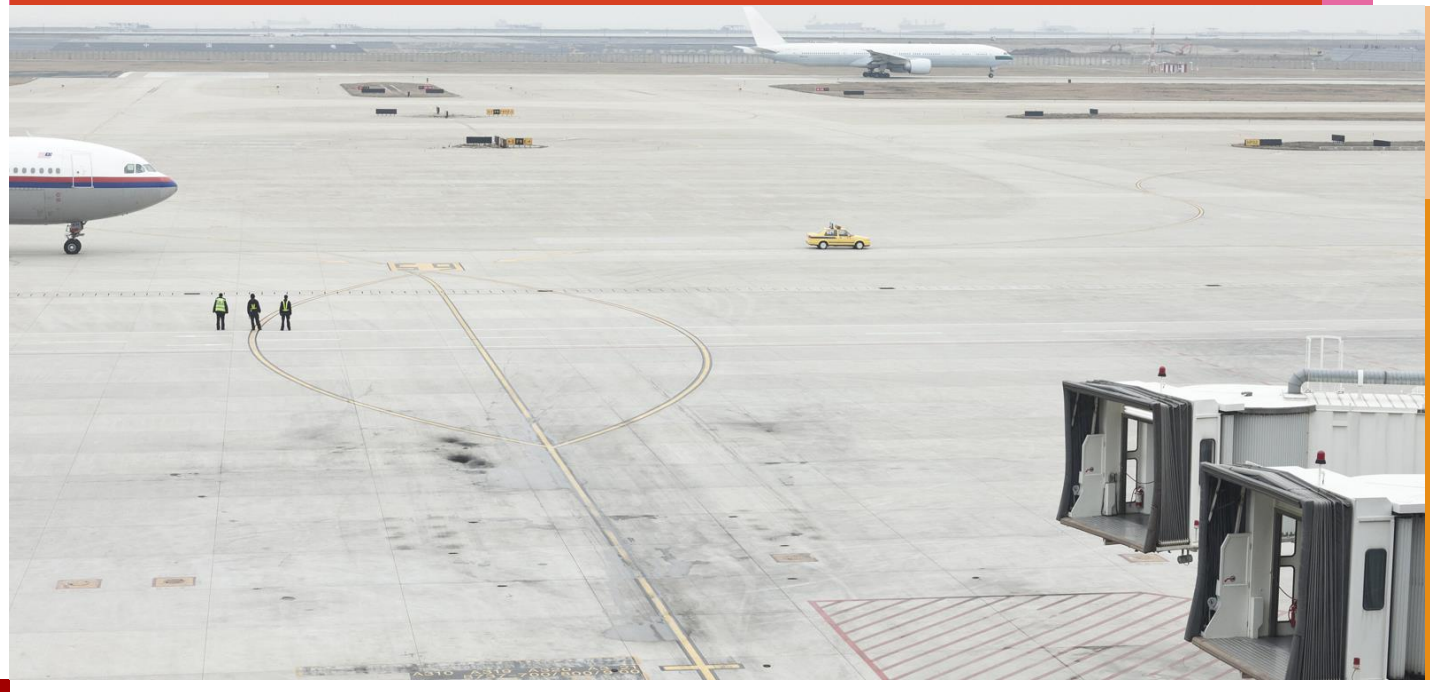
Airports Commission
Comparative connectivity analysis

13 December 2013



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Contents

Section 1
Introduction & objectives

Background and scope of work

Background / context of work

The Airports Commission will produce an interim report by the end of 2013 which will identify and recommend a shortlist of options for maintaining the UK's status as an international hub for aviation, and suggest immediate actions to improve the use of existing runway capacity in the next 5 years.

One of the questions that this report will attempt to answer is what the UK's future aviation connectivity needs are, and how well the UK is connected compared with its international competitors.

As such, the Airports Commission consider it necessary to understand how the UK's connectivity has evolved over time and how it compares internationally.

Scope of work

The aim of our work in this project has been to compare measures of connectivity over time. In particular, the Airports Commission is interested in analysis at the level of:

- Hub airports – i.e. London Heathrow vs. Frankfurt Airport vs. Amsterdam Schiphol vs. Paris Roissy-Charles de Gaulle vs. Madrid Barajas vs. Dubai International Airport;
- Cities – i.e. London vs. Frankfurt vs. Paris vs. Amsterdam vs. Dubai;
- Countries – i.e. the UK vs. France vs. Germany vs. Netherlands; and
- Other geographical aggregations – i.e. London vs. non-London airports in the UK. London airports are defined as Heathrow, Gatwick, Luton, Stansted, London City Airport, and London Southend Airport. All other UK airports are defined as non-London airports.

The Airports Commission asked us to focus our analysis on indices which are based on the IATA connectivity indicator methodology rather than other methodologies or measures of connectivity.

Our analysis was conducted using data from Sabre and the IMF's World Economic Outlook database. More information on the methodology and data used can be found in Appendix A at the back of this report.

This report has been prepared for and only for the Airports Commission in accordance with the terms of the Airports Commission Analysis and Strategy Support framework, specifically Contract Reference PPRO 04/08/72 dated 2nd May 2013, and for no other purpose.

Criteria for connectivity indicator and hypothesis

Criteria

The Airports Commission asked us to use the IATA connectivity indicator as an approach to measuring aviation connectivity because:

1. The indicator is **simple** and **familiar**. The methodology of the IATA connectivity index is easy to understand;
2. The indicator can **capture the value of connections to businesses**. This is an important criterion, as one of the questions which the Airports Commission is trying to answer is how continued constraints on UK aviation capacity might affect UK businesses' ability to compete internationally;
3. The indicator is **calculated at the airport, city and country level** . The indicator takes on an **additive** structure – i.e. the connectivity of a country should be the sum of the connectivity of its cities, which in turn should be the sum of the connectivity of all the airports which are situated in those cities; and
4. It is relatively easy to **calculate and analyse the indicator over time**. The connectivity indicator could be plot as a time series.

Section 2
Charts of connectivity indicators

The IATA connectivity indicator

Introduction to the IATA connectivity indicator

The IATA connectivity indicator measures the degree of integration that an airport or country has within the global air transport network. It is calculated by the formula:

$$\sum_{All\ destinations\ served} \frac{(Frequency * Available\ seats\ per\ flight * Weighting\ based\ on\ the\ passenger\ movement\ at\ the\ destination\ airport)}{1000}$$

According to this indicator, connectivity increases when:

- The range of destinations increases;
- The frequency of service increases;
- The number of seats on the aircraft used increases; and / or
- Larger airports are served (as reflected in the weighting term).

A higher figure for the connectivity indicator represents a greater degree of access to the global air transport network. It reflects the importance of not just serving a large number of destinations, but also serving destinations that are likely to have a high economic importance and the ability to access a large number of onward connections (as captured by the weighting term).

Please note that in our analysis of connectivity indicators, we use annual capacity rather than weekly capacity, and divide the indicator through by 100,000 to make it a more manageable number.

Weights

The Airports Commission asked us to ensure that the connectivity indicator captures the value of connections to businesses, whilst working within the IATA methodology. At its request, we therefore applied the following weights (more details on which are provided in the appendix):

Weight 1: Passenger movements

Destination airports with a higher number of passenger movements are given a higher weighting. This is the weights used by the IATA indicator.

Weight 2: Country GDP

Destination countries with a higher GDP level are given a higher weighting. Our analysis uses IMF purchasing-power-parity (PPP) valuations of country GDP, sourced from the IMF World Economic Outlook database (April 2013). We used April 2013 WEO data because that was the most up to date data that was available at the time when this project began.

The IATA connectivity indicator

Weight 3: Short-term growth potential

Destination countries which are expected to grow rapidly (in terms of the increase in the level of GDP between 2013 – 2018) are given a higher weighting. Data is sourced from the IMF World Economic Outlook database (April 2013).

Weight 4: Long-term growth potential

Destination countries which are expected to grow rapidly (in terms of the increase in the level of GDP between 2040 – 2050) are given a higher weighting. Data is sourced from PwC's "World in 2050" publication. It is important to note that PwC's "World in 2050" publication only covers 29 countries, so destination countries not covered in this publication are given a weighting of 0 and are excluded from our calculations. This is unlikely to have a significant impact on the connectivity analysis, as the 29 countries covered in the "World in 2050" publication accounts for over 80% of world GDP.

Rationale of the use of country GDP and growth potential weights

- Weight 1: The use of this weight allows the Commission to analyse connectivity based on the strength of onward connections. The weight is also the weight used by the IATA connectivity indicator.
- Weight 2: The use of country weights allows the Commission to analyse connectivity based of the *size* of the economy of the destination country; whereas
- Weights 3 and 4: The use of growth potential weights allows the Commission to analyse connectivity based on the *size* of the *forecast increase* of the destination country's economy.

Main observations on analysis

Total connectivity

- The UK has been very well connected in the past according to the measures of connectivity we used.
- Heathrow and London are significantly better connected than other airports and cities, regardless of which weight is used to construct the connectivity indicator. However, when the analysis is carried out at the country level, Germany has a similar connectivity to the UK and when measured using passenger movement weights, actually overtook the UK in 2012. When growth potential weights are used instead of passenger movement or country GDP weights, the extent to which the UK is better connected than Germany increases.
- London airports are better connected than non-London airports, particularly when country GDP and short-term / long-term growth potential weights are used instead of passenger movement weights.

Long haul connectivity

- Long haul flights are defined as flights with an origin or destination outside Western Europe. We have used the DfT's definition of Western Europe in our analysis.
- The large number of flights between the US and Heathrow account for Heathrow's and London's high levels of connectivity when compared with other international airports and cities that we analysed.
- Dubai International Airport and Dubai city have made significant gains in long haul connectivity over the past decade. Dubai International Airport now ranks second (among the six airports that we are considering within the scope of this project, which are London Heathrow, Frankfurt Airport, Amsterdam Schiphol, Paris Roissy-Charles de Gaulle, Madrid Barajas and Dubai International Airport) in three of the four different specifications of the connectivity indicator that we have analysed.

Short haul connectivity

- Short haul flights for all compared airports, are defined as flights within Western Europe. We have also defined flights from Dubai to Western Europe as "Short Haul" to provide a comparison with the European airports. Again, the definition of Western Europe that we have used in our analysis is the definition used by the DfT in their aviation demand model.
- None of the airports we analysed had a substantially higher level of short haul connectivity than the others. London and Paris have the highest short-haul connectivity at the city level, whereas Germany is the country with the highest short-haul connectivity.

Running order of connectivity charts

Connectivity measure	Geographical level	Weights	Slide number
Total connectivity	Airport	Passenger movement and country GDP	10
		Short-term and long-term growth potential	11
	City	Passenger movement and country GDP	12
		Short-term and long-term growth potential	13
	Country	Passenger movement and country GDP	14
		Short-term and long-term growth potential	15
	London vs. Non-London	Passenger movement and country GDP	16
		Short-term and long-term growth potential	17
Long haul connectivity	Airport	Passenger movement and country GDP	18
		Short-term and long-term growth potential	19
	City	Passenger movement and country GDP	20
		Short-term and long-term growth potential	21
	Country	Passenger movement and country GDP	22
		Short-term and long-term growth potential	23
	London vs. Non-London	Passenger movement and country GDP	24
		Short-term and long-term growth potential	25
Short haul connectivity	Airport	Passenger movement and country GDP	26
		Short-term and long-term growth potential	27
	City	Passenger movement and country GDP	28
		Short-term and long-term growth potential	29
	Country	Passenger movement and country GDP	30
		Short-term and long-term growth potential	31
	London vs. Non-London	Passenger movement and country GDP	32
		Short-term and long-term growth potential	33

Notes for connectivity indicator charts

This section provides some useful notes for interpreting the connectivity indicator charts shown in the subsequent slides.

Interpretation and making comparisons

- It is important to note that we interpret the numbers on the following charts as connectivity indicators rather than connectivity indices. This is because the numbers themselves are not indexed to anything to give it an intuitive interpretation. The only way that the connectivity indicators can be interpreted is that a higher number indicates better connectivity.
- It is also important to note that comparisons can only be made within a chart.

Airport acronyms

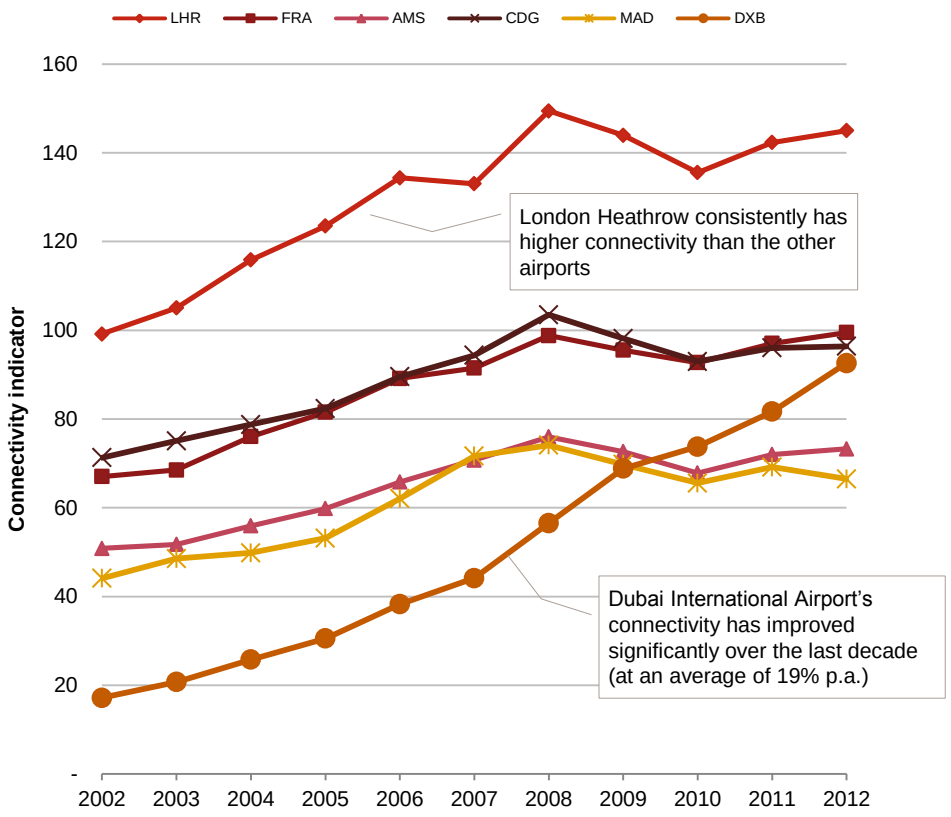
- The following airport codes are used in the subsequent charts of connectivity indicators.

Airport code	Airport
LHR	London Heathrow
FRA	Frankfurt Airport
AMS	Schiphol
CDG	Paris Roissy-Charles de Gaulle
MAD	Madrid Barajas Airport
DXB	Dubai International Airport

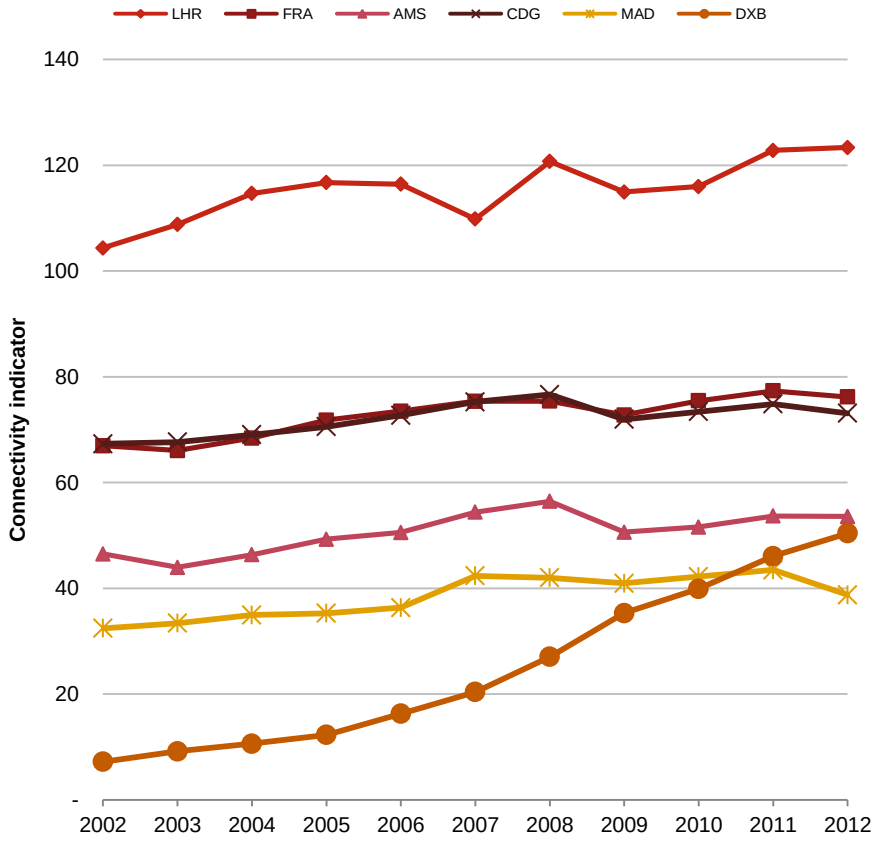
Total connectivity, airport level

Passenger movement and country GDP weights

Total connectivity - airport level (Passenger movement weight)



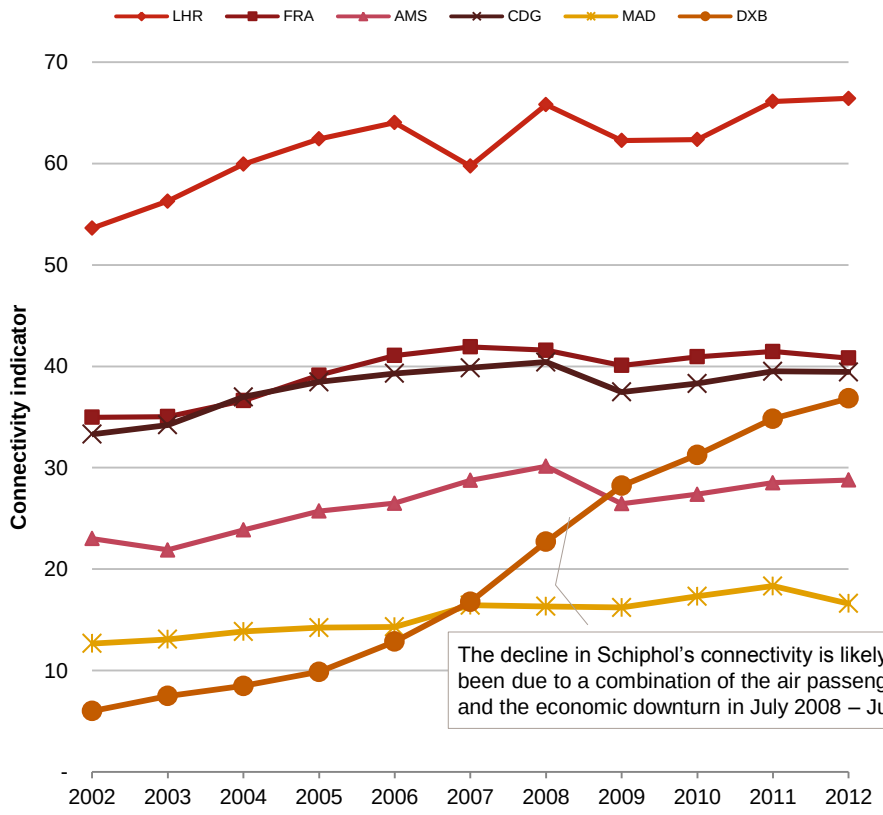
Total connectivity - airport level (Country GDP weight)



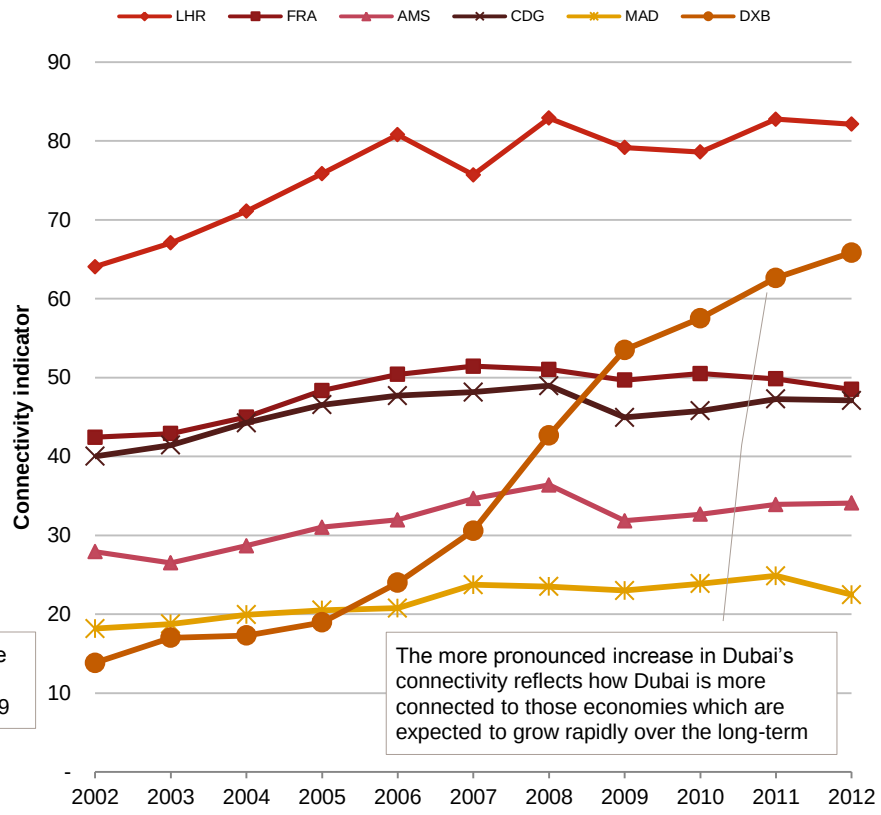
Total connectivity, airport level

Short-term and long-term growth potential weights

Total connectivity - airport level (Short-term growth potential weight)



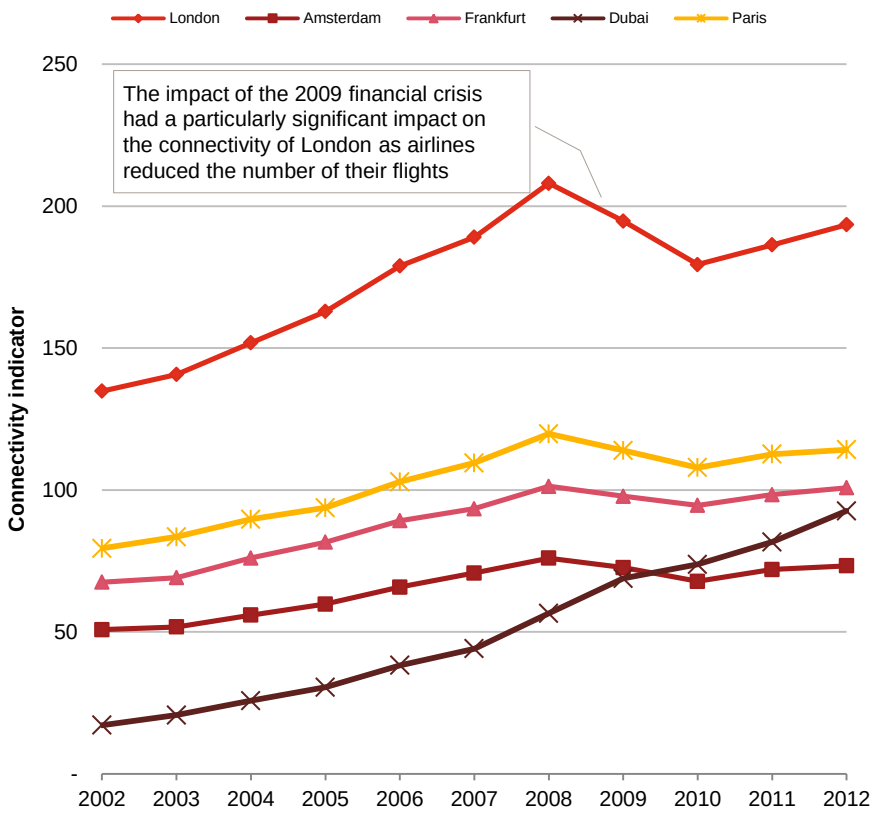
Total connectivity - airport level (Long-term growth potential weight)



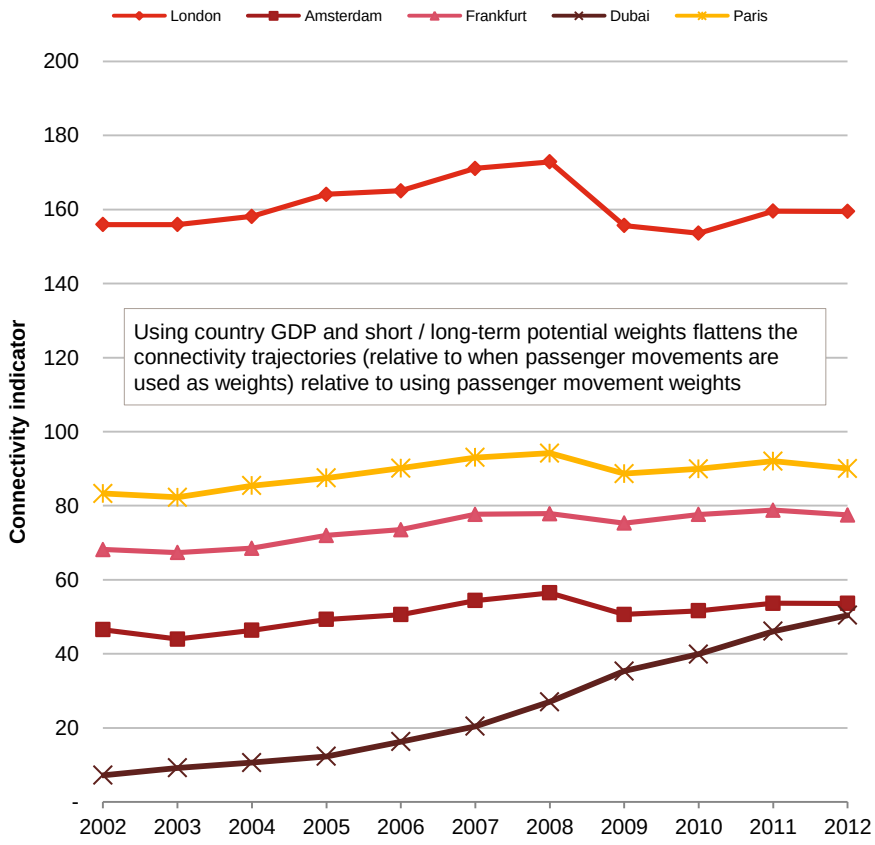
Total connectivity, city level

Passenger movement and country GDP weights

Total connectivity - city level (Passenger movement weight)



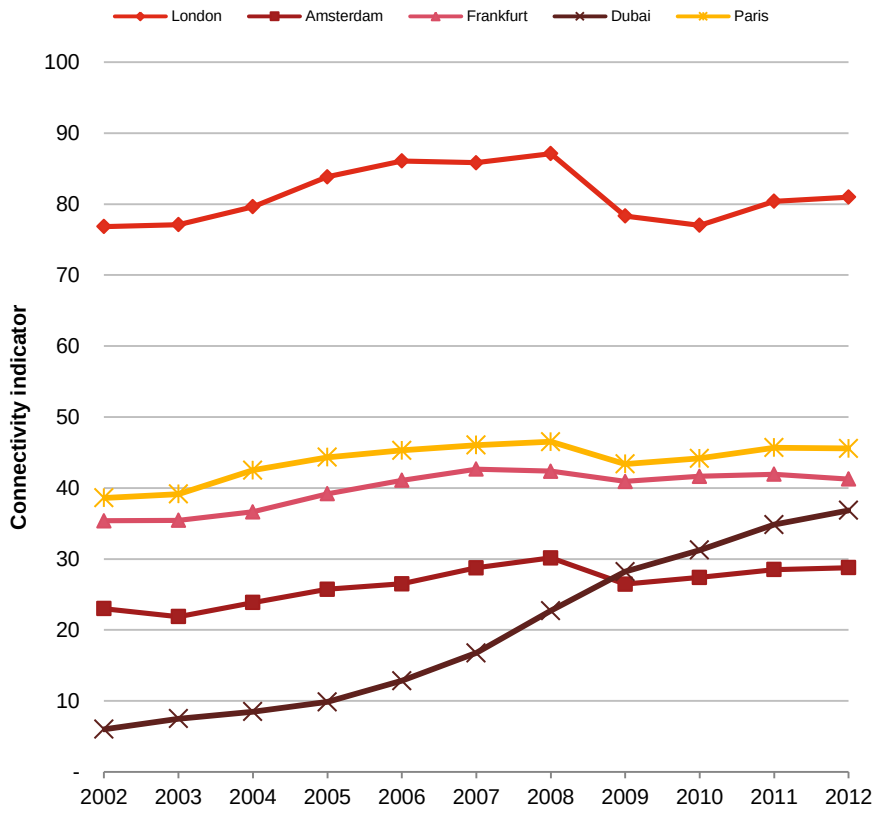
Total connectivity - city level (Country GDP weight)



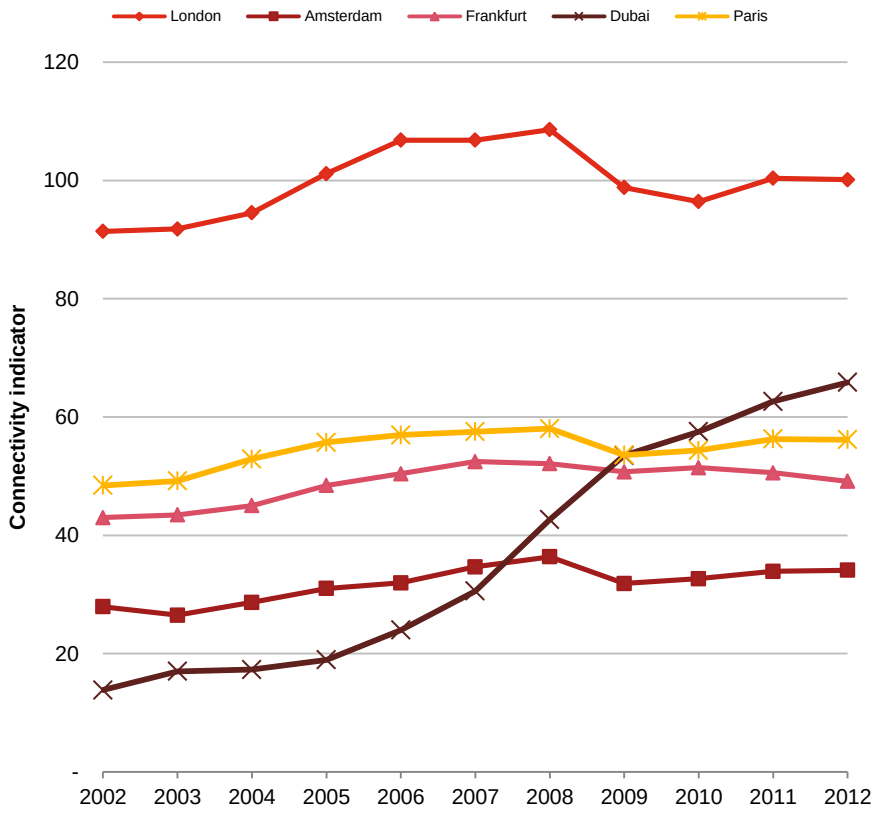
Total connectivity, city level

Short-term and long-term growth potential weights

Total connectivity - city level (Short-term growth potential weight)



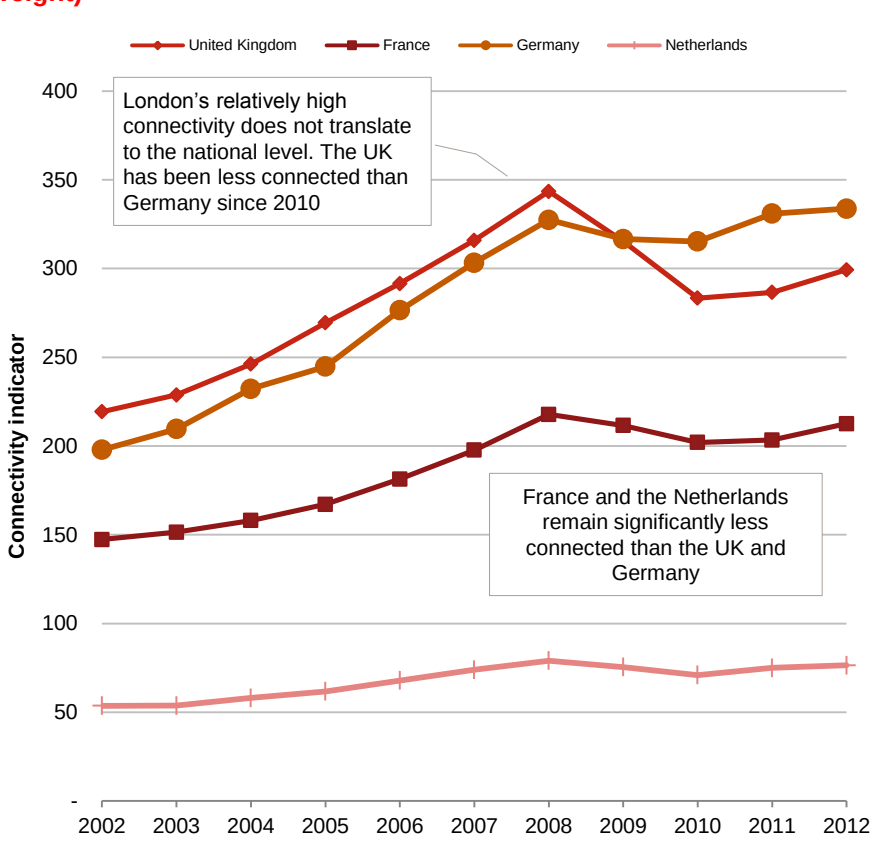
Total connectivity - city level (Long-term growth potential weight)



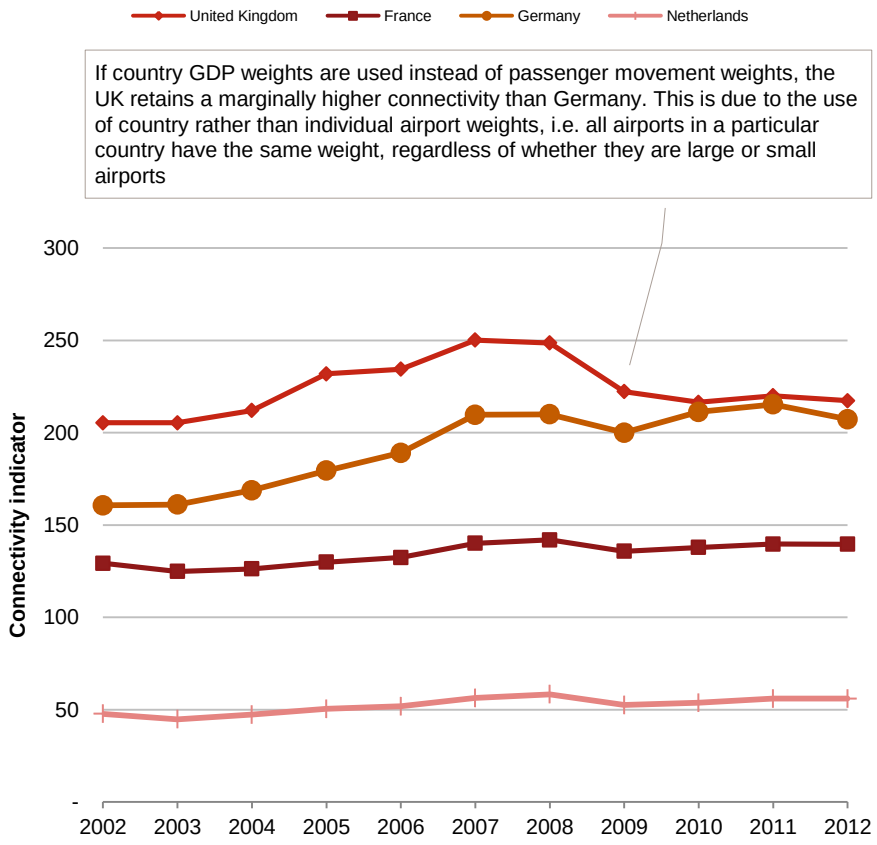
Total connectivity, country level

Passenger movement and country GDP weights

Total connectivity - country level (Passenger movement weight)



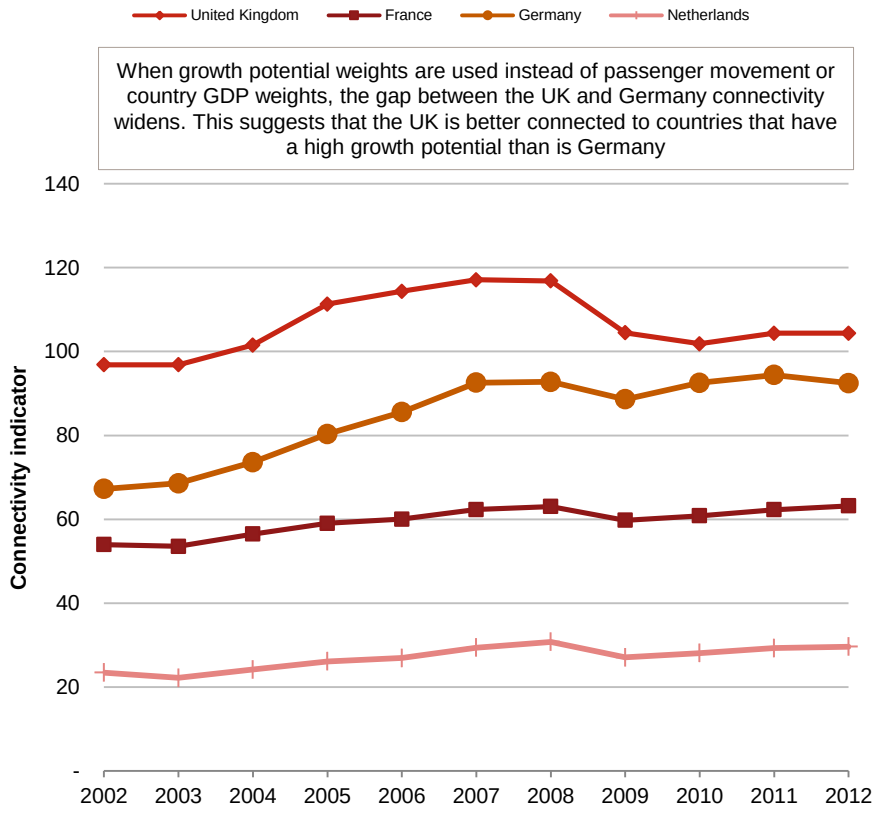
Total connectivity - country level (Country GDP weight)



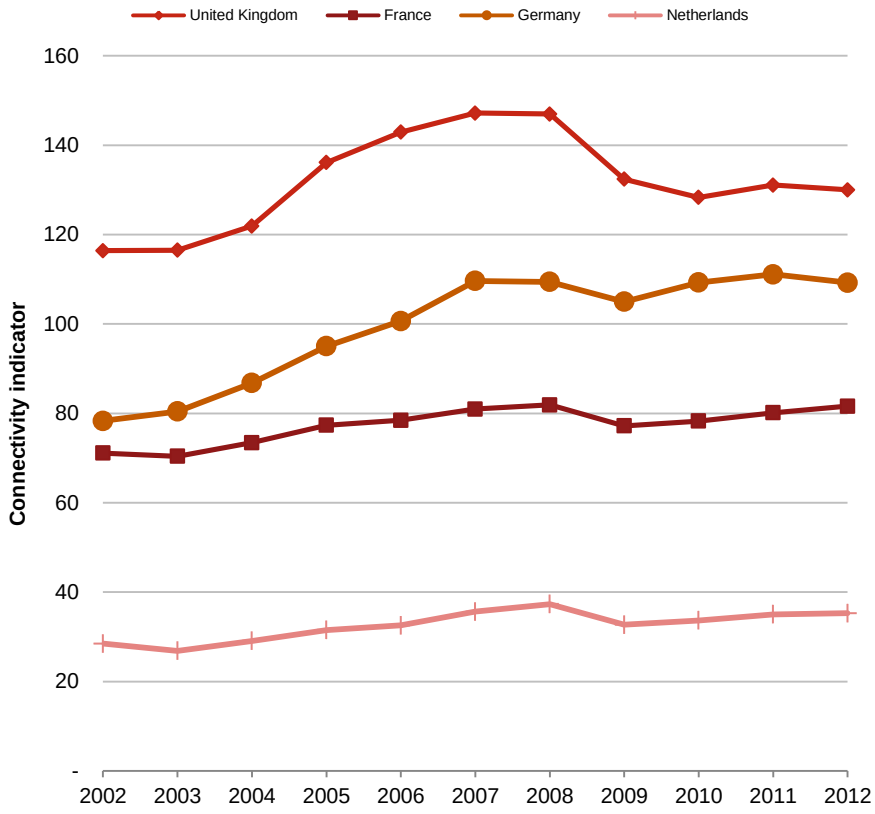
Total connectivity, country level

Short-term and long-term growth potential weights

Total connectivity - country level (Short-term growth potential weight)



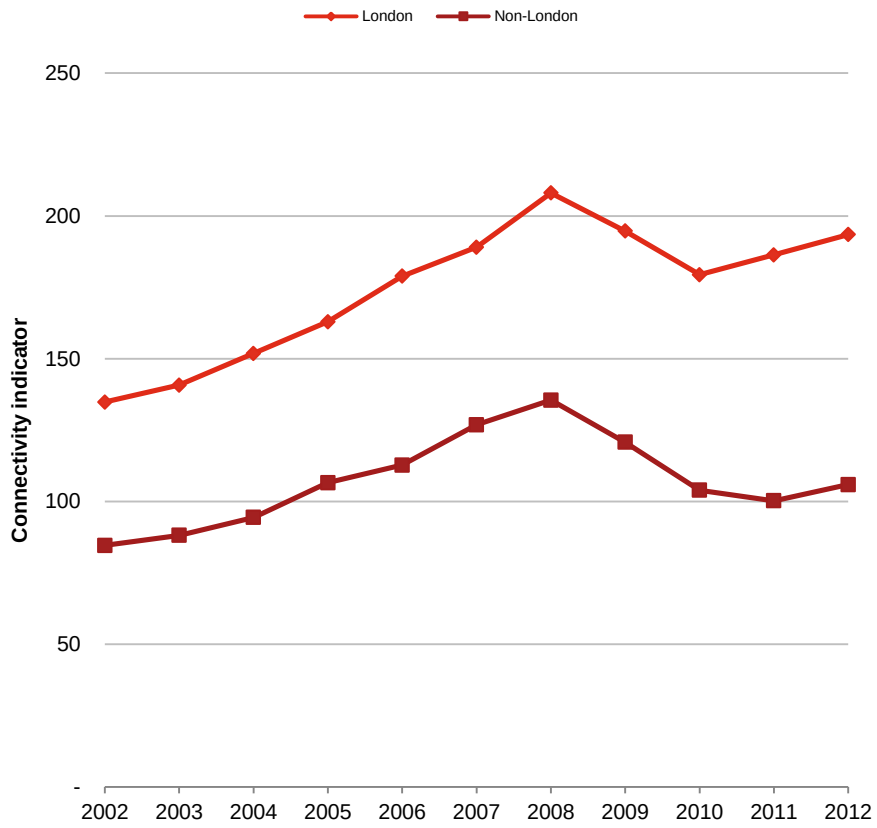
Total connectivity - country level (Long-term growth potential weight)



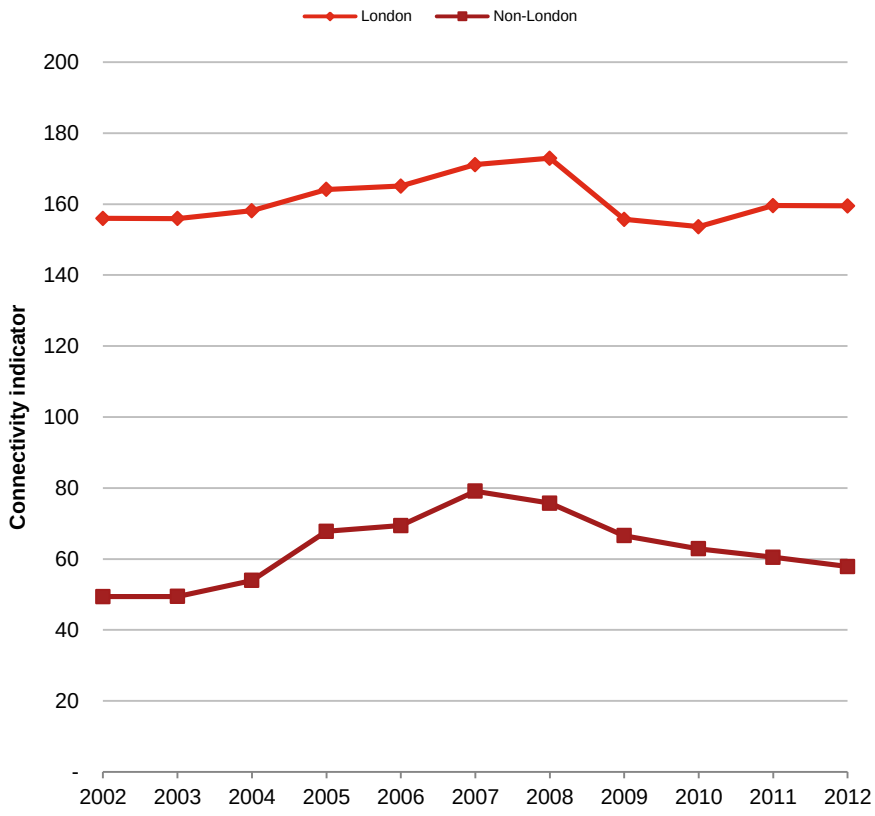
Total connectivity, London vs. non-London level

Passenger movement and country GDP weights

Total connectivity - London vs. non-London (Passenger movement weight)



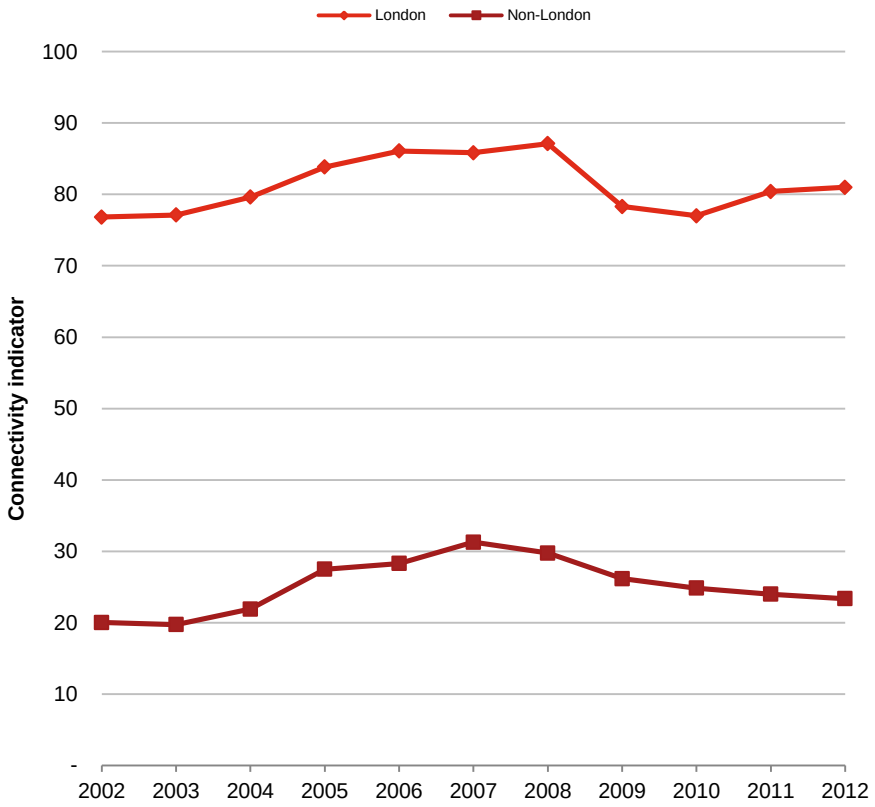
Total connectivity - London vs. non-London (Country GDP weight)



Total connectivity, London vs. non-London level

Short-term and long-term growth potential weights

Total connectivity - London vs. non-London (Short-term growth potential weight)

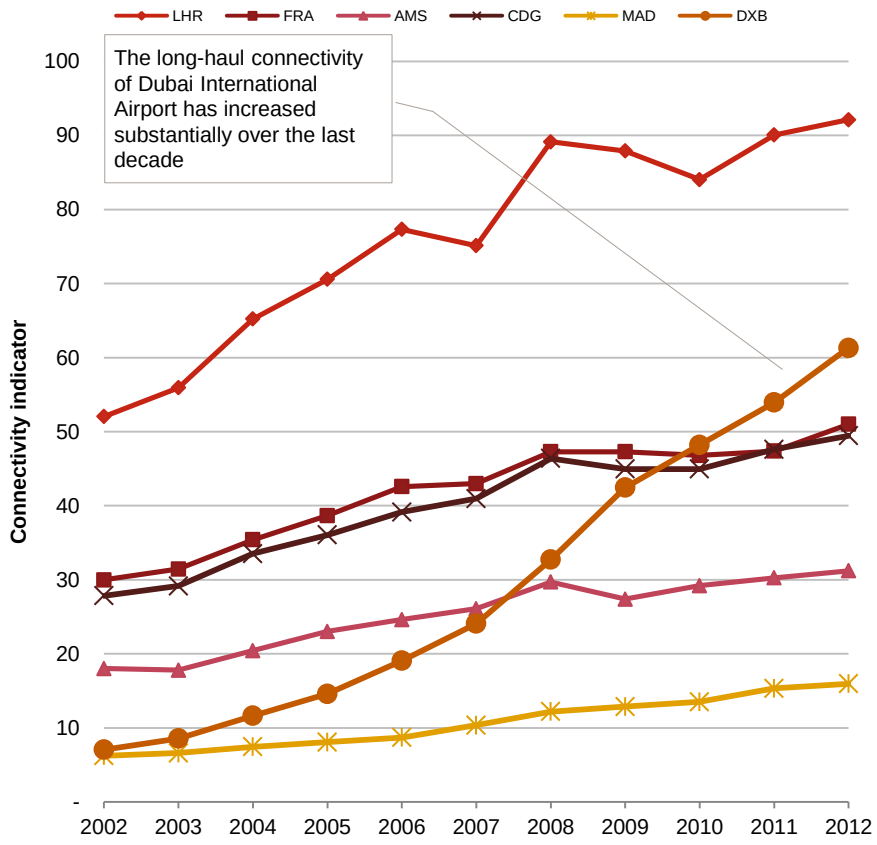


Total connectivity - London vs. non-London (Long-term growth potential weight)

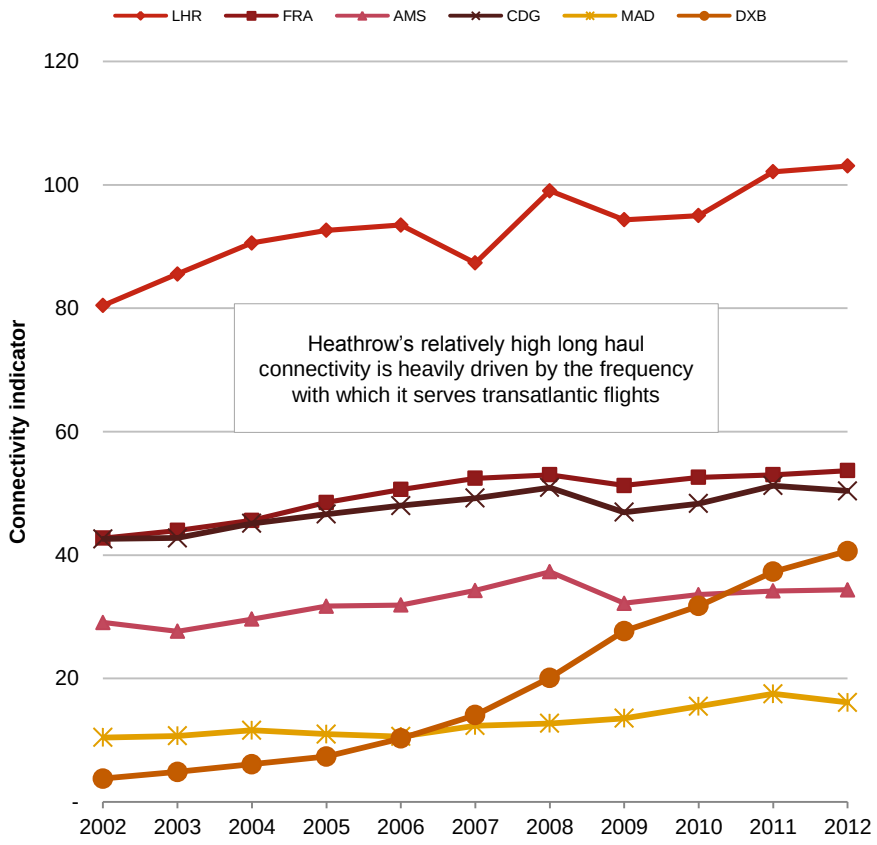
Long haul connectivity, airport level

Passenger movement and country GDP weights

Long haul - airport level (Passenger movement weight)



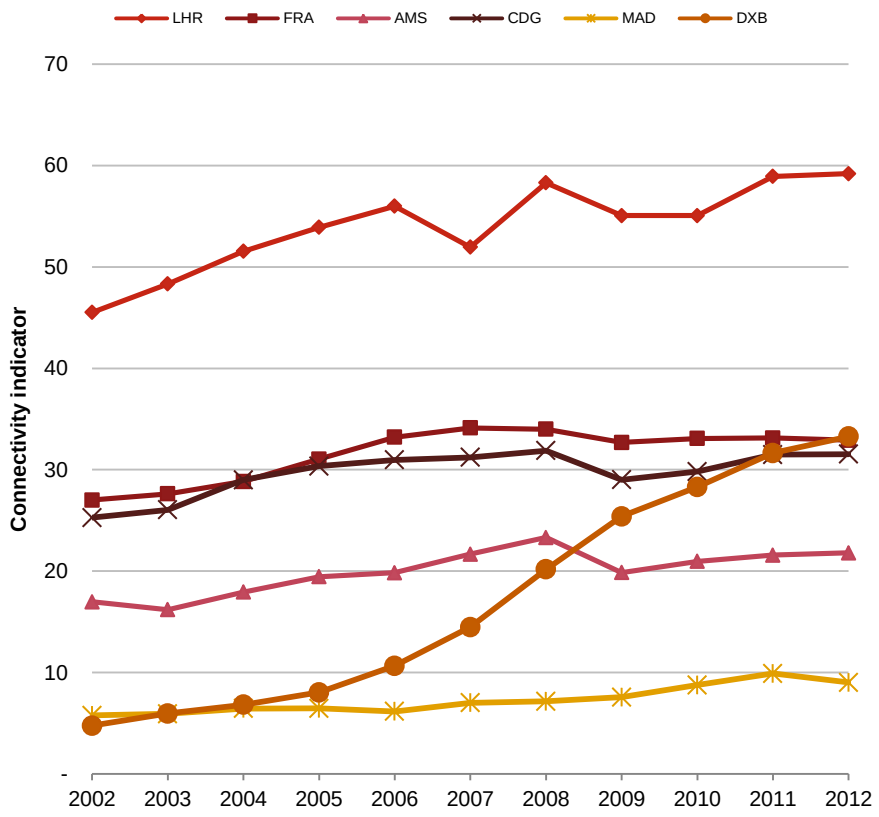
Long haul - airport level (Country GDP weight)



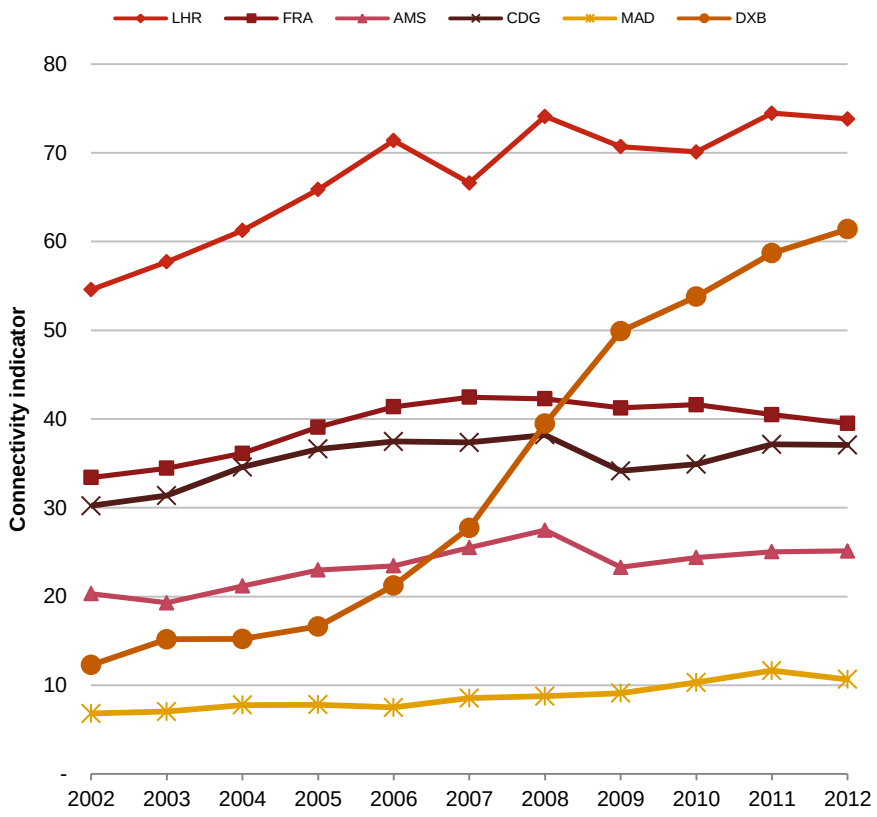
Long haul connectivity, airport level

Short-term and long-term growth potential weights

Long haul - airport level (Short-term growth potential weight)



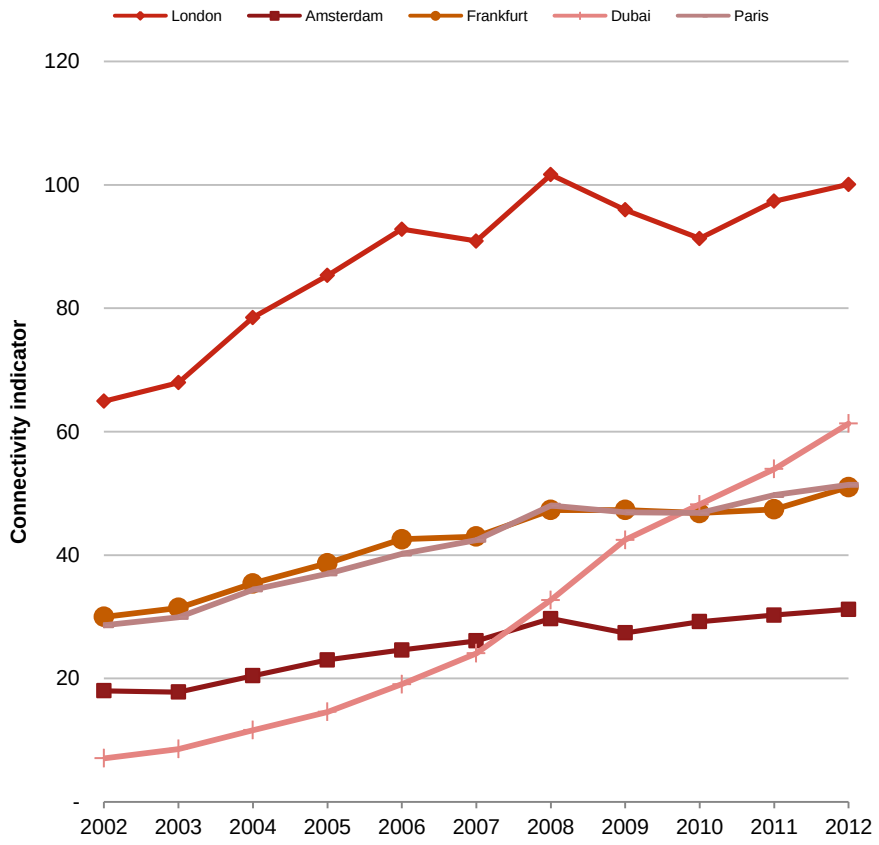
Long haul - airport level (Long-term growth potential weight)



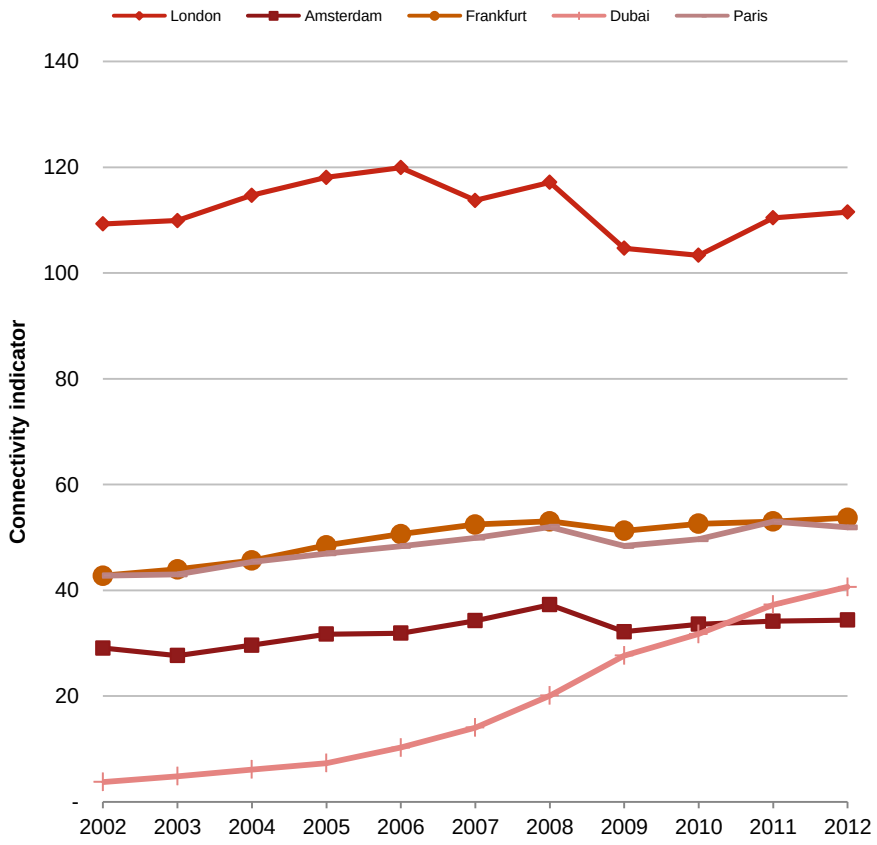
Long haul connectivity, city level

Passenger movement and country GDP weights

Long haul - city level (Passenger movement weight)



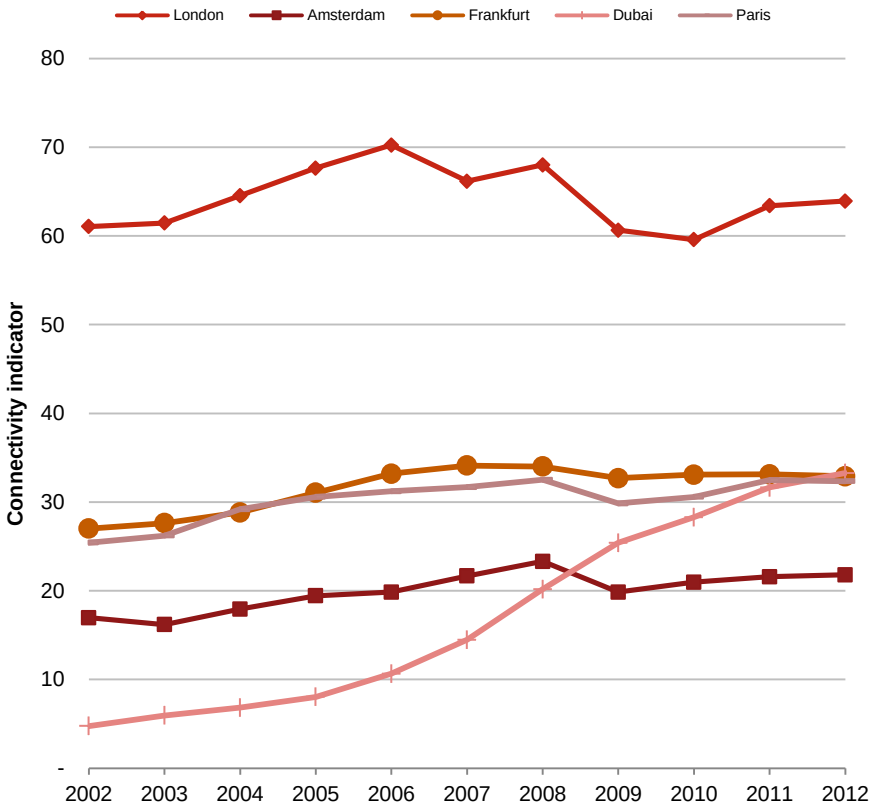
Long haul - city level (Country GDP weight)



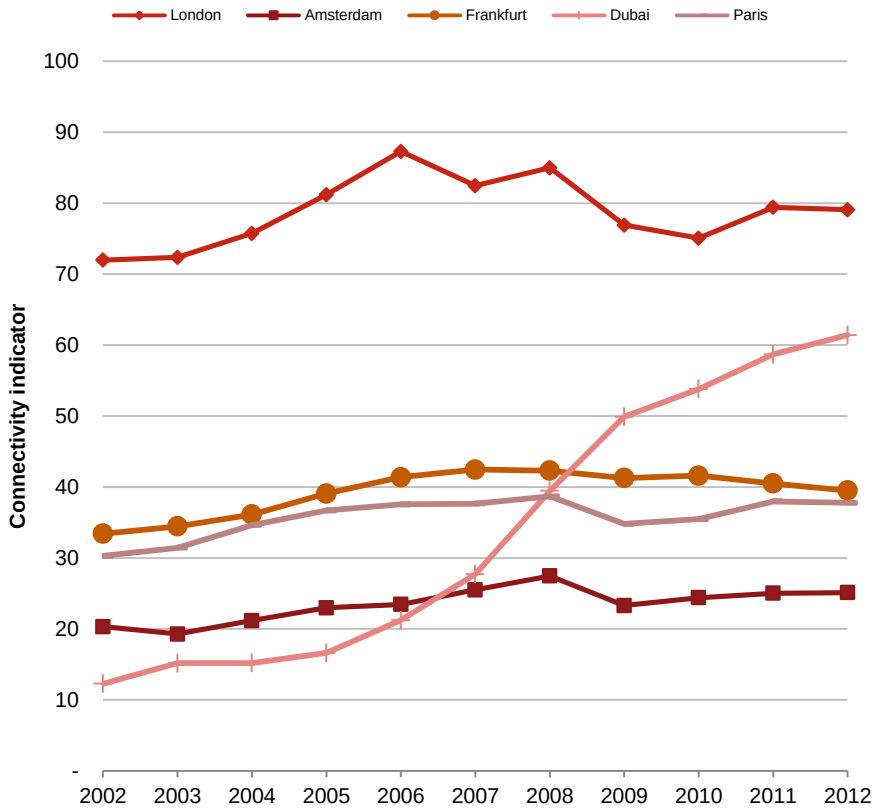
Long haul connectivity, city level

Short-term and long-term growth potential weights

Long haul - city level (Short-term growth potential weight)

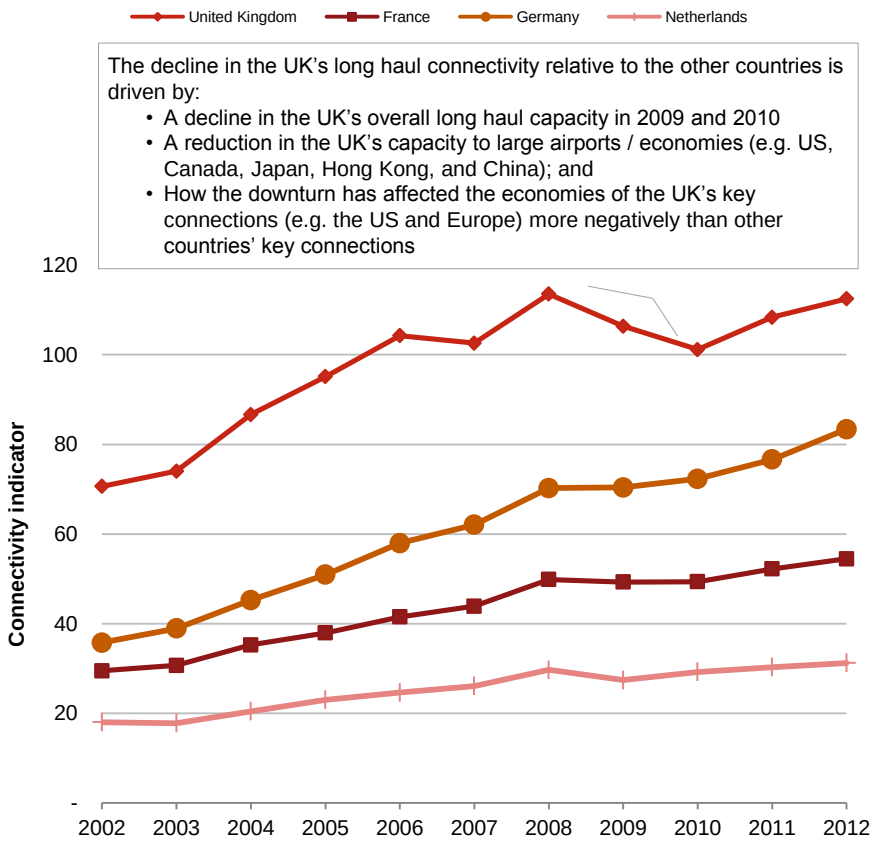


Long haul - city level (Long-term growth potential weight)

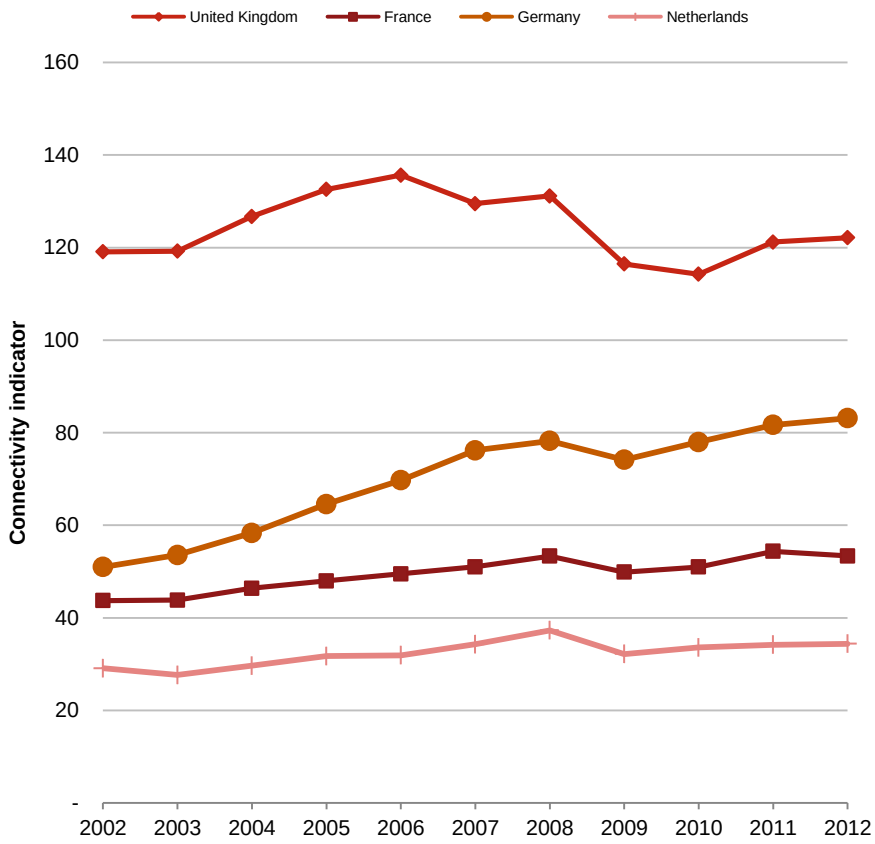


Long haul connectivity, country level
Passenger movement and country GDP weights

Long haul - country level (Passenger movement weight)

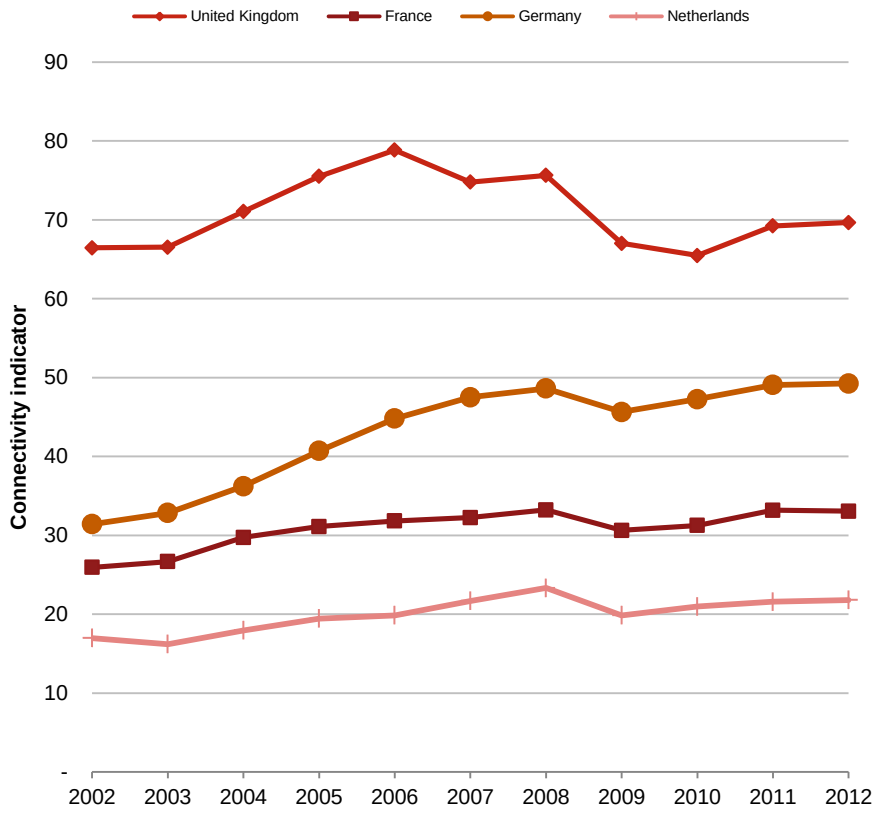


Long haul - country level (Country GDP weight)

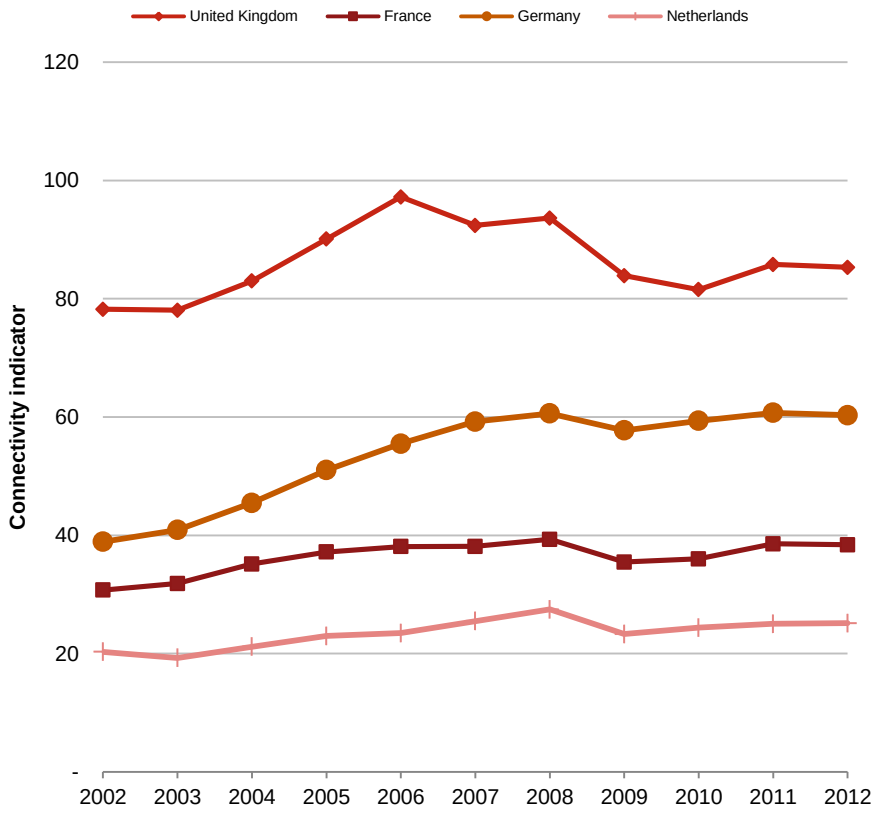


Long haul connectivity, country level
Short-term and long-term growth potential weights

Long haul - country level (Short-term growth potential weight)



Long haul - country level (Long-term growth potential weight)

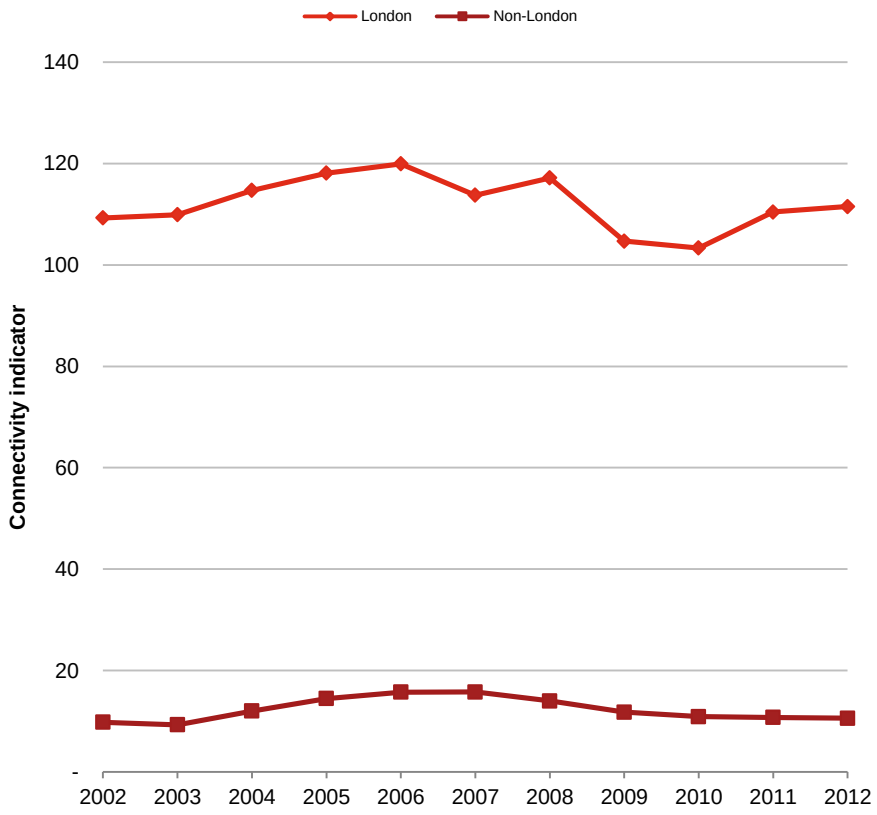


Long haul connectivity, London vs. non-London level

Passenger movement and country GDP weights

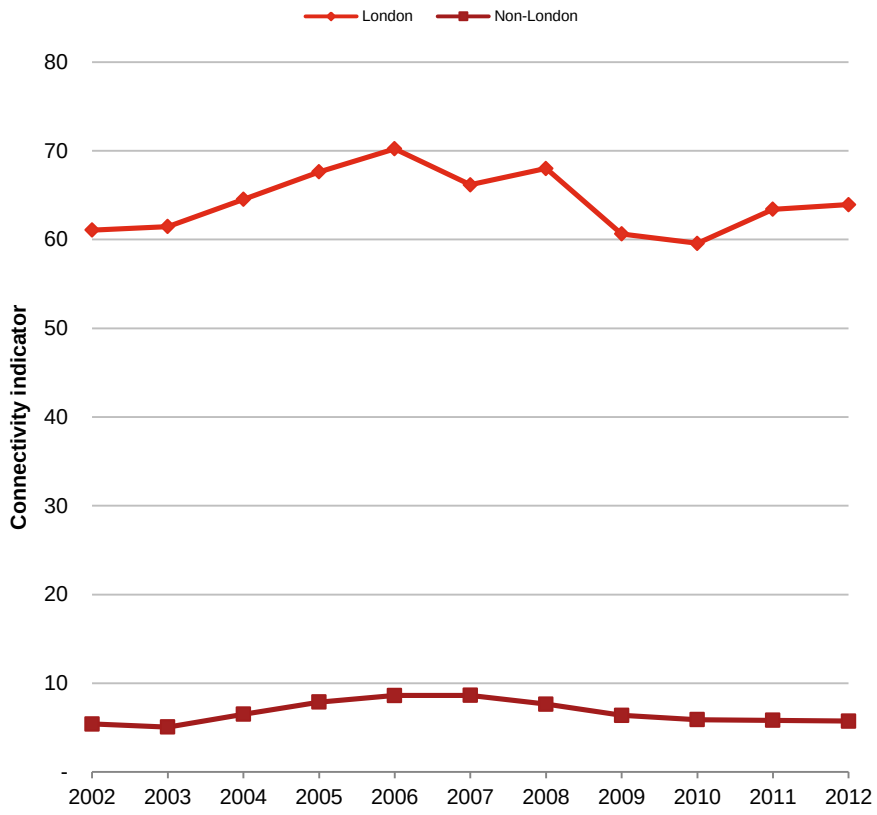
Long haul - London vs. non-London (Passenger movement weight)

Long haul - London vs. non-London (Country GDP weight)

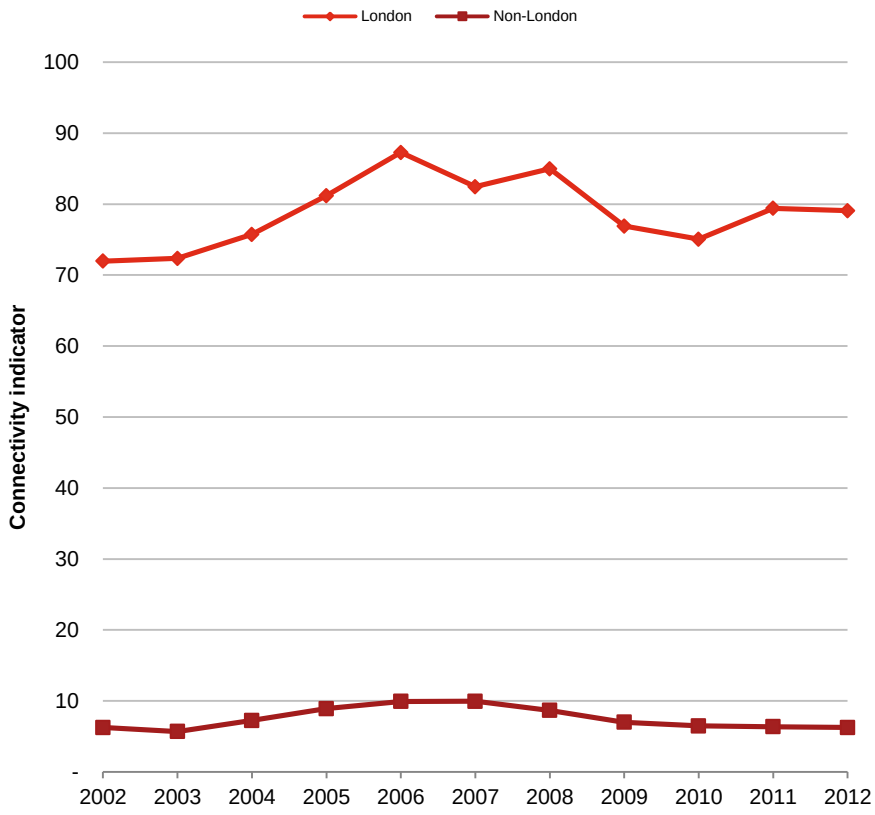


Long haul connectivity, London vs. non-London level
Short-term and long-term growth potential weights

Long haul - London vs. non-London (Short-term growth potential weight)



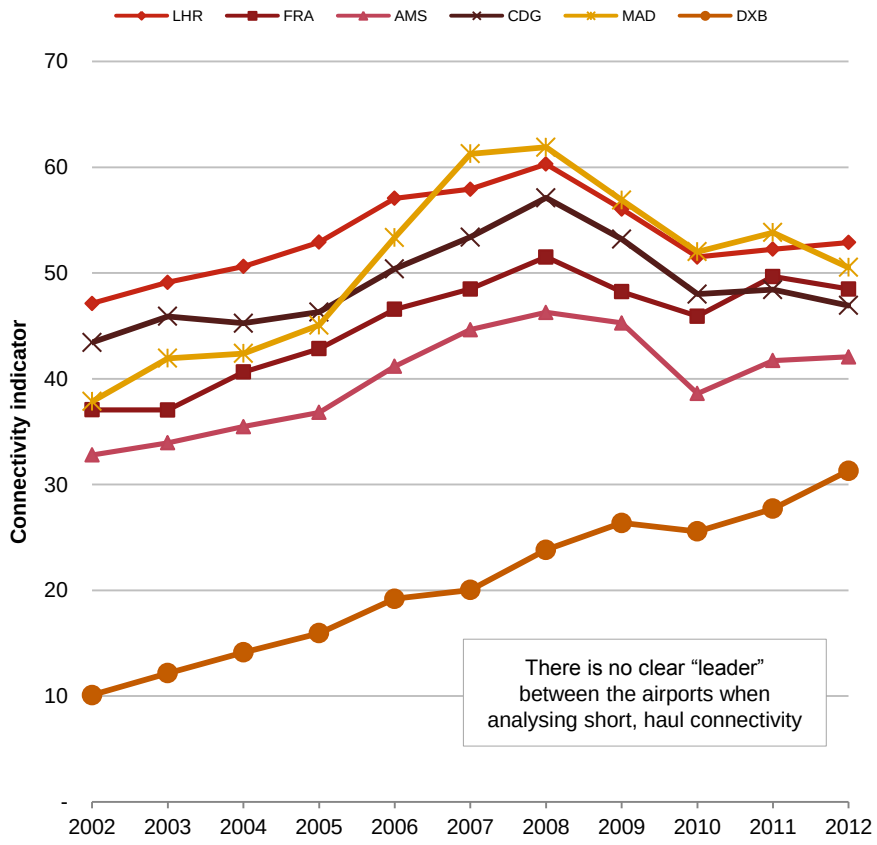
Long haul - London vs. non-London (Long-term growth potential weight)



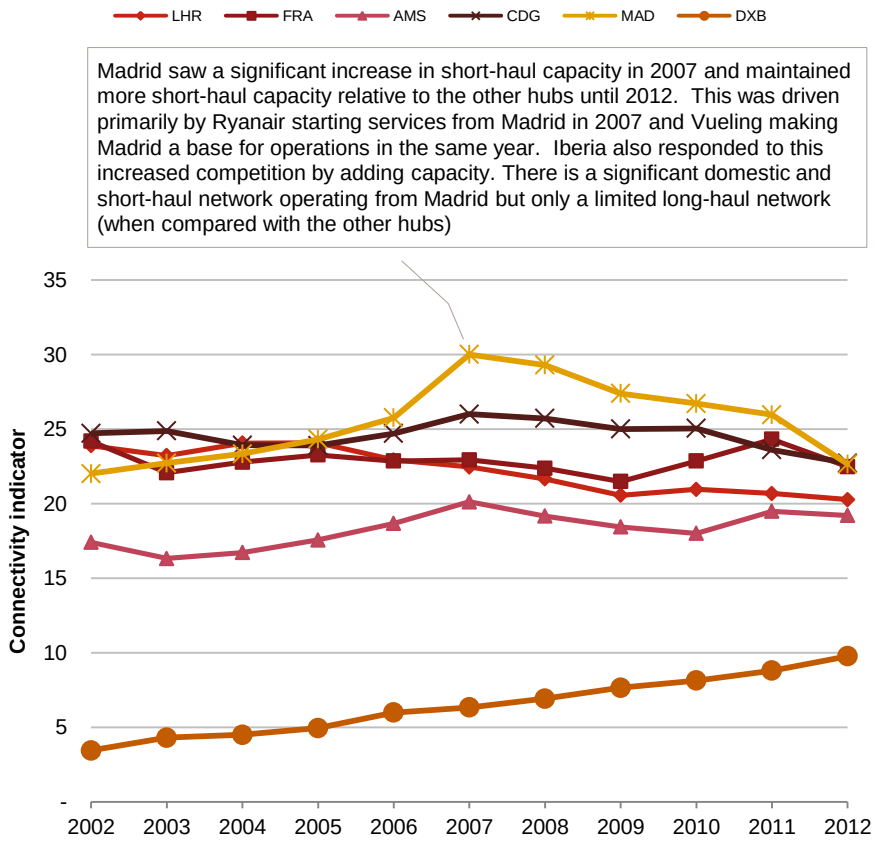
Short haul connectivity, airport level

Passenger movement and country GDP weights

Short haul - airport level (Passenger movement weight)



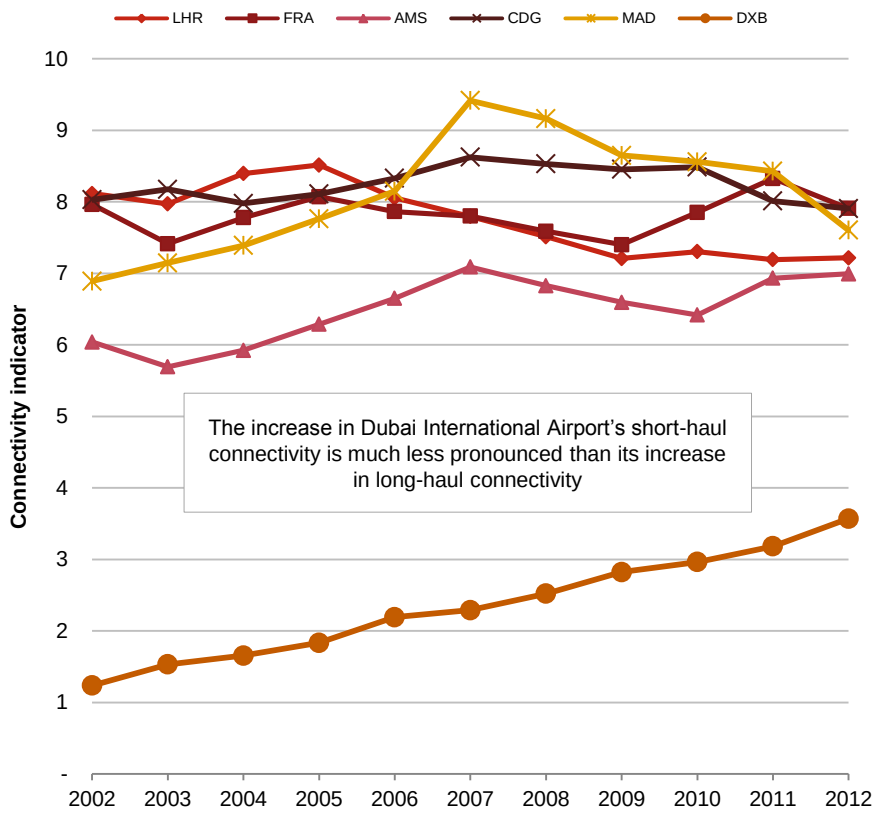
Short haul - airport level (Country GDP weight)



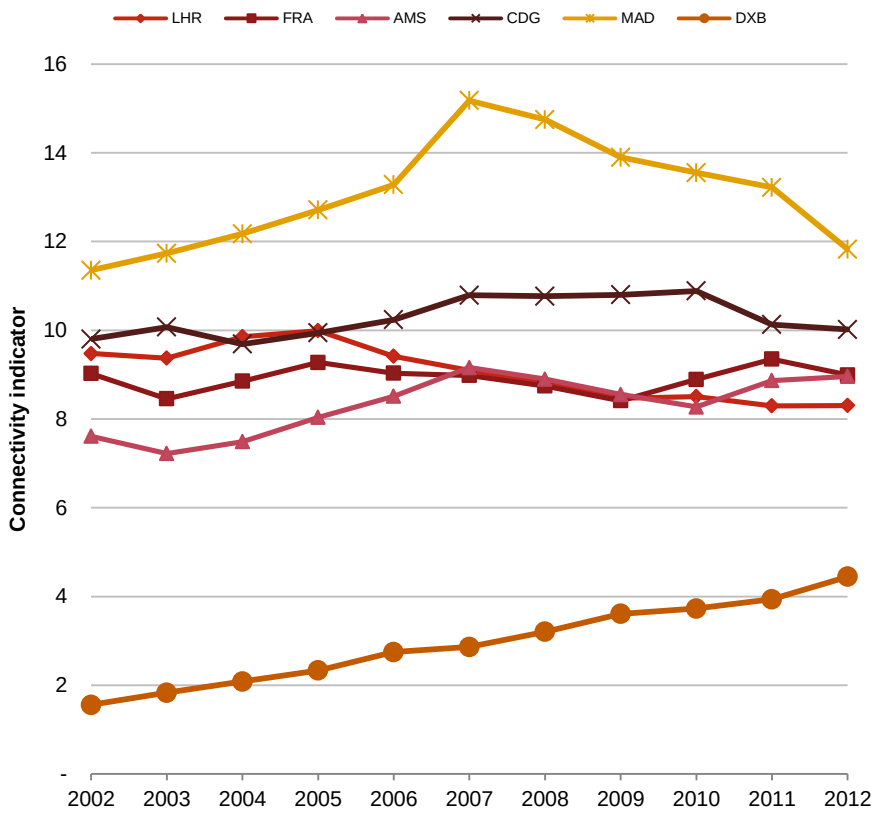
Short haul connectivity, airport level

Short-term and long-term growth potential weights

Short haul - airport level (Short-term growth potential weight)



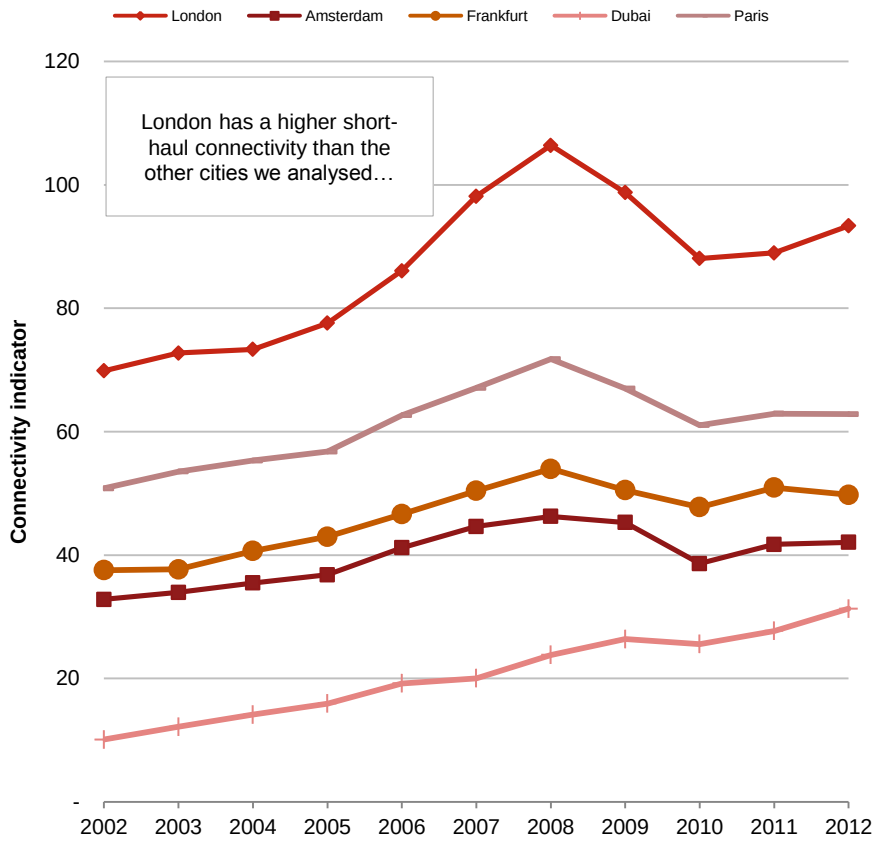
Short haul - airport level (Long-term growth potential weight)



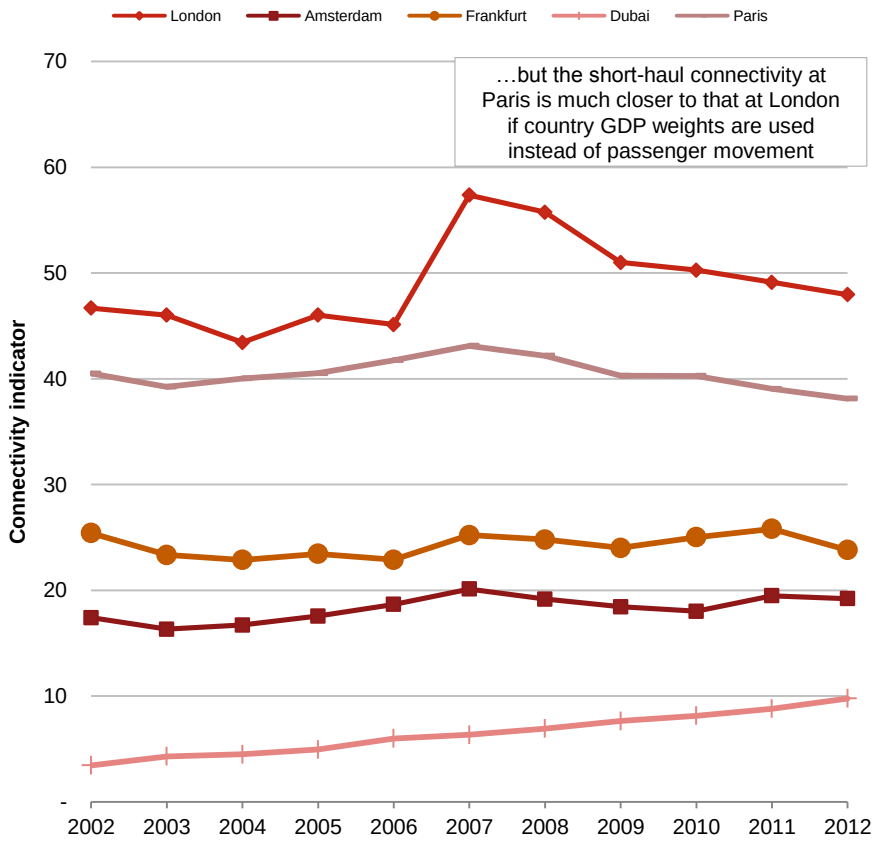
Short haul connectivity, city level

Passenger movement and country GDP weights

Short haul - city level (Passenger movement weight)



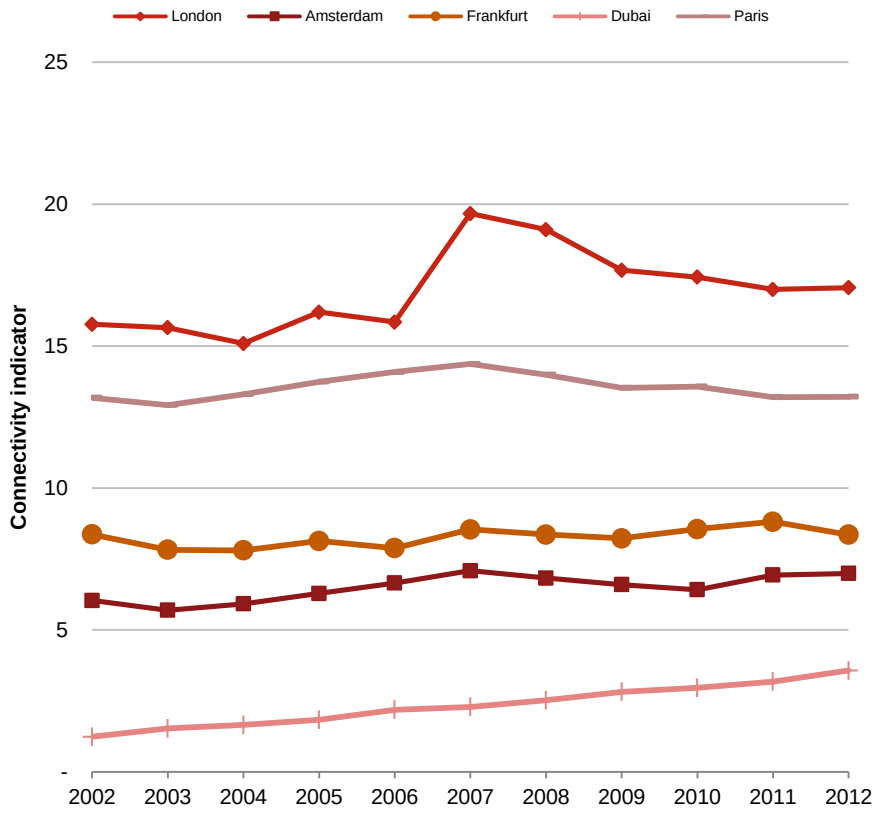
Short haul - city level (Country GDP weight)



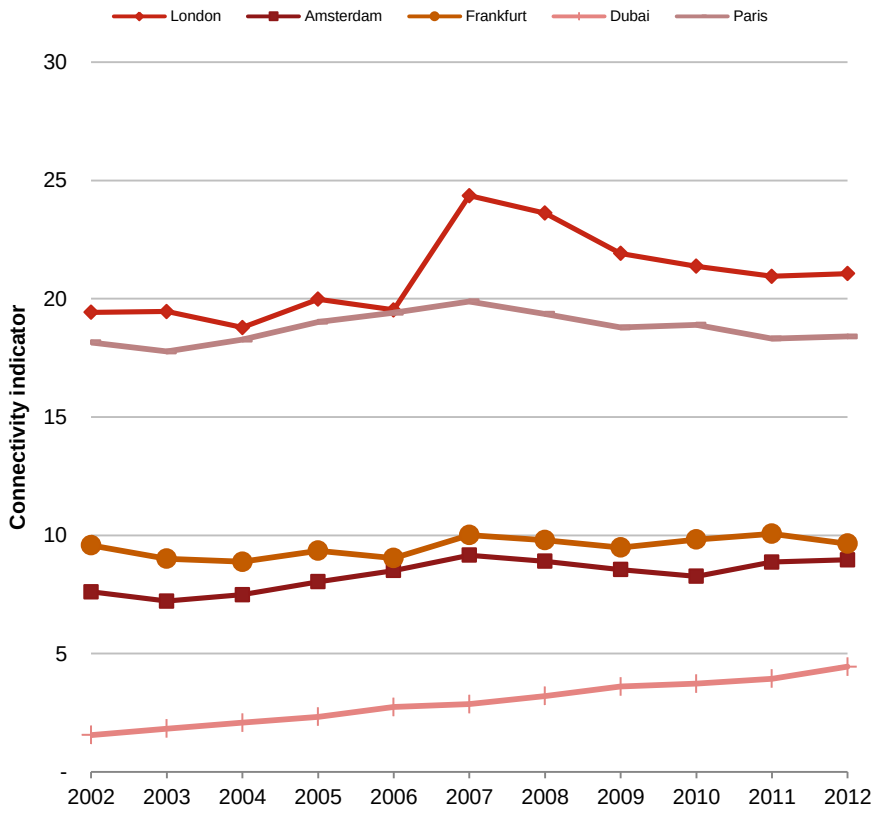
Short haul connectivity, city level

Short-term and long-term growth potential weights

Short haul - city level (Short-term growth potential weight)



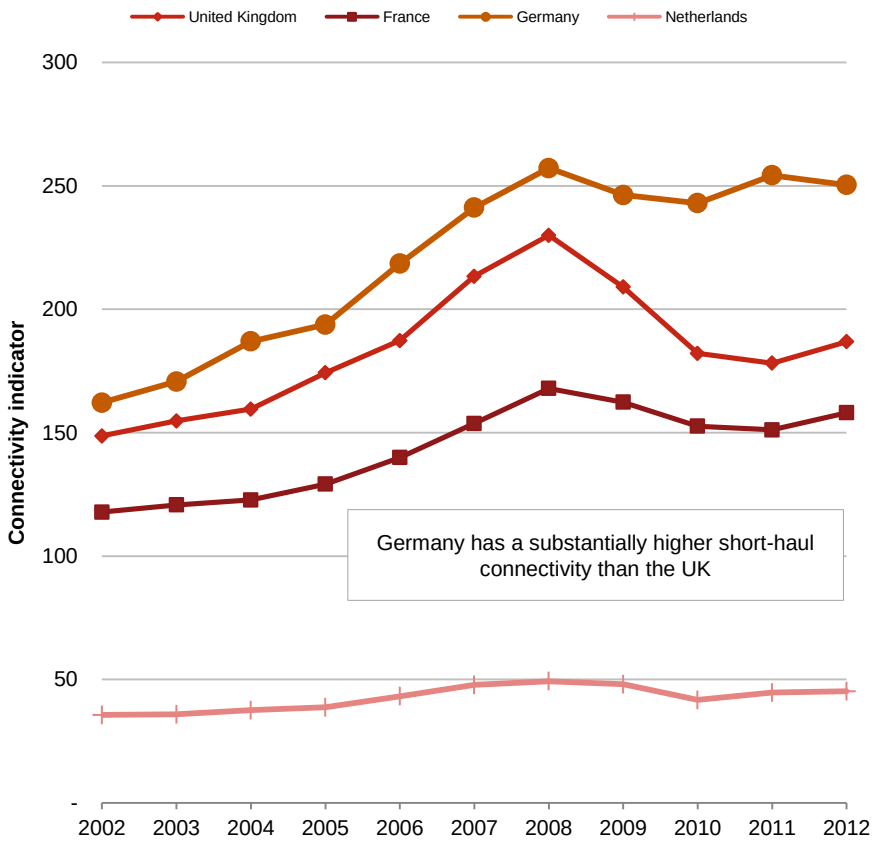
Short haul - city level (Long-term growth potential weight)



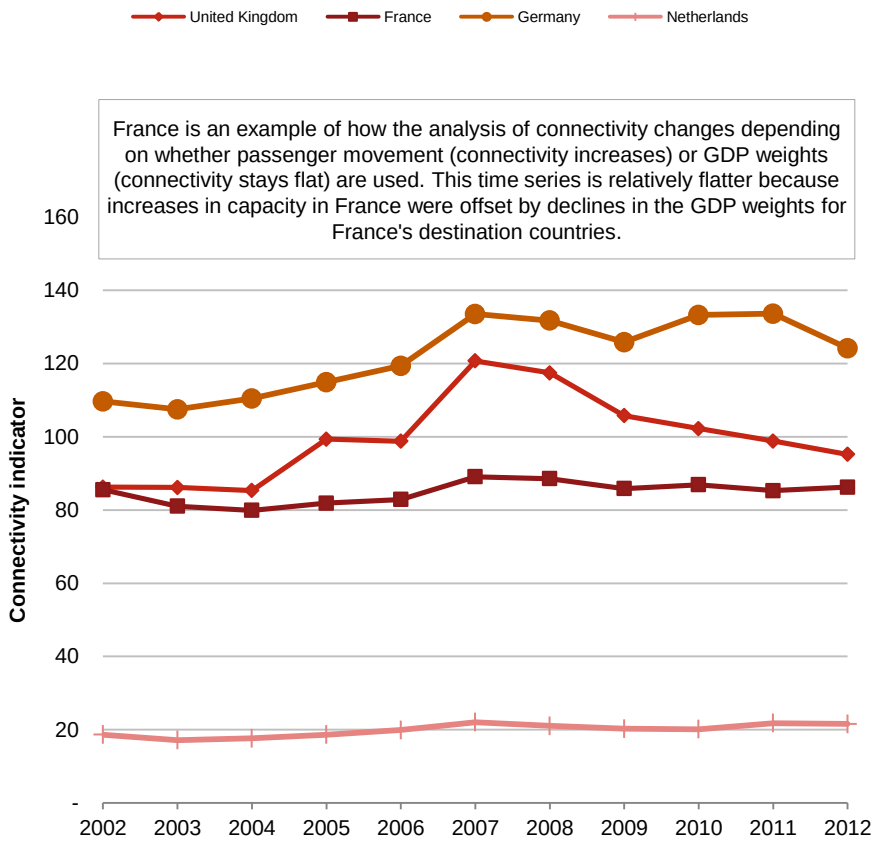
Short haul connectivity, country level

Passenger movement and country GDP weights

Short haul - country level (Passenger movement weight)



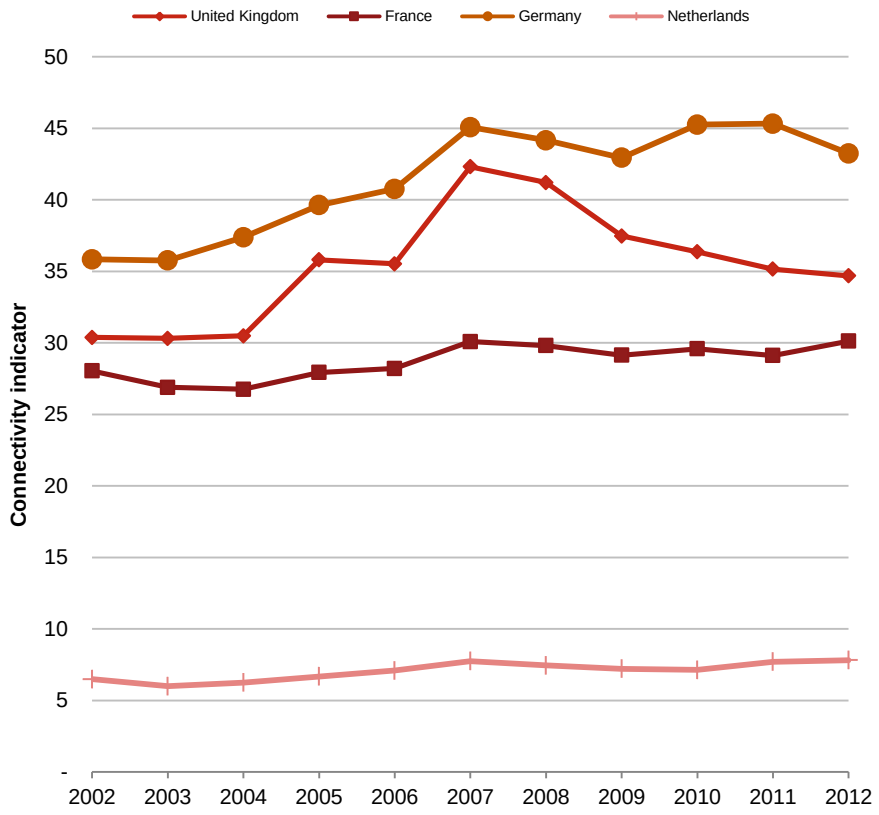
Short haul - country level (Country GDP weight)



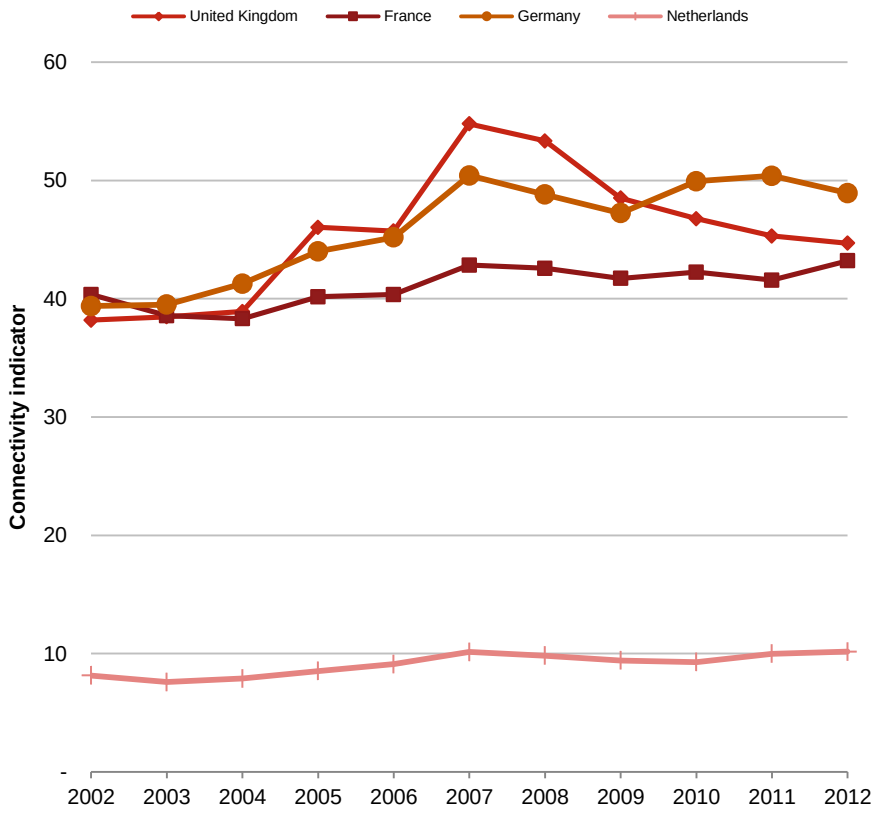
Short haul connectivity, country level

Short-term and long-term growth potential weights

Short haul - country level (Short-term growth potential weight)



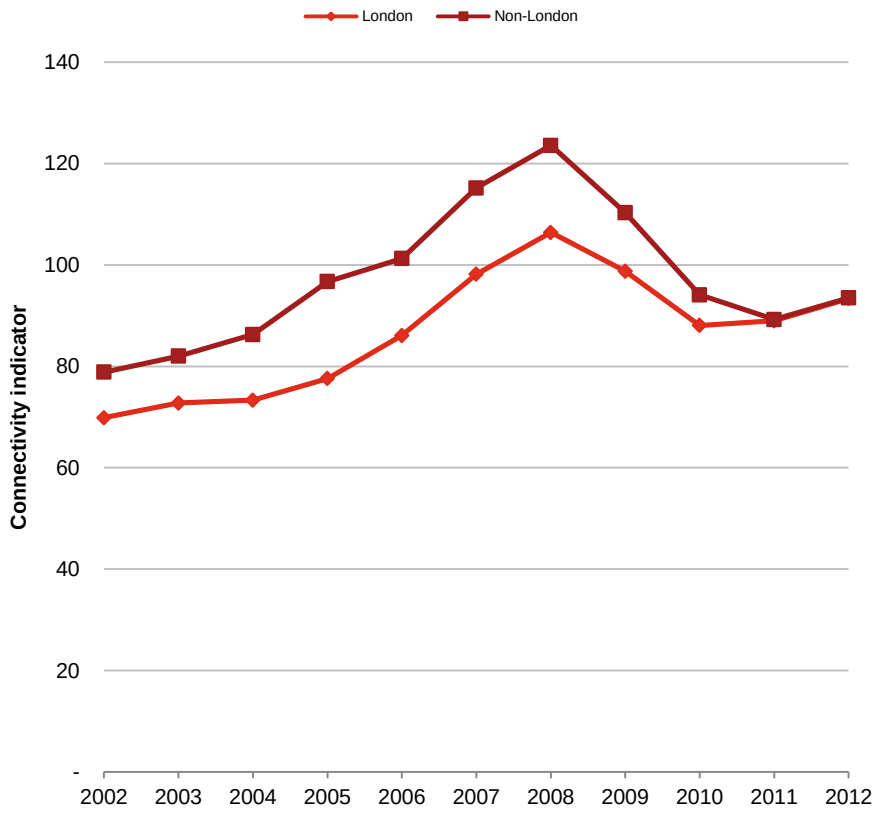
Short haul - country level (Long-term growth potential weight)



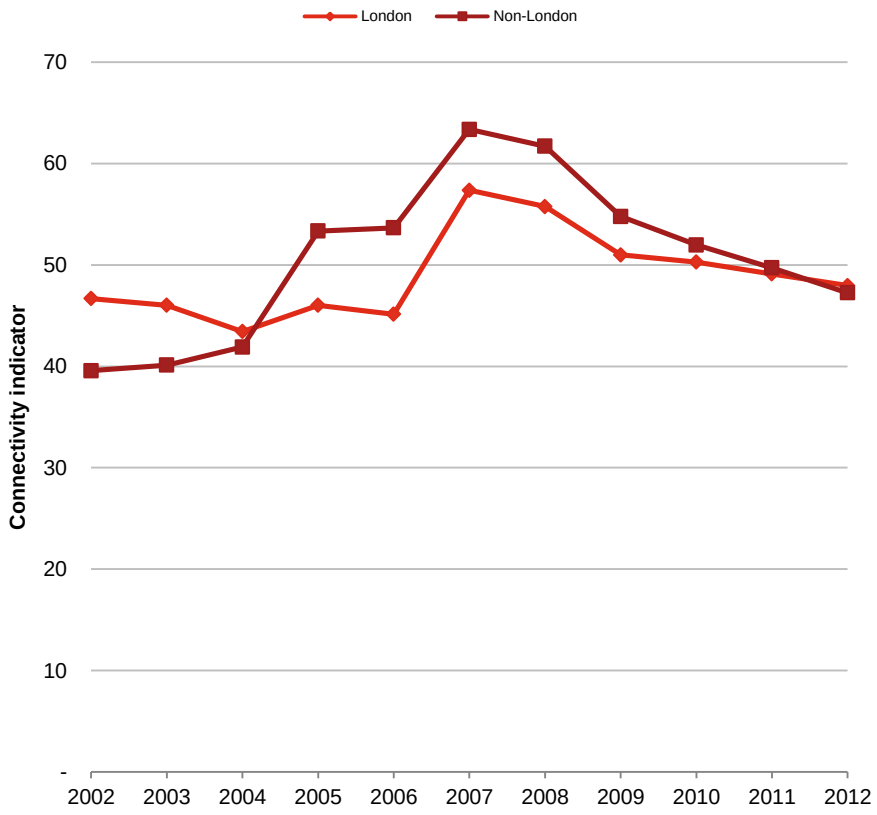
Short haul connectivity, London vs. non-London level

Passenger movement and country GDP weights

Short haul - London vs. non-London (Passenger movement weight)



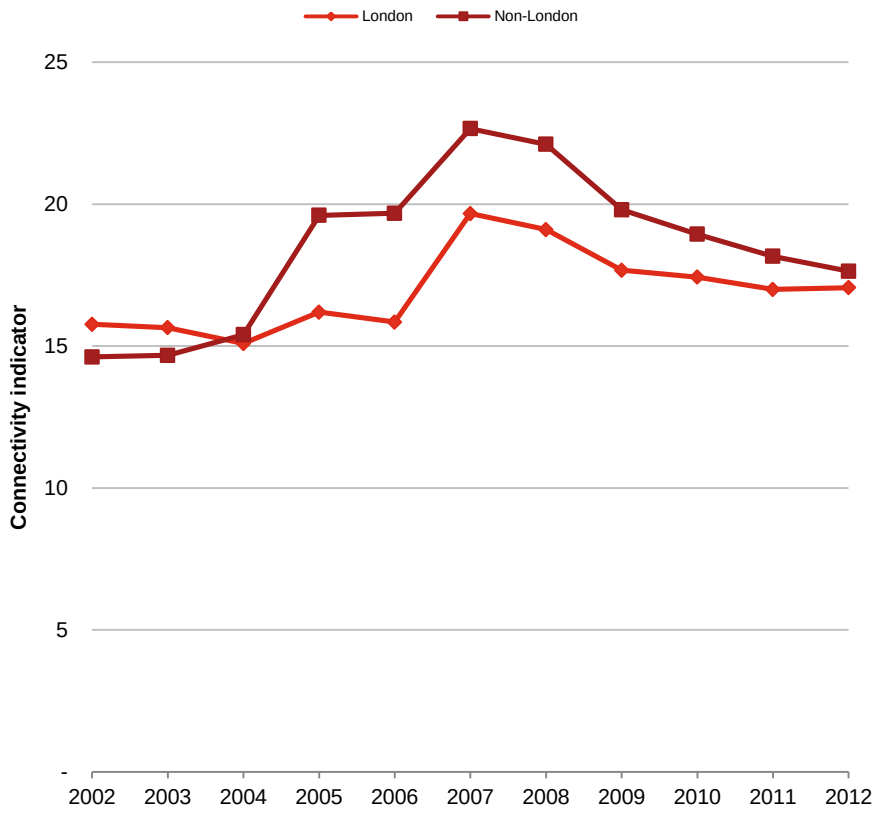
Short haul - London vs. non-London (Country GDP weight)



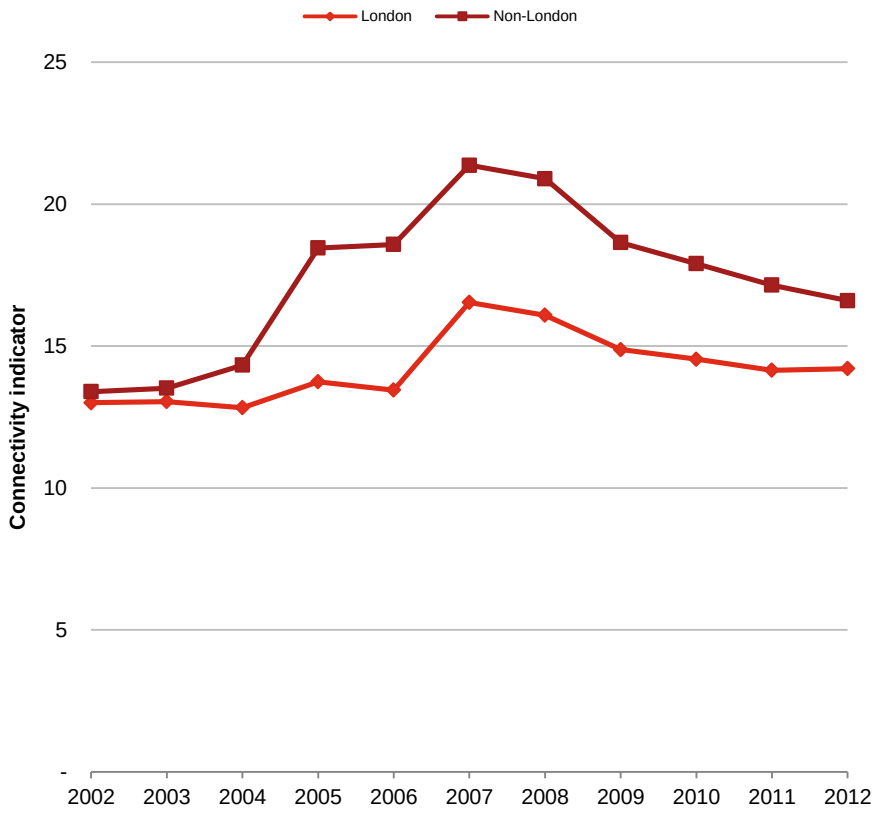
Short haul connectivity, London vs. non-London level

Short-term and long-term growth potential weights

Short haul - London vs. non-London (Short-term growth potential weight)



Short haul - London vs. non-London (Long-term growth potential weight)



Section 3
Additional analysis

Additional analysis

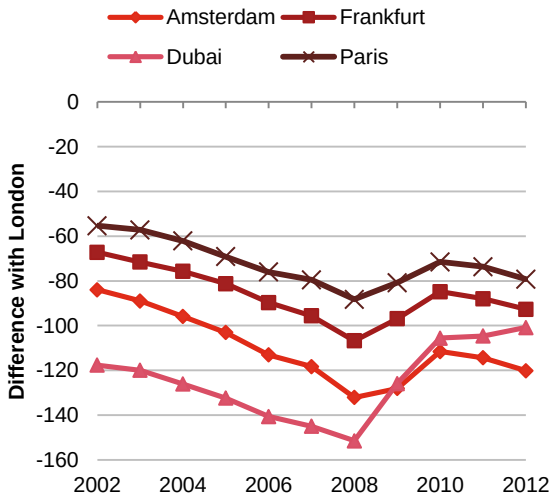
In this section we present the results of some additional analysis that we agreed to carry out for the Airports Commission during the course of the project.

Analysis	Description
Convergence analysis	Analysis which shows whether, and if so the rate at which, the connectivity of other cities is catching up with that of London
Geographical breakdown of the connectivity indices (at the city level)	A breakdown of the connectivity indices by geographical regions served. This analysis helps to show which regions are the main contributors to the connectivity of each city.
Alternative measure of connectivity	One of the characteristics of the IATA connectivity indicator is that it is driven heavily by capacity. We therefore calculated another measure of connectivity which assesses a country's connectivity purely based on: i. The size of the economies to which it is connected; and ii. The *share* of capacity associated with each of these economies This measure presents us with another way of comparing connectivity purely based on the size of the countries / economies to which a country is connected.
Geographical spread of destination countries served	Analysis of the geographical spread of the destinations served for each city
Weighted average distance of the routes served	Analysis which shows the weighted average distance of the routes served for each city

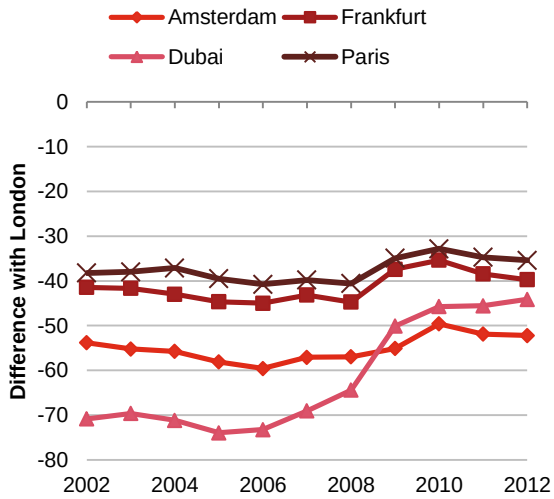
Convergence analysis

- The charts below show the difference between each city's connectivity indicator and that of London. A positive slope implies convergence with London. The analysis has been carried out using three different types of weights.
- The analysis is carried out based on total connectivity (i.e. it takes long-haul and short-haul together).
- The analysis suggests that Dubai is the only city that is converging on London. However, it is worth noting that London Heathrow (which is 99% utilised) is the only airport which is currently facing a binding capacity constraint. By contrast, Frankfurt is running at 69%; Dubai is at 80% (and has plans for a new airport); Paris is at 70%; and Amsterdam is is at 83%.

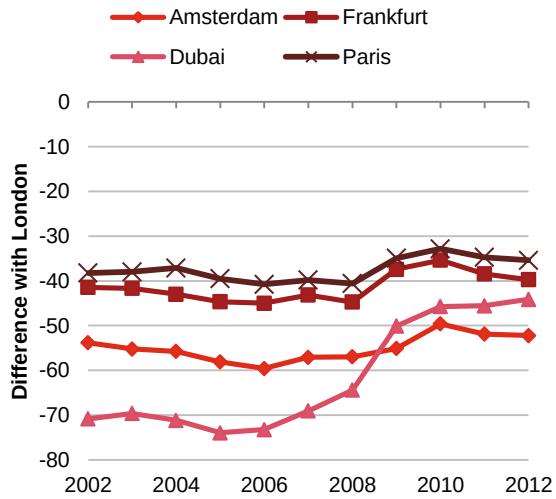
Convergence analysis – Passenger movement weight



Convergence analysis – Country GDP weight

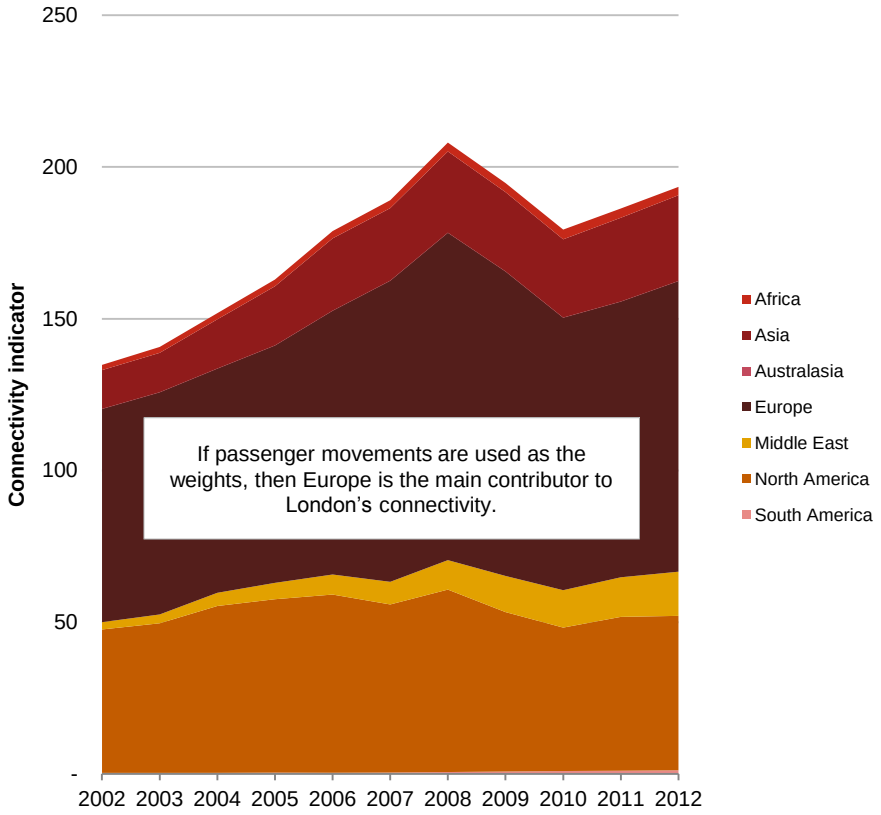


Convergence analysis – Short-term growth potential weight

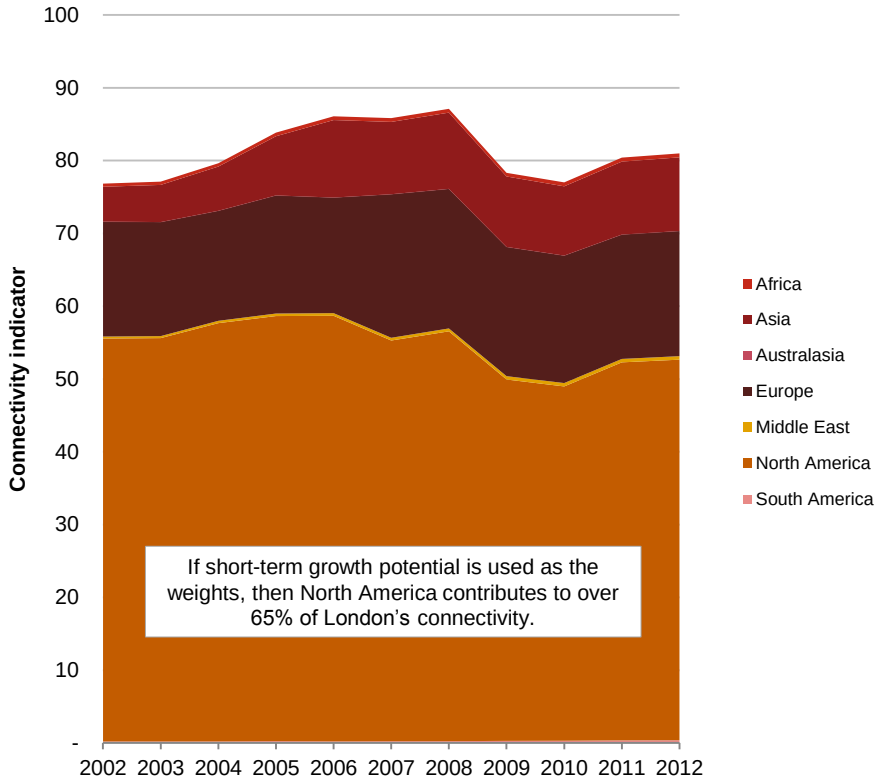


Geographical breakdown of connectivity indices
London

London – geographical breakdown of connectivity indicator (Passenger movement weight)

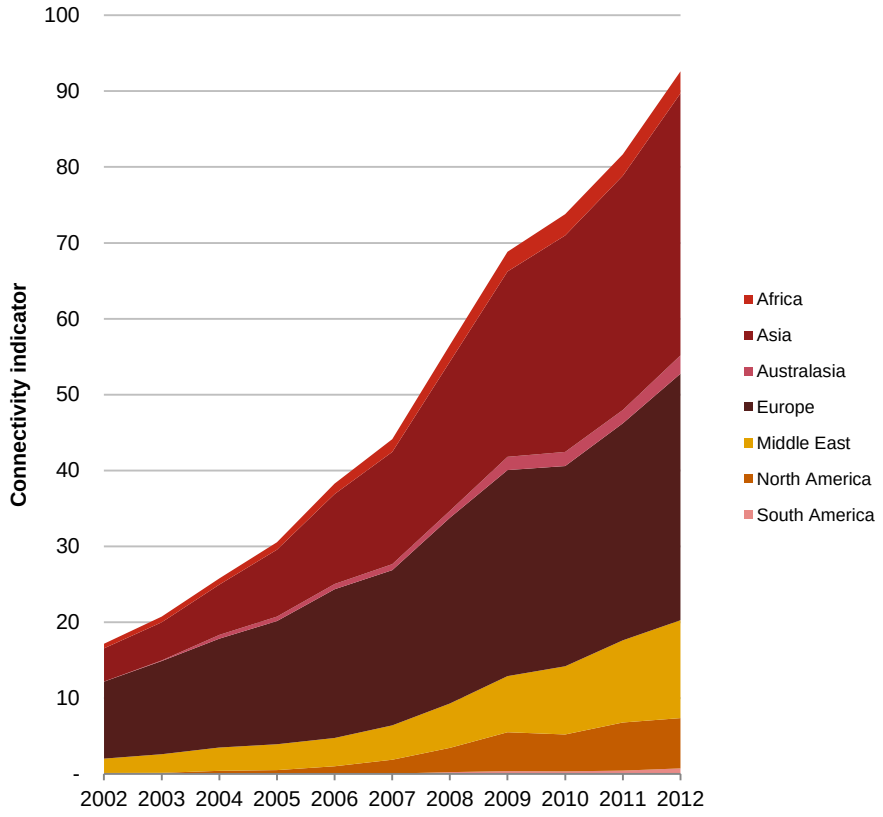


London – geographical breakdown of connectivity indicator (Short-term growth potential weight)

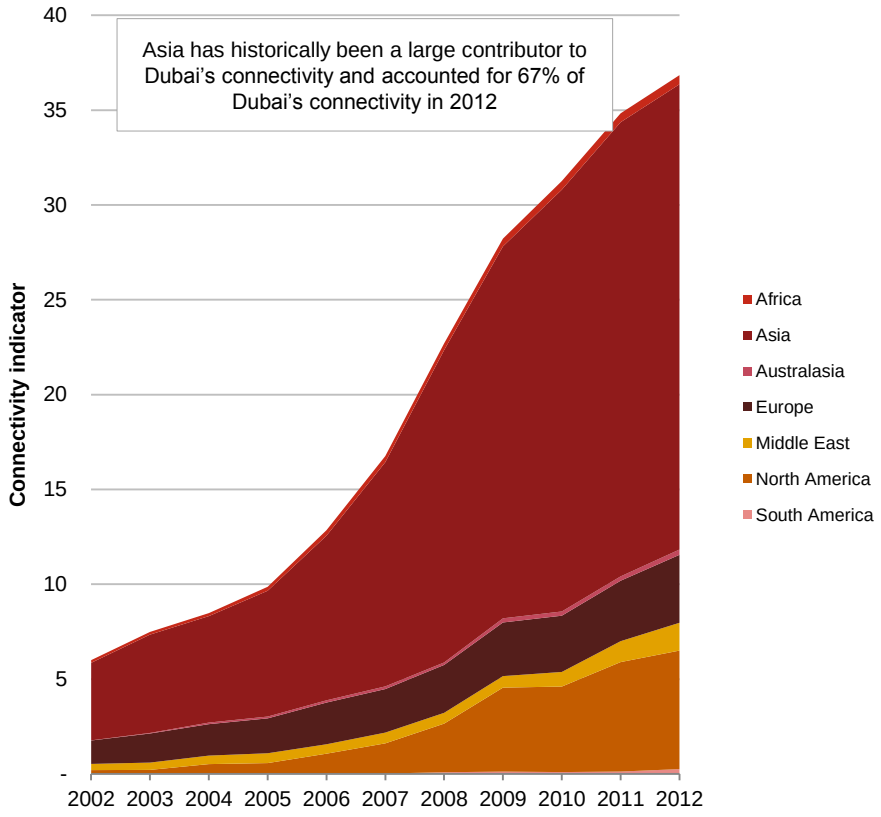


Geographical breakdown of connectivity indices
Dubai

Dubai – geographical breakdown of connectivity indicator (Passenger movement weight)

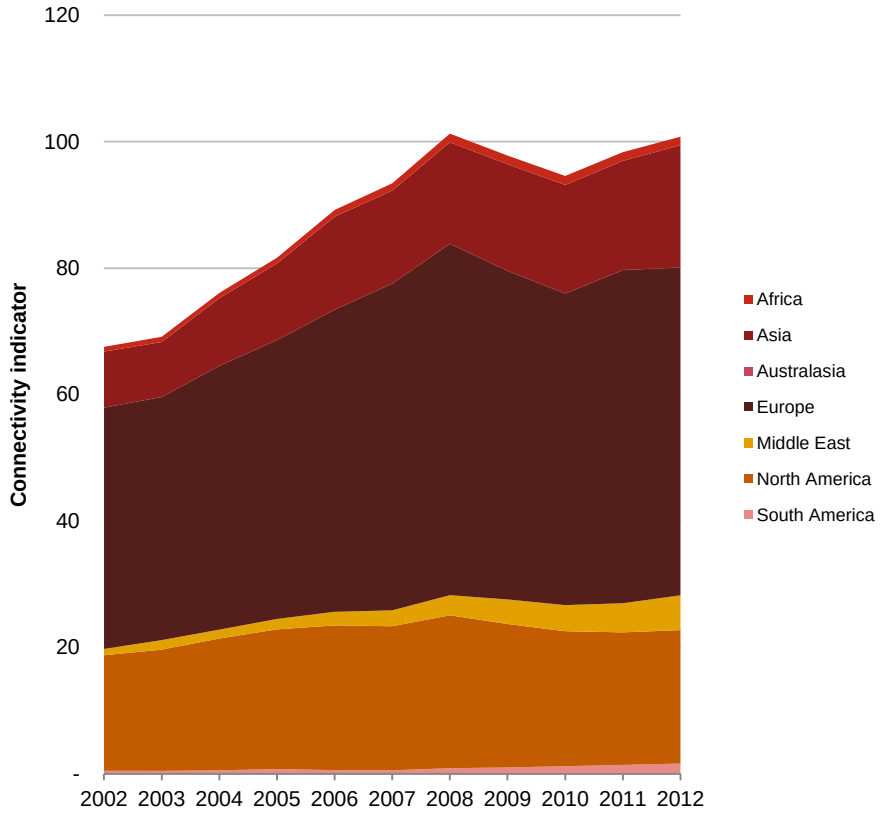


Dubai - geographical breakdown (Short-term growth potential weight)

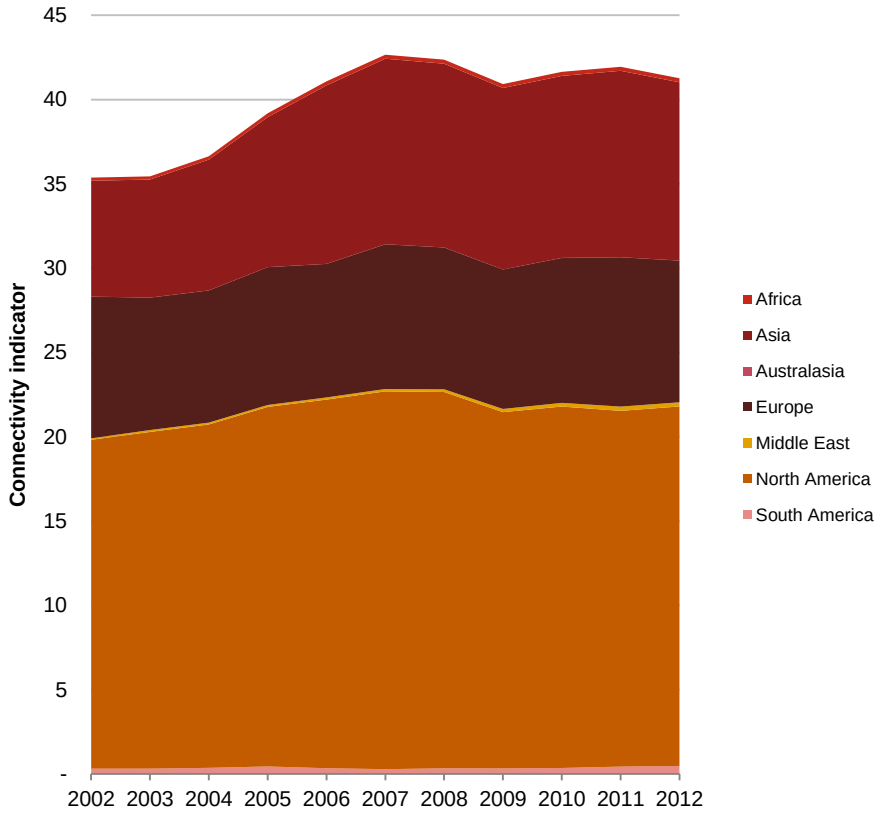


Geographical breakdown of connectivity indices
Frankfurt

Frankfurt – geographical breakdown of connectivity indicator (Passenger movement weight)

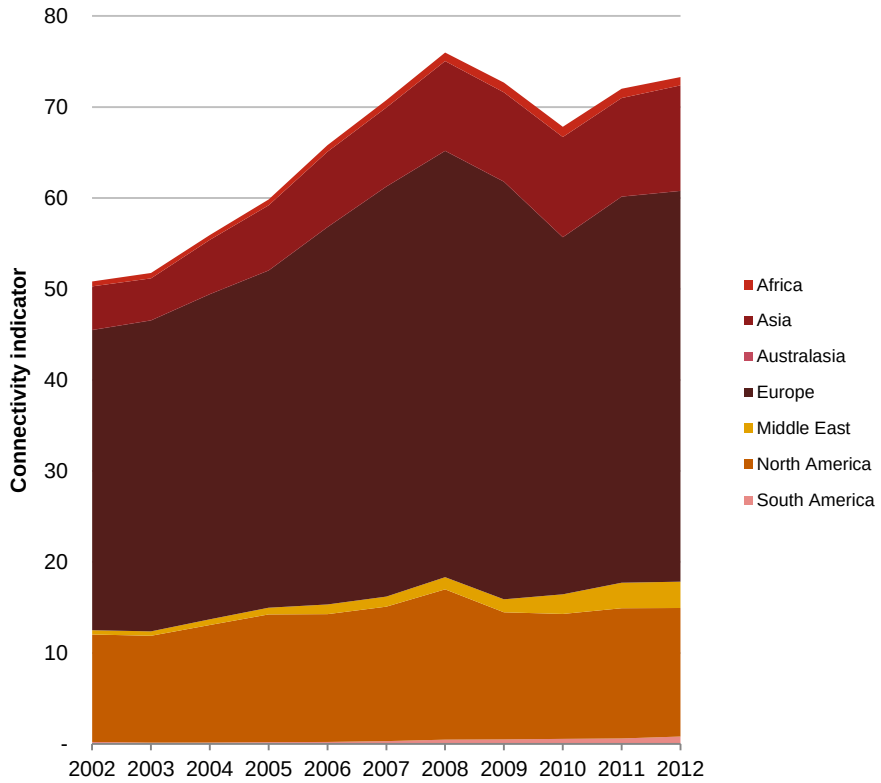


Frankfurt – geographical breakdown (Short-term growth potential weight)

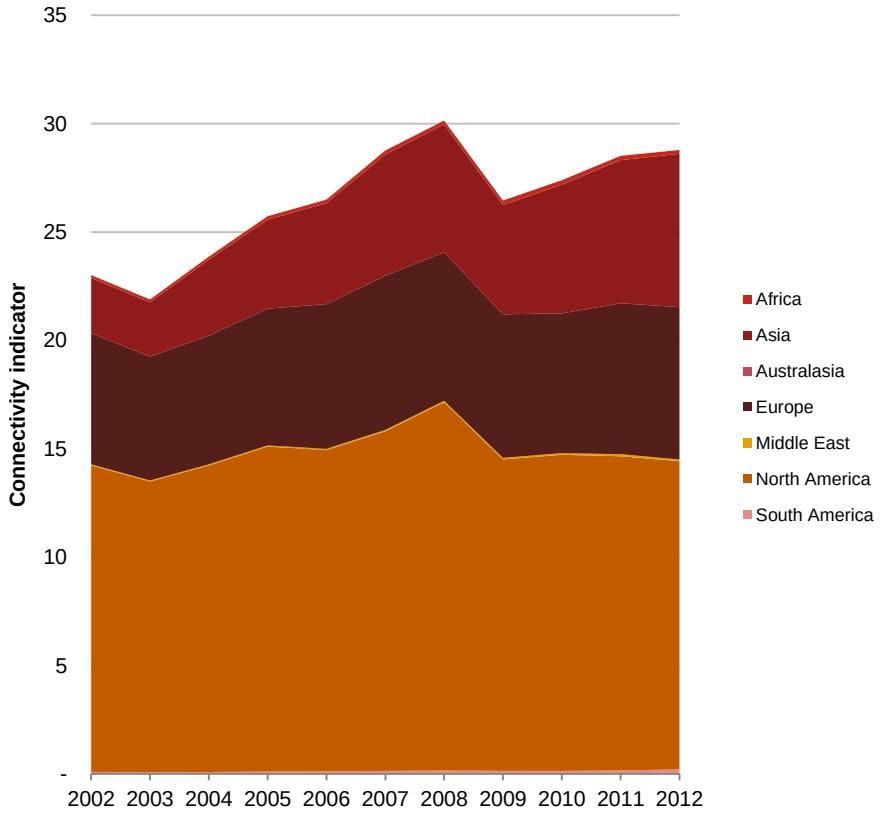


Geographical breakdown of connectivity indices
Amsterdam

Amsterdam – geographical breakdown of connectivity indicator (Passenger movement weight)

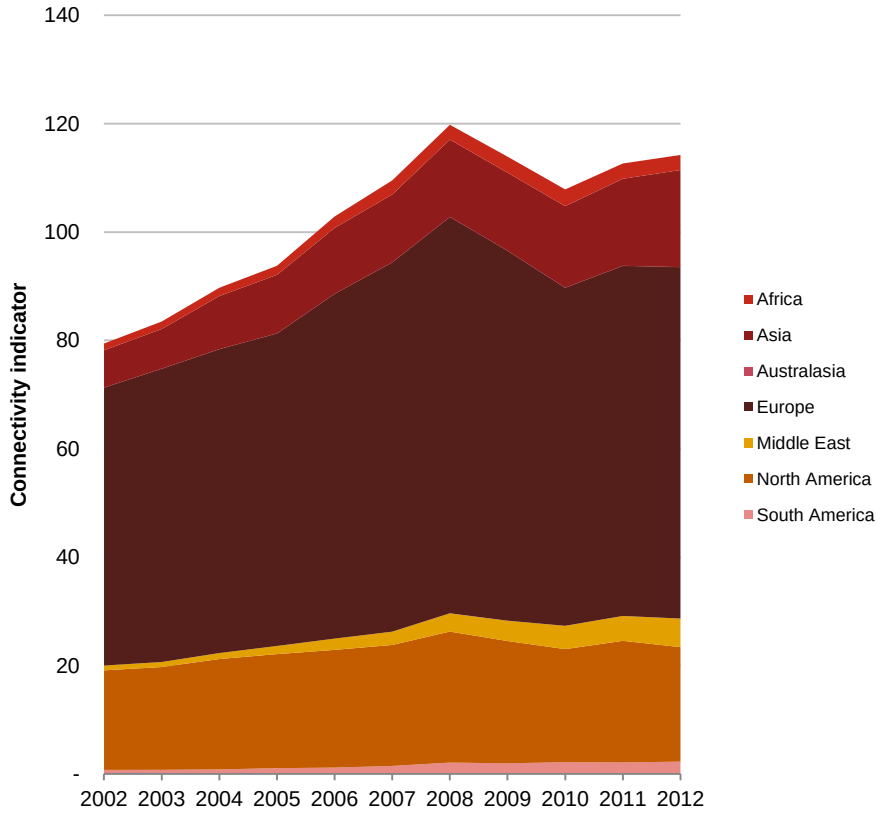


Amsterdam - geographical breakdown (Short-term growth potential weight)

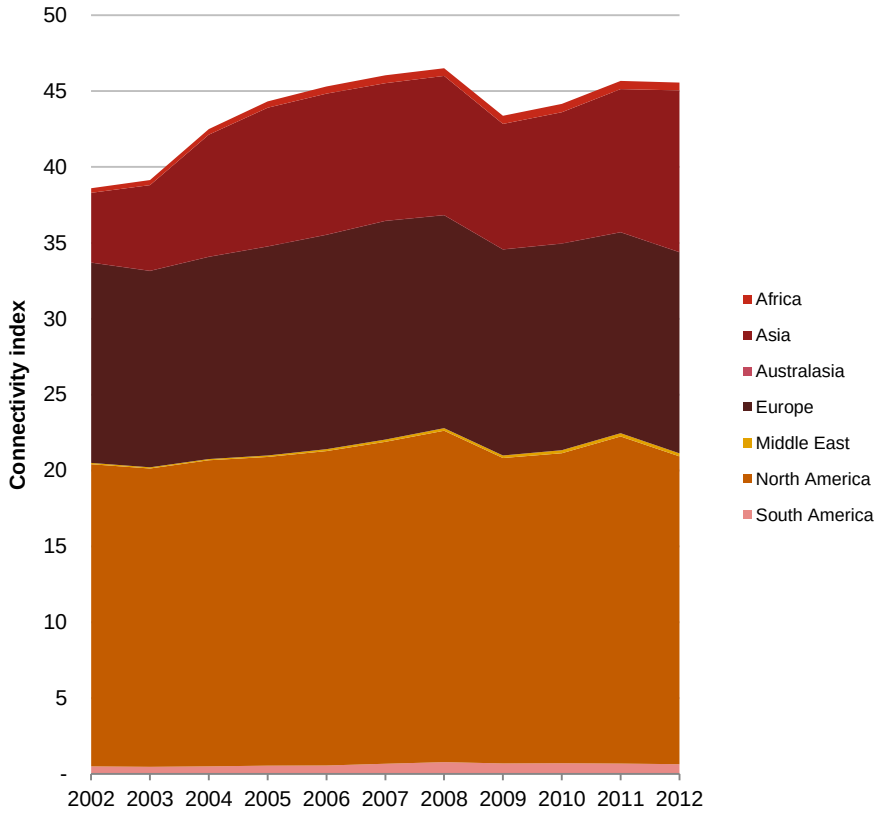


Geographical breakdown of connectivity indices
Paris

Paris – geographical breakdown of connectivity indicator (Passenger movement weight)



Paris - geographical breakdown of connectivity index (Short-term growth potential weights)



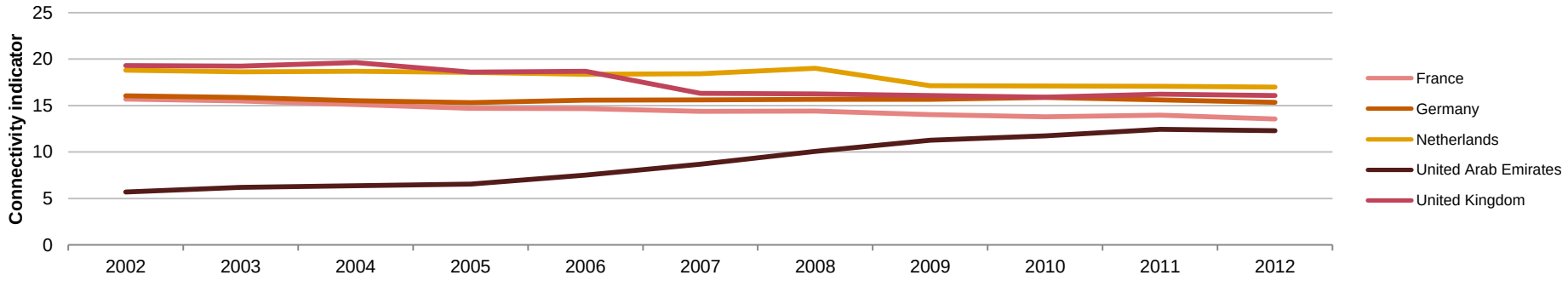
Alternative measure of connectivity

- The capacity of flights heavily influences the IATA indicator (we call this the "volume effect"). We therefore calculated another indicator which allows us to compare the connectivity of different countries free of these volume effects. The measure is calculated purely based on: i) the economy of the country to which an airport is connected; and ii) the *share* of capacity which is allocated to that country.
- We have calculated this measure using the formula:

$$\sum_{\text{All destination countries}} \text{Share of capacity allocated to destination country} * \text{Country GDP weight of destination country}$$

- This measure can be interpreted as a measure of the "quality" of a country's connections. A higher number on this measure indicates that the country in question is connected to larger economies.
- If connectivity is compared using this measure, a very different picture emerges:
  - There is no clear "leader" in connectivity among the European countries;
  - The UK experiences a decline in connectivity relative to other European countries (likely due to the US being more negatively affected by the downturn in 2006); and
  - Dubai has increased its connectivity over the past decade and has converged with the UK and other European countries.
- Please note that the capacity data we used for this analysis includes all airports, whereas the capacity data we used for the connectivity indicator analysis earlier only includes DfT model airports, hence there'll be some minor discrepancies between the data used.

Alternative measure of connectivity



Geographical spread of destination countries served

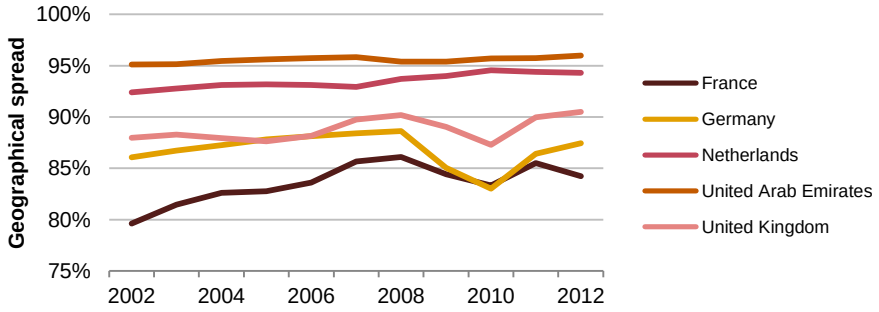
- The Herfindahl-Hirschman Index (HHI) is a commonly accepted measure of market concentration.
- We have calculated a measure of geographical spread of the destination countries served by each country by drawing on the principles of the HHI. We have calculated this by using the formula:

$$(1-\sum_{i=1}^{N} s_i^{\,2})*100$$

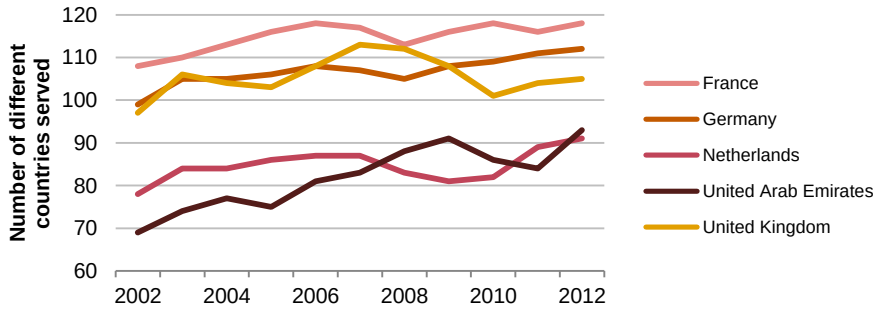
Where s_i is the share of capacity allocated to destination country i, and N is the total number of destination countries served by the origin country.

- Please note that from the equation above, since we are subtracting the sum of squares from 1, which is the *reverse* of the HHI index.
- A high figure indicates a wide geographical spread of destination countries served and a low figure indicates concentration in the destination countries served.
- Our analysis suggests that the United Arab Emirates has the widest geographic spread, despite the fact that it serves a relatively small number of destination countries compared with France, Germany and the UK.
- Similarly, the Netherlands serves the least amount of destination countries in 2013 but it has the second widest geographical spread of destination countries.

Geographical spread of destinations served



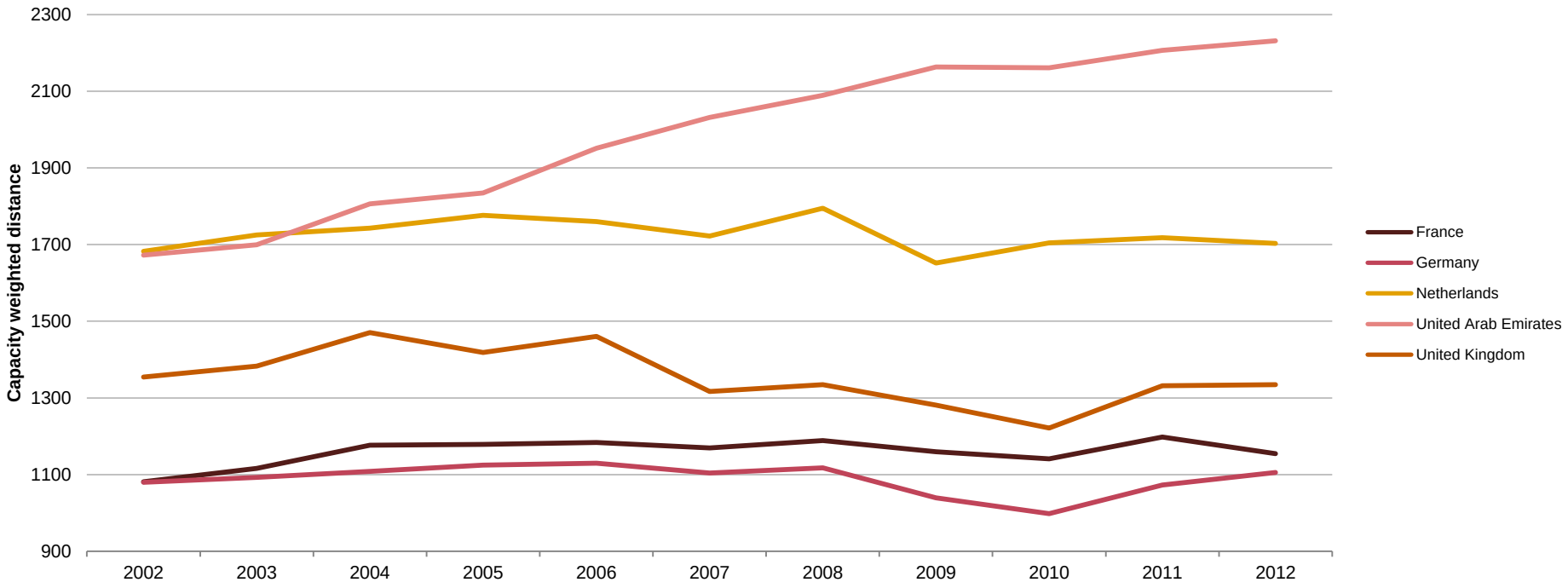
Number of countries served



Weighted average distance of the routes served

- We have calculated the weighted average distance of the routes served from each origin country. The weights in this average are the amount of the capacity allocated to each route – i.e. if more capacity were to be allocated to longer routes, then the weighted average distance would increase
- The UAE has been steadily increasing its average distance served over the past decade, as more of its capacity is allocated to long-haul routes

Weighted average distance of the routes served from each destination country



Country comparison

- The table below shows the top 20 countries ranked in terms of increase in projected GDP based on the IMF WEO (April 2013) and PwC's World in 2050 publication (fastest growing at top)

GDP increase according to IMF	GDP increases according to PwC's World in 2050		
2013 - 2018	**2013 - 2018**	**2020 - 2030**	**2040 – 2050**
China	China	China	China
United States	United States	United States	India
India	India	India	United States
Brazil	Russia	Brazil	Mexico
Russia	Brazil	Russia	Brazil
Japan	Indonesia	Mexico	Indonesia
Indonesia	Turkey	Indonesia	Nigeria
Germany	Mexico	Turkey	Russia
Korea	Korea	United kingdom	Turkey
Mexico	United Kingdom	France	France
United Kingdom	Germany	Japan	United Kingdom
France	France	Saudi Arabia	Philippines
Turkey	Spain	Spain	Vietnam
Canada	Japan	Korea	Saudi Arabia
Taiwan	Saudi Arabia	Nigeria	Spain
Saudi Arabia	Canada	Italy	Germany
Italy	Australia	Argentina	South Africa
Australia	Nigeria	Germany	Argentina
Nigeria	Argentina	Canada	Japan
Thailand	Egypt	Vietnam	Korea

Appendix A
Methodology

Methodology
Connectivity indices

- In order to construct our connectivity indices, we obtained capacity and frequency data from Sabre. We obtained this data on a route level basis for all flights originating from the airports of interest in this project (i.e. all airports in the UK, France, Germany and the Netherlands, as well as Madrid Barajas Airport and Dubai International Airport), for the period 2002 – 2012.
- We then multiplied the capacity data with the frequency data along with a weight (more details on which we provide in the next slides) for all routes. This provided us with a connectivity indicator at a route level.
- It is important to note that one of the differences between IATA's methodology and our calculations is that IATA uses weekly frequency data, whereas we use annual frequency. We believe the use of annual data mitigates potential seasonality issues with the data. To account for the difference in size between the two frequency variables, we divided the entire indicator by 100,000, rather than the 1,000 used by IATA. The choice of using 100,000 is arbitrary (as is IATA's 1,000) but was chosen in order to transform the indicator to a smaller and more manageable number.
- Since the data described above is at an airport to airport level, we have mapped each origin and destination airport to their respective cities and countries. We can sum the individual route indicator numbers (as described above) to get the connectivity indicator at an airport level, city level or country level based on the mapping classification. For example, we can sum all routes that originate from Heathrow to calculate the connectivity indicator of Heathrow; to calculate the connectivity of London, we sum the connectivity indices of all London airports.
- It is also important to note that when calculating the connectivity indicator for Heathrow, we only sum the connectivity indicator of routes which *originate* from Heathrow (i.e. we do not sum routes where the *destination* is Heathrow). This is consistent with the IATA methodology and is likely due to the pairing of outbound and inbound flights.

Methodology
Connectivity indices

- We categorized the destinations as either “Short-haul” or “Long-haul”, which allowed us to calculate corresponding connectivity indices.
- The Airports Commission asked us to define “Short haul” as routes which begin and end within the UK or Western Europe, and “Long haul” as routes which begin or end outside the UK or Western Europe. At the request of the Airports Commission, we have also defined flights from Dubai to Western Europe as “Short Haul”, and flights from Dubai to outside Western Europe as “Long Haul”.
- Please note that we have used DfT’s definition of Western Europe in our analysis.

Methodology

Weights used in the calculation of the connectivity indicator

- We constructed four different weights for use in our connectivity indicator calculations. These are explained below.

Weight	Methodology
Passenger movements	We set the airport with the highest passenger movements in any given year as 1, and then index other airports relative to that (i.e. passenger movement of airport in question / passenger movement of airport with highest movement = weight).
Country GDP	We set the country with the highest GDP level in any given year as 1, and then index other countries relative to that. We then map this back on to specific airports. The difference between this weight and the passenger movement weight is that there will be multiple airports with the same weight (e.g. all US airports will be given a weight of 1, as the US is the largest economy). GDP is based on purchasing-power-parity (PPP) valuations of country GDP.
Short-term growth potential	We take country GDP level forecasts from the IMF's World Economic Outlook database, and subtract each country's forecast GDP in 2018 from its estimated GDP in 2013. Following a similar procedure to the above, we set the country with the highest GDP increase (in terms of level) for the period 2013 – 2018 as 1, and we index other countries relative to that. Note that this weight does not change over time, whereas the two weights described above does. GDP is based on purchasing-power-parity (PPP) valuations of country GDP.
Long-term growth potential	This weight is exactly the same as the short-term growth potential weight, except that we use PwC's "World in 2050" country GDP projections rather than the IMF's country GDP projections to construct the weights, and the time period is from 2040 – 2050 rather than 2013 – 2018. GDP is based on market exchange rate (in USD) valuations of country GDP.

Methodology

Weights used in the calculation of the connectivity indicator

Weight	Source	Rationale for using this weight
Passenger movements	Sabre dataset	Passenger movements were used as weights in the IATA methodology.
Country GDP	IMF World Economic Outlook database, April 2013	This approach is intended to give higher weighting to connections with bigger economies (rather than the number of passenger movements at an airport). One thing to note is that this weight is calculated at the country-level, e.g. all US airports would be weighted as 1 because US is the biggest economy.
Short-term growth potential	IMF World Economic Outlook database, April 2013	We used the forecast increase in GDP from the period 2013 – 2018 (according to the IMF WEO) as a weight. This is different from the country GDP weight described above because this takes into account the *growth potential* of a connection, rather than the size of the entire economy. This provides a different criteria against which to assess the benefit of being connected with a country.
Long-term growth potential	PwC's "World in 2050" publication	Rather than just looking at short-term growth potential, the Airports Commission wanted to weight connections on the long-term growth potential of the destination countries. We therefore used long-term projections, sourced from our "World in 2050" publication, as weights. One thing to note is that the "World in 2050" publication only covers 29 countries, so other destination countries are given a weighting of 0 and are excluded from the calculation. However, since the 29 countries covered accounts for over 80% of world GDP, this does not affect the analysis significantly

Methodology
Destinations defined as "Short Haul"

- The Airports Commission asked us to define "Short haul" as routes which begin and end within the UK or Western Europe, and "Long haul" as routes which begin or end outside of the UK or Western Europe
- The list of countries defined as "Short Haul" is listed in the table below. These are the definitions used in the DfT aviation model.

Destinations defined as "Short Haul"			
Andorra	Finland	Lithuania	San Marino
Austria	France	Luxembourg	Serbia
Belgium	Germany	Macedonia	Slovakia
Bosnia Herzegovina	Gibraltar	Malta	Slovenia
Cape Verde	Greece	Moldova, Rep. Of	Spain
Croatia	Greenland	Monaco	Sweden
Cyprus	Hungary	Montenegro	Switzerland
Czech Republic	Iceland	Netherlands	Turkey
Denmark	Ireland	Norway	United Kingdom
Estonia	Italy	Poland	
Faroe Islands	Latvia	Portugal	

Methodology

Countries included in PwC's "Word in 2050" publication

- PwC's "World in 2050" publication covers 29 countries, as shown in the table below.
- Countries which are not covered are excluded from the connectivity indicator, so they get a weighting of 0.

World in 2050 country coverage

Argentina	Indonesia	Russia
Australia	Italy	Saudi Arabia
Bangladesh	Japan	South Africa
Brazil	Korea	Spain
Canada	Malaysia	Thailand
China	Mexico	Turkey
Egypt	Nigeria	United Kingdom
France	Pakistan	United States
Germany	Philippines	Vietnam
India	Poland	