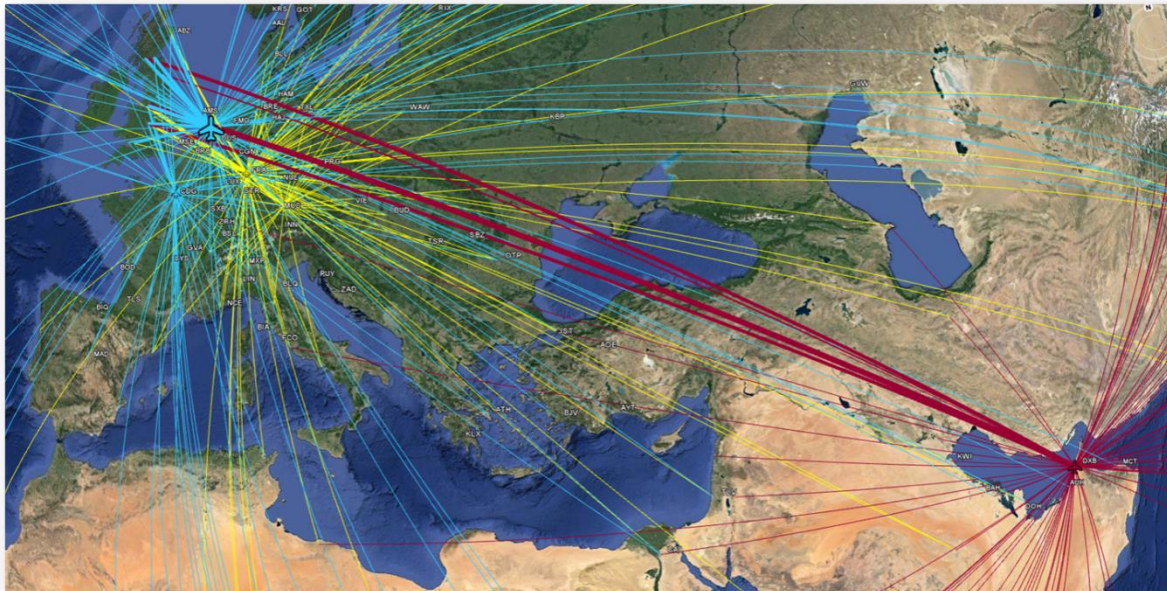


The role of South East airports in providing connectivity for the UK: regional dependence on foreign hubs



Response to the consultation 'Discussion Paper 06: Utilisation of the UK's Existing Airport Capacity', prepared by:

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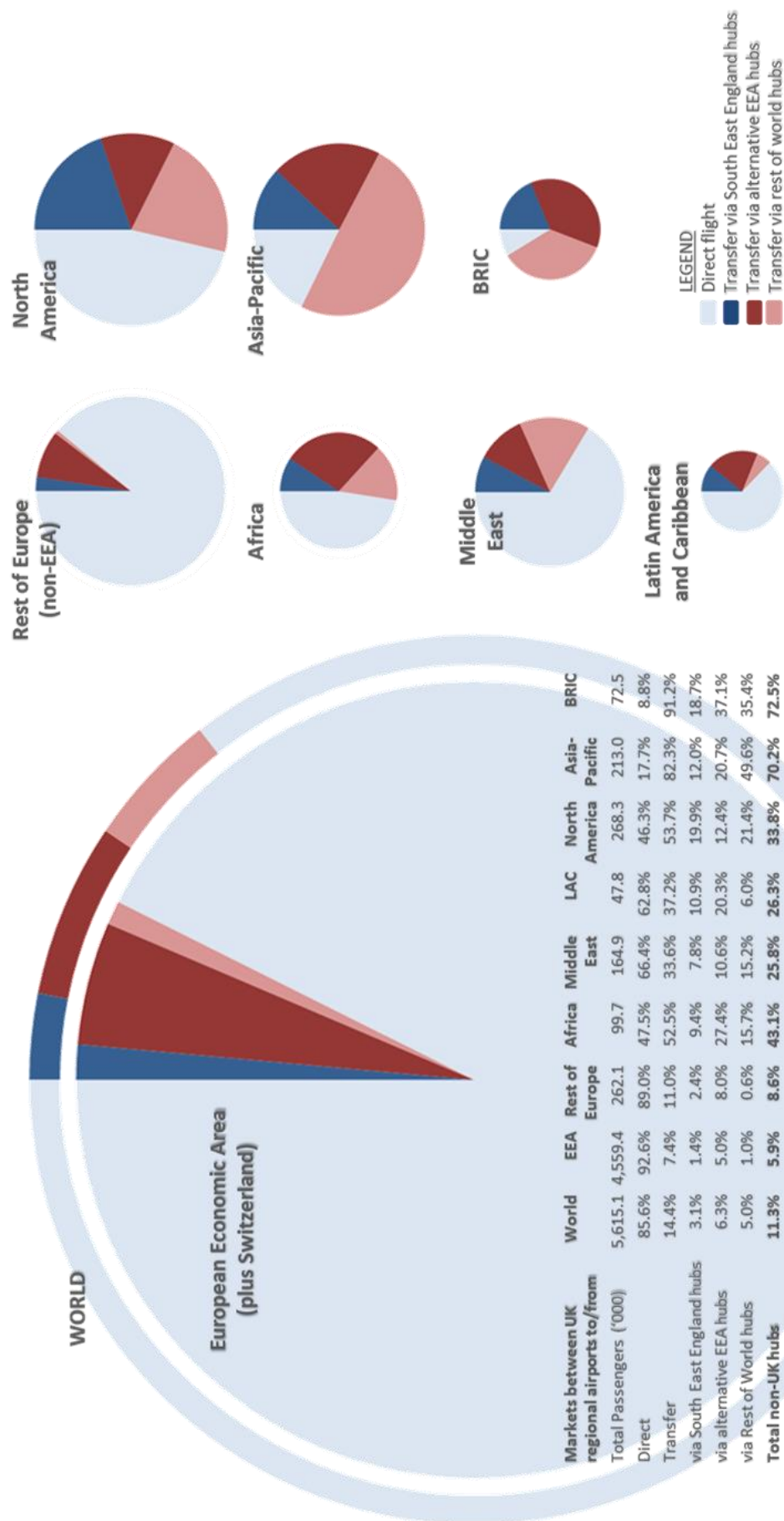
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Executive Summary

1. The reduction in air connectivity between London and UK regions in recent years entails the risk of “decoupling” of UK regional air transport markets. This is evidenced by an increase in the number of regional passengers travelling via foreign hubs, rather than through London Heathrow, to destinations all over the world. These trends may challenge the status of Heathrow as the main hub “for the UK” and that future regional connectivity to world markets could be vulnerable to foreign aviation policies.
2. The objective of this report is to provide detailed and objective evidence on the extent of the aforementioned “decoupling” of UK regional air transport markets as well as measuring the relative contribution of London Heathrow in its dual role as domestic and international hub. While previous publications on this topic from the Airports Commission employ limited CAA statistics, this report benefits from access to the well-known Market Information Data Transfer (MIDT) database, which provides enough information to analyse the actual hub choices of UK passengers travelling on international routes.
3. Results show that the vast majority (85%) of passengers originating from UK regional airports are able to travel non-stop to their destinations, mainly because of the good point-to-point connectivity to European countries. The proportion of direct travel, however, is much lower in long-haul markets, where a significant dependence on intermediate hubs exists (between 50% and 90% of trips require a transfer). Furthermore, around 76% of the connecting traffic between UK regions and the rest of the world is served via non-UK hubs, located mainly in Europe and the Middle East.
4. The dependence on foreign hubs is particularly high in the routes to/from Asia-Pacific, where above 82% of passengers originating from UK regional airports use transfer flights. In these markets, London Heathrow provides service to 12% of the passengers –the same proportion as Amsterdam–, while Dubai’s traffic share exceeds 32%.
5. A similar picture appears when analysing regional traffic to/from BRIC countries. Transfer itineraries account for over 90% of passenger journeys (there are only direct flights between the UK regions and Russia) and the share of traffic handled by non-UK hubs is slightly above 72%. Despite the relatively small size of the actual market (1.3% of total passenger traffic originating from UK regions), this result is significant in light of the importance of BRIC countries as emerging economies and the strategic implications of having such a large dependence on foreign airports and airlines.
6. With regards to Heathrow, results show that the London hub benefits from its significant traffic generation to remain the most central gateway for overall UK air transport markets, as well as the main regional gateway to North America and the Middle East. However, results also suggest that strong hub competition in Europe, coupled with the lack of new route developments due to congestion, may damage Heathrow’s ranking among world-class connecting gateways in the coming years.

ITINERARIES OF UK REGIONAL PASSENGERS TO/FROM WORLDWIDE REGIONS (MAY 2013)



1. Introduction

1.1 In 2013, approximately 138 million passengers travelled through one of the five main airports serving the South East of England: Heathrow, Gatwick, Stansted, Luton, and London City (CAA, 2014). These five airports combined offered flights to 399 international destinations in 106 countries all over the world (Source: Official Airline Guide). In contrast, all remaining airports outside the South East combined (they will be referred throughout this report as “regional airports”) provide direct flights to only half the destinations that are available from London (200 international destinations in 52 countries). These figures support the view that airports in the South East should play a significant role in providing worldwide connectivity for the other UK regions.

1.2 The existing literature has already established the influence of air traffic services on economic development and the attractiveness of a region (e.g., Goetz, 1992; Brueckner, 2003; Green, 2007; Bel and Fageda, 2008; Bilotkach, 2013). Furthermore, due to the particular economic geography of the UK, which gravitates around a large core city, air transport connectivity is a crucial factor influencing the position of regional population centres in the world-city hierarchy (Zook and Brunn, 2006; Derudder and Witlox, 2008), and their integration in the globalization dynamics (Goetz and Graham, 2004; Cidell, 2006; Otiso et al., 2011). Whilst UK regions have become well connected to many European destinations with the growth of low-cost airlines, their weak position in the UK urban hierarchy limits their ability to capture direct air services to intercontinental destinations, along with the added value they bring (Shin and Timberlake, 2000; Hall, 2009; Bentlage, et al., 2013). Currently, intercontinental markets are accessible indirectly via a hub airport, for which the natural choice seems to be Heathrow (ITC, 2013). This view is implicitly stated in the UK Aviation Policy Framework document, which points out that “continued connectivity to London is essential to regional economies and national cohesion” (UK Government, 2013).

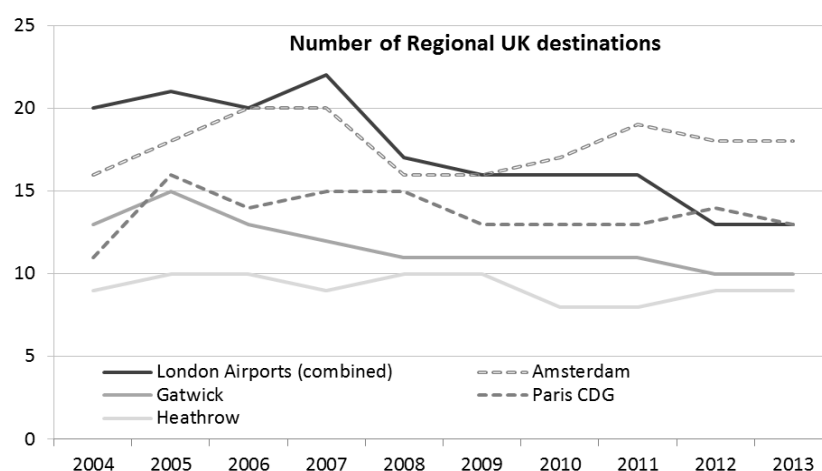


Figure 1. Evolution of regional UK destinations served from selected airports 2004-2013

Source: OAG, own elaboration

1.3 In spite of that, the evolution of traffic at the five main London airports during the last decade shows a steady decrease in the number of annual flights available to other UK regions, from 74,875 flights in 2004 to 51,647 in 2013 (a 31% drop). A similar trend is observed in the number of regional UK cities that are connected by air to the capital. Figure 1 shows that, since 2009, the five main London airports combined are connected by air to fewer cities in the rest of the UK than Amsterdam and, as of 2013, they reach the same number of cities as Paris-Charles de Gaulle. Both European hubs combined offer 35,308 annual flights to UK regions, which represents 68% of what is offered by the London airports.

1.4 The shortage of runway capacity in the South East can be cited as the cause of the problem. Heathrow is already operating at full capacity and presents important expansion difficulties due to the urban

developments around the airport. Given its level of saturation, airlines have given up domestic services and, by relying on the strong London market, have substituted them with long-haul services flown by larger aircraft that accommodate more passengers (Table 1). In addition, the lack of room for new route developments at Heathrow has led to an evident stagnation in the number of destinations served during the last decade, especially in comparison with other European and Middle Eastern hubs. These figures challenge the traditional status of Heathrow, not only as the most important hub “for the UK”, but also as one of the world’s main international gateways.

Table 1. Evolution of traffic indicators at London Heathrow and selected airports 2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Change 04-13%
Number of annual flights to UK regions	31,218	31,880	30,011	30,224	31,135	26,632	25,743	23,097	22,739	23,375	-25.1%
Seats per aircraft movement	198	200	197	202	195	195	203	202	207	210	6.1%
Number of destinations served-Heathrow	189	185	194	186	176	172	167	173	176	176	-6.9%
Number of destinations served at Amsterdam	240	250	250	259	246	251	266	278	275	275	14.6%
Number of destinations served at Paris CDG	239	259	260	264	277	285	280	279	273	274	14.6%
Number of destinations served at Frankfurt	291	293	286	297	289	285	294	295	309	293	0.7%
Number of destinations served at Istanbul	114	124	149	155	158	171	173	188	216	234	105.3%
Number of destinations served at Dubai	139	136	147	154	163	169	180	190	200	220	58.3%

Source: OAG, own elaboration

- 1.5 This situation, in combination with the strong competition that exists between European, American, Middle Eastern, and Asian major carriers – which seek to transport passengers via their hubs–, is changing the way air transport demand from UK regions is being served. This is evidenced by an increase in the number of UK regional passengers connecting through hubs other than Heathrow, such as Amsterdam, Paris, or Dubai, a fact that has been reported by the UK Government’s Airports Commission (AC, 2014).¹ This suggests the existence of some degree of “decoupling” of UK regional airports from London in an effort to improve their indirect connectivity to intercontinental markets.
- 1.6 The two main consequences of these trends were pointed out by the Independent Transport Commission (ITC). First, the reduction in the number of flights between the UK regions and London would constrain domestic connectivity. Second, the UK would become dependent on foreign aviation policies to guarantee future regional connectivity to worldwide markets (ITC, 2014). While the problem has indeed been identified, no detailed measurements of the scale of this “decoupling” have been produced, mainly because of the lack of appropriate data on passenger itineraries and hub choices in intercontinental routes.
- 1.7 Within this context, the objective of this report is to provide detailed evidence on the extent of the aforementioned “decoupling” of UK regional air transport markets as well as measuring the contribution of London Heathrow in its different roles as domestic and international hub. While all previous publications that cover this topic employ limited CAA statistics, this report benefits from access to the well-known Market Information Data Transfer (MIDT) database, which provides enough information to analyse the hub choices of UK regional passengers travelling in international routes. The available data covers all worldwide passenger itineraries served by the European airport network during May 2013.

¹ Suau-Sanchez and Burghouwt (2012) also report the increasing role of foreign hubs in shaping the accessibility between Spain and the rest of the world.

2. The different roles of London Heathrow

- 2.1 Establishing whether Heathrow is currently the most important hub “for the UK” requires first a clarification of what “for the UK” means. In this regard, note that the role played by hub airports is sensitive to the subset of markets considered in the analysis. A single market is typically defined as the total number of passengers travelling between two airports in both directions. Most markets can be served via different itineraries, depending on the points of connection. Thus, an airport can contribute to a market (or a set of markets) in two ways: either as origin/destination or as an intermediate point. When evaluating London Heathrow’s contribution as a domestic hub, this section focuses on all markets between the UK and the rest of the world. For the sake of contrast, Heathrow’s contribution to worldwide and intra-European markets will also be investigated.
- 2.2 There is also need to define the concept of “hub”. Several authors link that concept to the ability of an airport to support hub-and-spoke airline operations, which are typically achieved by consolidating originating and transfer passenger flows (Button, 2002; Doganis, 2010). Following this definition, Rodriguez-Déniz et al. (2013) proposed two simple demand-based indicators to measure the dimensions of airport “hubbing”: traffic generation and connectivity. The same indices are used throughout this report.
- 2.3 An airport’s importance as traffic generator (OD_i) is calculated as the ratio between the passengers in a relevant set of markets who originate or terminate at the i-th airport (od_i), and the total number of unique passengers in the same markets (P)². The second indicator (C_i) measures the airport’s contribution to other origin and destination markets as a connecting gateway. It is calculated as the ratio between connecting passengers at the i-th airport (c_i) and total passengers that do not originate or terminate at the i-th airport (P – od_i)³. This value of “relative connectivity” indicates how important each airport is at the time of facilitating connections between other city-pairs⁴.
- 2.4 A third indicator of “absolute connectivity” is also included (C’), which simply measures the proportion of connecting passengers served by the i-th airport with respect to the total number of unique passengers travelling in connecting routes within the relevant markets (P_c). Finally, in order to put all the connectivity analysis in the appropriate context, the overall connecting rate (CR) in each market will also be reported, defined as the proportion of connecting passengers over total passengers. A high dependence on non-UK hubs can be mitigated or reinforced by connecting rates that are significantly low or high, respectively.

$$OD_i = \frac{od_i}{P} \qquad C_i = \frac{c_i}{P - od_i} \qquad C'_i = \frac{c_i}{P^c} \qquad CR = \frac{P^c}{P}$$

- 2.5 Table 2 reports the top 20 airports ranked by absolute connectivity (C’) in: 1) worldwide markets served by European airports, 2) markets within the European Economic Area (EEA), 3) routes between the UK and the rest of the world.
- 2.6 In the worldwide case, Heathrow ranks the first in traffic generation (6.3%), but third in connectivity (behind Frankfurt and Istanbul). Despite the unavailability of time-series data for further evidence, the explosive increase in the number of destinations served from Istanbul (Table 1) suggests that, despite the trade-off between short- and long-haul flights, the lack of new route developments at Heathrow, together with increased hub competition, may damage its ranking among world-class connecting gateways in upcoming years.

² For example, if there are 14.8 million passengers travelling between the UK and the rest of the world, of which 3.97 million either originate from or terminate at Heathrow, the airport’s OD index in UK↔international markets will be 26.7%.

³ For example, if there are 10.8 million passengers travelling between the UK and the rest of the world who did neither originate nor terminate at Heathrow, yet 150 thousand of those passengers did connect through it, the airport’s C index in UK↔international markets will be 1.4%.

⁴ It is based on the concept of “flow centrality” developed by Freeman et al. (1991) in the context of social networks.

Table 2. Top 20 airports according to absolute connectivity in different markets (May 2013)

<i>Europe – Worldwide Markets</i>				<i>Markets within the EEA (incl. Switzerland)</i>				<i>UK – International Markets</i>			
<i>Airport</i>	<i>Ci'</i>	<i>Ci</i>	<i>ODi</i>	<i>Airport</i>	<i>Ci'</i>	<i>Ci</i>	<i>ODi</i>	<i>Airport</i>	<i>Ci'</i>	<i>Ci</i>	<i>ODi</i>
Frankfurt	8.7%	1.9%	3.3%	Frankfurt	10.5%	1.0%	2.9%	Dubai	10.0%	1.3%	1.0%
Istanbul Ataturk	6.9%	1.5%	3.4%	Munich	9.1%	0.8%	3.3%	Amsterdam	9.9%	1.3%	2.7%
Heathrow	6.0%	1.3%	6.3%	Amsterdam	5.7%	0.5%	3.9%	Heathrow	8.1%	1.4%	26.7%
Amsterdam	5.3%	1.1%	3.4%	Oslo	5.6%	0.5%	3.5%	Frankfurt	5.0%	0.7%	1.0%
Paris CDG	5.2%	1.1%	4.7%	Copenhagen	5.2%	0.5%	3.2%	Paris CDG	4.1%	0.5%	1.2%
Munich	4.4%	0.9%	2.7%	Rome Fiumicino	5.0%	0.5%	3.7%	Istanbul Ataturk	3.0%	0.4%	0.5%
Dubai	4.2%	0.9%	0.9%	Madrid	4.8%	0.4%	4.4%	Doha	2.4%	0.3%	0.2%
Madrid	3.2%	0.7%	3.4%	Paris CDG	3.8%	0.3%	4.0%	Singapore Changi	2.2%	0.3%	0.4%
Rome Fiumicino	2.8%	0.6%	3.1%	Zurich	3.5%	0.3%	2.3%	Abu Dhabi	2.2%	0.3%	0.2%
Sheremetyevo	2.7%	0.6%	2.0%	Stockholm	3.4%	0.3%	3.2%	Chicago O'Hare	2.1%	0.3%	0.3%
Zurich	2.2%	0.5%	2.0%	Vienna	3.3%	0.3%	2.0%	Munich	2.1%	0.3%	1.0%
Vienna	2.1%	0.4%	1.7%	Heathrow	2.9%	0.3%	4.7%	Newark	1.9%	0.2%	0.6%
Doha	1.8%	0.4%	0.2%	Barcelona	2.6%	0.2%	5.5%	Dublin	1.7%	0.2%	3.5%
Copenhagen	1.8%	0.4%	2.3%	Duesseldorf	2.0%	0.2%	2.7%	Atlanta	1.6%	0.2%	0.2%
Oslo	1.5%	0.3%	2.2%	Berlin Tegel	2.0%	0.2%	2.7%	Madrid	1.5%	0.2%	1.0%
Istanbul Sabiha	1.3%	0.3%	1.4%	Brussels	1.9%	0.2%	2.2%	Hong-Kong	1.5%	0.2%	0.5%
Atlanta	1.2%	0.2%	0.2%	Paris Orly	1.7%	0.2%	3.7%	Kuala Lumpur	1.4%	0.2%	0.2%
Abu Dhabi	1.1%	0.2%	0.1%	Palma de Mallorca	1.4%	0.1%	5.0%	Copenhagen	1.4%	0.2%	1.1%
Lisbon	1.1%	0.2%	1.4%	Gatwick	1.1%	0.1%	5.5%	Zurich	1.3%	0.2%	0.9%
Stockholm	1.1%	0.2%	2.2%	Lisbon	1.7%	0.2%	1.9%	Washington Dulles	1.2%	0.2%	0.3%
Total Passengers: 66,959,805				Total Passengers: 38,028,897				Total Passengers: 14,865,572			
Connecting rate: 13,813,059 (20.6%)				Connecting rate: 3,367,110 (8.9%)				Connecting rate: 1,913,941 (12.9%)			

Source: MIDT, own elaboration. EEA: European Economic Area.

2.7 The picture is different in intra-EEA markets. Heathrow becomes the fourth largest “traffic generator”, behind Gatwick, Barcelona, and Palma de Mallorca, which range between 5% and 5.5% ODi. While the connecting rate in this market is limited (less than 9%), since it is terrain for low-cost point-to-point travel, only some airports that are geographically central to West-East flows (i.e., Frankfurt, Munich, Rome-Fiumicino), North-South flows (i.e., Amsterdam), and gateways to remote regions (i.e., Oslo and Copenhagen) play a role in the intra-EEA market from a connectivity perspective. However, the relevant result is that it is Gatwick, and not Heathrow, the main UK airport with regards to EEA traffic.

2.8 In the UK case, Heathrow scores high in both dimensions. The massive level of traffic generation (26.7%) can be linked to the prominence of London as global business centre and tourist destination. In terms of absolute connectivity (Ci'), Heathrow ranks third. Overall, more UK passengers choose Dubai (10%) and Amsterdam (9.9%) as intermediate stops rather than Heathrow (8.1%). Nevertheless, it is important to recognize the distortion of originating traffic, as passengers that originate or terminate at Heathrow do not choose a UK hub to connect and will instead feed other hubs. The Ci indicator removes this distortion and points at Heathrow as the most relevant airport to other city-pair markets (1.4%). Thus, despite the number of UK passengers travelling via foreign airports, Heathrow remains the most relatively important hub “for the UK”, as proven by the highest contribution in terms of traffic generation and connectivity to other city-pairs between the UK and the rest of the world. This status, however, is cemented on the enormous level of traffic generated by London. The next section removes the London markets to investigate the role of Heathrow and the South East in providing connectivity exclusively for UK regional airports.

3. The gateways of UK regional airports

- 3.1 Figure 2 summarizes the distribution of UK regional passenger itineraries to/from worldwide regions⁵. Results show that the vast majority (85%) of passengers originating from UK regional airports are able to travel non-stop to their destinations, mainly because of the good point-to-point connectivity to European countries. The proportion of direct travel, however, is much lower in long-haul markets, where a significant dependence on intermediate hubs exists (between 50% and 90% of trips require a transfer). Furthermore, around 76% of this connecting traffic is served via non-UK hubs, mainly from Europe and the Middle East.

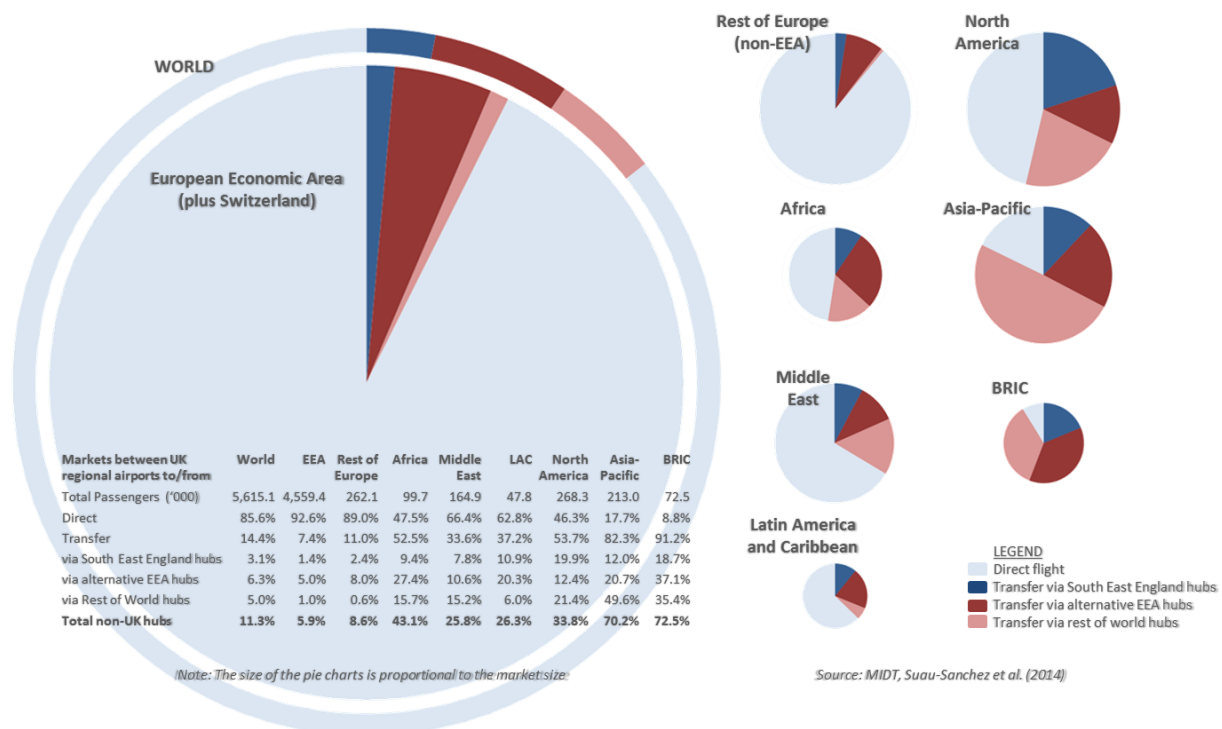


Figure 2. Itineraries of UK regional passengers to/from worldwide regions (May 2013)

- 3.2 Tables 3 and 4 complement the information from Figure 2 by detailing the top 15 hub choices in terms of absolute connectivity for each market⁶. Heathrow and Amsterdam are the main gateways of UK regional airports to access the rest of the world, both connecting approximately the same proportion of transfer passengers ($Ci'=19.1\%$). The third most important gateway is Dubai ($Ci'=10.7\%$), followed by Frankfurt ($Ci'=6.1\%$) and Paris-CDG ($Ci'=6\%$). Gatwick makes a small contribution that increases the share of absolute connectivity of South East England airports to 21.7%.
- 3.3 Heathrow acts as the main regional gateway for two international markets, the Middle East ($Ci'=21.4\%$) and North America ($Ci'=35.2\%$), the latter being the most important connecting market in terms of long-haul passengers from UK regional airports. In these two markets, British Airways, together with the other Oneworld members, offers the highest number of onward destinations to North America from Heathrow (28 destinations). For the Middle East market, Istanbul, Dubai and Frankfurt offered more destinations than Heathrow (10 destinations by Oneworld members), but British Airways and KLM serve a wider range of UK regional airports, hence they can capture more demand and obtain a higher Ci' value.

⁵ Disaggregated statistics for England, Scotland, Northern Ireland, and Wales are provided in Appendix B.

⁶ Note that proportions in Tables 3 and 4 are calculated over connecting passengers, while in Figure 2 and Table 5 they are calculated over total passengers. All these proportions are fully equivalent.

Table 3. Top 15 hub choices in routes to/from regional UK airports by geographical market (May 2013)

Regional UK to/from World		Regional UK to/from EEA		Regional UK to/from Rest of Europe (non-EEA)		Regional UK to/from Africa		Regional UK to/from Middle East	
Hub airport	Ci'	Hub airport	Ci'	Hub airport	Ci'	Hub airport	Ci'	Hub airport	Ci'
Amsterdam	19.1%	Amsterdam	23.6%	Istanbul Ataturk	29.2%	Amsterdam	21.5%	Heathrow	21.4%
Heathrow	19.1%	Heathrow	14.6%	Heathrow	19.9%	Dubai	17.1%	Amsterdam	18.3%
Dubai	10.7%	Frankfurt	9.2%	Amsterdam	16.1%	Paris CDG	16.6%	Istanbul Ataturk	16.2%
Frankfurt	6.1%	Paris CDG	6.0%	Frankfurt	11.6%	Heathrow	16.5%	Dubai	15.5%
Paris CDG	6.0%	Dublin	4.7%	Munich	5.2%	Frankfurt	5.6%	Frankfurt	6.4%
Newark	2.9%	Copenhagen	4.2%	Paris CDG	4.4%	Brussels	3.8%	Abu Dhabi	4.8%
Istanbul Ataturk	2.7%	Gatwick	4.1%	Gatwick	1.4%	Istanbul Ataturk	3.4%	Doha	3.8%
Gatwick	2.6%	Munich	4.0%	Zurich	1.2%	Lusaka	2.0%	Paris CDG	3.4%
Dublin	2.5%	Brussels	3.4%	Brussels	1.0%	Gatwick	1.4%	Gatwick	1.7%
Munich	2.2%	Dusseldorf	2.0%	Istanbul Sabiha	1.0%	Abu Dhabi	1.1%	Manchester	1.5%
Abu Dhabi	2.0%	Zurich	1.7%	Dusseldorf	0.9%	Doha	1.0%	Zurich	1.1%
Brussels	1.9%	Manchester	1.4%	Copenhagen	0.8%	Lisbon	0.7%	Munich	0.8%
Copenhagen	1.8%	Edinburgh	1.1%	Dublin	0.8%	Madrid	0.7%	Cairo	0.7%
Doha	1.4%	Madrid	1.1%	Dalaman	0.5%	Casablanca	0.6%	Brussels	0.5%
Philadelphia	1.3%	Stavanger	1.1%	Prague	0.3%	Toulouse	0.6%	Antalya	0.5%
Total Passengers	5,615,182		4,559,413		262,143		99,675		164,943
Share of total	100%		81.2%		4.7%		1.8%		2.9%
Connecting pax.	809,713		336,222		28,802		52,324		55,391
Connecting rate	14.4%		7.4%		11.0%		52.5%		33.6%
Absolute connectivity:									
Via SEE Hubs	21.7%		19.3%		21.6%		17.9%		23.1%
Via Alt. EEA hubs	43.9%		67.6%		72.7%		52.2%		31.6%
Via Non-UK Hubs	76.6%		76.8%		77.8%		81.9%		74.5%

Source: MIDT, own elaboration. SEE: South East England. EEA: European Economic Area.

Table 4. Top 15 hub choices in routes to/from regional UK airports by geographical market (May 2013)

Regional UK to/from Latin America and Caribbean		Regional UK to/from North America		Regional UK to/from Asia-Pacific		Regional UK to/from BRIC	
Hub airport	Ci'	Hub airport	Ci'	Hub airport	Ci'	Hub airport	Ci'
Amsterdam	26.5%	Heathrow	35.2%	Dubai	39.5%	Dubai	25.1%
Paris CDG	19.3%	Newark	15.6%	Amsterdam	14.5%	Heathrow	20.2%
Heathrow	16.1%	Amsterdam	13.0%	Heathrow	14.5%	Amsterdam	19.2%
Gatwick	13.1%	Philadelphia	7.4%	Abu Dhabi	7.5%	Paris CDG	9.8%
Frankfurt	5.4%	Atlanta	6.5%	Doha	5.2%	Frankfurt	6.7%
Newark	3.6%	O'Hare	4.1%	Paris CDG	5.2%	Doha	5.8%
Atlanta	3.2%	Dulles	3.3%	Frankfurt	3.0%	Abu Dhabi	3.8%
Lisbon	1.7%	Paris CDG	3.1%	Singapore	2.9%	Istanbul Ataturk	1.6%
Saint Lucia	1.6%	Dublin	2.9%	Istanbul Ataturk	1.5%	Munich	1.5%
New York JFK	0.9%	Gatwick	1.8%	Munich	1.2%	Zurich	1.4%
Barbados	0.6%	Frankfurt	1.6%	Bangkok	0.7%	Ashgabat	1.3%
Buenos Aires	0.5%	Keflavik	1.5%	Zurich	0.7%	Brussels	0.8%
Brussels	0.5%	New York JFK	1.1%	Ashgabat	0.5%	Lisbon	0.5%
Philadelphia	0.5%	Toronto	0.6%	Kuala Lumpur	0.3%	Copenhagen	0.5%
Munich	0.4%	Brussels	0.4%	Brussels	0.2%	Gatwick	0.3%
Total Passengers	47,760		268,251		212,997		72,518
Share of total	0.8%		4.8%		3.8%		1.3%
Connecting passengers	17,749		144,020		175,205		66,168
Connecting rate	37.2%		53.7%		82.3%		91.2%
Absolute connectivity:							
Via SEE Hubs	29.3%		37.1%		14.6%		20.5%
Via Alt. EEA hubs	54.6%		23.1%		25.1%		40.7%
Via Non-UK Hubs	70.5%		62.6%		85.3%		79.4%

Source: MIDT, own elaboration. SEE: South East England. BRIC: Brazil, Russia, India, China.

3.4 While the large number of UK regional airports served by KLM places Amsterdam as an important gateway, it only ranks above Heathrow in the smallest markets –i.e., Latin America and Caribbean (0.8% of the total demand) and Africa (1.8% of the total demand)– and the lower yield markets –i.e., the short-haul EEA market.

3.5 For reaching the growingly important Asia-Pacific market, where above 82% of passengers originating from UK regional airports use transfer flights, Dubai is by far the airport delivering a higher *Ci'* value:

almost 40% of the connecting passengers to Asia-Pacific fly via Dubai. In May 2013, Emirates only served four –but major– UK regional airports (i.e., Birmingham, Manchester, Glasgow and Newcastle), but the exceptional geographical position of Dubai and the large number of destinations offered by Emirates to this market (36 destinations compared to the only 16 destinations offered by Oneworld at Heathrow) make of Dubai the prime gateway of UK regions to Asia-Pacific. Indeed, as highlighted by Murel and O’Connell (2011) the “Gulf carriers are growing traffic by cannibalising the traditional traffic flows between Asian and European hubs, and by connecting secondary cities as a result of exercising their sixth freedom traffic rights”.

3.6 Tables 3 and 4 also show a relatively new player, Istanbul, that because of its geographical position, ranks fairly high as gateway to the Middle East and it is the first hub choice to access non-EEA European destinations. Nevertheless, the latter is mainly a point-to-point market and connecting passengers only represent 11% of total traffic.

3.7 Connectivity to/from BRIC countries is analysed separately. Brazil, Russia, India, and China accumulate more than 40% of the world population and are implicitly given strategic importance by the UK Aviation policy framework when measuring UK connectivity to emerging economies. It is worth noting that trips between BRIC countries and UK regional airports only account for 1.3% of the total passenger demand (Note that this does not account for UK residents outside South East England that decide to commute to Heathrow or Gatwick for a long-haul trip). Within this small level of traffic, 91.2% of the passengers connect in an intermediate hub, and 79.4% of those transfer passengers connect using a non-UK hub (25.1% fly via Dubai and 19.2% via Amsterdam), while Heathrow’s contribution is slightly over 20%.

Table 5. UK passenger breakdown to/from BRIC countries, May 2013.

Total UK airports to/from						
Country	Total Passengers	Direct	Via South East hubs	Via EEA hubs	Via rest of World hubs	Share to/from country
Brazil	45,128	21,267	1,371	13,426	9,064	10.30%
China	91,965	45,158	3,272	19,087	24,448	20.90%
India	190,462	85,176	7,004	6,178	92,104	43.40%
Russia	111,511	89,715	1,917	12,015	7,864	25.40%
Total to/from BRIC	439,066	241,316	13,564	50,706	133,480	
Share	100%	55%	3.1%	11.5%	30.4%	100%
Regional UK airports to/from						
Country	Total Passengers	Direct	Via South East hubs	Via EEA hubs	Via rest of World hubs	Share to/from country
Brazil	4,935	0	1,371	3,536	28	6.8%
China	23,665	0	3,272	14,708	5,685	32.6%
India	30,325	0	7,004	3,547	19,774	41.8%
Russia	13,593	6,205	1,917	5,167	304	18.7%
Total to/from BRIC	72,518	6,205	13,564	26,958	25,791	
Share	100%	8.6%	18.7%	37.2%	35.6%	100%

Source: MIDT, own elaboration. SEE: South East England. BRIC: Brazil, Russia, India, China.

3.8 Table 5 breaks down the UK passenger demand to each of the BRIC countries. As of May 2013, only Russia is served directly from UK regional airports. Although the air service agreement between the UK and India allows to operate between any two airports of these countries (even though considering some frequency limitations for airports other than Heathrow) and the EU-Brazil market enjoys an “open skies” type air service agreement, only Manchester and Birmingham have non-stop services to India during a limited number of summer months that are out of the available cross-sectional sample. In the case of China, the current agreement limits the frequency to 31 return services per week between six destinations in both countries.⁷ Thus, while UK regions are highly dependent on foreign airports to be connected to BRIC countries, there is still room for further relaxation of the bilateral air service agreements in order to improve the prospects of establishing non-stop connections.

⁷ In regards to China, it is also worth highlighting the impact of the current fees required by the UK to obtain a Visa, which are higher than those payable for the Schengen area.

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- 3.9 In summary, the conclusion is that UK regions are well connected to Europe (EEA and non-EEA countries), but have a significant dependence on intermediate hubs to access long-haul markets. Overall, three quarters of the connecting traffic from UK regional airports depends on non-UK hubs, which, from a policy perspective, could represent an exposure to uncertain decisions that can take foreign governments in regards to hub development. Still, Heathrow remains the main gateway of UK regions to North America and the Middle East, although it is facing substantial competition, especially from Amsterdam and Dubai, in the other long-haul markets. In this regard, market coverage seems to play an important role for gaining market share. Having a large feeding network from UK regions seems to help KLM in boosting connectivity from Amsterdam and having a wide range of onward destinations appears to help British Airways in North America and the Middle East markets, and Emirates in the Asia-Pacific market. Obviously, the different network configurations do not answer exclusively to airlines' strategies, they also depend on historic links and commercial relationships, as well as regulatory approaches to bilateral air service agreements and the application of the freedoms of the air.
- 3.10 Finally, some results might be also explained by other reasons that, although beyond the scope of this report, are still worth highlighting. The ranking position of some airports in certain markets suggests that travellers are willing to withstand longer flying times and big detours even when a quicker travel option is available. This is the case, for example, of Dubai for the African market ($C_i'=17.1$) and of Amsterdam for the North American market ($C_i'=13\%$). This conforms with the findings of previous studies that identify a trade-off between airfares and travel time in air passengers' choice of itineraries (see, e.g. Hess, 2007).

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Appendix A: MIDT Dataset

A.1 A Marketing Information Data Transfer (MIDT) dataset was obtained from the OAG Traffic Analyser and contains a large sample of airline bookings for May 2013. This month was chosen as its traffic is close to the average monthly traffic for 2013. Each record contains information on the published airline, the points of origin and destination, the connecting airports (up to two intermediate stops), and the number of passengers. All worldwide markets that are served by at least one European airport are represented. This includes all itineraries that originate and/or terminate in Europe, as well as those markets between other geographic regions that connect via at least one European hub.

A.2 The dataset contains 489,573 different itineraries involving 66.9 million passengers, 436 airlines, and 2,158 airports (458 from the EEA). Table A1 shows the distribution of this passenger demand by geographical markets. The total share of intra-European traffic is 73.5%. Of the remaining network traffic, 25.6% is devoted to linking Europe with the rest of the world. The remaining 2.2% of passengers make use of European airports as gateways during their journeys between other continents.

Table A1. Distribution of passenger demand by geographical markets (May 2013)

(passengers travelling between)	EEA	Rest of Europe (non-EEA)	Africa	Asia-Pacific	Latin America and Caribbean	Middle East	North America
European Economic Area (EEA)	39,467,960	4,754,625	2,805,692	3,533,354	1,468,124	2,077,940	4,245,743
Rest of Europe (non-EEA)		4,986,112	194,130	1,526,990	92,764	861,170	330,923
Africa			7,121	24,707	7,987	29,458	115,009
Asia-Pacific				14,866	41,904	22,512	167,143
Latin America and Caribbean					0	27,111	0
Middle East						2,397	153,938
North America							0

Source: MIDT, own elaboration.

A3. The original sources of information for the MIDT dataset are Global Distributions Systems (GDSs). According to ARG (2013), while 55% of all bookings of network airlines were done through GDSs in 2012, the proportion falls to 16% for low-cost carriers (LCCs). In order to correct for any possible imbalance, the data provider (OAG) adjusted the GDS bookings using mathematical algorithms based on frequencies and supplied seats. The reliability of these adjustments, in terms of LCC representation, can be judged by calculating the airline traffic shares in the intra-EEA market that result from the dataset. These are shown in Figure A1. The combined market shares of LCCs is approximately 46%, which is virtually the same estimate provided by the European Commission for the common market in 2013 (EC, 2014).

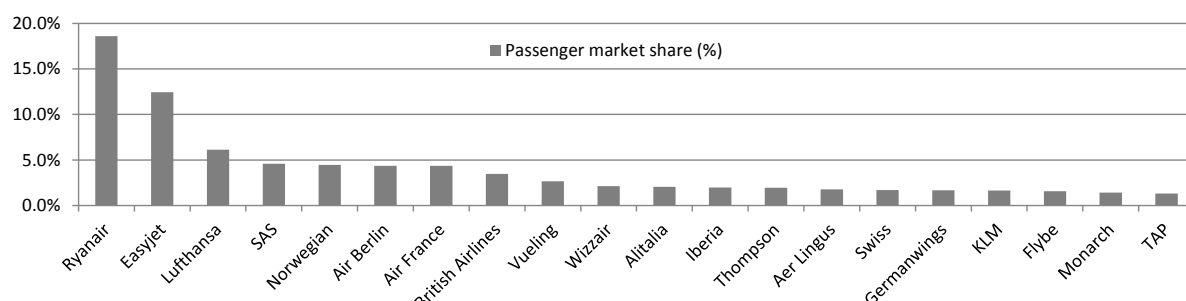


Figure A1. Top 20 airline traffic shares in intra-EEA markets (May 2013)

Source: MIDT, own elaboration.

Appendix B: Connectivity statistics for the Home Nations

- B1. Table B1 disaggregates the UK regional traffic to/from worldwide destinations for each of the four Home Nations. The vast majority of traffic (96%) originates or terminates in the English regions (ex-South East) and Scotland. It is worth noting that none of these figures takes into account that passengers may transfer to other UK regions by road or rail to start their journey. In the absence of detailed information on said transfers, this report does not intend to be an accurate representation of the regional air transport demand, rather than an assessment of the connectivity options that are available in each region's airports.

Table B1. Breakdown of UK regional traffic to/from worldwide destinations (May 2013)

<i>Traffic originating/terminating in</i>	<i>Passengers ('000)</i>	<i>%</i>
Airports in England (ex-South East)	4,358.7	77.6%
Airports in Scotland	1,032.2	18.4%
Airports in Northern Ireland	138.9	2.5%
Airports in Wales	85.3	1.5%
Total	5,615.1	100.0%

Source: MIDT, own elaboration.

- B2. The results for the English regions (Table B2) are similar to those reported in the main document. While direct connectivity is available to all regions, the dependence on foreign hubs is significant in long-haul markets (Asia-Pacific and BRIC countries) that present much higher connecting rates. Amsterdam and Dubai are the top hub choices while Heathrow remains the main gateway to North America.

Table B2. Breakdown of passenger itineraries: England (ex-South East) to/from worldwide destinations (May 2013)

<i>English Regions to/from</i>	<i>World</i>	<i>EEA</i>	<i>Rest of Europe</i>	<i>Africa</i>	<i>Middle East</i>	<i>LAC</i>	<i>North America</i>	<i>Asia-Pacific</i>	<i>BRIC</i>
Total Passengers ('000)	4,358.7	3,547.1	215.8	76.8	133.7	39.5	176.9	168.8	53.6
Direct	88.8%	94.1%	91.9%	57.5%	73.0%	74.0%	54.5%	26.1%	10.7%
Transfer	11.2%	5.9%	8.1%	42.5%	27.0%	26.0%	45.5%	73.9%	89.3%
via South East England hubs	1.5%	0.7%	0.9%	4.8%	3.8%	4.6%	12.5%	6.5%	11.2%
via rest of UK hubs	0.2%	0.3%	0.1%	0.0%	0.5%	0.2%	0.0%	0.0%	0.0%
via alternative EEA hubs	6.0%	4.9%	4.0%	23.1%	8.7%	18.0%	11.1%	19.2%	38.2%
via Rest of World hubs	3.5%	0.0%	3.1%	14.6%	14.1%	3.3%	21.8%	48.2%	39.9%
Total non-UK hubs	9.5%	4.9%	7.1%	37.7%	22.8%	21.2%	32.9%	67.4%	78.1%

Source: MIDT, own elaboration.

- B3. The results for Scotland (Table B3) indicate that direct connectivity is available to all regions except Asia-Pacific. The dependence on foreign hubs in this market exceeds 70% of passenger traffic, and a similar picture is drawn for the air markets between Scotland and the BRIC countries. In spite of that, London Heathrow is the first hub choice overall and in most geographical markets. These results indicate that any dependence on foreign hubs is not linked to reduced domestic connectivity to London rather than just being an issue of poor direct connectivity from Scottish airports. The objective of developing new non-stop connections between Scotland and the Asia-Pacific region should be given appropriate consideration in the relevant policy frameworks.

Table B3. Breakdown of passenger itineraries: Scotland to/from worldwide destinations (May 2013)

<i>Scotland to/from</i>	<i>World</i>	<i>EEA</i>	<i>Rest of Europe</i>	<i>Africa</i>	<i>Middle East</i>	<i>LAC</i>	<i>North America</i>	<i>Asia-Pacific</i>	<i>BRIC</i>
Total Passengers	1,032.2	823.9	33.9	18.4	27.2	7.5	80.4	41.0	16.9
Direct	75.2%	86.4%	74.2%	19.2%	41.8%	22.8%	32.6%	0.0%	2.8%
Transfer	24.8%	13.6%	25.8%	80.8%	58.2%	77.2%	67.4%	100.0%	97.2%
via South East England hubs	9.3%	4.4%	10.5%	25.1%	23.3%	36.7%	34.9%	28.8%	38.3%
via rest of UK hubs	1.8%	0.6%	0.2%	0.8%	1.7%	0.9%	0.5%	0.4%	0.0%
via alternative EEA hubs	10.0%	8.6%	10.0%	43.6%	19.3%	32.8%	16.5%	27.5%	38.0%
via Rest of World hubs	3.7%	0.0%	5.2%	11.2%	13.9%	6.8%	15.6%	43.3%	20.9%
Total non-UK hubs	13.6%	8.6%	15.2%	54.8%	33.2%	39.6%	32.1%	70.8%	58.9%

- B4. The results for Northern Ireland (Table B4) indicate that more than 80% passengers fly non-stop to their destinations. In all geographical markets except North America, South East England hubs are the

most important connecting gateway. The contribution of London airports is crucial in linking Northern Ireland with long-haul destinations in Africa, Asia-Pacific, Latin America & Caribbean, where no direct travel options are available. There is no substantial dependence in foreign hubs at the time of providing connectivity between Northern Ireland and the rest of the world.

Table B4. Breakdown of passenger itineraries: Northern Ireland to/from worldwide destinations (May 2013)

<i>Northern Ireland to/from</i>	<i>World</i>	<i>EEA</i>	<i>Rest of Europe</i>	<i>Africa</i>	<i>Middle East</i>	<i>LAC</i>	<i>North America</i>	<i>Asia-Pacific</i>	<i>BRIC</i>
Total Passengers ('000)	138.9	119.6	3.7	0.9	1.8	0.6	10.1	2.2	1.0
Direct	81.4%	89.6%	80.9%	0.0%	20.8%	0.0%	25.7%	0.0%	0.0%
Transfer	18.6%	10.4%	19.1%	100.0%	79.2%	100.0%	74.3%	100.0%	100.0%
via South East England hubs	10.2%	5.4%	13.7%	79.2%	66.0%	78.2%	29.6%	81.3%	89.1%
via rest of UK hubs	2.7%	2.7%	1.1%	4.4%	7.5%	3.5%	1.0%	2.9%	2.8%
via alternative EEA hubs	2.4%	2.4%	2.5%	12.4%	1.6%	3.7%	0.4%	2.6%	4.9%
via Rest of World hubs	3.3%	0.0%	1.8%	4.0%	4.0%	14.6%	43.4%	13.2%	3.2%
Total non-UK hubs	5.7%	2.4%	4.2%	16.4%	5.6%	18.3%	43.7%	15.8%	8.1%

Source: MIDT, own elaboration.

- B5. The results for Wales (Table B5) indicate that 86.9% of passengers fly non-stop to their destinations. However, there are no direct connections for several long-haul markets, including the BRIC countries, in which 100% of the observed itineraries are served via foreign hubs. While these markets are indeed very small the results are relevant in that any indirect air connectivity between Wales' own airports and the emerging economies is not provided via the London airport system and is exposed to foreign aviation policies. From the point of view of Welsh residents, the lack of direct connectivity to long-haul destinations may generate the need to transfer by road or rail to London and thus, appropriate services should be made available to ensure that Wales remains well connected with all the world's regions.

Table B5. Breakdown of passenger itineraries: Wales to/from worldwide destinations (May 2013)

<i>Wales to/from</i>	<i>World</i>	<i>EEA</i>	<i>Rest of Europe</i>	<i>Africa</i>	<i>Middle East</i>	<i>LAC</i>	<i>North America</i>	<i>Asia-Pacific</i>	<i>BRIC</i>
Total Passengers ('000)	85.3	68.6	8.8	3.6	2.3	0.2	0.8	1.0	0.5
Direct	86.9%	86.6%	94.2%	83.0%	66.7%	0.0%	0.0%	0.0%	0.0%
Transfer	13.1%	13.4%	5.8%	17.0%	33.3%	100.0%	100.0%	100.0%	100.0%
via South East England hubs	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
via rest of UK hubs	0.6%	0.5%	0.2%	0.7%	2.4%	0.0%	0.4%	0.3%	0.0%
via alternative EEA hubs	12.0%	12.7%	4.9%	15.2%	30.0%	87.2%	98.1%	87.5%	92.2%
via Rest of World hubs	0.3%	0.0%	0.7%	1.1%	0.9%	12.8%	1.5%	12.2%	7.8%
Total non-UK hubs	12.3%	12.7%	5.6%	16.3%	30.9%	100.0%	99.6%	99.7%	100.0%

Source: MIDT, own elaboration.

More detailed air connectivity statistics for the Home Nations are available in the authors' websites:

<http://www.peresuau.com>

<http://www.business-school.ed.ac.uk/about/people/939/Augusto/Voltes-Dorta>