

Assessment of the strategic and economic importance of UK-based airlines



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Executive Summary

Introduction

Steer was appointed by Airlines UK to undertake an assessment of the strategic and economic importance of UK-based carriers. It has been undertaken in the context of the UK Government’s publication of its strategic framework for aviation, “Flightpath to the Future”, which emphasised four themes: sustainable recovery, innovation, realising benefits for the UK and delivering for users.

While UK airlines contribute significantly to the UK air transport network, there remains limited understanding of the value they bring to the UK economy in terms of connectivity and economic impact, specifically due to being based in the UK, as compared to other airlines serving UK routes but based elsewhere. The purpose of this study is to assess and quantify the value of UK airlines to the UK economy now and looking forwards, considering their importance in providing jobs and contributing to national income across the nations and regions of the UK, and in facilitating tourism and investment and growth in the wider economy.

Economic contribution of UK airlines

As recovery from Covid-19 is still underway, we have used 2019 as the most representative year for our analysis of the UK airline industry. In that year, UK airlines had **894 aircraft** based and maintained across the country, providing the totality of domestic air services and 67% of the seats departing to international destinations.

Direct, indirect and induced impacts

By having bases at UK airports, UK airlines employ a significant proportion of local people including in back-office functions, who support local economies by spending their money in the country, while supporting UK supply chains and financing public services through national insurance, Value Added Tax and others. Analysis of the economic impacts on employment, employee income, and gross value added (GVA) of the UK airline industry based on its “direct”, “indirect”, and “induced” effects on the UK economy indicates that UK airlines generate £65 billion of output, £13 billion of employee income from over 370,000 jobs, and £24 billion of GVA (contribution to national GDP).

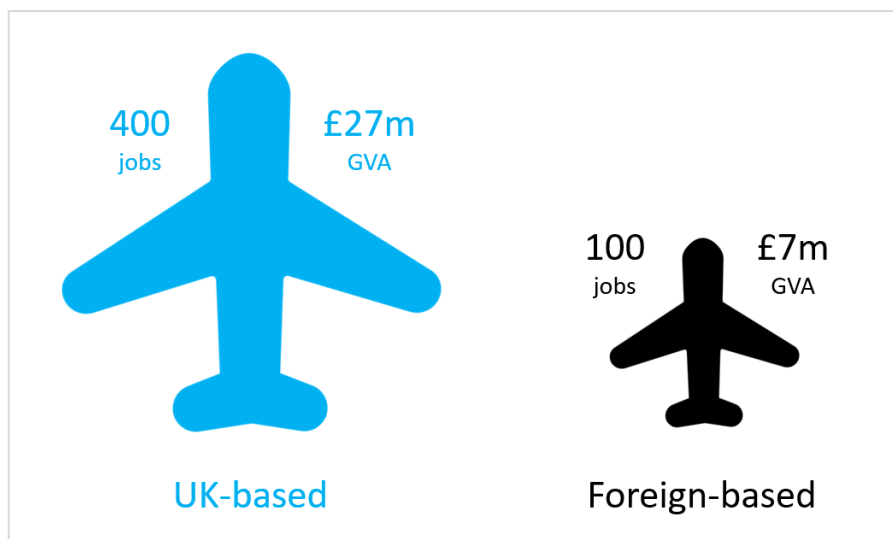
Table 1: Total economic impact of UK airline on the UK economy (2018)

Value	Direct	Indirect	Induced	Total
Output (£m)	25,680	18,775	20,675	65,130
Income (£m)	3,585	4,434	4,946	12,965
Employment ('000s)	76	128	166	370
GVA (£m)	5,031	7,849	11,436	24,315

Source: ONS, Steer analysis

This suggests that **each aircraft based at UK airports supports over 400 jobs in the UK and £27 million of GVA per year**. In comparison, we estimate that the same aircraft based abroad operating on international routes to the UK would likely each **support only around 100 jobs in the UK and £7 million of GVA per year** assuming equivalent aircraft usage to that achieved by UK airlines, i.e. a contribution per aircraft of only one quarter of that of UK airlines.

Figure 1: Average direct, indirect and induced contribution per aircraft per year, 2018



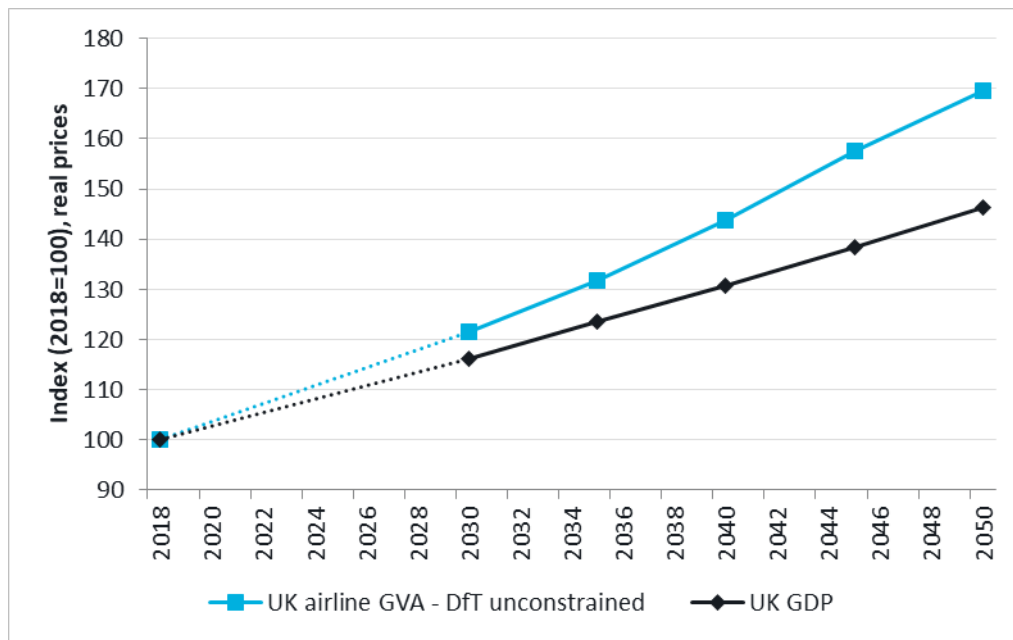
Source: ONS, UK airlines, Steer analysis.

The regions containing London’s airports accounted for the majority of the UK airline’s employees and GVA. However, a large number of employees are based in Yorkshire and The Humber (6%) and the North West (7%). Furthermore, in term of GVA, North West (£1.5bn GVA) and Scotland (£1.3bn) are also large contributors representing in 17% of the country’s total. Northern Ireland (£400m GVA) and Yorkshire and The Humber (£1bn GVA) also benefit substantially from UK airlines activities located there.

Potential future economic impact

Air passengers are expected to grow by 70% from 2018 to 2050 in the UK according to the latest DfT forecast, assuming the right policy support to enable the aviation sector to meet this demand. Based on this forecast, we estimate that the economic benefits of UK airlines would grow and, by 2050, would be likely to generate £111 billion of output, £22 billion of employee income from over 629,000 jobs, and £41 billion of GVA (2018 prices). This is equivalent to one new job generated for two extra flights operated by UK airlines departing from UK airports. **UK airlines are a growth sector of the economy and are expected to generate GVA and jobs growth at a rate greater than the wider economy as a whole.**

Figure 2: UK airport passenger growth vs UK GDP growth (2018-2050)



Source: OECD, ONS, DfT, Steer analysis

However, the above estimate assumes UK airlines will continue to provide 72% of the seat capacity. Given the much lower economic impact of foreign carriers, if this share falls to 65% or 60% by 2050, this would be likely to reduce respectively UK jobs by between 46,000 and 79,000 jobs and UK GVA by between £3.0 billion and £5.2 billion.

Catalytic impacts

In addition to the economic benefits generated by the aviation industry itself (including its supply chain and employee expenditure in the economy), the industry also acts as a catalyst for other sectors of the economy. These other sectors benefit from the activities of the industry (principally providing international connectivity) over and above their expenditure on air tickets or air freight airwaybills in a number of ways. Key examples of these “catalytic impacts” include supporting:

- tourism including expenditure on accommodation, restaurants and attractions;
- foreign direct investment (FDI); and
- the aircraft maintenance industry.

We estimate that UK airlines flew in 20 million overseas visitors who spent a total of £14 billion in the country in 2019. This extra income supported around 887,000 UK jobs.

We also estimate that the FDI generated by additional air connectivity achieved through UK-based airlines would have contributed £2 billion additional GDP to the UK economy in 2019.

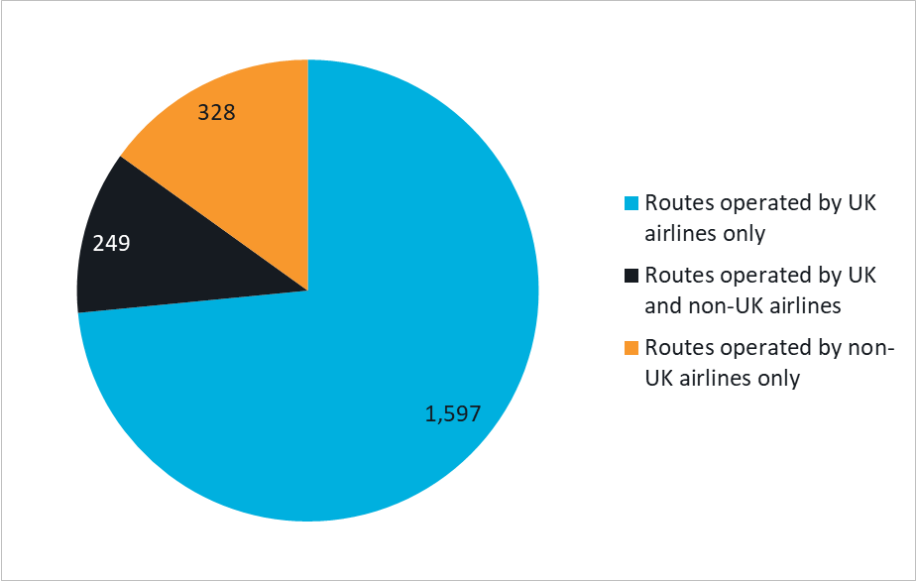
The presence of UK airlines helps to support the UK’s aircraft maintenance industry, which we estimate would contribute around £1 billion less to UK GDP if all international services were provided by foreign carriers.

Connectivity benefits

Direct connectivity

Thanks to their based operations at UK airports, UK airlines can viably operate a wide range of routes. Of the 2,174 unique international routes operated from UK airports in 2019, UK airlines operated on the majority (1,846 routes, 85% of the total), while just under three quarters of the routes served (1,597, 73%) were exclusively operated by UK-based airlines. **An absence or reduction of UK airline fleets at UK airports would likely significantly reduce direct connectivity to and from the UK.**

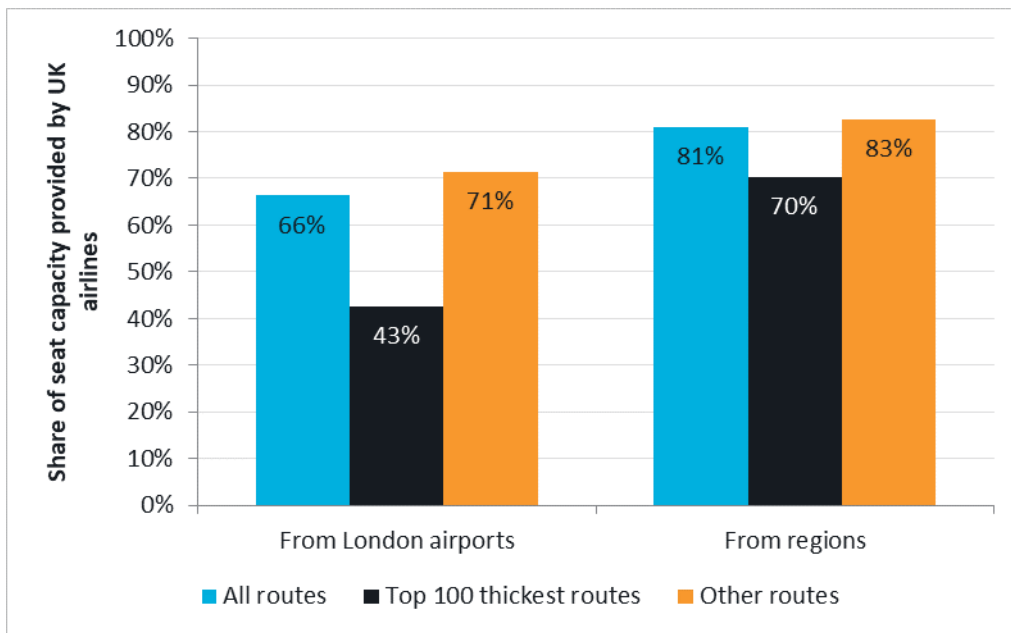
Figure 3: International routes operated by UK and non-UK airlines from UK airports, 2019



Source: OAG Schedules Analyser, Steer analysis

Their focus tended to be on thinner routes, i.e. routes with lower seat capacity per year, compared with those served by foreign airlines, **offering connectivity to destinations where there would have otherwise been little to no direct connectivity to the UK.**

Figure 4: Share of seats operated by UK airlines from UK airports to international destinations, 2019

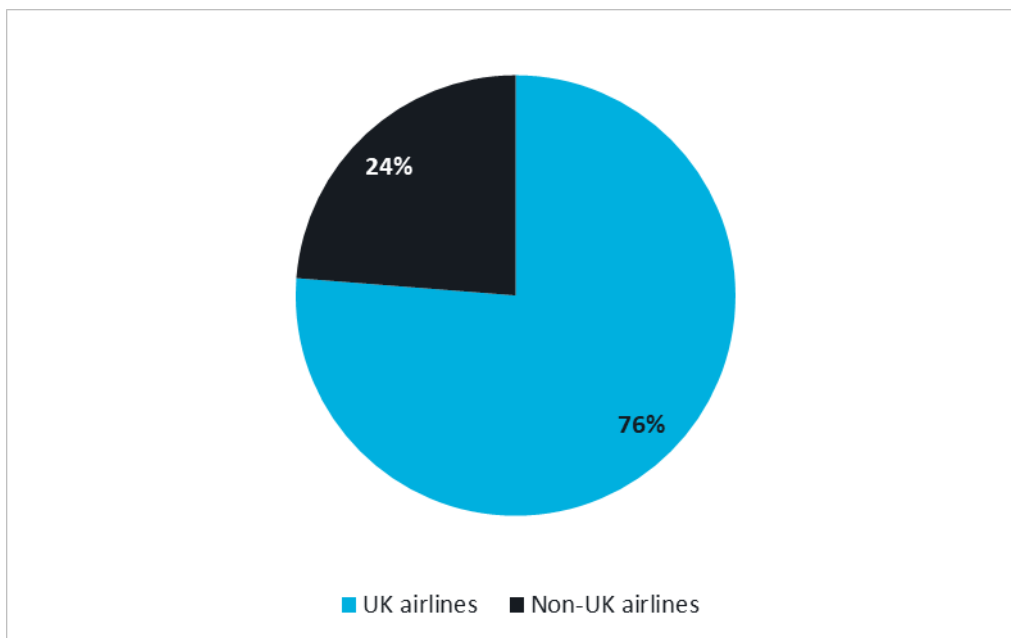


Source: OAG Schedules Analyser, Steer analysis

Indirect connectivity

Thanks to UK airlines’ hub networks, they facilitated the transfer of 76% of passengers connecting via UK airports, mainly through London Heathrow (which handled 83% of all connecting journeys in 2019).

Figure 5: International routes operated by UK and non-UK airlines from UK airports, 2019



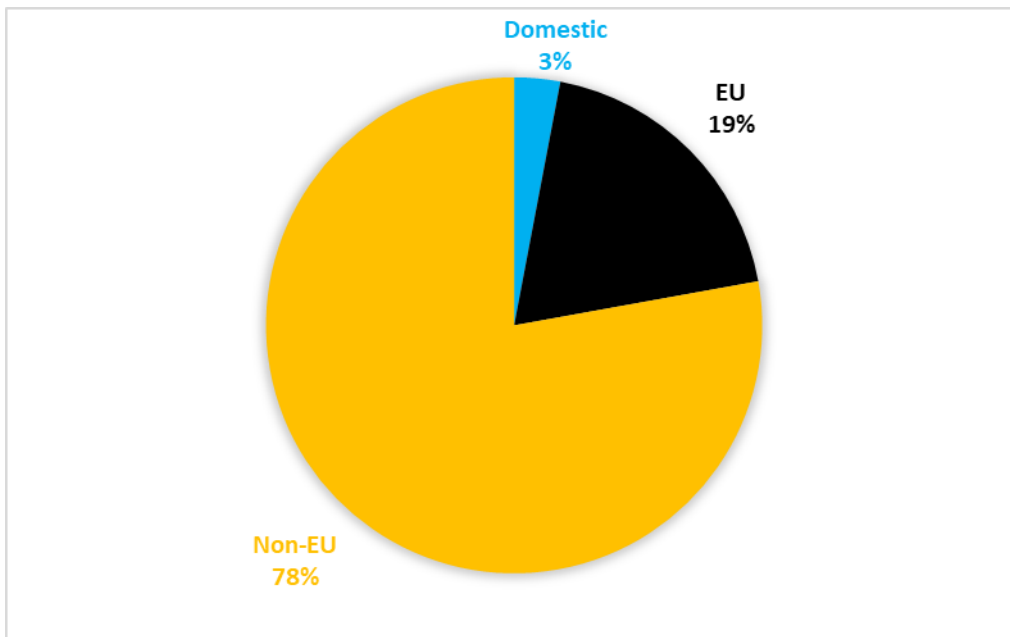
Source: OAG Traffic Analyser, Steer analysis.

Cargo

2.5 million tonnes of cargo were handled at UK airports in 2019. The majority, 63%, was handled through Heathrow, mainly in the bellies of passenger aircraft. In contrast, at the second busiest cargo airport, East Midlands Airport, with 13% of the total, almost all cargo was transported via dedicated freighter aircraft. Stansted, Gatwick and Manchester account for most of the remaining cargo activity at UK airports.

In terms of origins and destinations, the large majority of freight is international, with most of this to destinations outside Europe. This reflects the relative time advantage of air cargo over longer distances compared to alternative modes of freight transport, such as rail and shipping.

Figure 6: Share of air freight handled at UK airports by destination, 2019



Source: CAA, Steer analysis

Complementary to UK scheduled airlines, the value of specialist charter airlines based in the UK should not be underestimated. These airlines operate aircraft to achieve ad-hoc specific missions that scheduled airlines would not be able to achieve.

UK Competitiveness

The IATA Competitiveness report stated in 2019 that “taxes and airport charges in the UK are significantly higher than its regional peers.” In addition, the United Kingdom experienced a reduction of its direct connectivity in 2019. According to the 2019 ACI Airport Industry connectivity report, this is attributed to a cost base that hampers the ability of UK airlines to open new viable routes.

In the World Economic Forum’s (WEF) Travel & Tourism Competitiveness Report 2019, the UK was ranked 140 out of 140 countries for cost competitiveness and behind France and Germany overall. This is a poor performance for an island economy like the UK.

On supporting decarbonisation, the EU and US have actively taken steps to create conditions to help keep their aviation sectors competitive, for example through policies to close the cost gap between Sustainable Aviation Fuels (SAF) and fossil jet fuels, and by supporting SAF

production. With equivalent UK policies less advanced, **UK airlines face the possibility of paying a premium for SAF, eroding their international competitiveness and their ability to grow and connect the UK to the world.**

Decarbonisation

UK airlines support government initiatives to reduce the environmental impacts of the industry and have already made significant efforts in the past 20 years to reduce the environmental effects of their activities. Industry and governments are looking towards Sustainable Aviation Fuels as a key solution to reduce aviation emissions at source. UK airlines have already started to use SAF blends and to invest in research and production at a large scale, to meet their own obligations as well as legislative mandates. Airlines are also conscious that other technologies will be needed to achieve the UK Government's net zero target by 2050. Therefore, UK airlines are working with aircraft and engine manufacturers to support the development of hydrogen aircraft, are seeking urgent progress to complete the modernisation of UK airspace to drive operational efficiencies, and are also investing in carbon removal technology to tackle remaining aviation emissions.

COVID-19 crisis and recovery

In 2020, passengers at UK airports declined by -75% versus 2019 levels; by 2021, the reduction in passenger numbers versus 2019 levels reached -78%. The pandemic and associated loss of passenger traffic has presented economic challenges for airlines, which have reported financial losses as a result. British Airways reported losses before exceptional items of £2.3 billion in 2020, and a further £1.9 billion in 2021. Other UK-based airlines to report losses included easyJet (£858 million, year to September 2021), and Jet2 (£271 million, year to March 2021). UK airlines had to take on additional debt which continue to drag on their profitability in 2023 and going forward.

The sudden and severe restrictions imposed on travel left thousands of travellers stranded abroad, whilst supply chains suffered significant disruption at a time when the need for the delivery of medical supplies was most acute. UK airlines operated hundreds of repatriation flights and carried million tonnes of PPEs and other medical supplies. They also formed a key part of the effort to supply vaccines to the country. This highlights the fact that **a strong UK airline industry is vital to enable government responses in times of crisis.**

The UK air transport market is still in recovery after the difficult years in 2020 and 2021. The number of seats operated by airlines in 2022 was 80% of 2019 levels. International Air Transport Association (IATA) indicates that air traffic in Europe is expected to fully recover by 2024¹.

¹ [Air Passenger Numbers to Recover in 2024](#), IATA, 1 March 2022 (accessed 20 March 2023)

1 Introduction

Background

- 1.1 Steer was appointed by Airlines UK to undertake an assessment of the strategic and economic importance of UK-based carriers. It has been undertaken in the context of the UK Government's recent publication of its strategic framework for aviation, "Flightpath to the future"², which emphasised four themes: sustainable recovery, innovation, realising benefits for the UK and delivering for users. This is the Final Report for the study.
- 1.2 While UK airlines contribute significantly to the UK air transport network, there remains limited understanding of the value they bring to the UK economy in terms of connectivity and economic impact, specifically in virtue of being based in the UK, as compared to other airlines serving UK routes but based elsewhere. The purpose of this study is to assess and quantify the value of UK airlines to the UK economy, considering their importance in providing jobs and contributing to national income across the nations and regions of the UK, and in facilitating tourism and investment and growth in the wider economy.

Our approach

- 1.3 To undertake this assessment, we undertook a review of the available literature and engaged with the members of Airlines UK through questionnaires and direct interviews. We analysed available economic and aviation-focused data sources and developed estimates of the economic impact of the industry – and specifically of the UK-based airlines – both directly and through the wider economy, including catalytic impacts on tourism, foreign direct investment and supporting related industries. In addition to data kindly provided by Airlines UK members, we used publicly available data from the following sources:
 - the Civil Aviation Authority (CAA);
 - the Office of National Statistics (ONS); and
 - the Official Airline Guide (OAG) database of airline schedules and traffic.

This report

- 1.4 This Final Report is a fact-based study analysing the contribution of UK-based airlines to the UK economy. The remainder of this report is structured as follows:
 - Chapter 2 quantifies the direct, indirect and induced economic contributions of UK airlines to the UK economy, as well as catalytic impacts;
 - Chapter 3 considers connectivity benefits provided by UK-based airlines;
 - Chapter 4 considers the competitiveness of UK airlines;
 - Chapter 5 reviews the moves of the UK airline industry to support decarbonisation; and
 - Chapter 6 discusses the impacts of the COVID-19 crisis on the UK airlines and the recovery.

² [Flightpath to the Future](#), Department for Transport, 2022 (accessed 06/10/2022).

2 Economic contribution of UK airlines

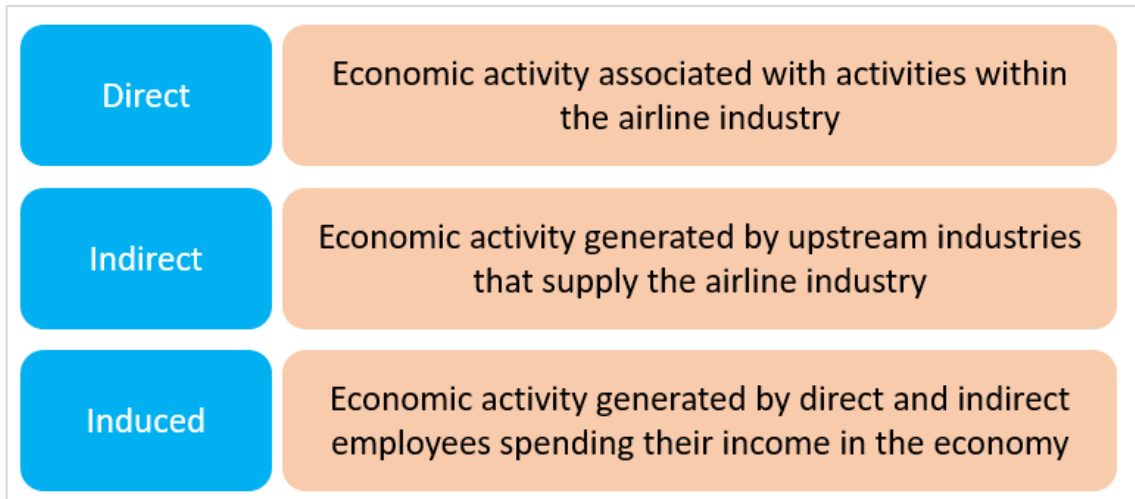
Direct, Indirect and Induced impacts

Introduction

- 2.1 As recovery from Covid-19 is still underway, we have used 2019 as the most representative year for our analysis of the UK airline industry. In that year UK airlines had 894 aircraft based and maintained across the country³, providing all domestic air services and 67% of the seats departing to international destinations.
- 2.2 By having bases at UK airports, UK airlines employ a significant proportion of local people including in back-office functions, who support local economies by spending their money in the country and in the UK supply chains and finance public services through national insurance, Value-Added Tax and others.
- 2.3 This chapter builds upon the analysis elsewhere in the report to estimate the economic contribution of UK airlines to the UK economy. In particular, the economic analysis considers the impacts of the UK airline industry on:
- employment (number of employees associated with the sector);
 - income received as salaries by employees; and
 - gross value added (GVA), i.e. the industry's contribution to national income (measured by gross domestic product, GDP).
- 2.4 GVA is an important economic indicator which considers the revenues generated by an industry less the costs of its inputs, for example, its expenditure on the outputs of other economic sectors or on imports (hence the term 'value added'). GVA aggregated to national level approximately equates to gross domestic product (GDP), with the difference between the two measures being an adjustment for taxes and subsidies on products.
- 2.5 We utilise the traditional measure of economic impacts on employment, income, and GVA of the UK airline industry based on its "direct", "indirect", and "induced" effects on the UK economy. A description of these impacts is shown in Figure 2.1 below. Further details on the methodology followed can be found in Appendix D.

³ locations of where aircraft are based presented in the table and map in Appendix A.

Figure 2.1: Direct, indirect, and induced economic impacts



Source: Steer

Direct contribution

2.6 Table 2.1 outlines the direct impact that UK airlines had on the UK economy in 2018, as well as a comparison of how these direct impacts compared against the wider transportation and storage sector, and the total UK economy. As indicated in Figure 2.1, these impacts relate to the economic activity directly generated by the air transportation industry.

Table 2.1: Direct impact of UK airlines to the UK economy (2018)

Measure	Direct impact
Output (£m)	25,680
Income (£m)	3,585
Employment ('000s)	76
GVA (£m)	5,031

Source: ONS, Steer analysis

2.7 The data indicates that the UK airline industry directly generates 76,000 jobs, with an average output per employee of £338,000 per employee, average income per employee of £47,000 and average GVA generated per employee of £66,000.

UK airlines earned higher revenues (output) by businesses and households in the UK in 2018 compared to non-UK airlines.

2.8 Table 2.2 shows that UK airlines generated £15.7 billion of revenue, whilst non-UK airlines generated £13.6 billion of revenue.

When also accounting for UK airlines’ exports (i.e. selling its services to overseas customers), UK airlines generated almost twice as much direct economic output compared to foreign airlines (£25.7 billion vs £13.6 billion). However, no data is available on the output of foreign airlines on routes to/from the UK in relation to sales to non-UK residents (the fourth, empty, quadrant of Table 2.2), so a complete like-for-like comparison is not possible.

Table 2.2: Comparison of direct economic output by UK and non-UK airlines (2018)

Measure (£m)	UK airlines	Foreign airlines
UK business and household expenditure	15,744	13,624
UK exports	9,936	-
Total direct economic output	25,680	13,624

Source: ONS, Steer analysis

Indirect and Induced contributions

2.9 Table 2.3 shows the multiplier effects for income, employment, and GVA generated by the air transportation industry. The multiplier for direct impacts is by definition equal to 1.

Table 2.3: Indirect and induced multiplier effects for the UK airline industry (2018)

Measure	Indirect	Induced (including indirect)	Induced only
Output	1.7	2.5	0.8
Income	2.2	3.6	1.4
Employment	2.7	4.9	2.2
GVA	2.6	4.8	2.3

Source: ONS, Steer analysis

2.10 Using these multipliers with the direct impacts and differencing appropriately generates the indirect and induced economic impacts of the UK air transport industry shown in Table 2.4.

Table 2.4: Total economic impact of UK airline on the UK economy (2018)

Value	Direct	Indirect	Induced	Total
Output (£m)	25,680	18,775	20,675	65,130
Income (£m)	3,585	4,434	4,946	12,965
Employment ('000s)	76	128	166	370
GVA (£m)	5,031	7,849	11,436	24,315

Source: ONS, Steer analysis

2.11 Overall, considering the direct, indirect, and induced impacts of UK airlines on the UK economy, UK airlines generate **£65 billion of output**, **£13 billion of employee income** from over **370,000 jobs**, and **£24 billion of GVA**. Note that these results only consider activity either within the airline industry, its supply chain and expenditure from its workforce. It does not consider further downstream “catalytic” impacts on the whole economy, which are discussed from paragraph 2.6.

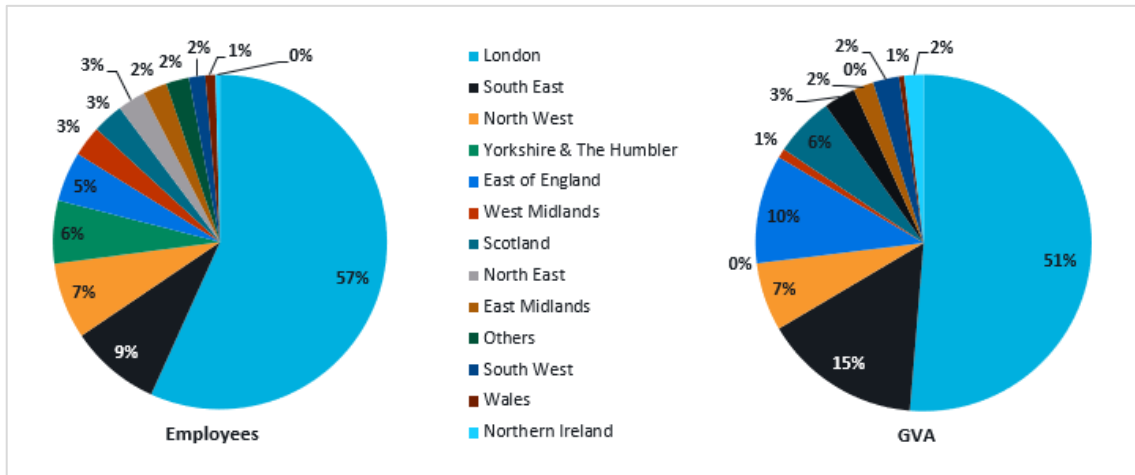
2.12 This suggests that **each aircraft** based at UK airports supports over **400 jobs** in the UK and **£27 million of GVA** per year.

Contributions in UK regions

2.13 Using regional GVA data from ONS, it is possible to estimate the economic impacts of UK airlines at the regional level.

2.14 The regions containing London’s airports accounted for the majority of the UK airlines’ employees and GVA. However, a large number of employees are based in Yorkshire and The Humber (6%) and the North West (7%) and the North West (7%). Furthermore, in term of GVA, North West (£1.5bn GVA) and Scotland (£1.3bn) are also large contributors representing in 17% of the country’s total. Northern Ireland (£400m GVA) and Yorkshire and The Humber (£1bn GVA) benefit substantially from UK airlines activities in their region too.

Figure 2.2: UK airlines employees (2019) and GVA contribution (2018) per region



Source: ONS, UK airlines, Steer analysis.

2.15 Further detail on employees of UK airlines and GVA contribution per region is available in Appendix E.

Case study: UPS air cargo hub at East Midlands airport



UPS invested £138 million to expand its cargo hub operations at East Midlands airport (EMA). Opened in 2021, the 36,000m² extended facility can now sort up to 22,500 packages per hour – more than twice the capacity of the previous facility.

This strengthens connections of UK outside London to world markets, but also the connection between the Midlands region and businesses

throughout the country thanks to UPS’s global smart logistics network. They can now benefit from the six daily flights that connect EMA to key markets, including Germany and vital trans-Atlantic opportunities in the U.S. This will help UK businesses to scale up their exports more easily. In particular, regional small and medium-sized businesses that may otherwise think exporting is beyond their reach.

The facility features automated scanning and sortation systems that make operations more sustainable by reducing UPS’s carbon footprint. EMA is also served in part by liquefied natural gas UPS vehicles that connect the facility to customers throughout the UK and refuel at the nearby ground hub in Tamworth.

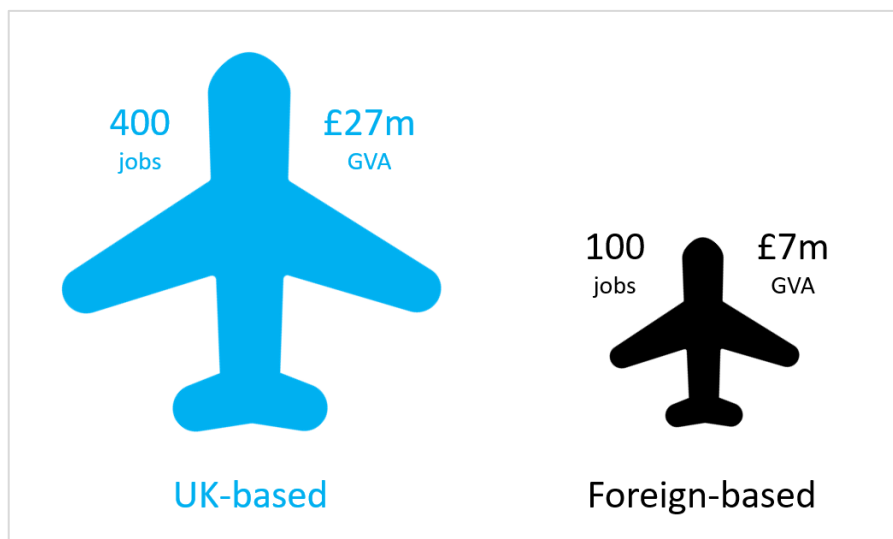
UPS’s operation at EMA represents more than 640 job opportunities for the region.

Benefits of UK-based airlines

Benefit to the economy of UK-based and foreign-based aircraft

- 2.16 As demonstrated above, considering the direct, indirect, and induced impacts of UK airlines, each **aircraft based at UK airports supports over 400 jobs in the UK and £27 million of GVA per year**. In comparison, the same **aircraft based abroad** operating on international routes to the UK, would likely **support only around 100 jobs in the UK and £7 million of GVA per year** assuming equivalent aircraft usage to that achieved by UK airlines, i.e. only a quarter the contribution of UK airlines.

Figure 2.3: Average direct, indirect and induced contribution per aircraft per year, 2018



Source: ONS, UK airlines, Steer analysis.

Hypothetical impact of loss of UK-based airlines

- 2.17 As a way of illustrating the benefits to the UK economy of having airlines based in the UK, we considered the hypothetical situation, admittedly extreme, where only domestic air services were provided by UK-based airlines. While in reality the UK-based industry is highly unlikely to disappear in its entirety, it is possible that it could be significantly reduced in size compared to foreign competitors in an unsupportive policy environment.
- 2.18 Under the hypothetical scenario described, all international flights would be operated by airlines based in other countries. Airlines based abroad are likely to base most of their staff and most of their supply chains in their home countries. For example, they are likely to undertake most aircraft maintenance there, with only immediate maintenance (for example on aircraft turnarounds) being undertaken in the UK.
- 2.19 Based on these assumptions, we estimate that of the 76,000 airline jobs provided by UK airlines (see Table 2.4 above), only 35,000 would remain in the UK, a reduction of 53%. It would be reasonable to assume that the level of direct employment income and of direct GVA generated would also reduce in proportion, with employment income falling from £3.6 billion to £1.6 billion and GVA falling from £5.0 billion to £2.3 billion.
- 2.20 Similarly, we estimate that of the £11 billion of purchases by UK airlines in the UK economy, only £5 billion would remain in the UK, a reduction of 55%. It would be reasonable to assume that the level of indirect employment and of indirect GVA generated would also reduce in

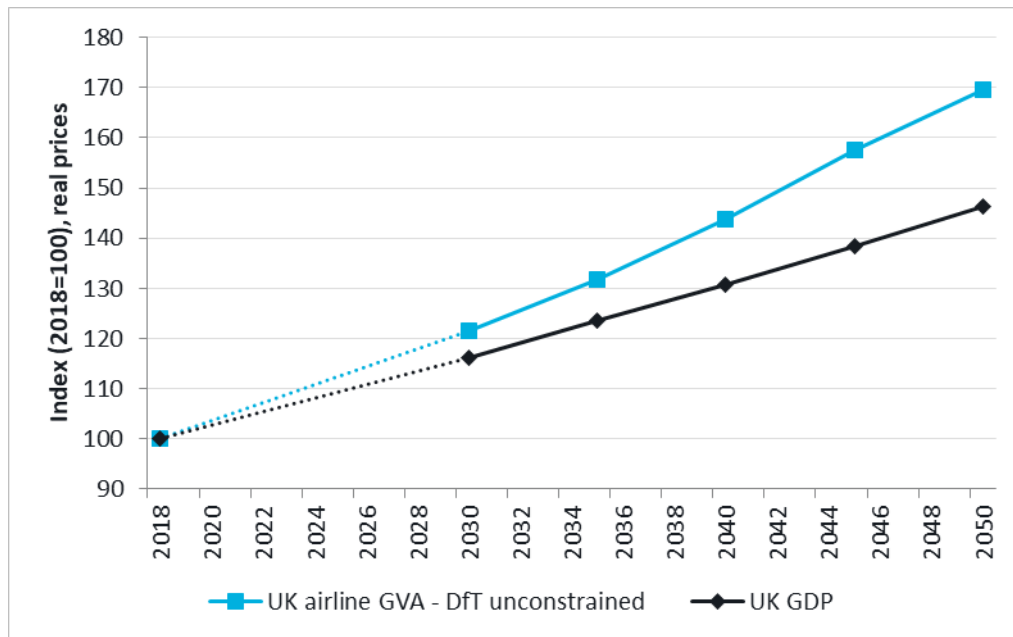
proportion, with employment falling from 128,000 to 60,000, employment income falling from £4.4 billion to £2.1 billion and GVA falling from £13 billion to £4 billion.

- 2.21 These impacts would be likely to be accompanied by corresponding reductions in “induced” impacts, based on the multipliers in Table 2.3 above. Overall, based on the economic impacts set out in Table 2.4 above, the **losses in the economy** could therefore amount to **200,000 jobs, employment income of £7.0 billion and GVA of £11.2 billion.**
- 2.22 If a less extreme scenario of a reduced UK airline industry were to transpire, the likely negative impacts on the economy would be proportionately reduced.

Potential future economic contribution

- 2.1 495 million passengers are expected to travel through UK airports in 2050 according to the latest DfT forecast⁴, assuming the right policy support to enable the aviation sector to meet this demand. This is an increase of 70% compared to 2018 and is significantly greater than the projected growth in the economy, based on the most recent OECD forecast⁵, as shown in Figure 2.4 below, which shows that UK national GDP is expected to grow by 46% over the same period (2018 to 2050).

Figure 2.4: UK airport passenger growth vs UK GDP growth (2018-2050)



Source: OECD, ONS, DfT, Steer analysis

- 2.2 Assuming that UK airlines maintain their market share in 2050, this additional passenger demand is likely to correspondingly expand the size of the UK airline industry by 70%. Using the multipliers for indirect and induced impacts shown in Table 2.3 above, Table 2.5 below provides an estimate of the contribution of UK airlines by 2050 (constant 2018 prices).

⁴ [UK Aviation Forecasts](#), Department for Transport, October 2017 (accessed 25 January 2023).

⁵ [GDP long-term forecast](#), OECD, 2018 (accessed 1 February 2023).

Table 2.5: Potential economic impact of UK airlines in 2050

Value	Direct	Indirect	Induced	Total
Output (2018 £m)	43,656	31,918	35,148	110,722
Income (2018 £m)	6,094	7,538	8,409	22,041
Employment ('000s)	128,350	218,255	282,821	629,426
GVA (2018 £m)	8,552	13,343	19,441	41,336

Source: Steer analysis, DfT air traffic forecast (assumed constant 2018 prices)

- 2.3 Overall, considering the direct, indirect, and induced impacts of UK airlines on the UK economy, under the DfT traffic scenario UK airlines are likely to generate **£111 billion of output, £22 billion of employee income** from over **629,000 jobs**, and **£41 billion of GVA in 2050** (2018 prices).
- 2.4 Therefore, the growth of UK airlines traffic by 70% would generate 259,000 extra jobs by 2050 compared to 2018. This is equivalent to **one new job generated per every two extra flights** operated by UK airlines.
- 2.5 **However, the above is estimated under the assumption that UK airlines continue to provide 72% of seat capacity at UK airports in 2050. Given the much lower economic impact of foreign carriers, if this share were to fall to 65% or 60% by 2050, this would be expected reduce UK jobs by between 46,000 or 79,000 jobs respectively, and similarly to reduce UK GVA by £3.0 billion or £5.2 billion respectively.**

Catalytic impacts

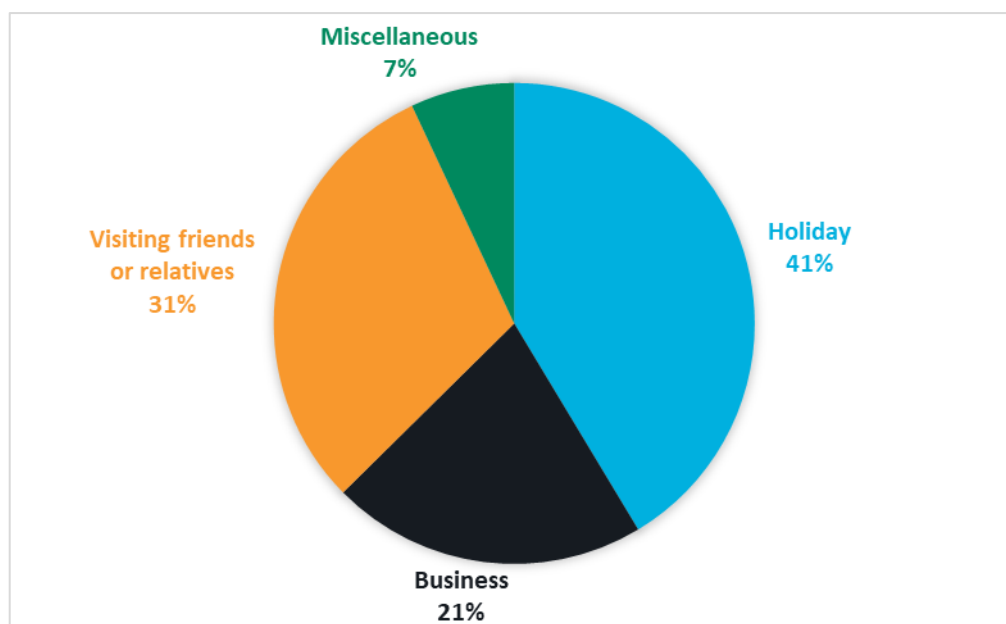
- 2.6 In addition to the economic benefits generated by the aviation industry itself (including its supply chain and employee expenditure in the economy), the industry also acts as a catalyst for other sectors of the economy. These other sectors benefit from the activities of the industry (principally providing international connectivity) over and above their expenditure on air tickets or air freight airwaybills in a number of ways. Key examples of these “catalytic impacts” include supporting:
- tourism including expenditure on accommodation, restaurants and attractions;
 - foreign direct investment (FDI);
 - the aircraft maintenance industry; and
 - training and education.

- 2.7 These effects are described in the sections below.

Tourism

- 2.8 The UK is a major destination for overseas residents for reasons of business, visits to friends and family and leisure visits to enjoy the country’s tourist attractions. There were 40.4 million tourist visits to the UK in 2019, of which 74% were arrivals by air.

Figure 2.5: Purpose of visits of overseas residents in 2019



Source: ONS

2.9 On average, overseas visitors stay on average seven nights and spend around £700. Based on this, we estimate that **UK airlines transported 20 million overseas visitors who spent a total of £14 billion in the country in 2019. This extra income supported around 887,000 UK jobs.**

Foreign direct investment

2.10 In 2019, net FDI into the UK was £42 billion (ONS data). Clearly foreign investment is strongly facilitated by air connectivity and the fact that 67% of international flights in that year were operated by UK-based airlines indicates their importance to supporting FDI. In turn, FDI supports national GDP, so through their support for air connectivity, UK-based airlines make a major contribution to the economy as a whole.

2.11 In order to quantify the benefits of UK airlines to the economy through facilitating FDI, in comparison to the situation where international routes were served by foreign airlines, it is necessary to consider:

- the loss of air connectivity which would occur if international routes were served by only foreign carriers;
- the impact of that loss of connectivity on FDI; and
- the impact of the loss of FDI on national GDP.

2.12 For the loss of air connectivity, we modelled the impact of the loss of UK-based airlines at both the Heathrow hub and other major airports. We identified a loss of over 30,000 international frequencies in 2019, or approximately 2% of total frequencies.

2.13 For the relationship between air connectivity and foreign direct investment (FDI) in a country we reviewed published studies, such as *“The economic contribution of the Aviation Industry in the UK”* by Oxford Economics Forecasting (2006). This concluded that “if air transport usage increases by 10% then business investment will tend to increase by 1.6% in the long run”. This is equivalent to saying that FDI has an elasticity to air connectivity of 0.16.

2.14 Similarly, several studies, including one published by the European Investment Bank (EIB) in 2020⁶, demonstrate the positive impact of FDI on economic growth. Indeed, FDI provides “needed financing for capital accumulation, but also supports the import of positive externalities in terms of new inputs and foreign technologies in the production function”. The EIB study concludes that, for a high-income country such as the UK, the impact on growth of a 1% increase in FDI would be a 0.15% increase in GDP, i.e. an elasticity of 0.15.

2.15 Combining these effects, our analysis showed that the **FDI generated by additional air connectivity achieved through UK-based airlines would have contributed £2 billion additional GDP to the UK economy in 2019.**

Support for the aircraft maintenance industry

2.16 Based on ONS data, UK and foreign airline expenditure on aircraft maintenance can be classified as shown in Table 2.6.

Table 2.6: Airlines purchases in the aircraft maintenance industry, 2018 (£m)

		Maintenance from	
		UK	Abroad
Airlines from	UK	2,476	859
	Abroad	1,482	not available
Total		3,958	not available

Source: ONS, Steer analysis

2.17 UK airlines contribute to the UK aircraft maintenance industry through their purchases of maintenance services. As maintenance service providers form part of the airlines’ supply chain, the economic impacts are captured as part of the “indirect impacts” of the industry shown in the relevant column of Table 2.4.

2.18 However, the presence of the large baseload demand from UK airlines in addition provides UK aircraft maintenance service providers with the economies of scale that allows them to compete successfully for business from foreign carriers (the £1,482 million shown in the second row of Table 2.6). This foreign carrier business is *not included* in the UK airline industry’s “indirect impacts” in Table 2.4, but rather can be considered to be an additional catalytic effect.

2.19 In the scenario considered above, where UK airlines only operate on domestic routes and all international services are operated by carriers based abroad, there would be likely to be two impacts on the UK aircraft maintenance industry:

- the international airlines operating into the UK would purchase most of their maintenance services abroad (for example, swapping over the contributions in the first row of Table 2.6, with only around £850 million spent in the UK); and
- the current expenditure by foreign airlines with UK maintenance service providers would be reduced due to loss of economies of scale and hence competitiveness for those service providers.

⁶ [Impact of FDI on economic growth](#), European Investment Bank, January 2020.

2.20 We estimate that these two effects could lead to a loss of sales output by the UK aircraft maintenance industry of between 50% and 70%. Assuming this translated into equivalent reductions in the GVA of the aircraft maintenance industry of £1,850, this could lead to a reduction in UK GDP of between £900 and £1,300 million.

2.21 Broadly speaking, this means that **UK airlines facilitate higher economic activity by UK aircraft maintenance suppliers (above their own purchases of air maintenance services) of £1 billion per annum.**

Support for training and education

UK airlines play a key role in the education and employment of British young people. They have well developed graduate programmes and apprenticeship schemes with many positions opening every year. In 2019, UK airlines recruited 418 apprentices in a wide range of expertise, as shown in the table below.

Table 2.7: New apprentices working in UK airlines, 2019

	New Starters
Engineering	112
Operations	214
IT	23
Administration	35
Project Management	6
Sales	28
Total	418

Source: UK airlines, Steer analysis

2.22 In addition, UK airlines have established charity programmes which undertake a variety of projects such as promotion of science, technology, engineering and maths (STEM) jobs to young people, volunteering at local vaccination centres and organisation of fundraising events. They also partner with local charities to donate food and equipment and to fund environmental, education and inclusive activities within the country.

Case study: Virgin Atlantic support to STEM initiatives



In September 2021, Virgin Atlantic pledged £2.5 million over five years to support STEM initiatives with grants, sponsorships, and investments through its Passport to Change programme. Working with new charity partners, Speakers for Schools, The Smallpiece Trust and UK for UNHCR, the airline’s community programme aims to inspire and empower young people from all corners of society to engage with STEM education and build career skills for the future in STEM. The programme provide access to STEM learning for young people through a combined model of direct school engagement, grants and scholarships.

The ambition of the Passport to Change programme is to grow its presence across destinations and,

through charity partnerships, encourage social mobility and close the difference between the majority and minority groups, creating opportunities to address inequity in educational learning.

The school engagement programme took place for the first time from September 2021 to July 2022. It involved approximately 300 students of both sexes and different ethnic backgrounds. For instance, 49% of the students were female, 62% were from a white background and 20% from a black background. During a series of 10 events, students learnt about aviation and science, worked as teams, used their creativity, and solved problems. The programme has been a success, with 78% of students saying they would recommend the Passport to Change programme based on their experience.

- 2.23 We have not attempted to put a monetary value on airlines' support for training and education.

3 Connectivity benefits

Market overview

UK airlines

- 3.1 This chapter sets out a description of the UK aviation market, focusing particularly on the role of UK airlines. For this purpose, we consider UK airlines as being all airlines that have significant established bases at UK airports. This includes some aircraft registered in other jurisdictions which are nevertheless based at UK airports, such as the majority of Ryanair’s aircraft based at Stansted. Aircraft based at UK airports generally use UK-based crews and maintenance facilities and make a significant contribution to the UK economy.
- 3.2 Based on these considerations, we have listed and classified the UK airlines based on their main market segment in Table 3.1 below.

Table 3.1: UK Airlines

Airline type	Airline Name	Description
Full-service	British Airways	Full-service airline of the United Kingdom. It has extensive commercial domestic and international operations from the UK with a well-developed transfer offer from their hub base at Heathrow Airport.
	Virgin Atlantic	Full-service carrier primarily operating from its bases at Heathrow and Manchester. It focuses on medium-haul and long-haul routes to North America, the Caribbean, Africa, the Middle East, and Asia.
Low-cost	EasyJet	Low-cost short and medium-haul carrier headquartered in the UK. It offers domestic travel and an extensive route network operating across Europe, with its largest base at Gatwick.
	Ryanair	Low-cost short and medium-haul carrier with a primary base at Stansted and based-operations from 16 UK airports (but headquartered in Dublin, Ireland). It provides both domestic and international connectivity, with hundreds of destinations served across Europe.

Airline type	Airline Name	Description
Leisure	Jet2	Low-cost leisure airline headquartered at Leeds Bradford and providing services from 11 bases across the UK
	TUI Airways	Leisure airline based at large number of UK airports across the breadth of the country. It offers scheduled and charter flights to destinations in Europe, Africa, Asia, and North America.
	Titan Airways	Charter airline based at Stansted. It specialises in short-notice lease operations as well as ad-hoc charter flights for tour operators, businesses, UK government, and the sports and entertainment sectors.
	2Excel	Charter airline offering bespoke travel around Europe, plus operates surveillance flights for the oil industry, training for military air controllers, search and rescue services for the UK government, and border and fisheries patrols.
Regional	Loganair	Regional airline with a primary base at Glasgow. It operates a significant number of domestic routes across the UK, in addition to routes to Norway.
	Eastern Airways	Regional airline operating scheduled and charter flights from several UK bases. It primarily serves routes within the UK and Ireland.
Cargo	UPS	Air cargo arm of UPS, a global parcel delivery company. It operates a large cargo hub at East Midlands, connecting the UK with businesses in Europe and North America.
	FedEx	American multinational freight transport company of which its air delivery service, FedEx Express, connects UK to the rest of the world since 1984. It has a sizable Integrator air freight activity in the UK.
	DHL	German logistic company of which its express mail service, DHL Express, is one of the market leaders for parcel services in Europe. It has a sizable Integrator air freight activity in the UK.

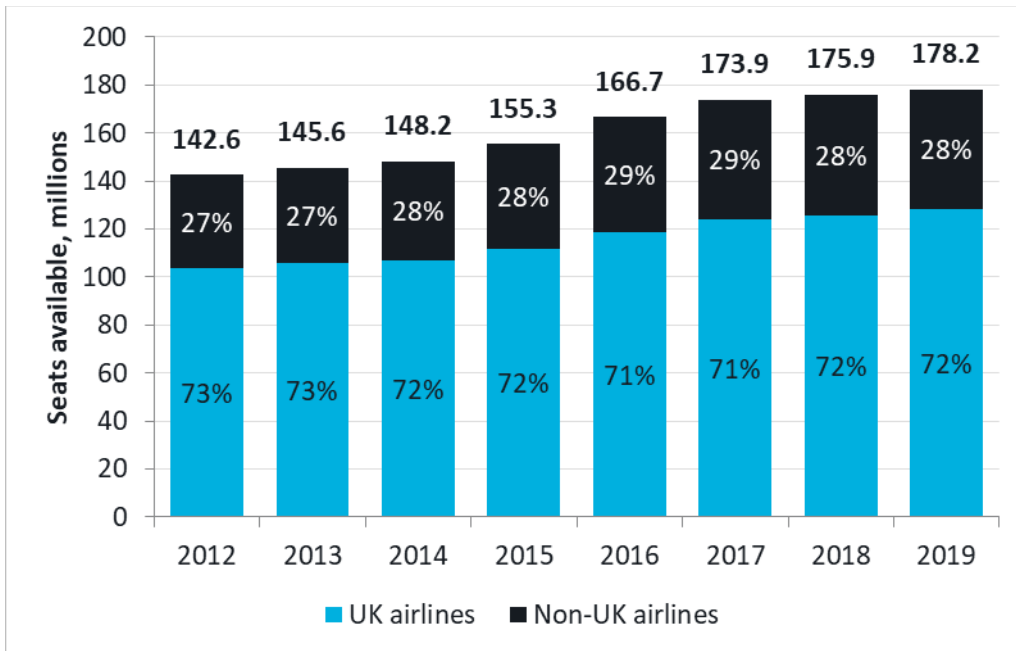
Airline type	Airline Name	Description
Military	Air Tanker	Military aviation service provider, which operates the 'Voyager' air-to-air refuelling tanker to the RAF and official transport of senior ministers and members of the Royal Family. It also leases aircraft for civilian missions.

Source: Steer analysis.

Traffic

- 3.3 In 2019, UK airlines had 894 commercial passenger aircraft based across the UK. Details on where aircraft are based in the country are available in Appendix A.
- 3.4 The number of seats offered by airlines (UK and Non-UK) from UK airports grew from 143 million in 2012 to 179 million in 2019 (CAGR 3.2%). UK airlines' operations expanded alongside the increase of air traffic and represented a stable share of the traffic during the period 2012-2019 with around 72% of the seats flown.

Figure 3.1: Seats departing from UK airports (one-way), 2012-2019



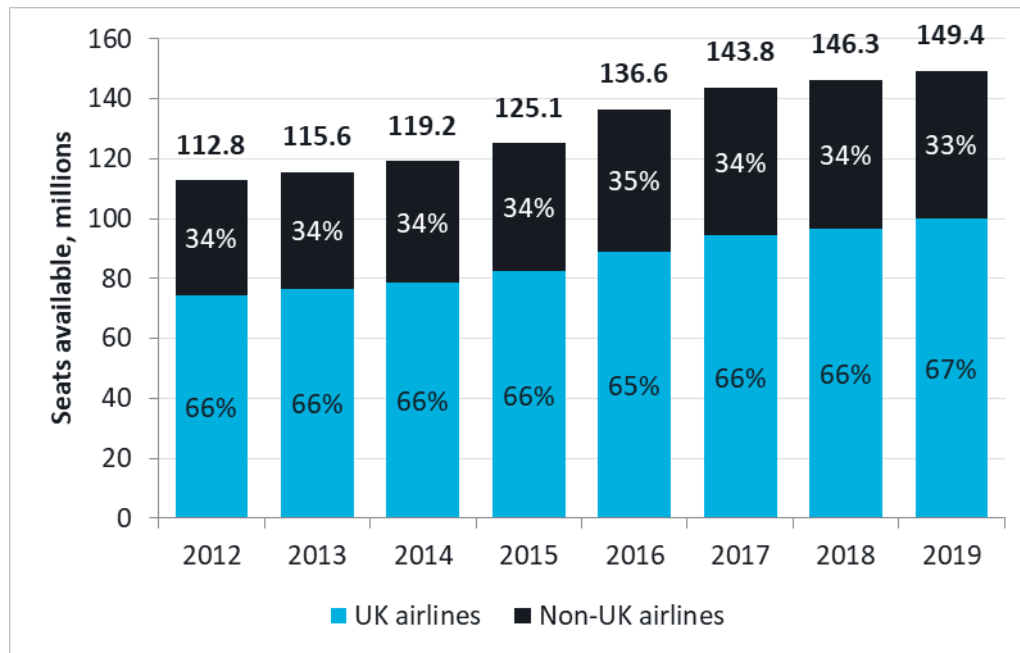
Source: OAG Schedules Analyser, Steer analysis

International

Traffic

- 3.5 Airline services to international destinations increased significantly in the period 2012-2019, from 112.6 million seats to 149.4 million (Compound Annual Growth Rate, CAGR, 4.1%). UK airlines have maintained a stable majority share of the UK international air transport market, operating around 66% of seats through the period 2012-2019.

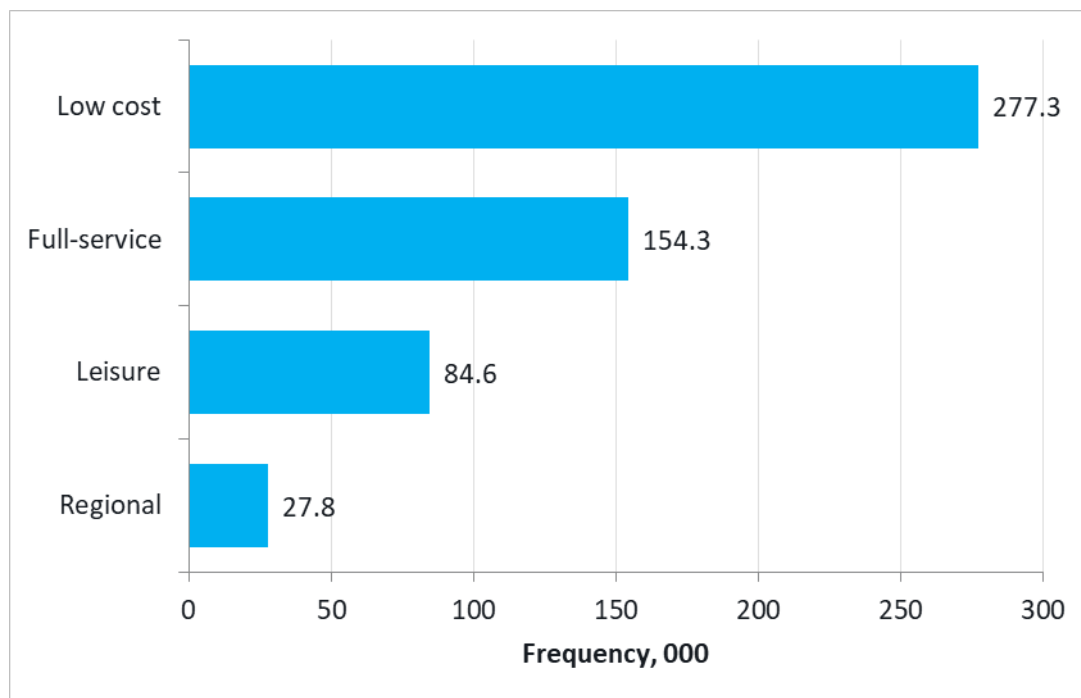
Figure 3.2: Seats departing from UK airports to international destinations split by airline nationality, 2012-2019



Source: OAG Schedules Analyser, Steer analysis

- 3.6 In 2019, UK carriers operated 544,000 flights to international destinations, of which just over half (277 thousand) were operated by low-cost carriers, mainly to Europe. In comparison, full-service carriers operated 154 thousand flights and Leisure carriers 85 thousand flights, as shown in Figure 3.3.

Figure 3.3: International flights operating by UK airlines (one-way), 2019

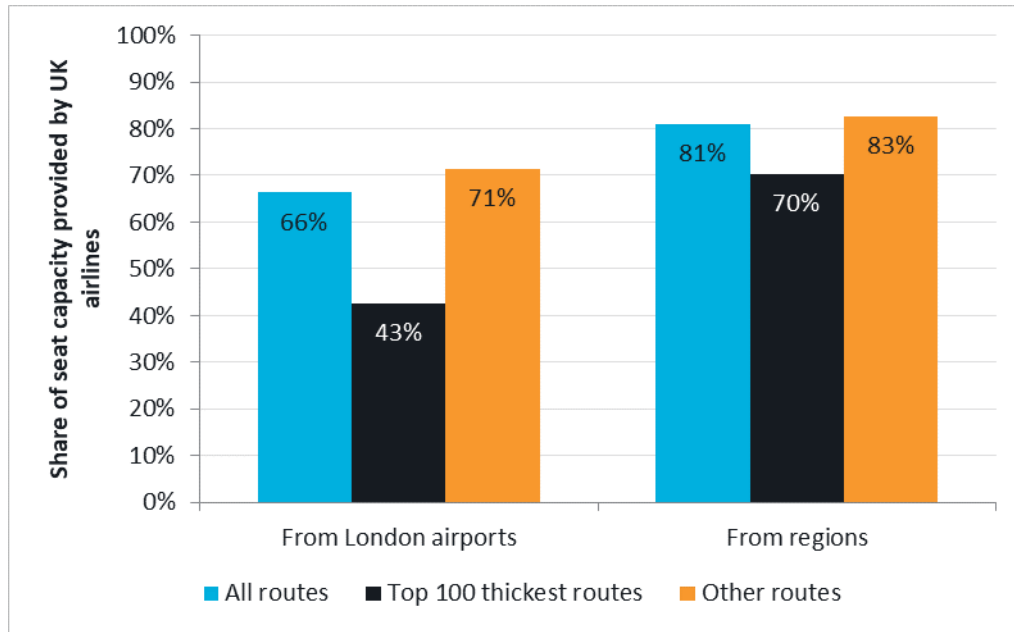


Source: OAG Schedules Analyser, Steer Analysis

Direct connectivity

- 3.7 On all international routes from the airports serving London and the South East, UK airlines provided 66% of the seat capacity in 2019, with a lower proportion on the 100 thickest routes (43%), i.e. routes with high annual seat capacity, but the large majority (71%) on the remaining, “thinner” routes. This means that UK airlines focus more on thin routes from London, usually routes where foreign airlines provide little or no connectivity.
- 3.8 From other regions, UK airlines provided the large majority of seats (81% of seat capacity) in general. However, they provided similarly a lower share of capacity (70%) on the 100 thickest routes and a higher share of capacity (83%) on the remaining thinner routes.
- 3.9 This is shown in Figure 3.4 below. It indicates that **UK airlines are particularly supportive of connectivity on routes to airports outside the London area and on thin routes where foreign airlines provide little or no connectivity.**

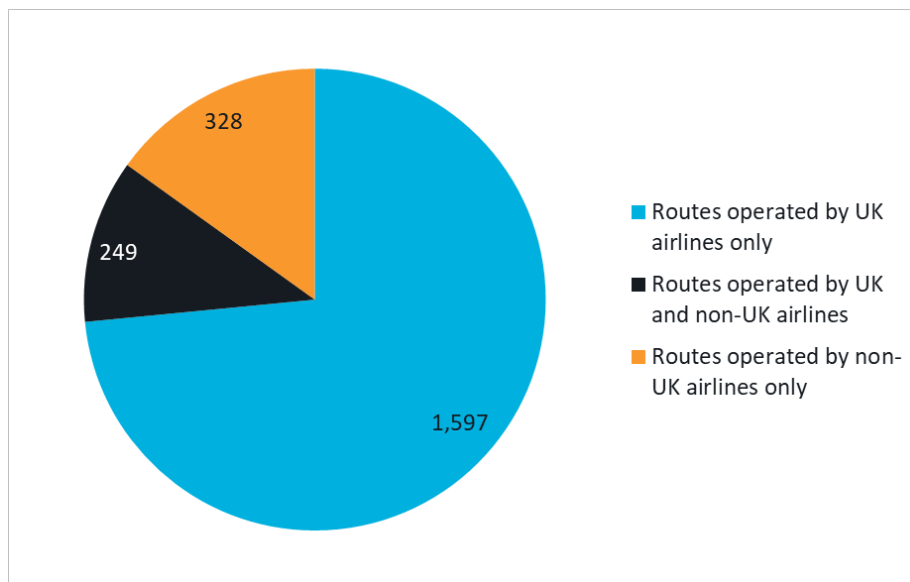
Figure 3.4: Share of seats operated by UK airlines from UK airports to international destinations, 2019



Source: OAG Schedules Analyser, Steer analysis

3.10 The importance of UK airlines for direct connectivity is confirmed by the prevalence of routes on which they operate, and particularly routes where no foreign airlines provide a service. Figure 3.5 shows that of the 2,174 unique international routes operated from UK airports in 2019, UK airlines operated on the majority (1,846 routes, 85% of the total), while just under three quarters of the routes served (1,597, 73%) were exclusively operated by UK-based airlines. In comparison, non-UK airlines operated on 577 international routes (23%), of which 328 (15%) were exclusively served by non-UK airlines.

Figure 3.5: International routes operated by UK and non-UK airlines from UK airports, 2019



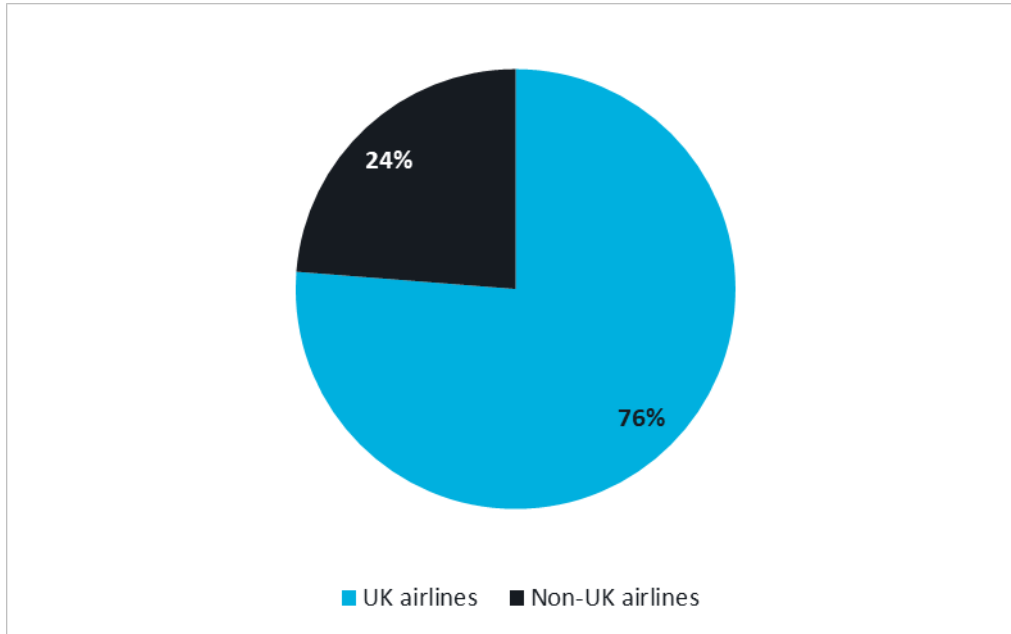
Source: OAG Schedules Analyser, Steer analysis

3.11 Thanks to their based operations at UK airports, UK airlines can operate viably on a wide range of routes. **An absence or reduction of their fleets at those airports would likely reduce significantly direct connectivity to the airport and the country.**

Indirect connectivity

3.12 In 2019, 12% of UK passengers connected through UK airports. The large majority (76%) connected on UK airlines (based on the airline carrying the passenger on the longest sector of their journey), as shown in Figure 3.8.

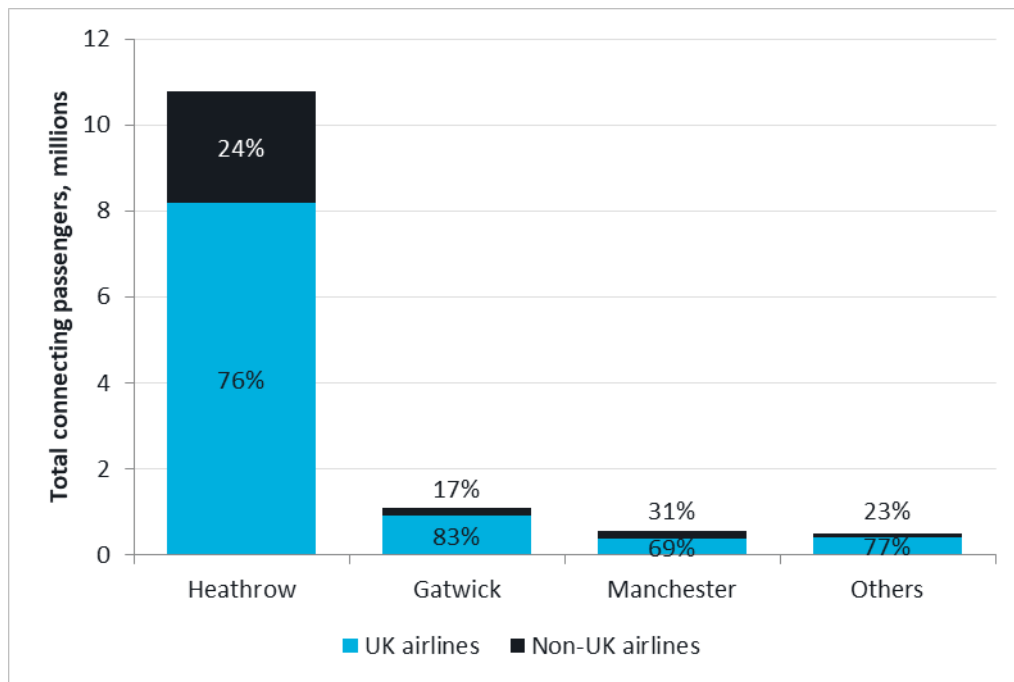
Figure 3.6: Share of passenger connecting on UK airlines at UK airports in 2019



Source: OAG Traffic Analyser, Steer analysis.

3.13 London Heathrow is the airport that handles the most connecting passengers by far in the UK (83%). Both British Airways and Virgin Atlantic have well developed hub operations at the airport and carried 76% of the connecting traffic there. Connecting passengers by airport and UK/non-UK carrier are shown in Figure 3.7.

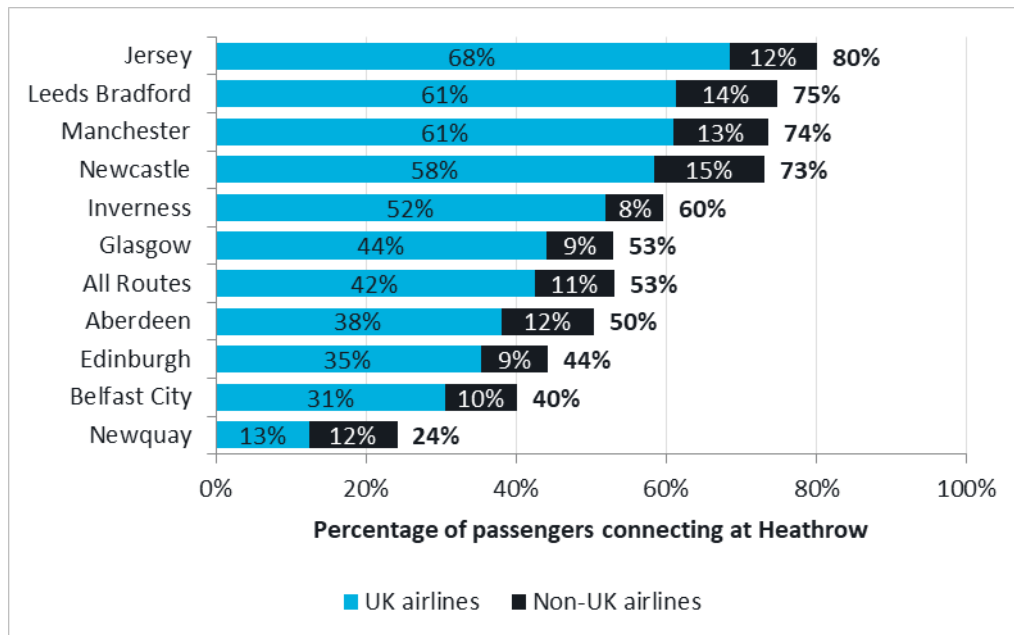
Figure 3.7: Passengers connecting at UK airports (one-way), 2019.



Source: OAG Traffic Analyser, Steer analysis

3.14 **Several highly frequented domestic destinations, such as Manchester, Newcastle, Glasgow, Aberdeen and Edinburgh, are very dependent on connecting traffic.** These routes would therefore almost certainly not be served at the same level of frequency without the presence of the hub at London Heathrow.

Figure 3.8: Share of connecting traffic on the 10 domestic routes from LHR with the highest number of connecting passengers, 2019

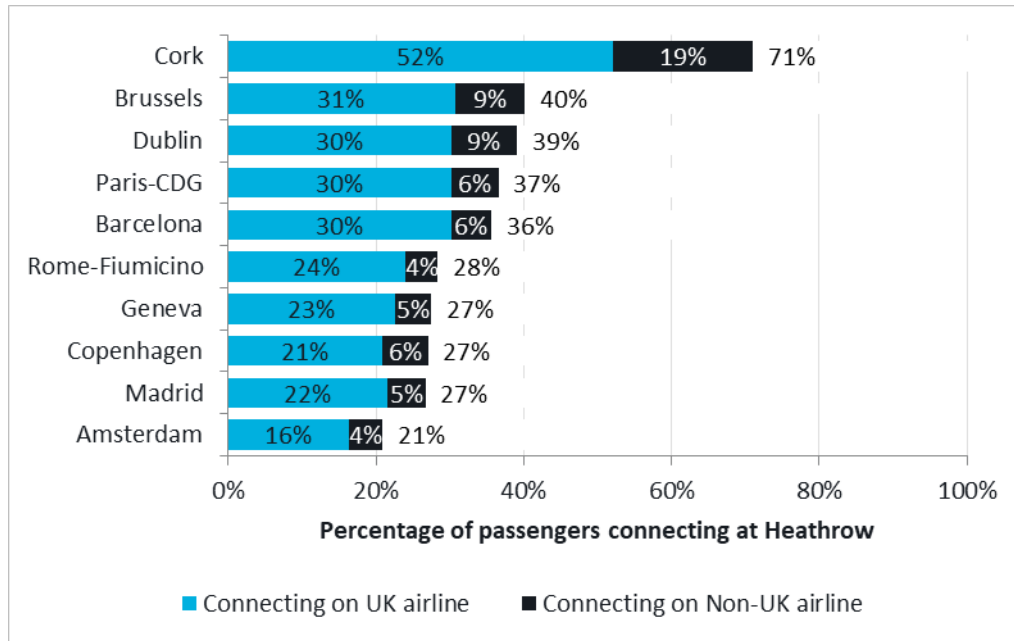


Source: OAG Traffic Analyser, Steer analysis. Note: airports selected represent the 10 UK airports with the highest number of connecting passengers, but they are sorted by the proportion of total passengers that are connecting.

3.15

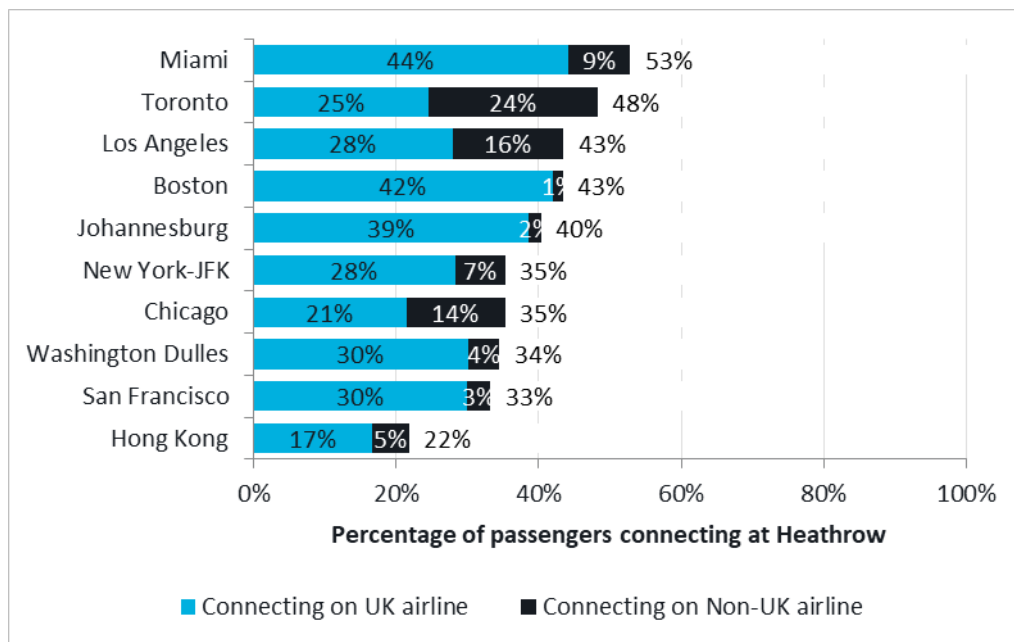
On international routes departing Heathrow, UK airlines also play a significant role in connecting passengers to other destinations. Some of the thinner routes and on routes particularly reliant on connecting traffic, the economic viability or existence of these routes is thus highly subject to the presence of strong UK-based carriers to operate them. The figures below show the short-haul and long-haul routes, respectively, most dependent on connecting passengers.

Figure 3.9: Share of connecting traffic on the 10 international short-haul routes from LHR with the highest number of connecting passengers, 2019



Source: OAG Traffic Analyser, Steer analysis. Note: airports selected represent the 10 short-haul airports with the highest number of connecting passengers, sorted by the proportion of total passengers that are connecting.

Figure 3.10: Share of connecting traffic on the 10 international long-haul routes from LHR with the highest number of connecting passengers, 2019

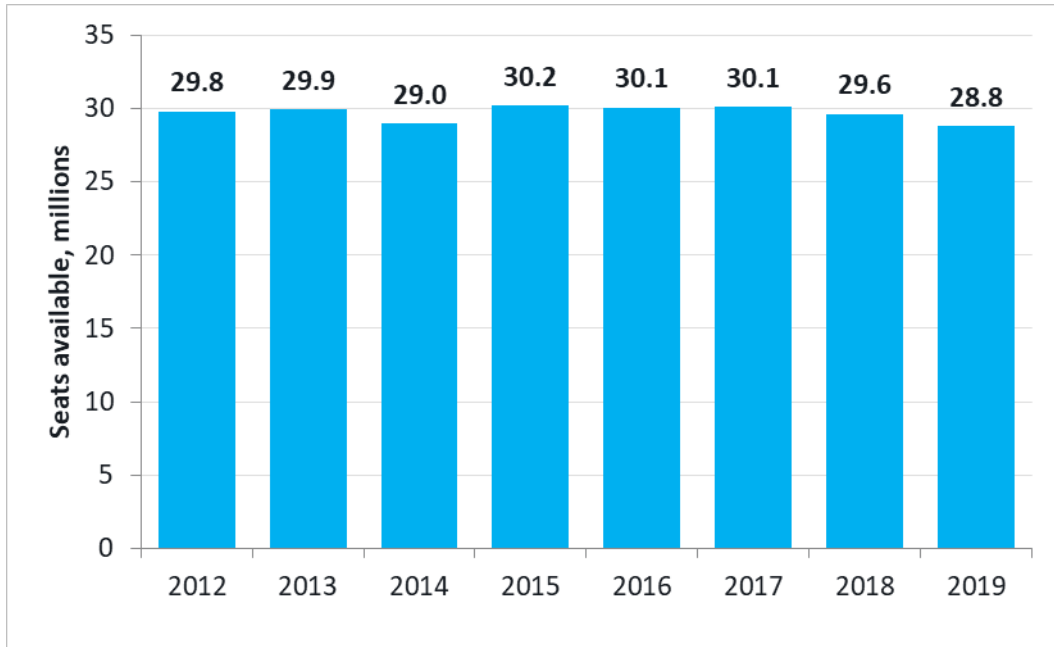


Source: OAG Traffic Analyser, Steer analysis.

Domestic

- 3.16 UK domestic flights are only operated by UK airlines. The number of seats offered to domestic destinations declined from 29.8 million to 28.8 million over the period 2012 to 2019. The UK’s domestic air transport market represented 16% of the total seats departing from UK airports in 2019 against 21% in 2012.

Figure 3.11: Seats departing from UK airports to domestic destinations (one-way), 2012-2019

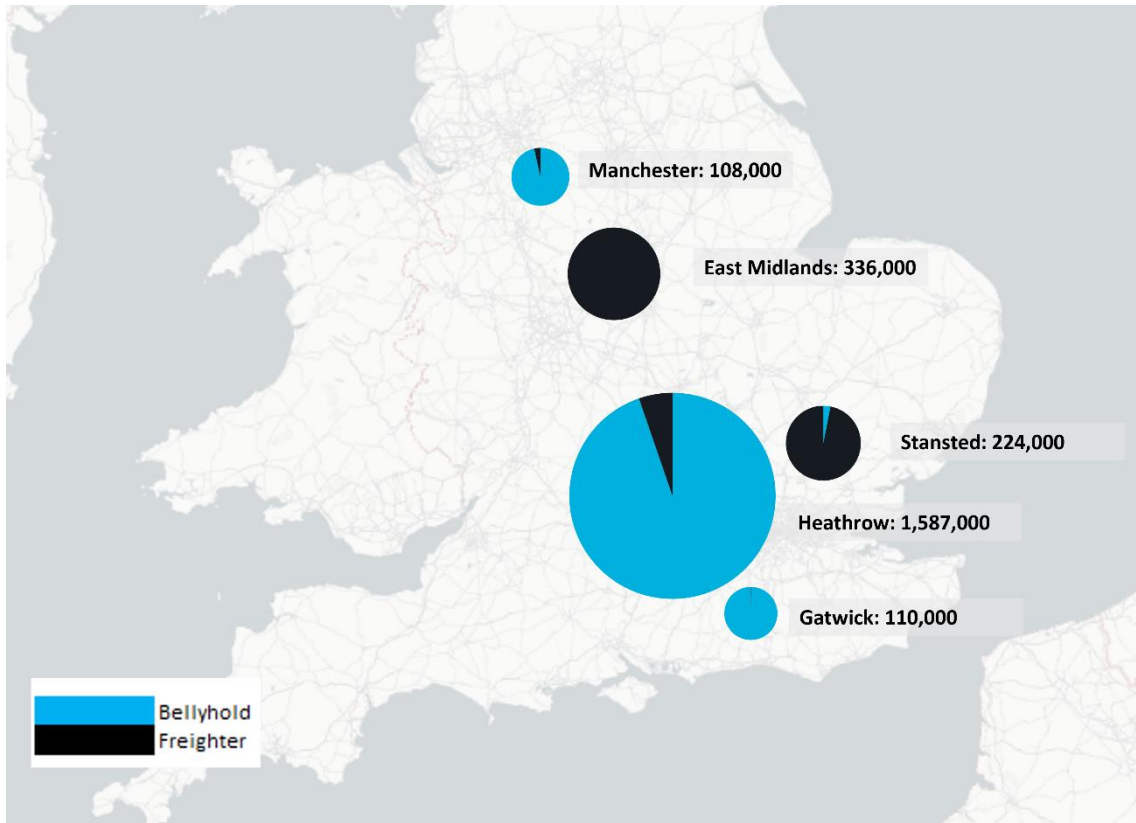


Source: OAG Schedules Analyser, Steer analysis

Cargo

- 3.17 2.5 million tonnes of cargo were handled at UK airports in 2019. The majority, 63%, was handled through Heathrow, mainly in the bellies of passenger aircraft. In contrast, at the second busiest cargo airport, East Midlands Airport, with 13% of the total, almost all cargo was transported via dedicated freighter aircraft. Stansted, Gatwick and Manchester account for most of the remaining cargo activity at UK airports, as shown in Figure 3.12.

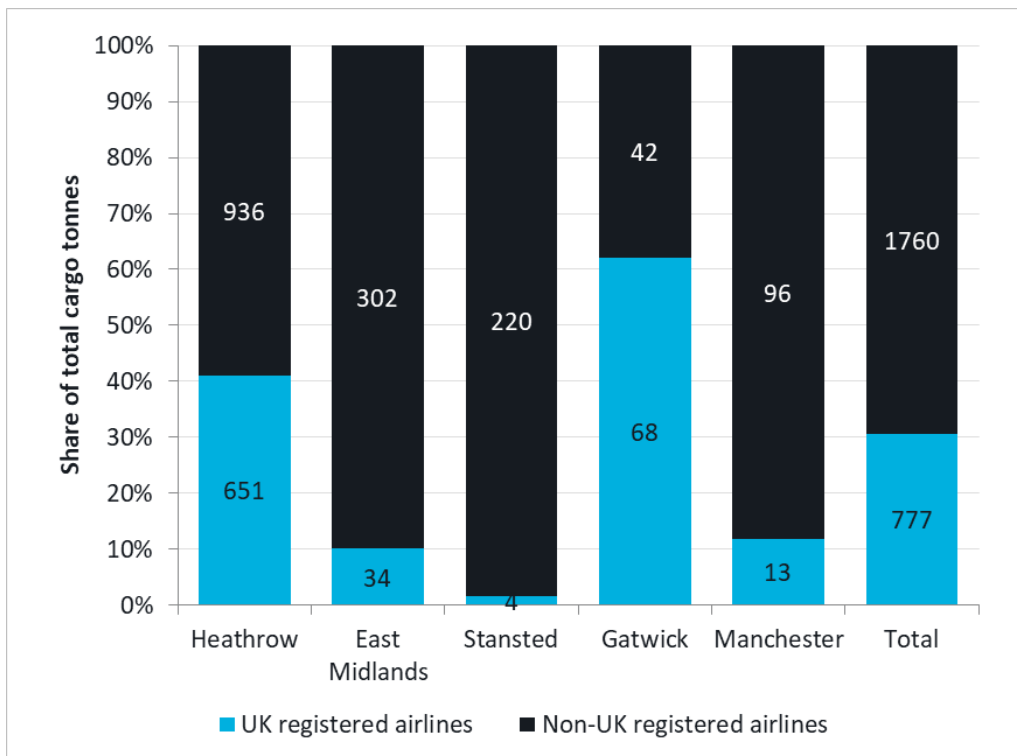
Figure 3.12: Top 5 UK airports by air cargo tonnes in 2019



Source: CAA, Steer analysis

- 3.18 While the available data on cargo does not allow us to distinguish UK-based from foreign airlines, CAA data indicates that UK registered airlines, i.e. airlines with a UK operating certificate, carried 770 thousand tonnes of air cargo in 2019, equivalent to 31% of the total market size. This is a narrower definition than the rest of this study as we otherwise have treated airlines that have an established bases at UK airports as counting as UK airlines, and hence the CAA data understates the presence of UK airlines in the UK air cargo market.
- 3.19 The share varied by airport, with larger UK registered airline shares of air cargo at Gatwick (62%) and Heathrow (41%) being higher than the average, reflecting the use of passenger aircraft for carrying freight at those airports.

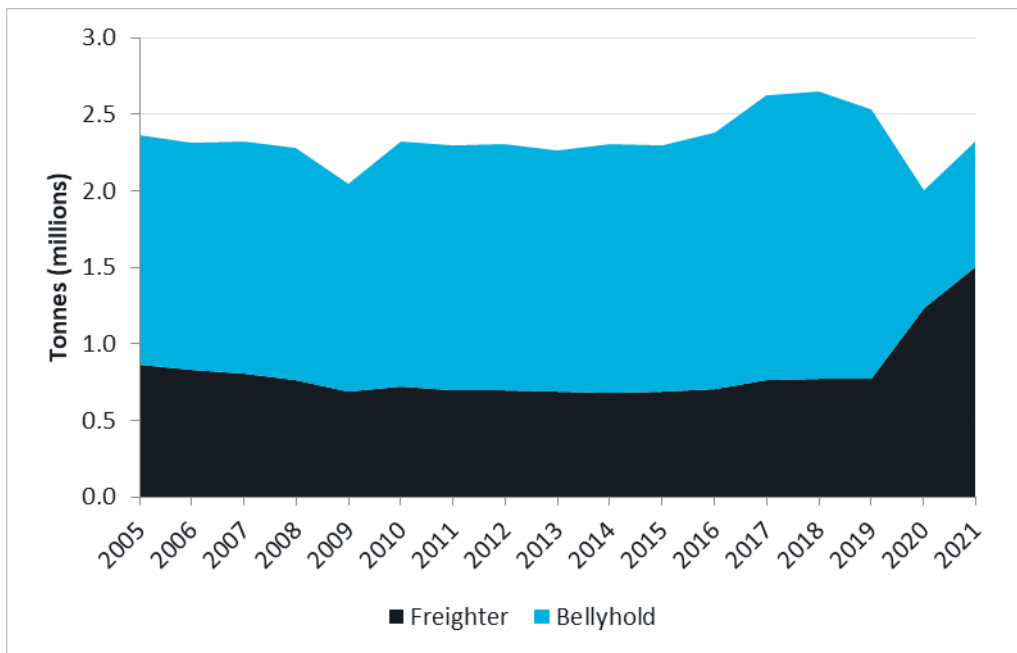
Figure 3.13: Thousands of cargo tonnes by top 5 UK airports, 2019



Source: CAA, Steer analysis

3.20 The UK air freight market saw accelerating growth between 2014 and 2017 before stabilising in 2018 and 2019. The COVID-19 pandemic caused a decline in air freight further than the 2008 financial crisis, with the market growing rapidly in 2021 in recovery. Most of the growth in the freight sector since the pandemic has been driven by freighter aircraft, given the longer-lasting effects of COVID-19 and travel restrictions on the air passenger market, although it is anticipated that the relationship between bellyhold and freighter aircraft in carrying freight will revert over time to the pre-COVID patterns.

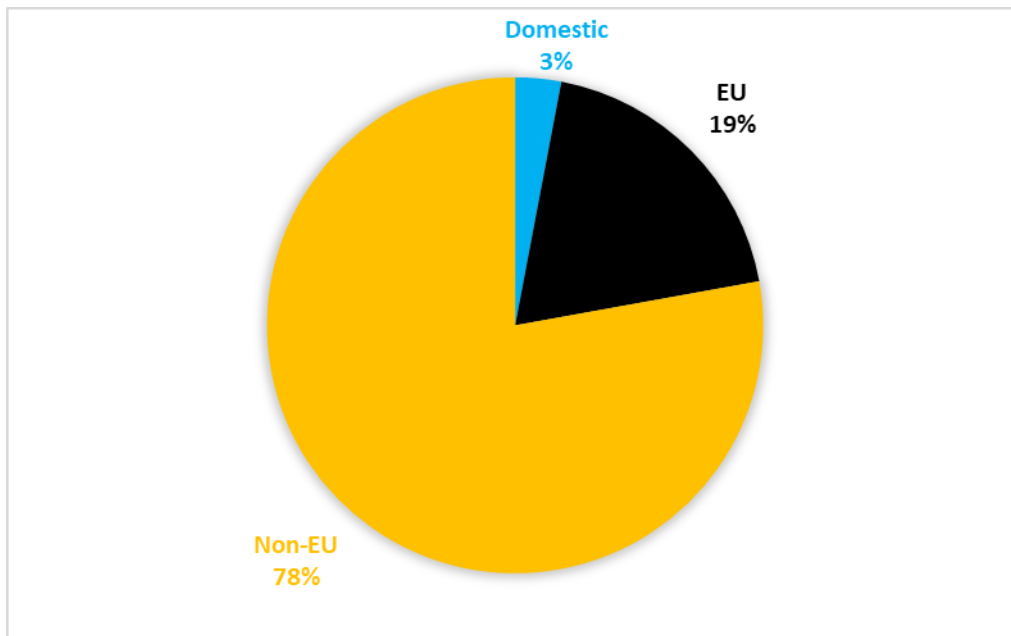
Figure 3.14: Air freight handled in the UK, 2005 – 2021



Source: CAA, Steer analysis

3.21 In terms of origins and destinations, the large majority of freight is international, with most of this to destinations outside Europe. This reflects the relative time advantage of air cargo over longer distances compared to alternative modes of freight transport, such as rail and shipping.

Figure 3.15: Share of air freight handled at UK airports by destination, 2019



Source: CAA, Steer analysis

Specialist charter services

- 3.22 Complementary to UK scheduled airlines, the value of specialist charter airlines based in the UK should not be underestimated. These airlines operate aircraft to achieve ad-hoc specific missions that scheduled airlines would not be able to achieve.
- 3.23 Their missions vary significantly in scope and goals. They include, for example:
- Operating short notice flights for the Foreign Office and a civilian ministerial transport aircraft;
 - Repatriation flights for immigration refusals chartered by the Home Office from UK to countries such as Algeria and Moldova;
 - Supporting the Ministry of Defence (MoD) in performing trooping operations during Ukrainian conflict to bases from the UK to Poland & Finland;
 - Mobilisation of several aircraft for repatriation of passengers to the UK and delivery of PPE during the COVID-19 pandemic;
 - Transporting English and Scottish sports teams to their international matches;
 - Providing freight and passenger services from UK to St Helena after the cessation of operation of the only airline serving this remote island;
 - Providing additional daily capacity to scheduled airlines at peak times and also responding at short notice to airlines covering operational issues and enabling them to deliver their services reliably and responsibly; and
 - Operating regular closed charter flights across the world in support of the oil and gas industry to ensure their ability to maintain regular crew changes.
- 3.24 Despite high fixed costs, specialist charters provide highly flexible and efficient operations in a wide range of areas in order to fulfil ad-hoc and specific requests. This segment of the airline market provides valuable support to Government to fulfil a vital “fire extinguisher” role to support the UK’s worldwide interests, in addition to its commercial role supporting UK businesses.
- 3.25 The case study below shows a particularly high-profile example of the type of service provided by these airlines.

Case study: Release of Nazanin Zaghari-Ratcliffe and Anoosheh Ashoori



Titan’s ability to work in sensitive areas led to the engagement to position an aircraft from the UK to Muscat, Oman in March 2022 to remain on standby for a possible operation. After the successful release two days later of Nazanin Zaghari-Ratcliffe and Anoosheh Ashoori from Tehran, they were transferred from an Omani Air Force aircraft to Titan Airways for their return to the United Kingdom accompanied by UK Government staff.

4 UK Competitiveness

Cost Competitiveness

- 4.1 The IATA Competitiveness report⁷ stated in 2019 that “**taxes and airport charges in the UK are significantly higher than its regional peers**. Air Passenger Duty (APD) is the highest passenger tax in the world and charges for using Heathrow are also among the highest in the world.”
- 4.2 These high taxes and charges on air travel results in high fares for passengers and additional costs for airlines which influence both demand and route viability affecting the UK air connectivity. A study by PwC⁸ estimated that eliminating APD would lead to the creation of 61,000 jobs and a boost of 0.5% of GDP for the UK.
- 4.3 In addition, the United Kingdom experienced a reduction of its direct connectivity in 2019. According to the Airport connectivity report⁹. This is attributed to a lack of capacity at UK largest airports like Heathrow and a cost base that hampers the ability of UK airlines to open new viable routes.
- 4.4 In the World Economic Forum’s (WEF) Travel & Tourism Competitiveness Report 2019¹⁰, **the UK was ranked 140 out of 140 countries for cost competitiveness**. On the overall index which takes into account a large set of factors and policies that enable the sustainable development of the Travel & Tourism, it ranks behind France and Germany. They were also behind on the Development Index in the WEF Travel and Tourism following report in 2021. This is a poor performance for an island economy like the UK.

Emissions trading scheme

- 4.5 UK airlines contribute significantly to the UK Emission Trading Scheme (ETS). As this policy is aligned with the Net zero target (see Chapter 5), the price of purchase of ETS allowances will increase and the number of free allowances given to airlines will decrease over years. UK airlines anticipate a significant increase in their financial contributions to the scheme. One major UK airline expects its annual contribution to rise by 2.5 times between 2022 and 2025.

International support for sector decarbonisation

- 4.6 The UK Jet Zero strategy includes the implementation of Sustainable Aviation Fuel (SAF) mandate with a target of at least 10% SAF by 2030. To support UK airline initiatives on decarbonisation, the government has created a public fund of £165 million for advanced fuels

⁷ [Air Transport Regulatory Competitiveness Indicators](#), International Air Transport Association (IATA), 2019 (accessed 3 May 2023).

⁸ [The economic impact of Air Passenger Duty](#), PwC, May 2015 (accessed 3 May 2023)

⁹ [Airport Industry Connectivity Report 2019](#), Airports Council International (ACI) Europe (accessed 3 May 2023)

¹⁰ [The Travel & Tourism Competitiveness Report 2019](#), World Economic Forum (accessed 3 May 2023).

to encourage manufacturers to open new SAF plants¹¹. However, leading UK airlines and airports believe that further state intervention will be needed to expand SAF usage in the UK and avoid competitive disadvantage compared to international competitors.

- 4.7 For example, the use of sustainable aviation fuels (SAF) by airlines is being supported within the EU and in the US, with the US using the recent Inflation Reduction Act (IRA) which includes a new set of tax credits for SAF production, equivalent to approximately £1.40 of support per litre. Within the EU, 20 million free allowances under the EU ETS scheme are to be set aside to 2030 to help cover the price differential between kerosene and eligible SAF. A proportion of airline revenues into the EU ETS are also to be hypothecated into its Innovation Fund (worth some €450 million annually) to support breakthrough innovative technologies and infrastructure, including production of low- and zero-carbon fuels.
- 4.8 The EU and US have, consequently, created the conditions to help keep their aviation sectors competitive by closing the cost gap between SAF and fossil jet and by supporting production. With equivalent UK policies less advanced, **UK airlines face the possibility of paying a premium for SAF, eroding their competitiveness and their ability to connect the UK to the world.**

¹¹ [Advanced Fuels Fund \(AFF\) competition winners](#), Department for Transport, 22 December 2022 (accessed 19 January 2022).

5 Decarbonisation initiatives

Operational improvements

- 5.1 In the context of targeting net zero carbon emissions for the UK by 2050, the Department for Transport published its Jet Zero strategy in July 2022, a framework and plan to address emissions generated by air transport. UK airlines fully acknowledge the need to decarbonise the industry and have committed themselves to achieving net zero. They have already invested significantly in the past 20 years to reduce the environmental impacts of their activities.
- 5.2 UK airlines have made major efforts to renew their aircraft fleets. New aircraft models have more efficient engines and improved aerodynamics, making them more fuel-efficient and quieter than the previous generation of aircraft. For example, Airbus A320neo aircraft are at least 15% more fuel efficient than the classic A320 models and provide a 50% noise footprint reduction. One of the major UK airlines testifies to having improved its fuel efficiency by 35% compared to 2010 thanks to the renewal of its aircraft.
- 5.3 UK airlines have also invested in new technologies and processes such as Artificial Intelligence and Big Data in order to optimise flight planning, aircraft maintenance and aircraft navigation. In addition, they have (or are in the process of):
- electrified ground handling vehicle fleets;
 - removed weight from aircraft by introducing lighter seats and more paperless content on board;
 - reduced the prevalence of single use plastic; and
 - enhanced recycling and waste management.

Sustainable Aviation Fuels

- 5.4 The Jet Zero strategy includes the implementation of Sustainable Aviation Fuel (SAF) mandate with a target of at least 10% SAF by 2030.
- 5.5 In the last five years, UK airlines have started to operate commercial flights using fuel incorporating SAF. This is planned to increase, and airlines have already contracted future purchases of SAF from suppliers over the next few years. Some airlines have gone further, setting a target of 30% of SAF use in their fleets by 2035.
- 5.6 Correspondingly, some UK airlines have launched programmes to offer to their customers the opportunity to purchase SAF along with their flight tickets in order to reduce the carbon footprint of their travel.
- 5.7 UK airlines have been working with partners to develop UK SAF production for more than 15 years and have established research centres where they collaborate with fuel suppliers and airports to deliver innovative solutions (see case study below).

Case study: British Airways build a SAF plant with Velocys

Though its parent company, International Airlines Group (IAG), BA will be the first airline in Europe to invest in building a waste-to-fuel plant with renewable fuels company, Velocys. The plant will convert household and commercial waste into SAF. This long-term relationship will ensure BA is able to begin to power its fleet more sustainably for years to come. Construction of the facility in North East Lincolnshire is expected to commence in 2024 and to be completed by mid-2026, following which commissioning and start-up will commence, with full scale commercial operation expected in 2027. The facility will take hundreds of thousands of tonnes of waste and convert it into clean-burning, sustainable fuels. The fuel produced from this plant will also create high quality green jobs and can connect to Humberside carbon capture and storage network.



The technology, built by Velocys, will reduce greenhouse gas emissions by 70% for every tonne of sustainable jet fuel that replaces a tonne of conventional fossil fuel. The annual carbon savings from the plant are equivalent to taking up to 40,000 cars per year off the road. The plant could produce enough fuel for more than 1,000 flights using SAF from London to New York each year in an A350 aircraft.

In addition, in November 2021 IAG signed an agreement with Velocys to acquire 220,000 tonnes of SAF over ten years. This equates to one third of the planned output of the company's new Bayou Fuels project in the US when it begins delivery in 2026. The technology used in this project will capture CO₂ from the manufacturing process to permanently remove it from the atmosphere.

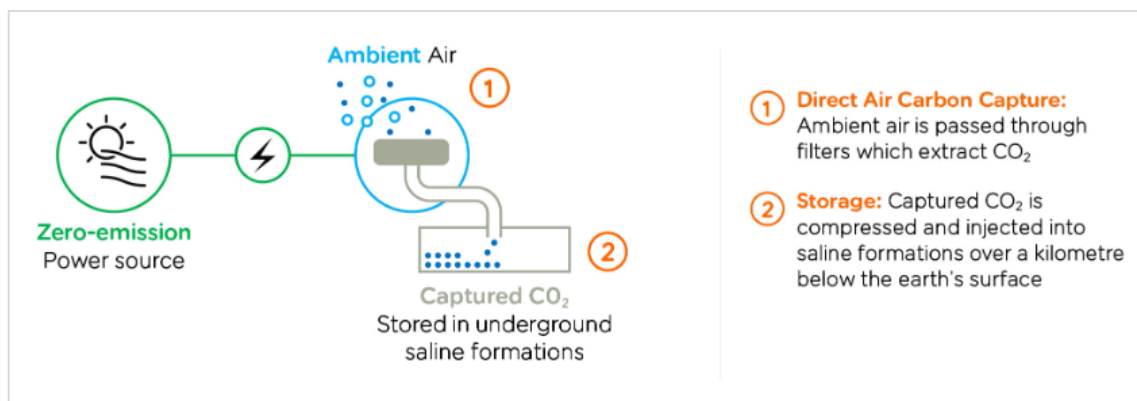
Zero emissions technologies

- 5.8 Apart from “drop-in fuels” such as SAF, hydrogen shows the most potential to further decarbonise and to achieve net zero by 2050. A major UK airline estimates that the use of hydrogen fuelled aircraft can reduce its carbon emissions per passenger kilometre by 78% by 2050 (vs 2019).
- 5.9 Over the past couple of years, UK airlines have accelerated the development of zero carbon emission technology, including by investing in ZeroAvia, a leading innovator in decarbonising commercial aviation based in the UK, so as to accelerate the development of 50+ seater aircraft capable of running on zero emissions hydrogen fuel cells as their power source. They have also announced a multi-million-pound investment into a partnership with Rolls-Royce to develop hydrogen combustion engine technology. UK airlines are working closely with the whole aviation supply chain, in partnership with companies such as Airbus, GKN Aerospace, Cranfield Aerospace Solutions and Wright Electric.

Carbon removal

- 5.10 Carbon removal technology has the potential to be the solution to address residual emissions and to take UK airlines to net zero. This nascent technology captures CO₂ from the atmosphere via a chemical process and then places it into underground storage sites or uses it in the production of cement or carbon fibre. It is recognised by climate scientists, including by the latest Intergovernmental Panel on Climate Change (IPCC) report¹², as critical to help the world go beyond climate mitigation and to support the achievement of net zero by removing residual emissions.
- 5.11 UK airlines have been supporting research and innovation to help accelerate the development of these solutions since 2019. In summer 2022, a UK airline signed a letter of Intent with Airbus in order to accelerate the on-going developments.

Figure 5.1: Carbon removal technology



Source: easyJet

¹²[AR6 Climate Change 2022: Mitigation of Climate Change](#), Intergovernmental Panel on Climate Change, April 2022.

6 COVID-19 crisis and recovery

COVID-19 crisis

Impact on the UK aviation market

- 6.1 The pandemic has presented challenging operating conditions for the aviation industry, both in the UK and around the globe. The UK international aviation market is a very large proportion of the total market size, which meant that the recovery of the UK aviation market was dependent on the easing of restrictions in international destinations.
- 6.2 In 2020, passengers at UK airports declined by -75% versus 2019 levels; by 2021, the reduction in passenger numbers versus 2019 levels reached -78%. This reflects the challenging operating conditions that the pandemic has presented for the aviation industry, both in the UK and around the globe.
- 6.3 The pandemic and associated loss of passenger traffic has presented economic challenges for airlines, who have reported financial losses as a result. British Airways reported losses before exceptional items of £2.3 billion in 2020, and a further £1.9 billion in 2021. Other UK-based airlines to report losses include easyJet (£858 million, year to September 2021), and Jet2 (£271 million, year to March 2021). UK airlines had to take on additional debt which continue to drag on their profitability in 2023 and going forward.

UK airlines support

- 6.4 At the outset of the COVID-19 pandemic, the sudden and severe restrictions imposed on travel left thousands of travellers stranded abroad, whilst supply chains suffered significant disruption at a time when the need for the delivery of medical supplies was most acute. UK airlines assisted with repatriating UK citizens from around the world, as well as operating cargo flights to fly vital medical supplies to the UK.
- 6.5 Between March and June 2020, British Airways operated 134 repatriation flights, from 33 cities across 21 countries. The airline states that these repatriation flights carried nearly 40,000 passengers from locations across the globe, including destinations not normally part of the airline's route network, back to the UK. Also, between March 2020 and February 2021, BA operated 455 charter flights to carry medical supplies such as vital Personal Protection Equipment (PPE), test kits, sanitisers, vaccines and ventilators¹³. Two Boeing 777 aircraft operated by the airline were temporarily converted into dedicated cargo aircraft in order to carry as many supplies as possible¹⁴.

¹³ British Airways

¹⁴ [British Airways operates over 1000 worldwide repatriation flights to bring home UK citizens, British Airways](#), 6 July 2020 (accessed 31 August 2022).

- 6.6 Virgin Atlantic also assisted the Foreign and Commonwealth Office (FCO) in operating COVID-19 repatriation flights, returning passengers from destinations including Delhi, Mumbai, Johannesburg and Cape Town. Additionally, Virgin Atlantic also operated charter flights between China and the UK to deliver essential medical supplies and PPE to be used within the NHS, delivering over 4 million tonnes of essential medical equipment into the UK. In preparation to deliver COVID-19 vaccines to the UK, Virgin Atlantic Cargo also adapted its pharmaceutical cargo offering to enable the airline to safely transport vaccine doses to the UK¹⁵.
- 6.7 In addition to the above examples, other UK airlines were involved in the government scheme to repatriate stranded travellers to the UK, such as easyJet, Jet2.com, Titan Airways and TUI¹⁶. **This highlights the criticality of having a strong UK airline sector to enable government responses in times of crisis.**

Recovery post-COVID-19

Overview

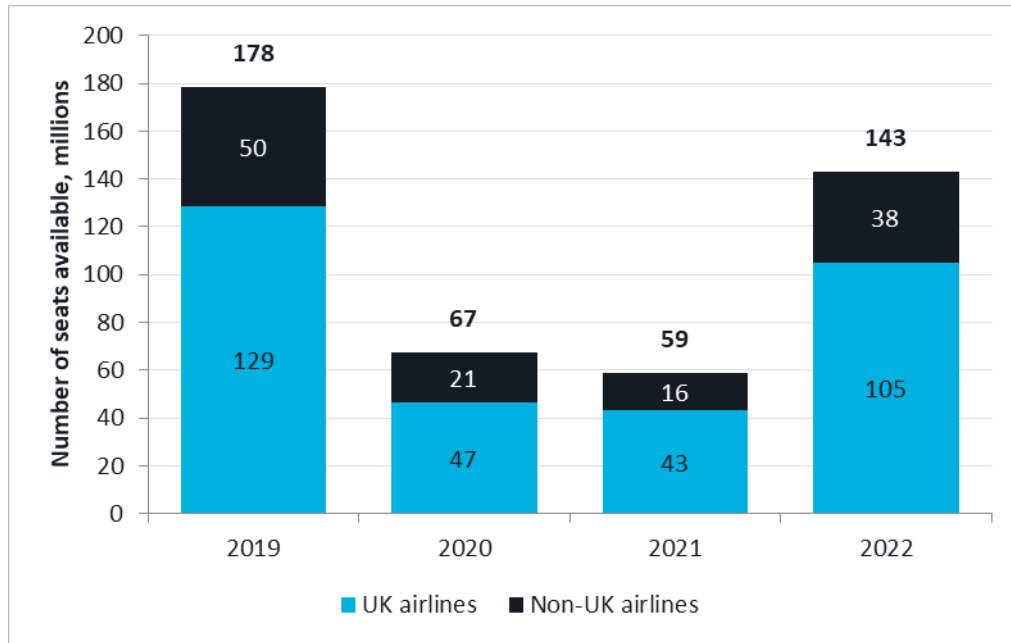
- 6.8 The UK air transport market is still in recovery after the difficult years in 2020 and 2021. The number of seats operated by airlines in 2022 was 80% of 2019 levels. The major airlines in the market in 2019 are recovering (except Flybe which was declared bankrupt in March 2020, was brought out from administration by one of its former shareholders, restarting operations in 2022 at a smaller scale, but which has now fallen into administration again (January 2023)). The trends in capacity operated are shown in Figure 6.1. International Air Transport Association (IATA) indicates that air traffic in Europe is expected to fully recover by 2024¹⁷.

¹⁵ Virgin Atlantic announces more cargo flights to bring medical supplies to the UK, Virgin Atlantic, 9 April 2020: <https://www.virgin.com/about-virgin/latest/virgin-atlantic-announces-more-cargo-flights-bring-medical-supplies-uk> (accessed 31 August 2022)

¹⁶ Coronavirus repatriation: “What should you do if you are stuck abroad?”, BBC, 30 March 2020: <https://www.bbc.co.uk/news/explainers-52098067> (accessed 31 August 2022)

¹⁷ [Air Passenger Numbers to Recover in 2024](#), IATA, 1 March 2022 (accessed 20 March 2023)

Figure 6.1: Seats departing from UK airports, 2019-2022

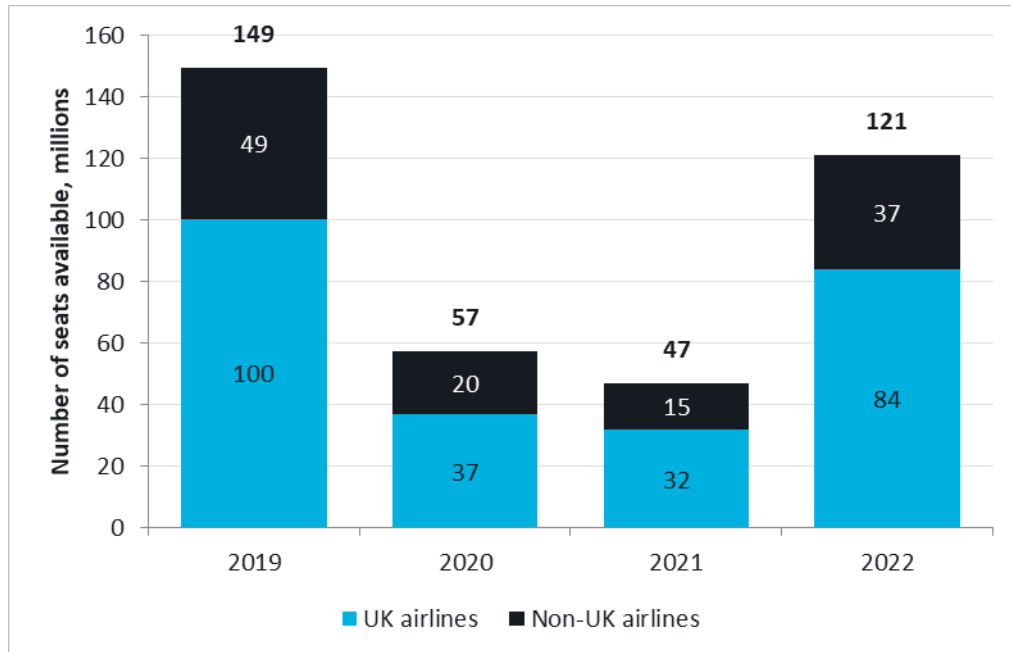


Source: OAG Schedules analyser, Steer analysis

International

6.9 The international market has recovered to 81% of the 2019 seats in 2022. UK airlines are driving the recovery with 84% of their seats in 2022 and represented 69% of the market.

Figure 6.2: Seats to international destinations (one-way), 2019-2022

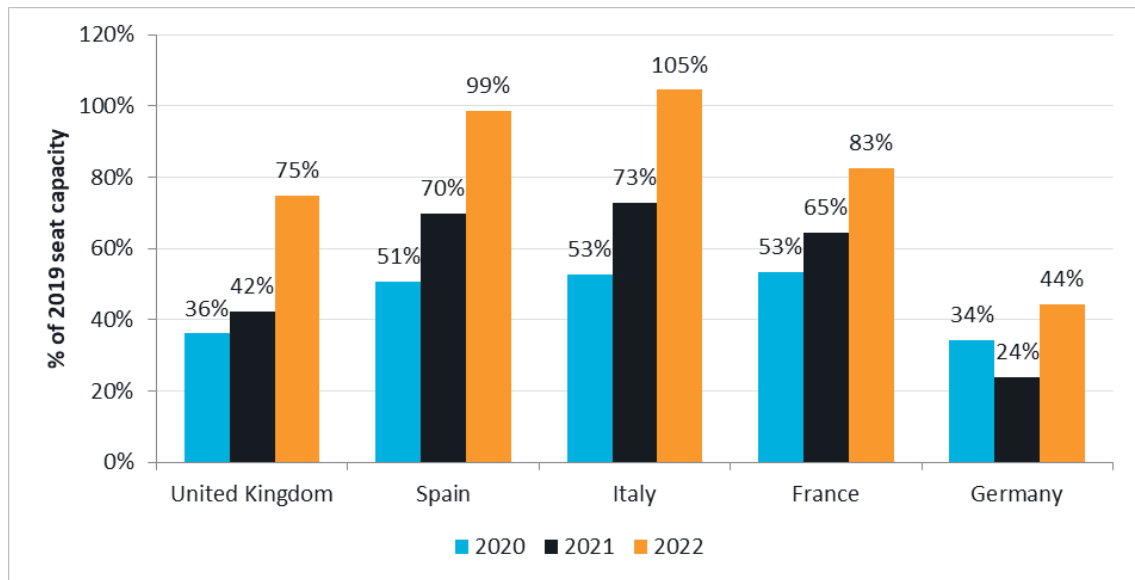


Source: OAG Schedules Analyser, Steer analysis

Domestic

- 6.10 The recovery of the domestic market appears to be happening at a slower pace than its European counterparts. As shown in Figure 6.3, the recovery of seat capacity is lower in United Kingdom compared to Spain, Italy or France in 2022. Italy have even reached a higher seat capacity than in 2019. The bankruptcy of Flybe in 2020 has severely affected the domestic offer in the country and still left a gap in 2022. Many frequencies previously operated by the regional airline have not been replaced by other airlines.

Figure 6.3: Domestic market recovery by country, 2020-2022



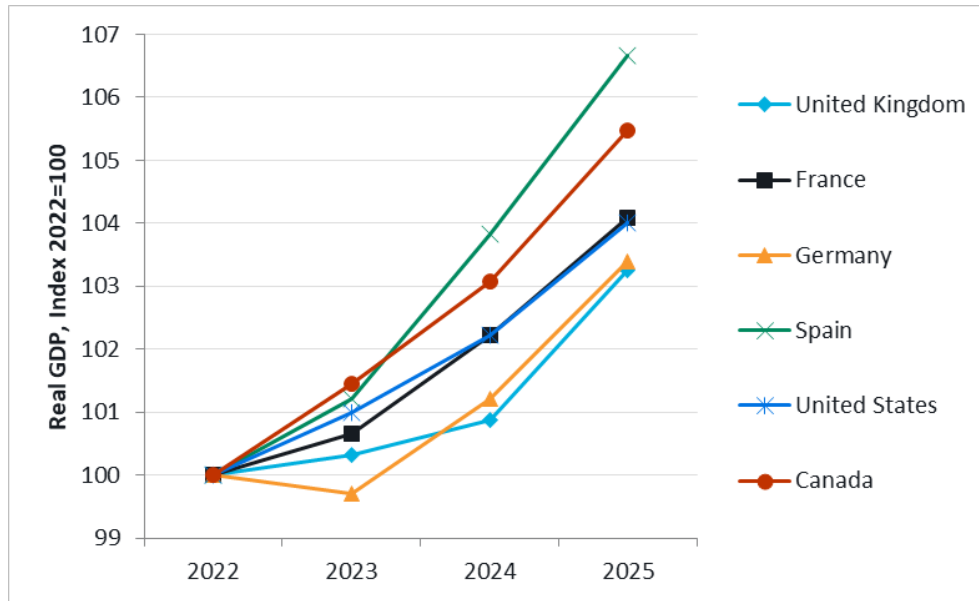
Source: OAG, Steer analysis

Economic headwinds

- 6.11 According to the recent GDP forecast published by International Monetary Fund (IMF)¹⁸, the UK is expected to have slower GDP growth than France, Germany, Spain, United States and Canada over the 2022-2025 period. These countries have strong based airlines which compete directly with UK airlines on the international air transport market.

¹⁸ [World Economic Outlook Report October 2022](#), International Monetary Fund (accessed 11 November 2022)

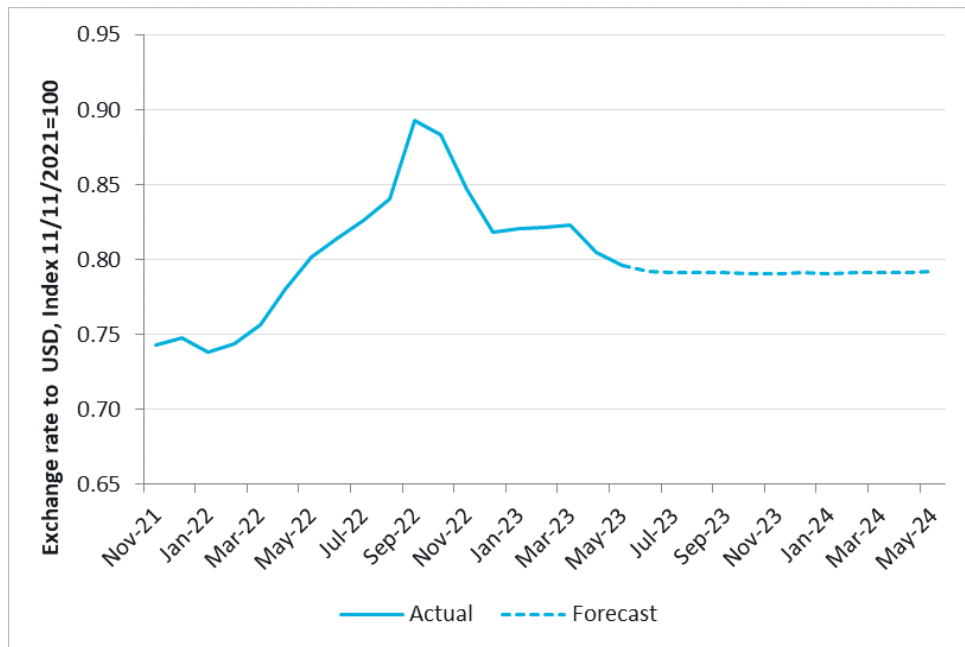
Figure 6.4: GDP evolution by country, 2022-2025



Source: IMF, Steer analysis

6.12 In addition, a large part of airlines’ operating costs is usually paid in US dollars currency, especially fuel and aircraft financing or purchase. Since November 2021, the value of the dollar has risen by 7% against the pound. Considering the current high levels of inflation and fuel prices, this provides additional cost pressures to UK airlines. The value of USD is expected to stay quite high over the next 12 months¹⁹.

Figure 6.5: Exchange rate evolution, November 2021 – May 2024



Source: FX Empire, Steer analysis

¹⁹ [GBP/USD Forward Rates](#), FX Empire (accessed 9 May 2023)

Appendices

A. Location of based aircraft

Table A.1: Location of based aircraft in the UK, 2019

Region	No. of aircraft	Airport	No. of aircraft
London	285	London Heathrow	261*
		London City	24
East of England	217	London Stansted	177
		London Luton	32
		London Southend	7
		Norwich	1
South East	125	London Gatwick	125
North West	86	Manchester	74**
		Liverpool	12
Scotland	41	Edinburgh	25
		Glasgow International	12
		Glasgow Prestwick	3
		Aberdeen	1
South West	35	Bristol	32
		Bournemouth	2
		Exeter	1
West Midlands	28	Birmingham	28
East Midlands	26	East Midlands	26
Yorkshire & The Humber	21	Leeds	18
		Doncaster Sheffield (now closed)	3
North East	14	Newcastle	14
Northern Ireland	12	Belfast International	12
Wales	3	Cardiff	3

Source: UK airlines data, Steer analysis. Notes:(*) 13% of the No. of aircraft is data from 2022. (**) 6% of the No. of aircraft is data from 2022.

Figure A.1: Map of UK airports with based airlines

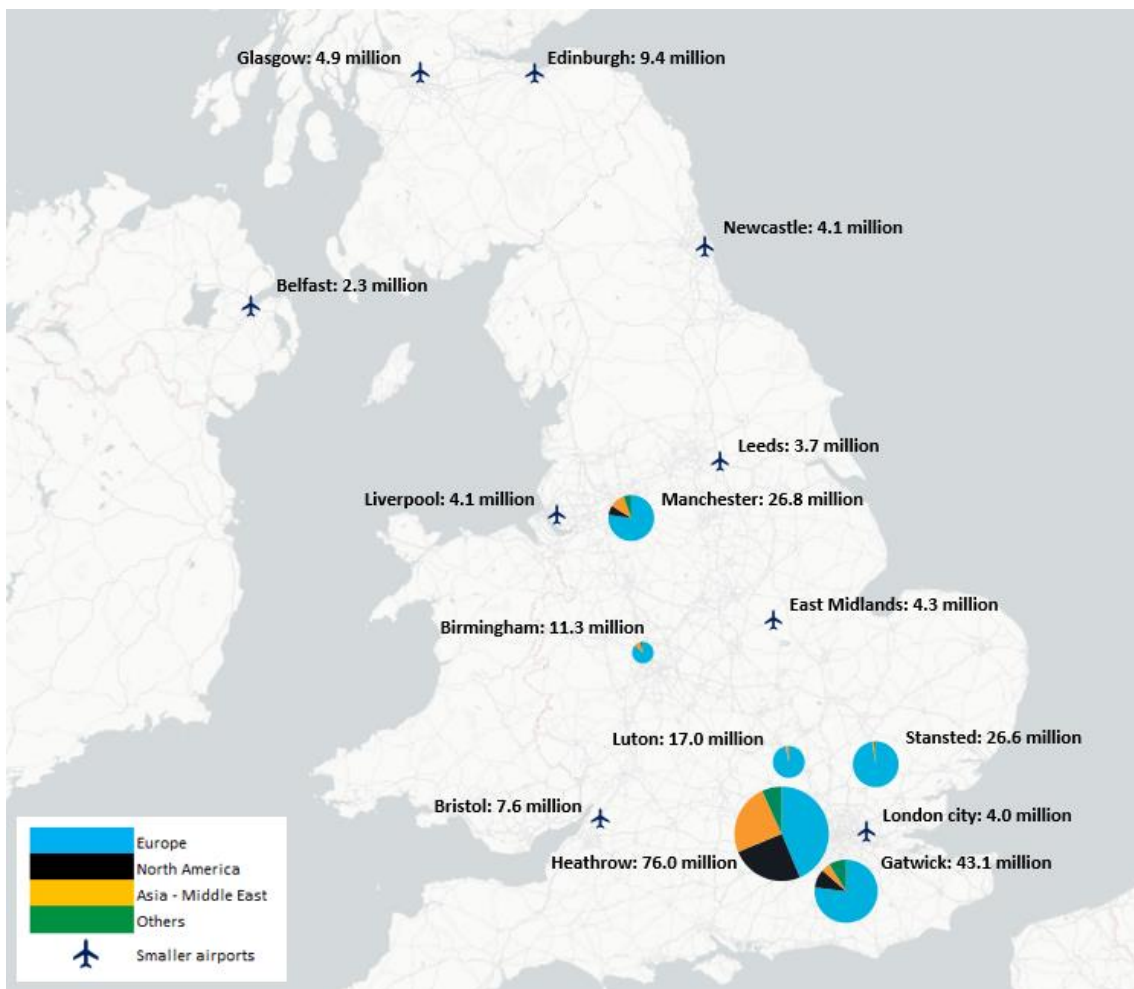


Source: Steer

B. Further information on international market

B.1 The busiest airports for international passengers are located in South East England. Most of the passengers heading towards long-haul destinations departed from Heathrow, Gatwick or Manchester in 2019.

Figure B.1: Number of international passengers at top UK airports split by region of destination, 2019



Source: CAA, Steer Analysis

B.2 The top 20 international destinations served by UK airlines are shown in Table B.1. The destinations include leisure destinations across Europe, as well as important business and trade hubs in Europe and North America (New York).

Table B.1: Top 20 international destinations by seat capacity served by UK airlines, 2019

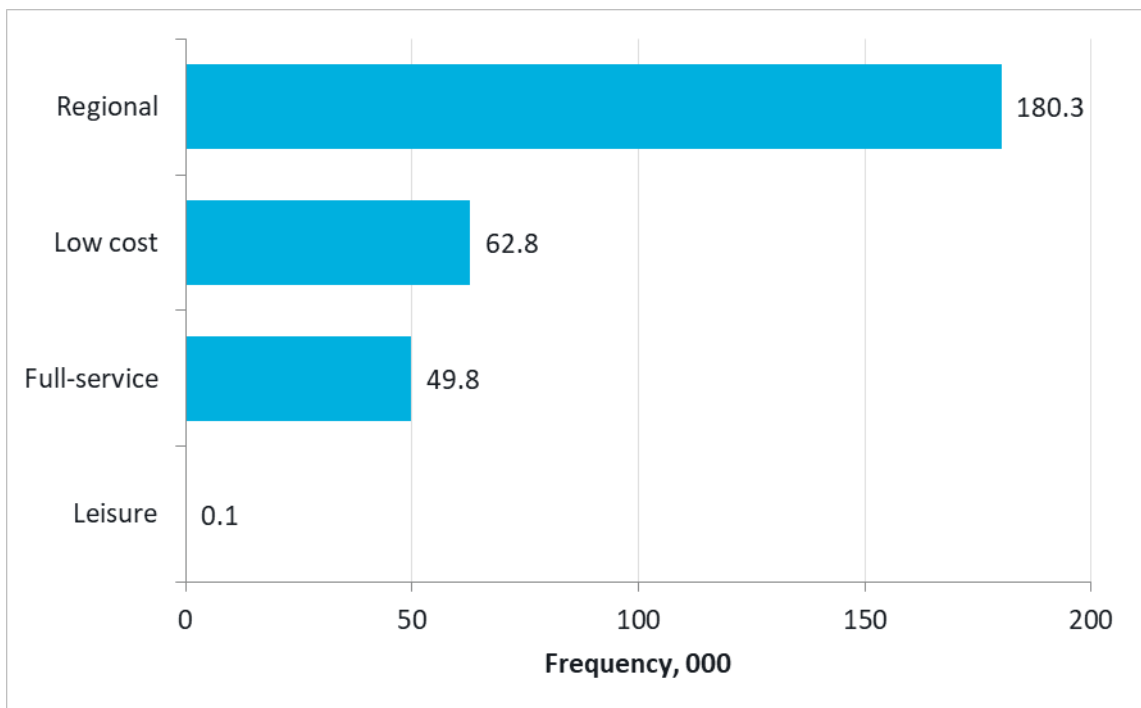
Rank	Destination	Seats
1	Dublin	4,089,977
2	Amsterdam	3,211,517
3	Alicante	3,054,051
4	Malaga	2,979,952
5	Palma de Mallorca	2,939,504
6	Faro	2,369,955
7	Tenerife Sur	2,316,274
8	Barcelona	2,205,730
9	Geneva	1,970,264
10	New York JFK	1,956,498
11	Paris CDG	1,663,375
12	Lanzarote	1,472,466
13	Madrid	1,204,208
14	Prague	1,172,859
15	Nice	1,152,988
16	Milan Malpensa	1,115,634
17	Ibiza	1,075,825
18	Venice	1,031,691
19	Krakow	1,017,305
20	Copenhagen	972,019

Source: OAG Schedules Analyser, Steer analysis

C. Further data on domestic market

C.1 In 2019, UK carriers operated 293 thousand flights, the majority by regional carriers (180 thousand) generally using single-aisle aircraft with fewer than 100 seats. Low-cost airlines operated 63 thousand flights and tended to use larger aircraft on more frequented routes, while full-service operated 50 thousand flights, providing both domestic links and connectivity to the rest of the world through international connections.

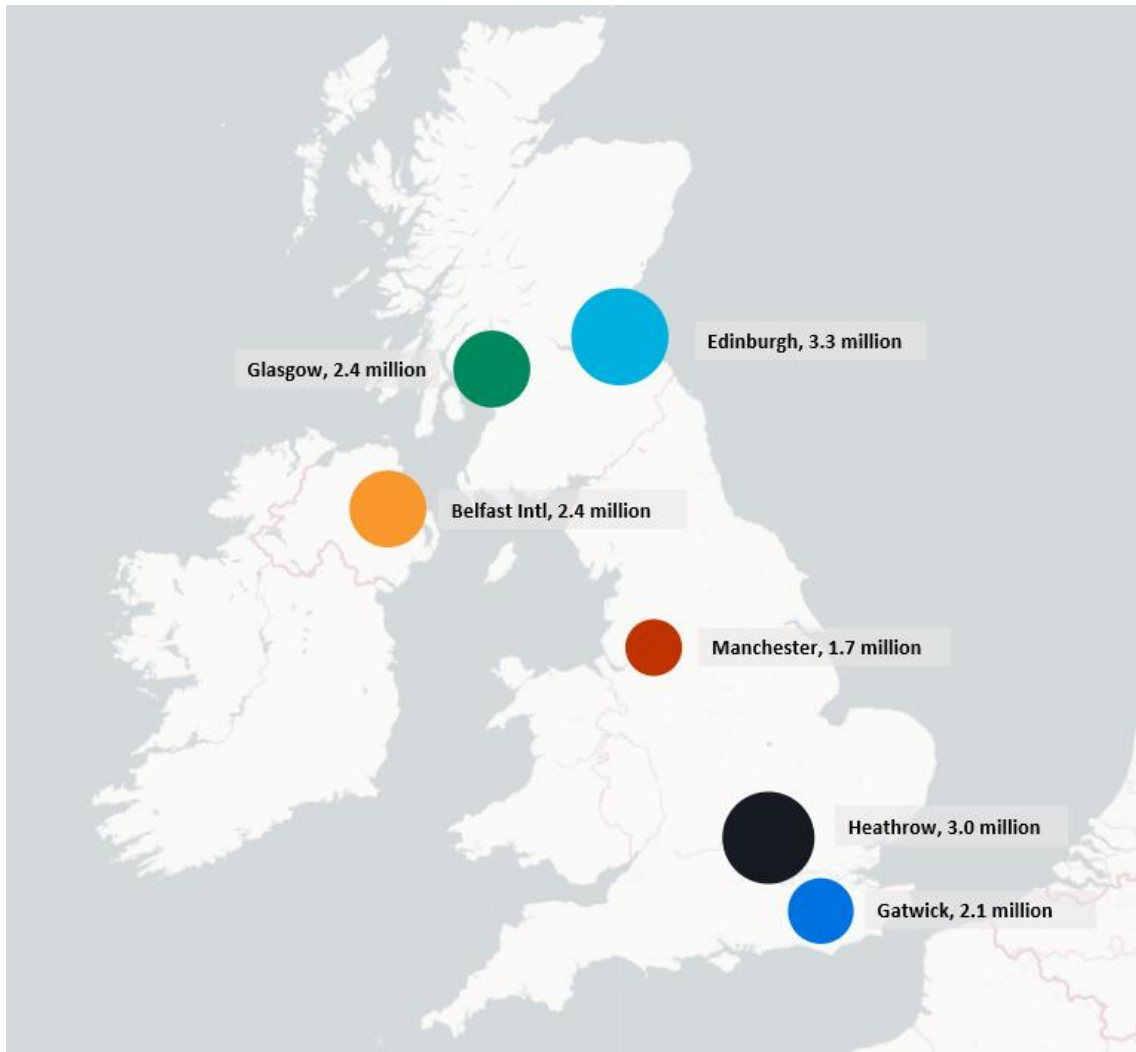
Figure C.1: Domestic flights operating by UK airlines (one-way), 2019.



Source: OAG Schedules Analyser, Steer analysis

C.2 The largest domestic airports are mainly located in Scotland, Northern Ireland and South East England, reflecting the role they play in connecting those parts of the UK.

Figure C.2: Top UK airports by domestic departing seats, 2019



Source: OAG Schedules Analyser, Steer analysis

D. Methodology to estimate economic contribution

- D.1 The calculation of direct, indirect, and induced economic impacts is based on the Input-Output tables (I-O tables) published by the Office for National Statistics (ONS), with the latest version published covering 2018. I-O tables cross-tabulate what every industrial sector purchases from each other industrial sector in the UK economy (i.e., “intermediate demand”), as well as data on household and government expenditure, employee income, company profit, taxes, capital investment, exports and imports.
- D.2 The Classification of Products by Activity (CPA) is used to divide the UK economy into industrial sectors for the purposes of I-O tables. To analyse the economic value of UK airlines to the UK economy, we consider the industry CPA, “H51 – Air transport services”. This measures the economic value of air transport businesses whose centre of economic interest is the UK.
- D.3 To compare UK airlines versus non-UK airlines, we use the domestic use I-O table to analyse the economic value of UK-based airlines, and the “imports use” table, also produced by the ONS, to analyse the economic value of non-UK-based airlines. The domestic use I-O table contains data on income received by employees and GVA associated with UK airlines, whilst the imports use I-O tables contains data on spending on non-UK airlines within the UK economy.
- D.4 To calculate the impacts of the UK airline industry on employment, we use employment data from the 2019 Business Register and Employment Survey (BRES) produced by the ONS.
- D.5 The direct impacts of the air transportation industry can be found in the relevant I-O table. To calculate the indirect impacts of the UK air transportation industry (i.e. the economic impact of the suppliers of air transportation industry), we use the standard “Leontief inverse matrix” method applied to intermediate demand to generate “Leontief Type I” multipliers for the UK domestic use I-O table. To calculate the induced impacts (i.e. induced expenditure in the economy generated by the expenditure of employees of the aviation industry and its suppliers in the economy), we again use the Leontief inverse matrix method, but incorporating data on employee compensation and household consumption as well as intermediated demand, to generate “Leontief Type II multipliers”.
- D.6 The use of these multipliers is standard practice to estimate indirect and induced economic impacts. The Leontief Type I and Type II multipliers are used to multiply the direct impacts for the air transportation industry to produce the indirect and induced impacts of the UK air transportation industry respectively. Note that the multipliers also include the direct impacts, so that these then need to be differenced to calculate the indirect and induced effects separately.
- D.7 Multiplier effects measure the extent to which the air transportation industry impacts the supply chain (indirect impact) and the knock-on effects of employee income generated by

direct and indirect impacts on the wider economy (induced impacts). Multiplier effects are calculated for an industry's output and then converted into corresponding effects on income, employment, and GVA.

E. Employees of UK airlines and GVA contribution per region

E.1 Table E.1 below presents the result of the analysis alongside the location of UK airlines employees in the country (at airports or airline offices/facilities). To complement the table, the map below shows UK airports' locations within regions.

Table E.1: Number of employees of UK airlines (2019) and GVA contribution per region (2018)

Region	GVA (£m)	No. of employees	Airport / Airline office/facility	No. of employees
London	11,996	30,970	London Heathrow Airport	30,969*
			London City Airport	1*
South East	3,551	3,939	London Gatwick Airport	2,877**
			Crawley	1,062*
North West	1,532	4,194	Manchester Airport	4,098***
			Liverpool Airport	96
Yorkshire & The Humber	937	3,319	Leeds Airport	3,124
			Doncaster Sheffield Airport	167
			Sheffield	28
East of England	2,440	2,623	London Stansted Airport	2,541
			London Southend Airport	53
			Norwich Airport	29
West Midlands	208	1,620	Birmingham Airport	1,620
Scotland	1,344	1,619	Glasgow International Airport	876***
			Edinburgh Airport	633****
			Glasgow Prestwick Airport	61
			Aberdeen Airport	49***
North East	714	1,481	Newcastle Airport	1,481*
East Midlands	456	1,263	East Midlands Airport	1,263
South West	585	861	Bristol Airport	725
			Bournemouth Airport	72
			Exeter Airport	64
Wales	119	537	Cardiff Airport	148****
			Swansea	389*
Northern Ireland	431	267	Belfast International Airport	231
			Belfast City Airport	36***
Others	N/A	1,210	Working from home	1,206
			Jersey Airport	4*

Source: ONS, UK airlines, Steer analysis. Note: (*) 2022 data, (**) Includes 45-61% of 2022 data, (***) Includes 8-27% of 2022 data, (****) Includes 1-2% of 2022 data.

Figure E.1: Map of UK airports by UK region/nation



Source: Steer

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