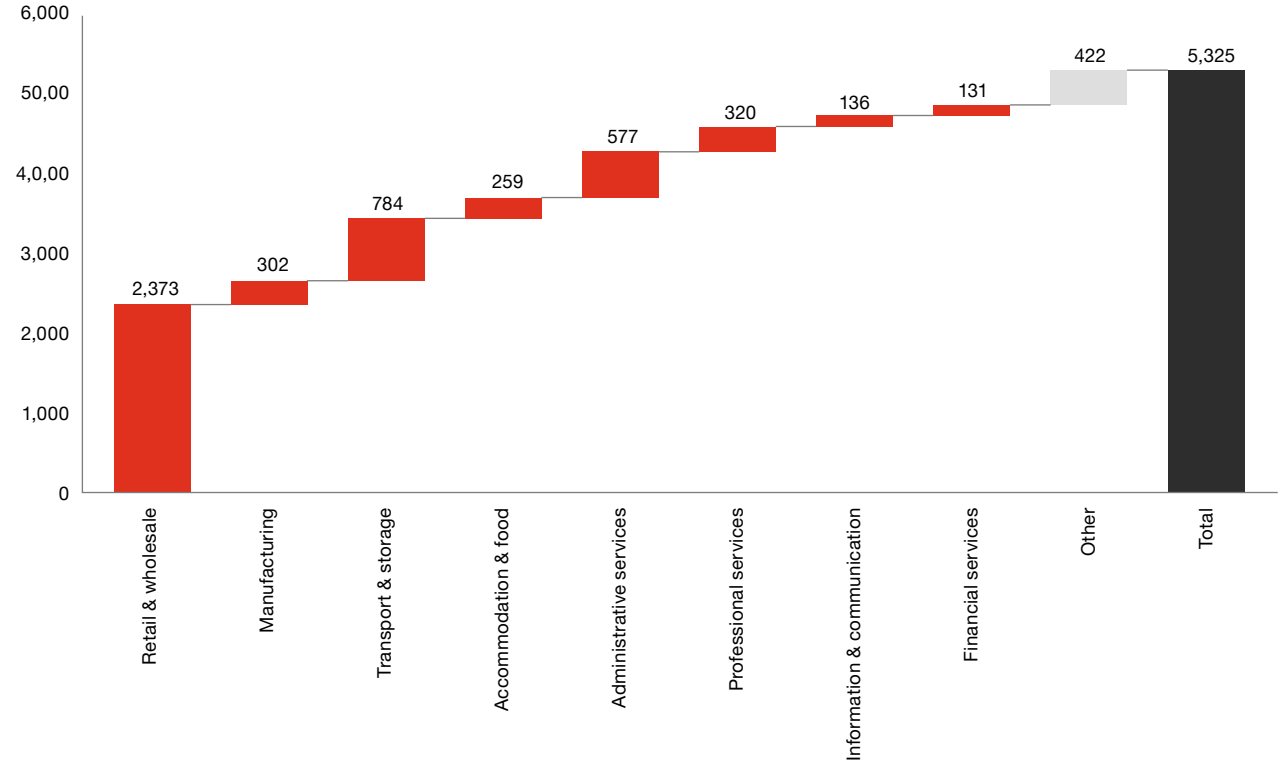


Figure 52: Iberia supported c.3,700 jobs, from supply chain and wage-induced spending, in the UK economy

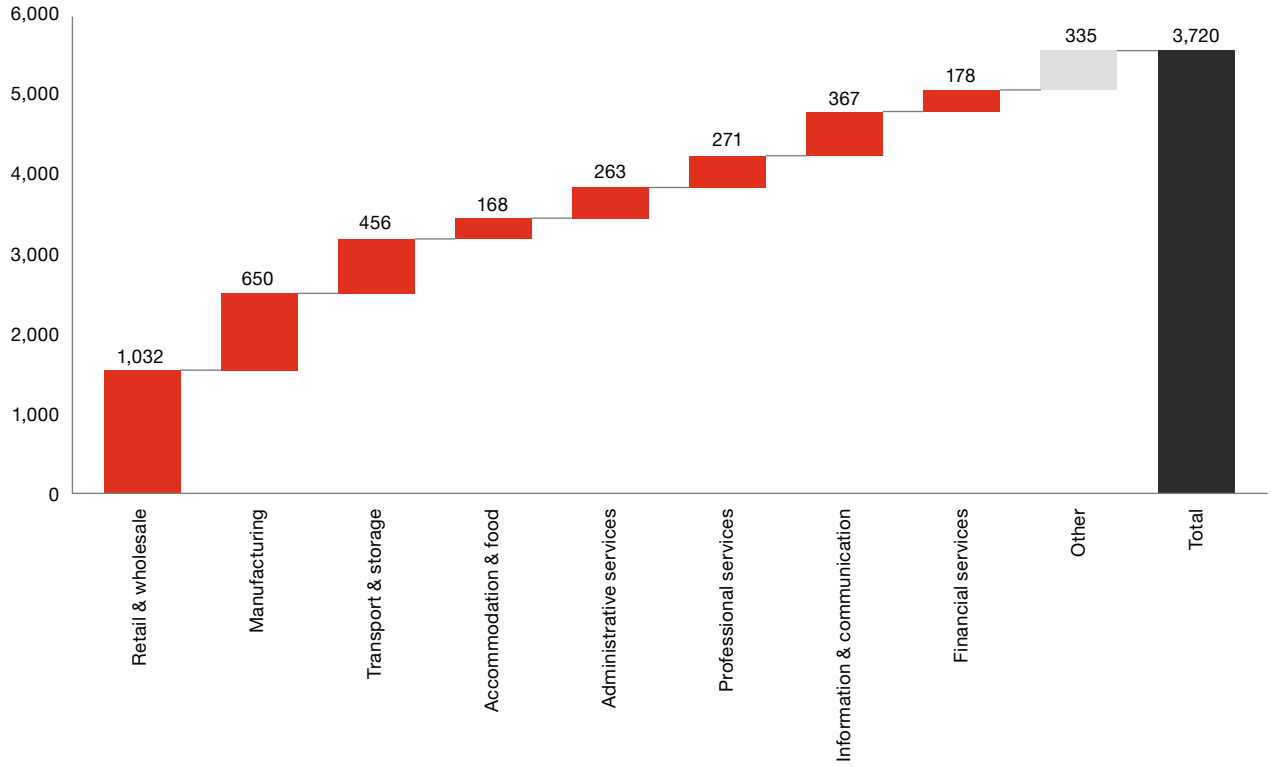


Figure 53: Vueling supported c.1,200 jobs, from supply chain and wage-induced spending, in the UK economy

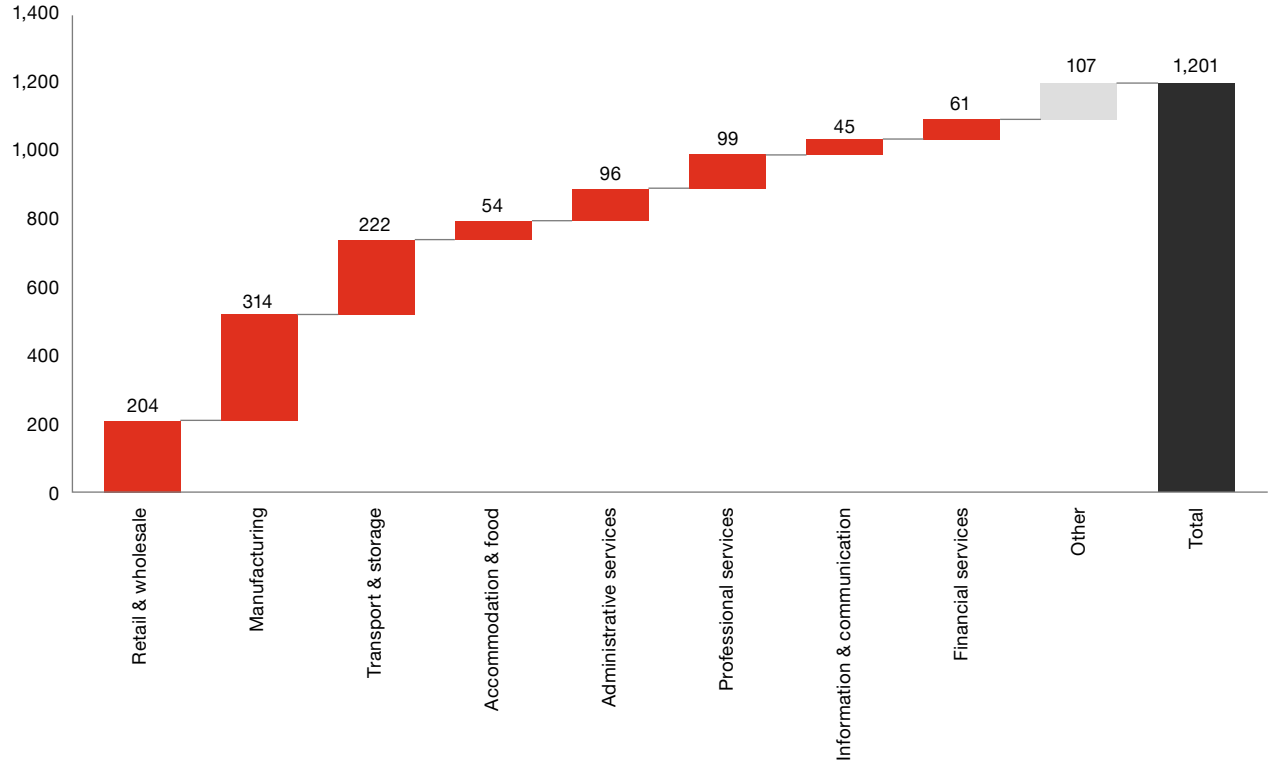


Figure 54: IAG Cargo supported c.1,100 jobs, from supply chain and wage-induced spending, in the UK economy

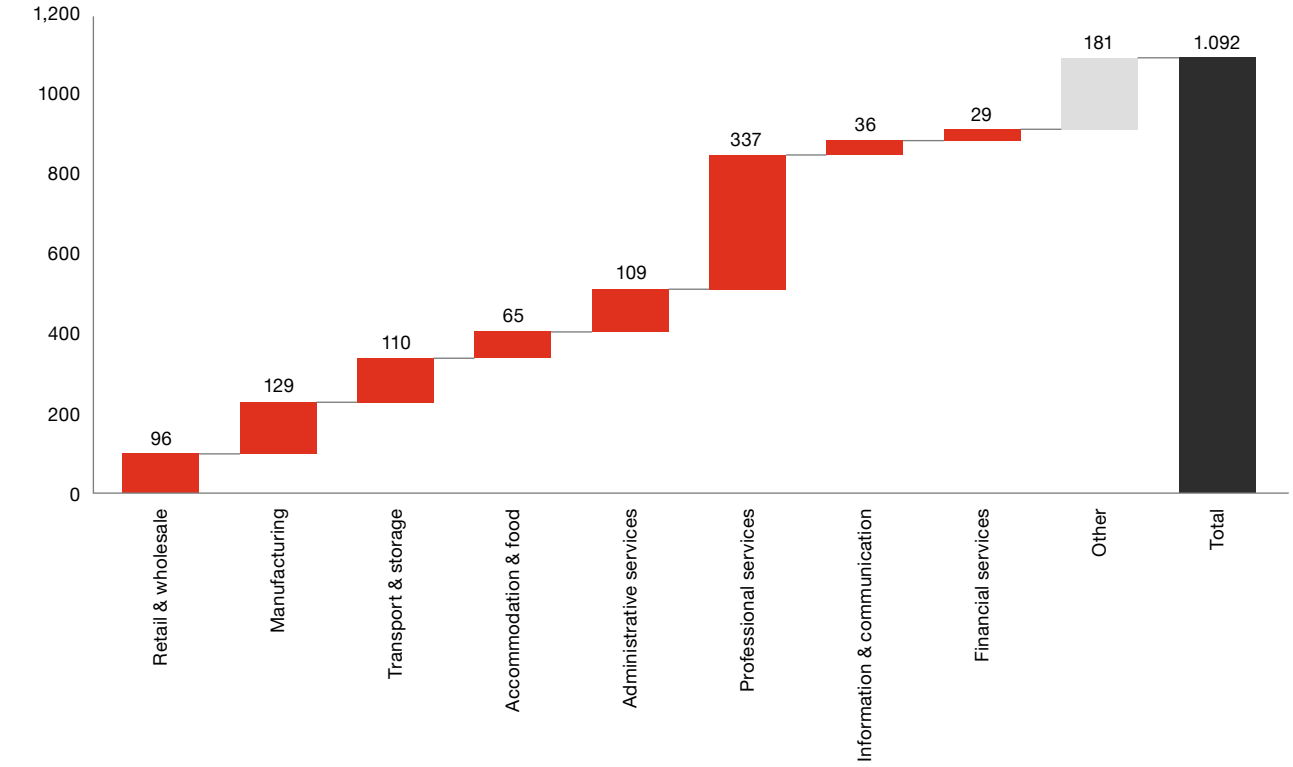
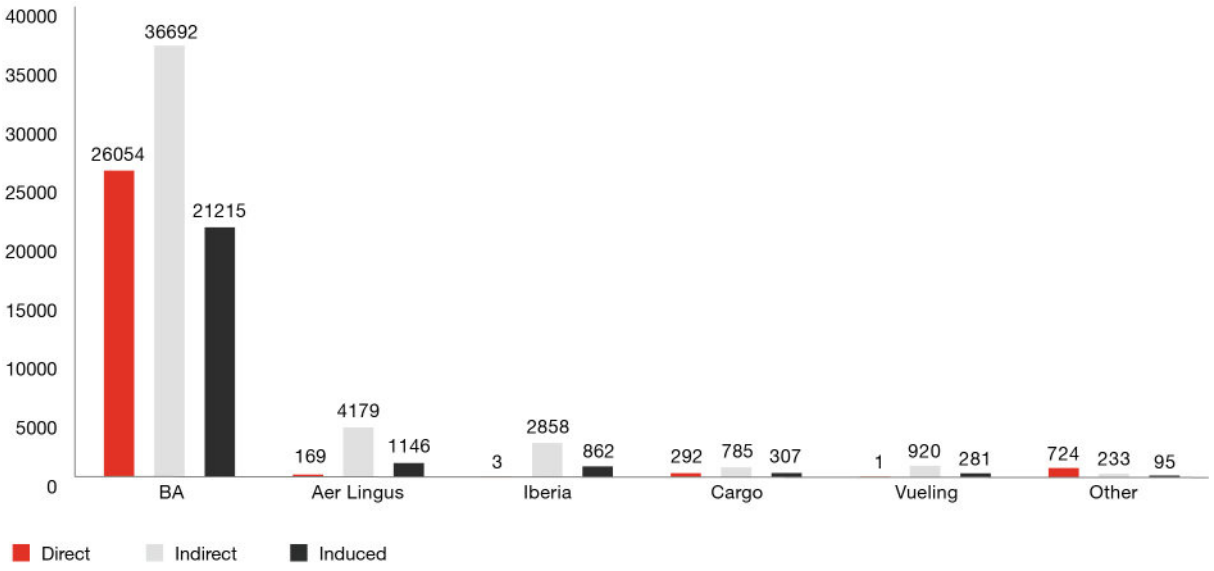


Figure 55: IAG supported a large number of full time equivalent employees (FTE) in the UK, across different channels of impact



IAG supports a significant number of jobs across impact channels in the UK. BA has a proportionally higher weighting of direct impacts, with other airlines having comparatively higher indirect impacts. The difference in impacts by channel is because other IAG airlines have lower direct employment in the UK, but still make supply chain purchases that then lead to broader employment impacts throughout the UK economy.

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