



# International Communications Market Report 2015

## 5 Telecoms and networks

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# 5.1 Key market developments in telecoms and networks

## 5.1.1 Overview

The telecoms section of this report looks at the fixed voice, fixed broadband and mobile voice and data markets in the UK and our 17 comparator countries. The section is split into three parts:

- **Key market developments** – provides an overall context, and highlights key developments in international telecoms markets, including the growth of next generation access (NGA) networks and the increasing use of VoIP services.
- **The telecoms industry** – provides a ‘top-down’ approach by looking at the telecoms sector from an industry and operator viewpoint, and compares and contrasts trends in revenues and market structures across our comparator countries, before looking specifically at voice and data markets.
- **The telecoms user** – provides a ‘bottom-up’ approach from the point of view of consumers and looks at the overall take-up of communications services, before focusing specifically on consumers’ experience of fixed-line voice, fixed broadband and mobile voice and data use.

## 5.1.2 Introduction

Availability and take-up of technologies used to access the internet continued to increase in 2014. As the internet becomes increasingly important to both businesses and consumers, the reliance upon and usage of the internet, and the devices used to access it, increase. The internet is used for a large range of purposes, including but not limited to: transactions, entertainment and the procurement of information. Increasing internet access speeds allow the internet to be used in a variety of new ways, and growing demand from consumers for higher speeds has led to a greater availability of 4G and next generation access (NGA)<sup>124</sup> technologies.

The availability of fixed-line broadband services increased in the majority of our comparator countries in the five years to 2014, with the exception of Australia (which remained stable at 95%). Seven out of our 18 comparator countries had 100% availability in 2014. Take-up of fixed-line broadband services grew across the majority of comparator countries in 2014, with Japan experiencing the largest annual change, from 35 connections per 100 population in 2013, to 39 connections per 100 population in 2014.

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<sup>124</sup> See page 29 for a definition of NGA technologies

**Figure 5.1 Key telecoms indicators: 2014**

	UK	FRA	GER	ITA	USA	JPN	AUS	ESP	NED	SWE	POL	SGP	KOR	BRA	RUS	IND	CHN	NGA
Telecoms service revenues (£bn)	29	19	25	16	172	79	15	14	7	4	6	3	20	30	19	15	110	6
Monthly telecoms revenues per capita (£)	37	25	25	22	45	52	53	24	34	36	14	49	33	12	11	1	7	3
Fixed voice connections per 100 population (inc. managed VoIP)	61	60	45	37	41	45	38	40	42	39	16	36	54	23	27	2	19	0
Monthly outbound fixed minutes per capita	131	119	156	77	112	83	121	79	90	100	23	80	99	67	81	4	8	0
Mobile connections per 100 population	130	125	137	154	111	122	131	108	134	151	151	147	116	140	168	74	94	78
Mobile data connections per 100 population	87	67	64	71	104	124	114	77	69	116	117	183	109	78	66	6	41	43
4G mobile network availability (% of population coverage of at least one operator)	84	75	92	77	98	99	87	76	100	99	80	99	100	42	51	2	73	11
4G as % of all mobile connections	28	14	12	4	40	37	39	13	19	27	7	39	63	2	5	0	8	0
Monthly outbound mobile minutes per capita	178	191	113	226	315	132	161	141	129	231	180	257	209	181	309	133	179	62
Average mobile data volumes per person (Mbyte)	362	397	398	684	1771	1495	481	370	313	3097	529	1537	2024	197	181	18	126	53
Fixed broadband connections per 100 population	37	40	35	23	30	39	29	28	41	34	21	33	39	11	19	1	18	0
Average monthly fixed broadband data volumes per person (Gbyte)	22	13	10	7	19	32	11	9	17	31	5	23	49	3	4	0	4	0
NGA connections per 100 population	13	4	10	1	22	26	10	10	25	22	8	22	34	5	13	0	8	0
Dedicated data-only mobile broadband connections per 100 population	8	6	10	11	9	12	26	4	6	23	15	2	1	3	14	1	1	3
Managed VoIP connections per 100 population	9	39	21	5	16	22	3	7	31	18	4	10	20	4	1	0	1	0

Source: IHS / industry data / Ofcom

### 5.1.3 Availability and take-up of next-generation access (NGA) services continues to grow

#### **Next-generation access (NGA) technology and 'superfast' broadband definitions**

Next-generation access (NGA) networks provide a platform for delivery of superfast broadband. 'Superfast' broadband describes broadband connections with actual modem sync speeds of 30Mbit/s or higher.

These terms (superfast broadband and NGA) are often used interchangeably however NGA connections do not always deliver 'superfast' speeds. For example, premises connected using VDSL technology might receive speed below 30Mbit/s due to long copper lines because of a large distance to the nearest street cabinet, or NGA services may be capped at less than 30Mbit/s.

This distinction becomes more significant as 'superfast' take-up increases and the measurement of broadband services in different countries improves. For this reason, we define 'superfast' broadband as a broadband service providing modem sync speeds of 'more than or equal to' 30Mbit/s (the modem sync speed represents the highest possible speed at which data can be transferred across the line). We also define fixed-line broadband with headline speeds of more than or equal to 30Mbit/s as 'superfast products'.

#### **Availability of NGA networks varied across our comparator countries in 2014**

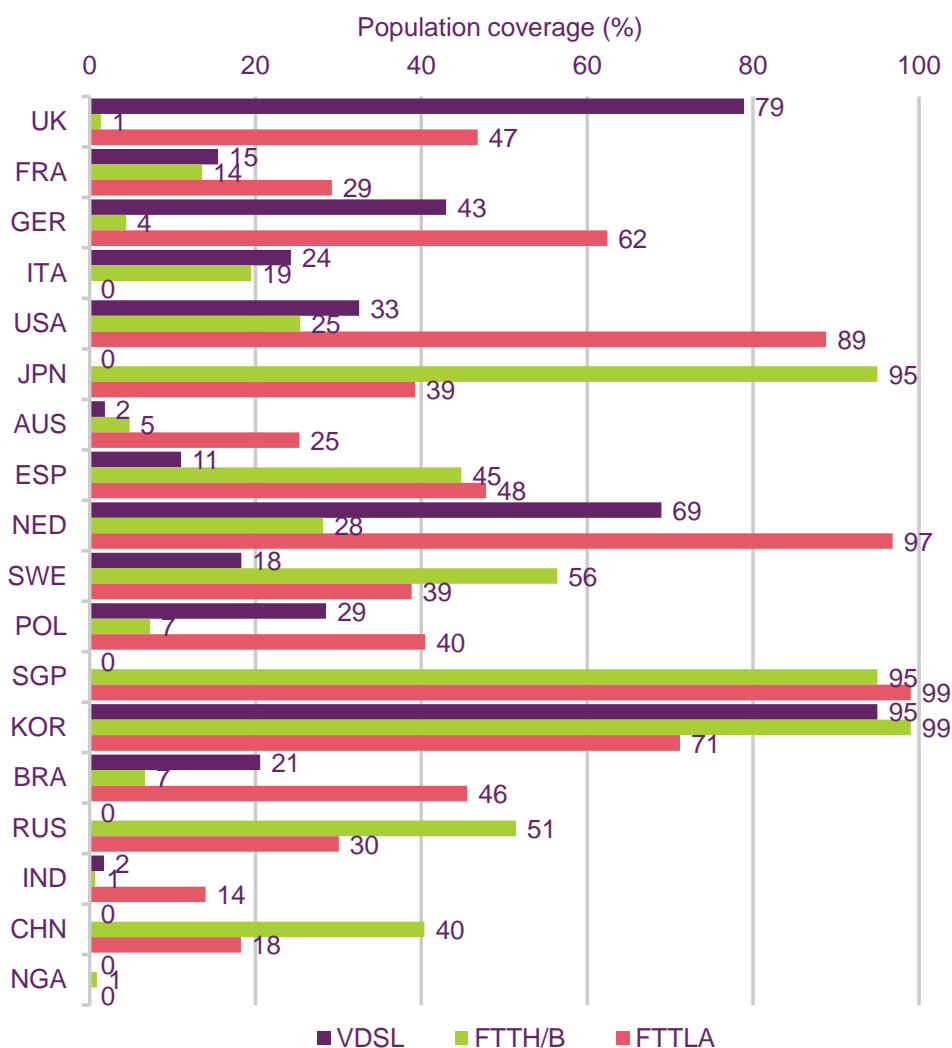
Many factors influence the availability of NGA connections. One of these factors is housing density as it is usually more expensive (per property) to build new NGA networks in low density areas. Availability of funds to invest into new infrastructure could also explain coverage differences between comparator countries, with more developed countries often having higher coverage percentages than less developed ones.

In the UK, VDSL was the NGA technology with the highest population coverage in 2014 (at 79%, up 11pp on last year), while FTTLA connections were available to 47% of the population (Figure 5.2). The UK had the second highest VDSL coverage (after South Korea at 95%) among the comparator countries, while Singapore had the highest FTTLA coverage at 99%, followed by the Netherlands at 97%.

FTTH/B technology was only available to around 1% of the UK population by the end of 2014, a low figure compared to the majority of non-BRIC comparator countries. This is in part due to BT's decision (announced in 2008) to use VDSL rather than FTTH/B for the majority of its fibre broadband network (building the infrastructure for VDSL is less expensive than that of FTTH/B, although it generally provides slower maximum speeds). In contrast to the UK, providers in countries such as Singapore and Japan, which are densely populated, deployed FTTH/B, resulting in the high availability of this technology in 2014, at 95% in each country (VDSL not being present in either).

Overall, superfast products were available to 86% of the population in the UK in 2014. This was the highest availability among the EU5 countries. Germany had the second highest availability of superfast products in 2014, at 75%.

**Figure 5.2 Population availability of NGA networks, by country and technology: 2014**



Source: IHS

Note: NGA on the left hand side of the chart is the country code for Nigeria, and does not refer to next generation access technologies.

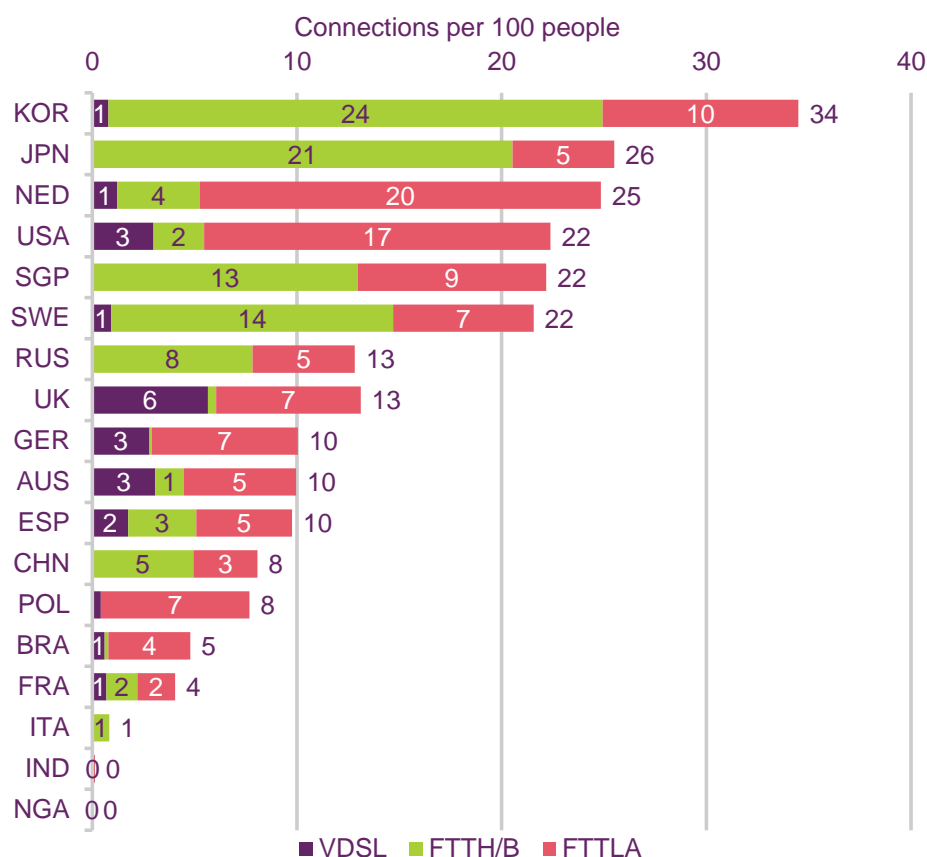
**NGA broadband take-up ranged from less than one to 34 connections per 100 people among our comparator countries in 2014**

The number of NGA connections per 100 people varied between comparator countries in 2014, from less than one connection in India and Nigeria to 34 in South Korea (Figure 5.3). The early introduction and widespread availability of NGA broadband in South Korea (in particular FTTH/B) are the likely reasons for the country’s high penetration.

Five countries had five or fewer NGA connections per 100 people, including two EU5 countries (France and Italy); this is probably due to low NGA network availability. The other possible reasons for low take-up in Brazil, India and Nigeria include lower economic prosperity and lower levels of investment in infrastructure in these countries. The UK had 13 NGA connections per 100 people at the end of 2014, ranking seventh among the comparator countries. The majority of NGA connections in the UK were FTTLA (54%) and there was less than one FTTH/B connection per 100 people at the end of 2014.

FTTLA and FTTH/B were the most prevalent NGA technologies across the comparator countries at the end of 2014. Out of all technologies, FTTLA had the highest take-up in ten of the comparator countries, including the Netherlands, the US and the UK, which had 20, 17 and seven FTTLA connections per 100 people, respectively. FTTH/B accounted for the highest proportion of connections per 100 people in eight of the comparator countries, including South Korea, Japan and Sweden with 24, 21 and 14 connections per 100 people respectively.

**Figure 5.3 NGA broadband connections per 100 people, by technology: 2014**



Source: IHS

Note: NGA on the left hand side of the chart is the country code for Nigeria, and does not refer to next generation access technologies.

### The UK had the highest take-up of superfast products of the EU5 countries in 2014

The proportion of fixed broadband connections classified as ‘superfast products’ (i.e. NGA connections with a headline speed of 30Mbit/s or higher) continued to grow in all of the comparator countries in 2014 (Figure 5.4). Only three of the countries (Italy, India and Nigeria) had less than 5% of connections with 30Mbit/s or higher headline speed, probably due to the low availability and take-up of NGA networks in these countries (Figure 5.3).

South Korea (89%), Singapore (83%) and Japan (81%) had the highest proportions of 30Mbit/s or higher speed connections at the end of 2014. Japan and South Korea had the highest proportion of connections with a headline speed of over 100Mbit/s, at more than 50% in both. This may be due to the early introduction and high availability of NGA technology in these countries.

Of our European comparator countries, Sweden and the Netherlands had the largest proportion of connections classified as superfast product, at 42% and 46% respectively. In

Sweden, 81% of superfast product connections had a headline speed of over 100Mbit/s (34% of total connections). In the UK, 35% of connections had a headline speed of over 30Mbit/s at the end of 2014, the eighth highest proportion among all comparator countries and the highest out of the EU5 countries. Nevertheless, only 5% of connections in the UK had headline speed of over 100Mbit/s, placing the UK behind Spain (11%) and France (7%) among the EU5 countries.

France had the highest proportion of fixed broadband connections with a headline speed between 8Mbit/s and 30Mbit/s (81%), followed by Spain (68%). Nigeria was the only country among the comparator countries in which more than half of the connections had a headline speed of less than 2Mbit/s (93%), followed by India (46%) and Brazil (33%). Nonetheless, in these countries the proportion of connections with higher headline speeds has increased since 2009. For example, the proportion of connections with headline speeds of less than 2Mbit/s roughly halved in the five years to 2014, in both Brazil and India.



**Figure 5.4 Fixed broadband connections, by headline speed: 2009 and 2014**



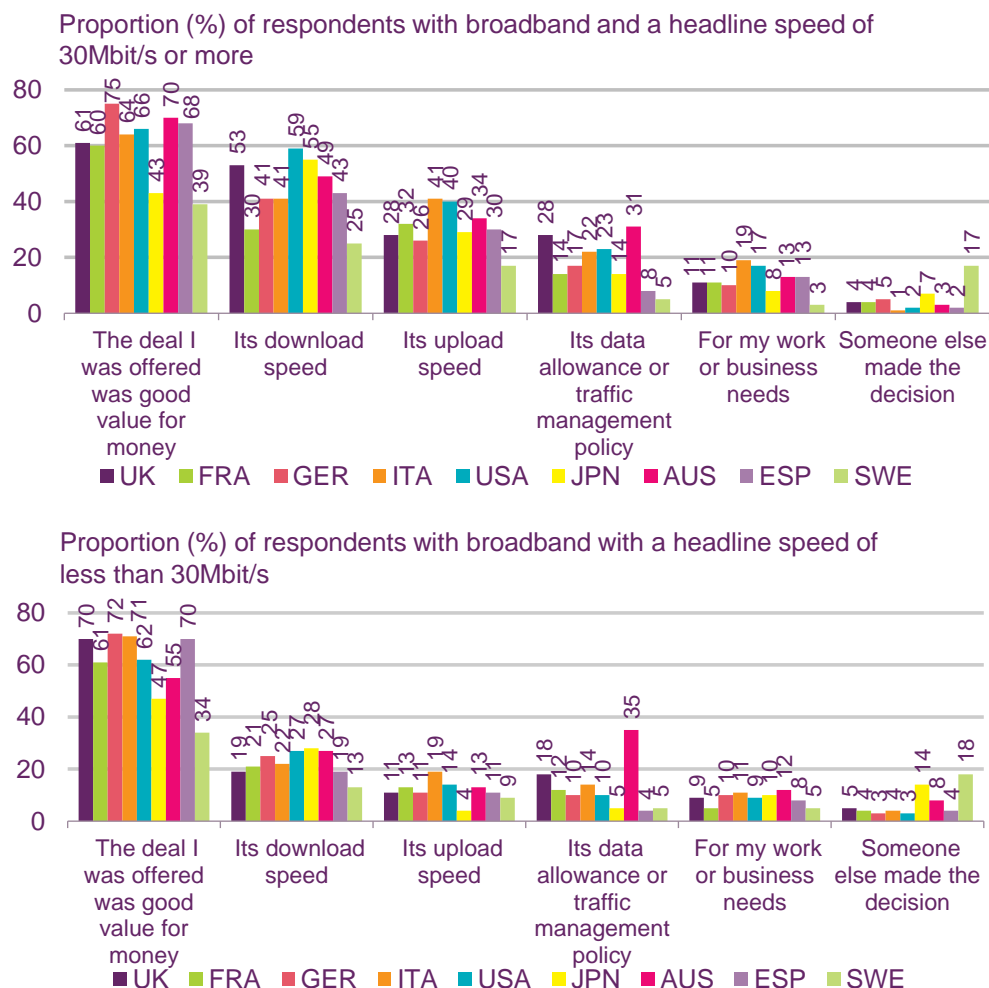
Source: IHS / Ofcom / operator data

## Value for money was the most commonly-cited reason for respondents choosing their current broadband service in 2015

Value for money was the most popular reason for respondents choosing their current fixed broadband service, among respondents both with and without a superfast broadband product (a headline speed of 30Mbit/s or more) in the majority of our comparator countries.

Across both groups of respondents, and the majority of comparator countries, download speeds were the second most popular reason for choosing broadband. However, there was a stark difference between those with a superfast broadband product who cited this reason and those without: 53% vs. 19% in the UK for example. This suggests that download speed is a much more important consideration for those who have headline speeds greater than 30Mbit/s. Less than two in ten respondents with a headline speed of less than 30Mbit/s chose a reason other than value for money and download speed, with the exception of Australia, where 35% of respondents chose their current service due to its data allowance/traffic management policy (a significantly higher proportion than in all other comparator countries).

**Figure 5.5 Reason for choosing current fixed broadband service**



Source: Ofcom consumer research September – October 2015

Base: All respondents with superfast broadband, UK=305, FRA=212, GER=273, ITA=151, USA=170, JPN=327, AUS=128, ESP=316, SWE=358

Base: All respondents with non-superfast broadband, UK=218, FRA=205, GER=229, ITA=334, USA=142, JPN=101, AUS=154, ESP=280, SWE=190

Q.29 Why did you choose your home broadband service?

## 5.1.4 The use of VoIP as an alternative to traditional telephony is increasing

### VoIP definitions

**Managed VoIP** refers to the provision of a packet-switched<sup>125</sup> voice over internet protocol (VoIP) service over a fixed broadband network such as xDSL, FTTP and FTTLA. Managed VoIP includes VoIP as a primary service (such as VoIP over FTTP or naked xDSL) and as a secondary service (such as VoIP over xDSL, where the subscriber also pays a monthly fee for a PSTN line). **Over-the-top (OTT) VoIP** services consumed over fixed broadband connections, such as Skype, are not included within the definition of managed VoIP because they do not support emergency calling and are therefore not marketed as landline replacement services.

**Over-the-top (OTT)** services are provided over the internet rather than a managed network and are delivered directly to the end-user by the service provider, independent of the internet service provider (ISP) which owns the network over which the service is provided. Unmanaged VoIP include services where a separate voice service provider provides the service on an OTT basis over a broadband connection. The provider of the broadband connection routes the traffic to the open internet and there is no guarantee that they will prioritise this traffic over other types of internet traffic. Therefore, quality of service is likely to be more variable than on a managed service.

### **The Netherlands had the highest proportion of fixed voice revenues that were generated by managed VoIP services in 2014, at 29%**

The proportions of fixed voice revenues generated by managed VoIP services have increased across the 17 comparator countries for which we have data since 2009. India is the exception; its revenues have remained stable across this period.

The Netherlands had the largest proportion of managed VoIP revenue in 2014, of all our comparator countries, at 29%, up 14pp in the five years to 2014 (Figure 5.6). This was due to strong cable market share in fixed broadband and voice services, as well as KPN's rapid migration to VoIP services. The US had the second highest proportion, at 24%, followed by Japan (23%). The US had the highest rate of growth of all comparator countries, at 17pp over the five-year period to 2014. For all other comparator countries, growth in managed VoIP revenues as a proportion of fixed voice revenues ranged from less than 1pp in India to 11pp in Japan over the period.

Managed VoIP services represented a small fraction of the fixed voice market among the BRIC countries (Brazil, Russia, India and China). The proportion of fixed voice revenues generated by managed VoIP services were highest in Brazil, at 8% (up 7pp over the five years to 2014).

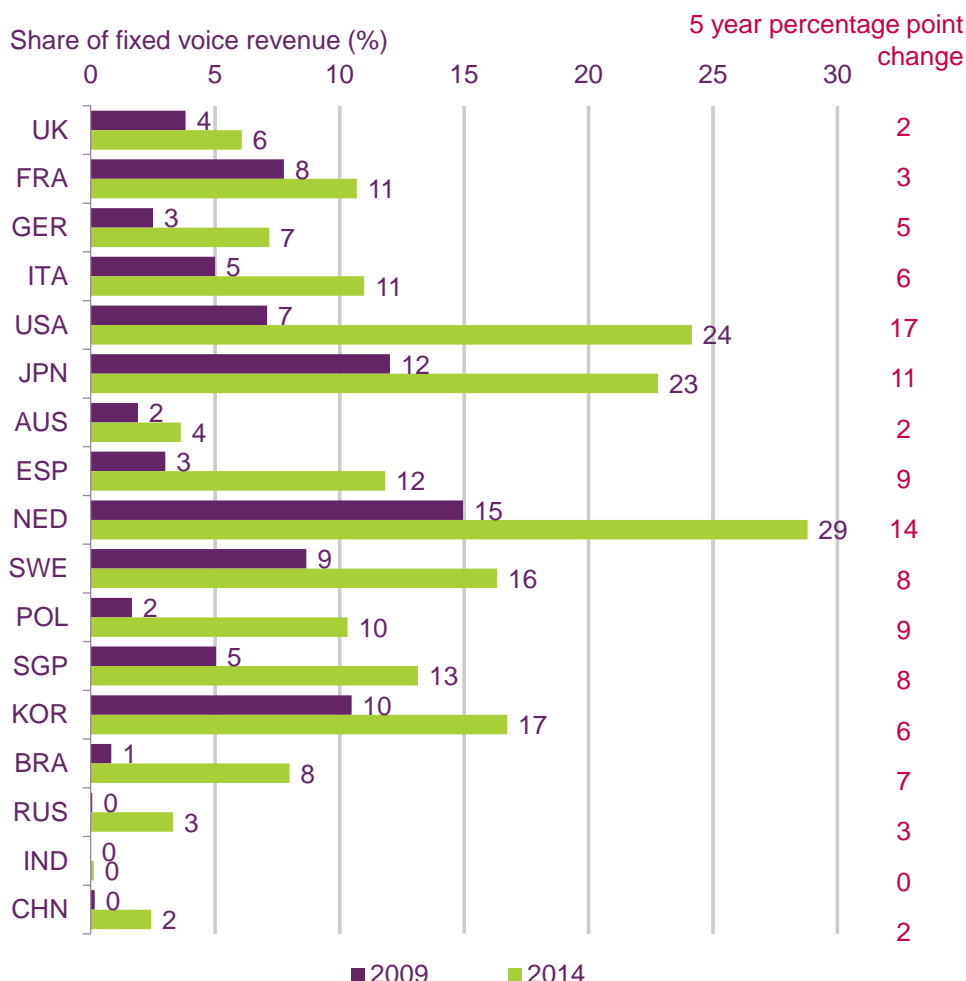
The UK, together with China and Australia, had the slowest growth in managed VoIP revenues over the five years to 2014; up by just 2pp to 6%. This was the lowest proportion of managed VoIP revenues among the EU5 comparator countries, behind Spain (12%), Germany (7%), France and Italy (both 11%). This was probably because some ISPs either

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<sup>125</sup> 'Packet switching' over internet protocol divides the data being sent into 'packets', each packet containing part of the data being sent over the network. The packets also carry information such as the IP addresses of the packet's source and destination. Instead of being sent across one dedicated route, each packet is sent to the destination along different routes. Once all of the packets are received at the other end, the data are reassembled. Packet switching is an efficient form of data transmission, as the individual packets can be sent across the least congested and cheapest routes.

do not offer, or do not advertise VoIP to consumers in the UK. However, use of OTT VoIP in the UK has grown since 2013 (see Figure 5.12).

**Figure 5.6 Managed VoIP revenues as a proportion of fixed voice revenues: 2009 and 2014**



Source: IHS / industry data / Ofcom

**The UK had the second highest managed VoIP revenue among the EU5 comparator countries, at £8.82 per month**

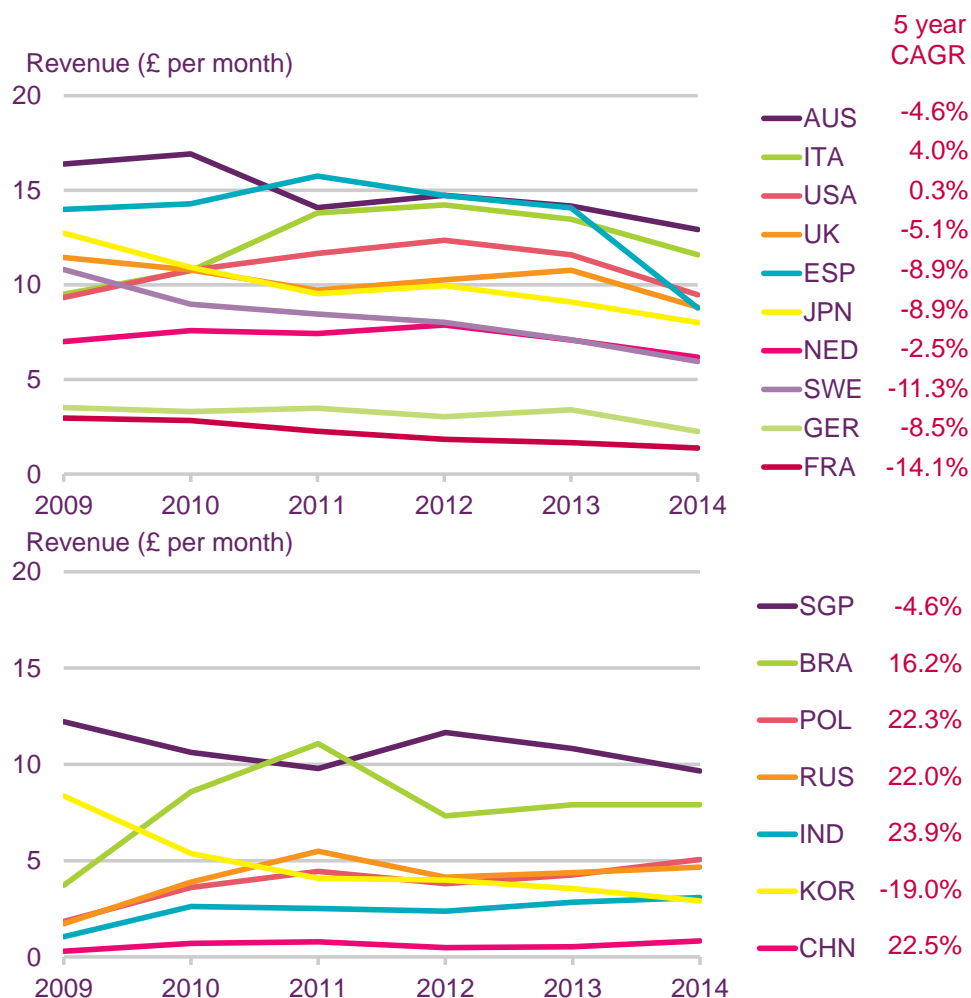
Of all our comparator countries, Australia showed the highest average revenue per managed VoIP connection in 2014, at £12.92 per month, followed by Italy at £11.59 per month (Figure 5.7). China had the lowest average revenue per managed VoIP connection, at £0.84 per month.

In the UK, managed VoIP revenues were £8.82 per month (broadly in line with Spain at £8.78). This was the second highest monthly VoIP revenue among the EU5 comparators (after Italy at £11.59) and the fifth highest overall in 2014. France had the lowest average monthly managed VoIP revenue per connection among the EU5 at £1.38 per month. However, this figure is based on data which include revenue gained from calls only (rather than access), which is why revenues appear lower for France compared to other comparator nations.

In the five years to 2014, the average annual growth rate of VoIP revenues was highest in India, increasing by an average 23.9% per year, while South Korea experienced the largest

decline in VoIP revenue, down by an average of 19.0% per year over the same period. However, in both instances, absolute revenues remained very low in 2014. By comparison, in the UK revenue declined by an annual average of 5.1% over the five years to 2014.

**Figure 5.7 Monthly managed VoIP revenue per connection**



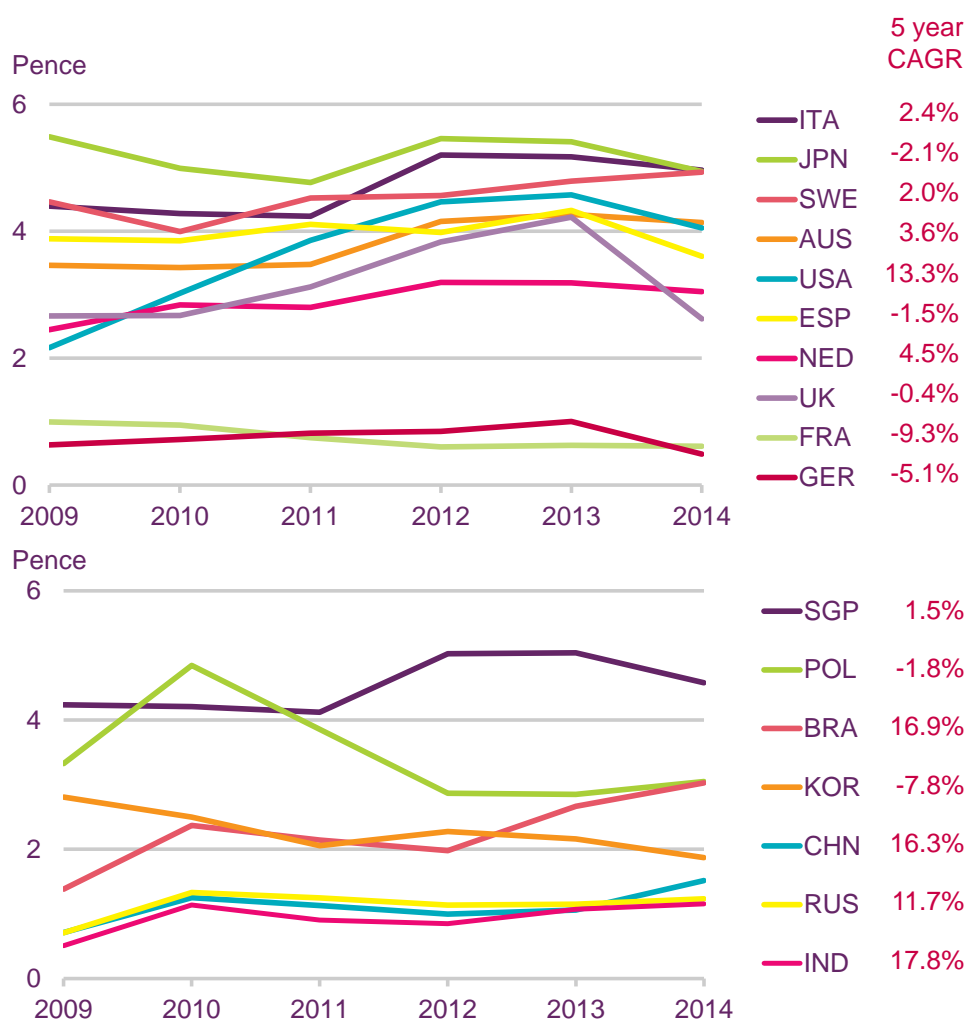
Source: IHS / industry data / Ofcom  
 Note: All figures expressed in nominal terms.

**Germany had the lowest average price per minute for VoIP calls in 2014, at 0.5 pence**

Of all our comparator countries, the average price per managed VoIP call minute was lowest in Germany in 2014, at 0.5 pence per minute, followed by France at 0.6 pence per minute (Figure 5.8). The average price per managed VoIP call minute was highest in Italy (at 5.0 pence per minute), followed by Japan and Sweden (both at 4.9 pence per minute). By comparison, the UK had an average price of 2.6 pence per minute for a managed VoIP call in 2014, down 38.0% since 2013.

In the five years to 2014, India experienced the largest compound annual growth in revenues, up by an average of 17.8% per year. However, in absolute terms, revenues in India remained very low compared to other comparator countries. France had the largest rate of decline over the period, with revenues falling on average by 9.3% per year.

**Figure 5.8 Average price per managed VoIP minute**



Source: IHS / industry data / Ofcom  
 Note: All figures expressed in nominal terms.

**Average monthly managed VoIP call minutes per connection in the UK increased by 32% to 337 minutes in 2014.**

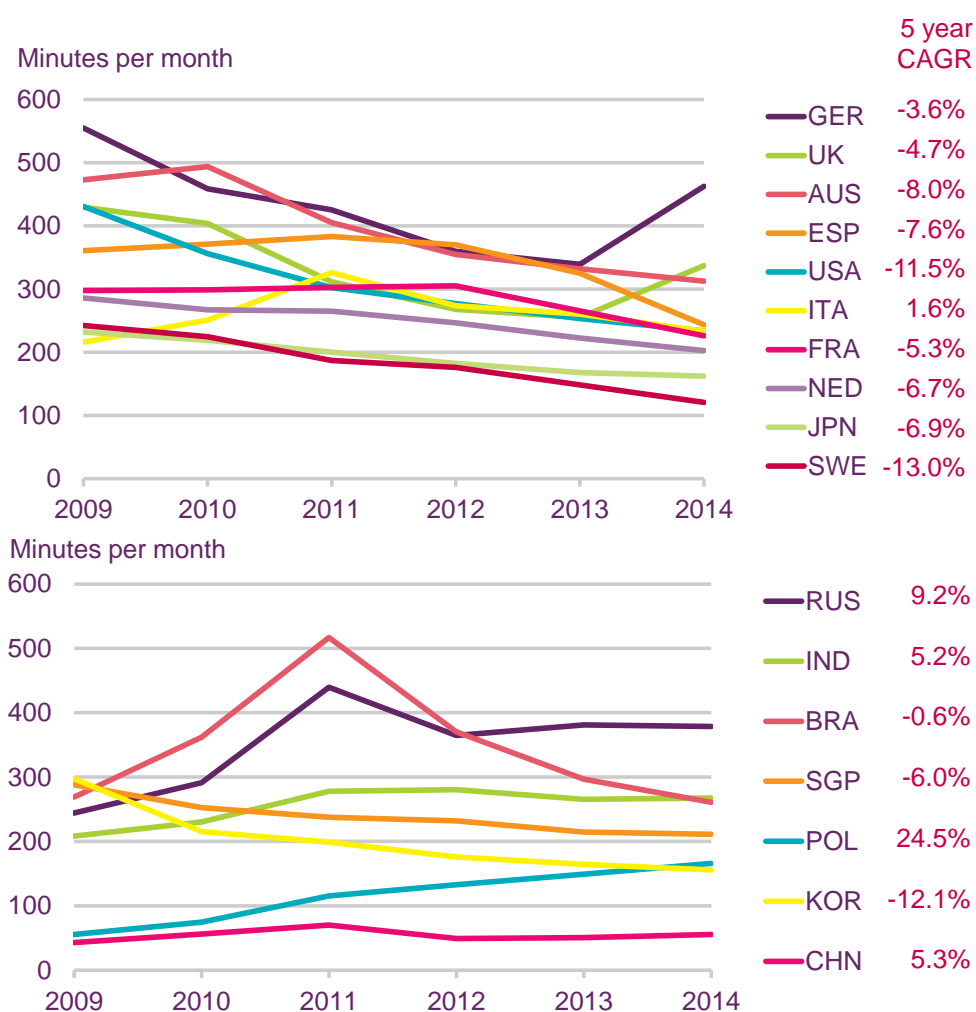
In the UK, (where managed VoIP is used mainly by businesses) the volume of average monthly managed VoIP minutes per connection was 337 minutes, the third highest of all our comparator countries (behind Russia and Germany). The UK was also one of only five comparator countries where the average number of VoIP minutes increased in the year to 2014, up by 82 minutes (32.0%). The other countries which had year-on-year growth included Germany (up 36.4%), Poland (11.2%), China (9.9%) and India (0.8%).

Overall, Germany had the highest level of average monthly managed VoIP call minutes per connection in 2014, at 463 minutes per month (Figure 5.9). This is probably due to the comparatively low cost of VoIP call minutes (see Figure 5.8) and the increased number of VoIP connections per 100 population (see Figure 5.10). The average monthly use of managed VoIP minutes per connection was lowest in China, at 55 minutes.

In the five years to 2014, Poland had the highest average compound annual growth in monthly managed VoIP call minutes per connection, up on average by 24.5% per year. This was 2.5 times more than Russia, which had the second highest growth, at an average of 9.2% per year. Sweden had the largest annual decline over the five years to 2014 (down by

13.0% a year on average). In the UK, average monthly managed VoIP minutes per connection fell at an average rate of 4.7% per year over the same period.

**Figure 5.9 Average monthly managed VoIP call minutes per connection**



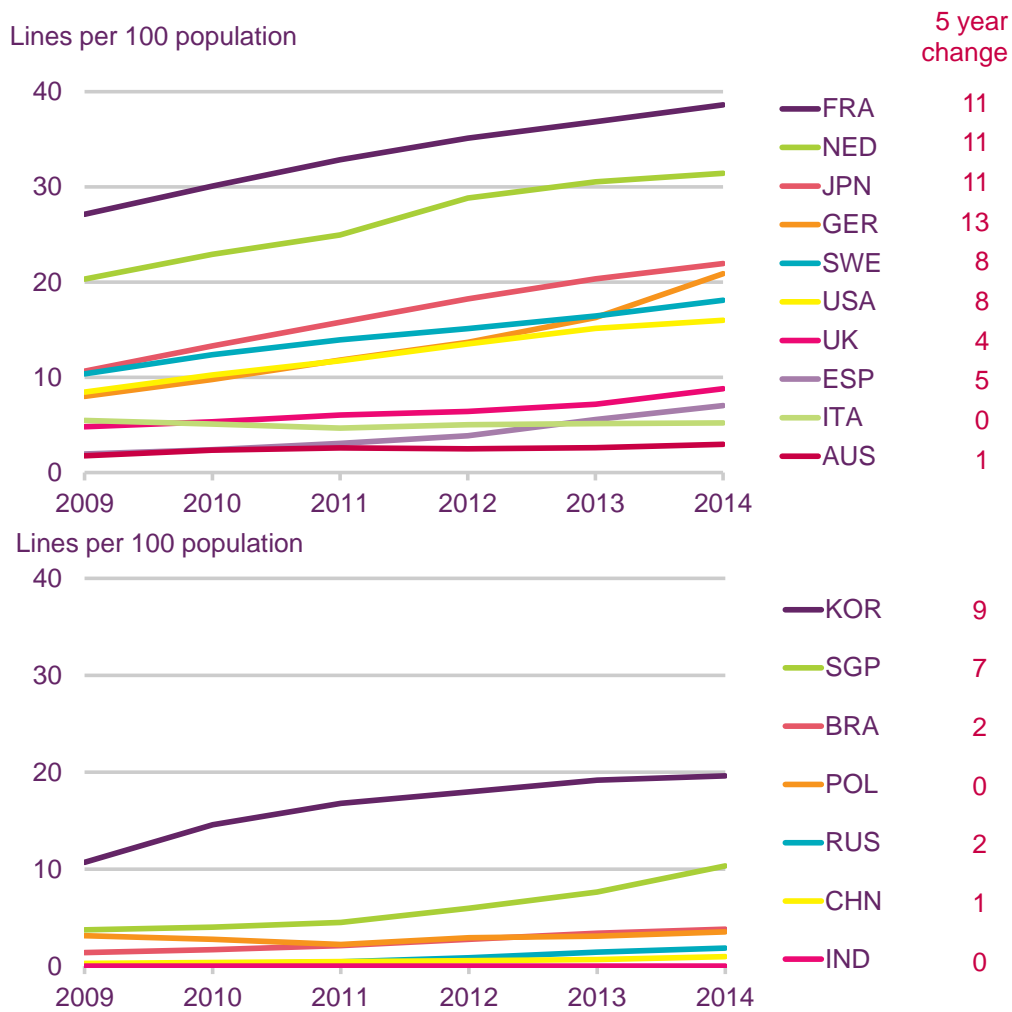
Source: IHS / industry data / Ofcom

**The number of managed VoIP connections per 100 people increased in the majority of our comparator countries in the five years to 2014**

As shown in Figure 5.10, the number of managed VoIP connections per 100 people was highest in France among our comparator countries in 2014 (39 connections per 100 people), followed by the Netherlands (31 connections) and Japan (22). The three comparator countries with the lowest number of managed VoIP connections per 100 people in 2014 were the BRIC countries: India (less than one connection per 100 people), China (one connection) and Russia (two). The UK had nine managed VoIP connections per 100 people by the end of 2014 (up by two since the previous year).

In the five years to 2014, the number of managed VoIP connections per 100 people increased in all but one of the comparator countries. Russia and India had the highest compound annual growth rates in managed VoIP connections over the five years to 2014 (up 65.2% and 61.7% a year respectively). However, in absolute terms, the number of connections in these countries remained very low. Italy was the only comparator country where managed VoIP connections fell over the same period (down by less than 1% per year).

**Figure 5.10 Managed VoIP connections per 100 people**



Source: IHS / industry data / Ofcom

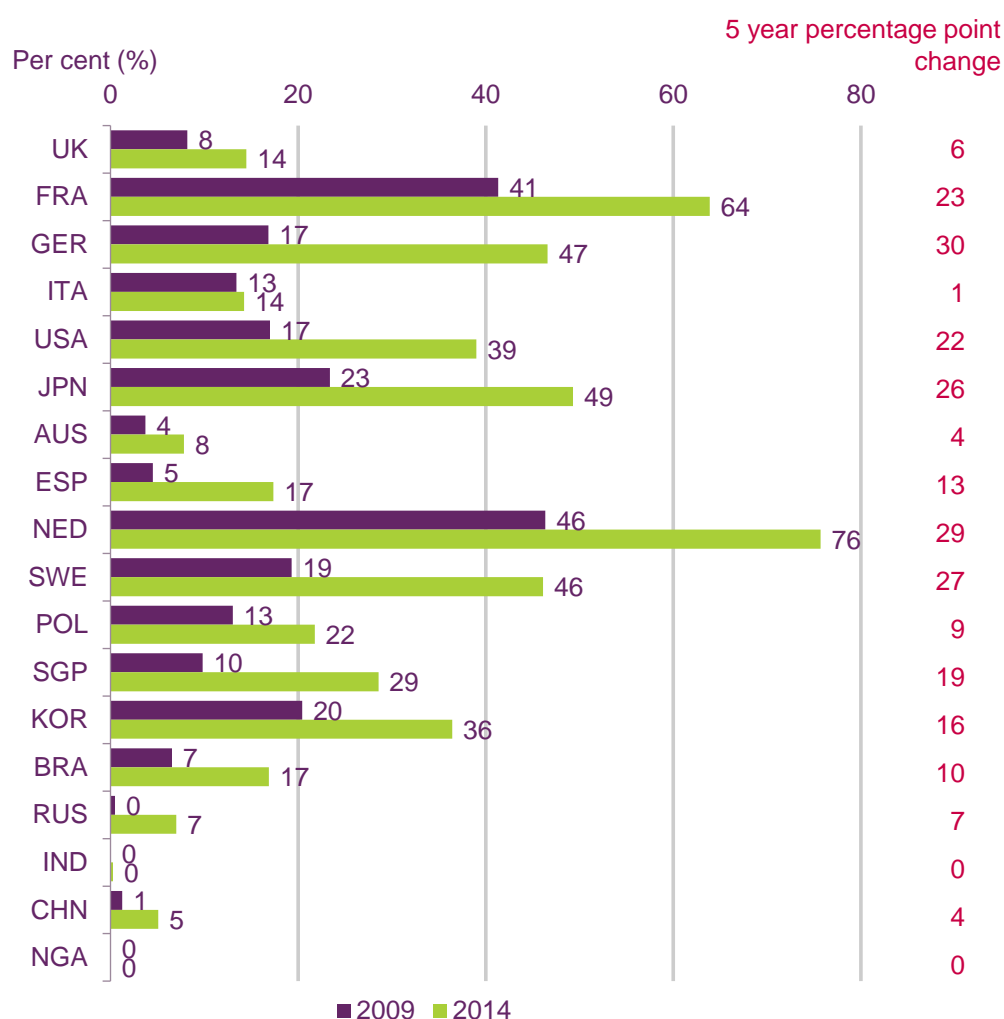
**Managed VoIP connections as a proportion of total voice connections was highest in the Netherlands in 2014, at 76%**

Among our 18 comparator countries, managed VoIP connections as a proportion of total voice connections in 2014 was highest in the Netherlands, at 76%, followed by France (64%); this figure was lowest overall in India (0.3%). By comparison, the proportion of managed VoIP connections in the UK was 14%, the fourth lowest of our EU5 comparator countries (ahead of Italy at 14%) and twelfth lowest overall.

Managed VoIP connections as a proportion of total fixed voice connections increased in all our comparator countries in the five years to 2014. This growth ranged from less than 1pp in India to 30pp in Germany. In the UK, the proportion of managed VoIP connections increased by 6pp in the same period.



**Figure 5.11 Managed VoIP connections as a proportion of total voice connections**



Source: IHS / industry data / Ofcom

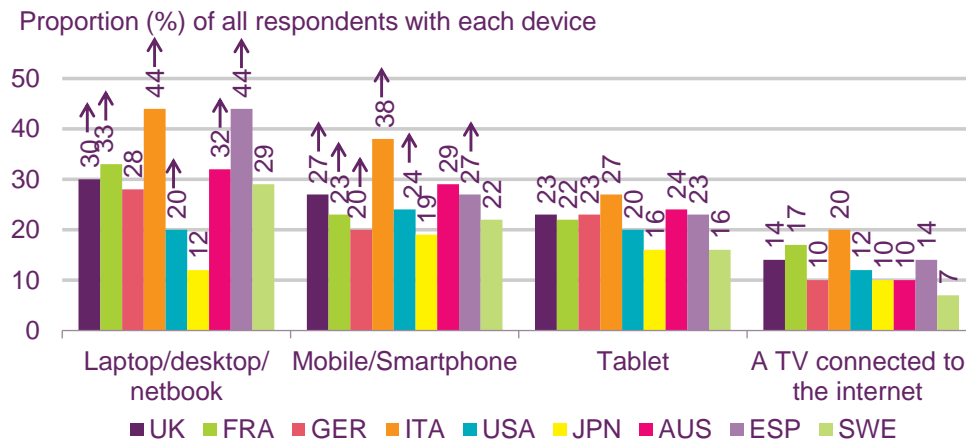
**Use of OTT VoIP services by owners of each device type (computers, mobiles, tablets and internet-connected TVs) was highest in Italy in 2015**

Of the nine comparator countries for which we have consumer research data, Italy had the highest proportion of respondents who claimed to use OTT VoIP services on each of the four device types: 44% of laptops/desktops/notebooks owners used VoIP, 38% on mobiles/smartphones, 27% on tablets and 20% on an internet-connected TV. For VoIP use on computers, Spain was in line with Italy (44%), while second highest use was in France (33%), followed by Australia (32%). Japan had the lowest claimed use of VoIP among owners of computers, mobiles and tablets (12%, 19% and 16% respectively), while respondents who owned an internet connected TV used VoIP the least in Sweden (7%).

In the majority of our comparator countries, the use of computers and mobiles for OTT VoIP services was significantly higher than in 2014. Computers were the most popular device used for OTT VoIP; more than a quarter of computer owners claimed to use their computer for VoIP in seven of the nine comparator countries in 2014. In the UK, a third of computer owners used OTT VoIP (30%), broadly in line with France, Germany, Australia and Sweden. Italy and Spain had the highest use, with 44% of computer owners using OTT VoIP in both countries. Use of VoIP was also highest in Italy among those who owned mobiles, at 38%. In the UK, 27% of mobile owners used VoIP services (in line with Spain).

There was generally little variation in use of OTT VoIP among owners of tablets or internet-connected TVs, across our comparator countries.

**Figure 5.12 OTT VoIP use, by device type**



↑ Direction of arrow indicates a statistically significant difference compared to last year

Source: Ofcom consumer research September - October 2015

Base: All who own each device, UK=879/594/398/235, FRA=913/568/335/122, GER=923/623/318/176, ITA=876/779/460/185 USA=904/523/319/195 JPN=840/573/234/98, AUS=906/610/370/191, ESP=897/803/435/194, SWE=879/678/343/213.

(Japan\* - Caution low base size less than 100).

Q.9b Which, if any, of the following ways of communicating over the internet do you use each of your devices for?

## 5.2 The telecoms industry

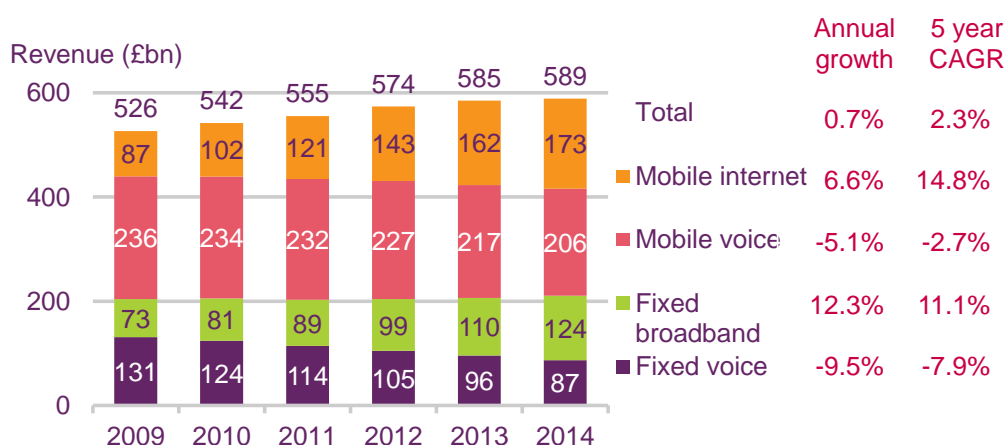
### 5.2.1 Market overview

#### Total comparator country retail telecoms revenues increased by 0.7% in 2014

Total retail telecoms revenues across our comparator countries increased by £4bn (0.7%) to £589bn in 2014 (Figure 5.13). Mobile internet and voice services generated the largest proportion of total retail telecoms revenue, at 64.2% (£378bn), a slightly lower proportion than in 2013 (64.8%). Fixed services (broadband and voice) contributed 35.8% (£211bn) to total retail revenue in 2014, up £5bn since 2013. Total fixed voice revenue fell by £9bn (9.5%) to £87bn in 2014, as a result of falling call volumes (see Figure 5.20), while total fixed broadband revenue increased (by £14bn (12.3%) to £124bn) in 2014, due to the increased use of these services (see Figure 5.42).

Mobile internet revenue (including messaging) increased by £11bn (6.6%) to £173bn between 2013 and 2014, almost doubling since 2009 (£87bn). This was partially due to increasing data use. Total mobile voice revenues continued to fall, down by £11bn (5.1%) to £206bn. Mobile voice generated a greater proportion of total telecoms retail revenue than mobile internet at (34.9%) in 2014, although this proportion was lower than in 2013 (37.1%).

**Figure 5.13 Total comparator country retail telecoms revenue, by sector: 2009- 2014**



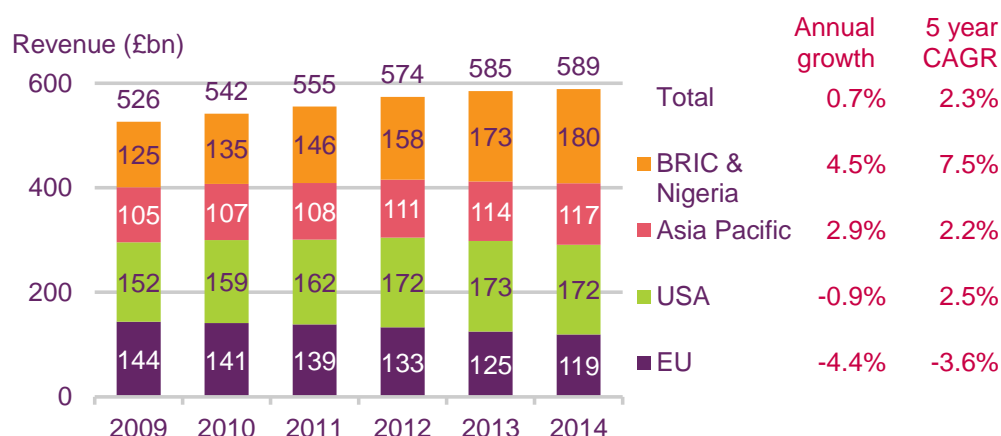
Source: IHS / industry data / Ofcom

Note: Fixed voice revenues include managed VoIP revenues; voice revenues include access/line rental revenues and may include revenues relating to bundled data services. Mobile internet excludes mobile messaging services. All figures expressed in nominal terms.

#### The BRIC countries and Nigeria generated the largest proportion of retail telecoms revenue of all the comparator nations

The increase in total comparator country retail telecoms revenue in 2014 is likely to have been driven by revenue growth in Nigeria and the BRIC comparator countries, up 4.5% to £180bn, and in Asia Pacific, up 2.9% to £117bn (Figure 5.14). The BRIC countries and Nigeria contributed the largest proportion of total retail telecoms revenue in 2014, at 30.6%, ahead of the US (29.1%) which had previously been the largest contributor to retail telecoms revenue. Total retail telecoms revenue in the US fell for the first time since 2009; by 0.9%, from £173bn in 2013 to £172bn in 2014. Revenue among the European comparator countries declined at an average rate of 3.7% per year in the five years to 2014, while year on year, revenues fell by £6bn (4.4%) to £119bn in 2014.

**Figure 5.14 Total comparator country retail telecoms revenue, by country type: 2009-2014**



Source: IHS / industry data / Ofcom

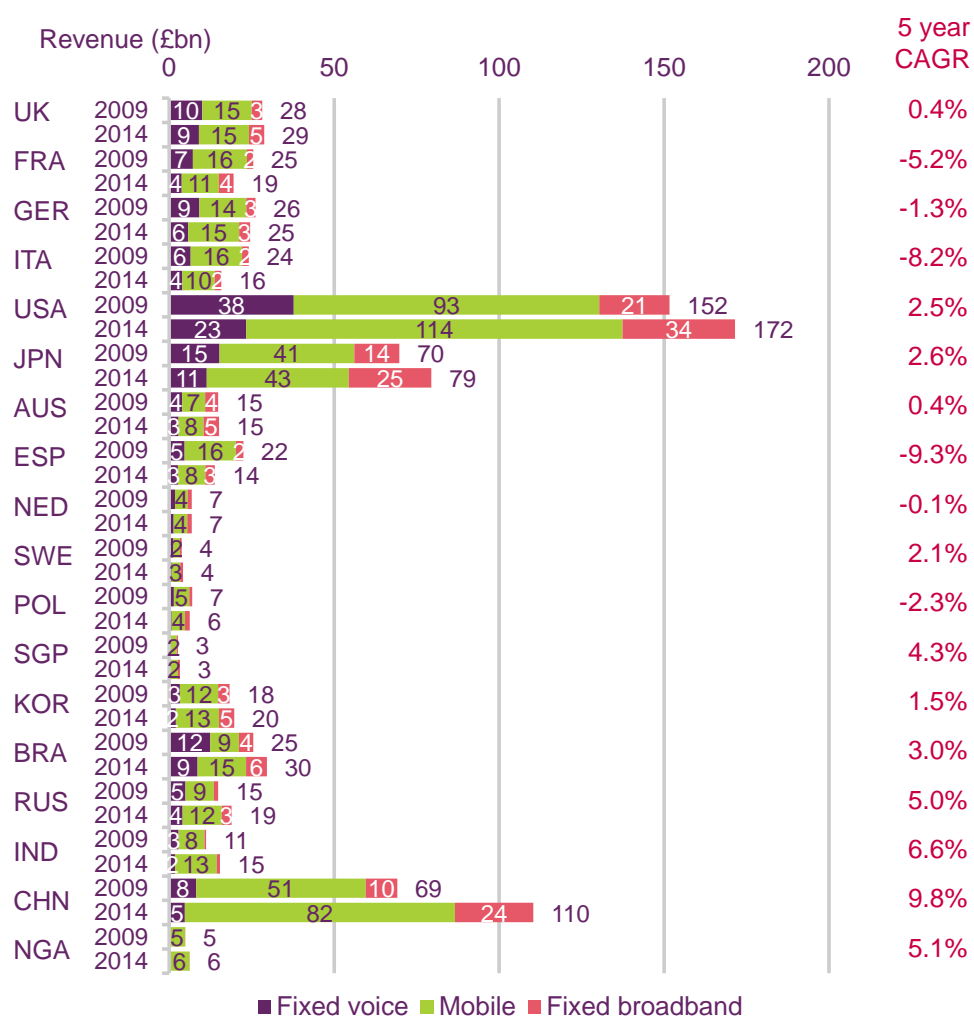
Note: All figures expressed in nominal terms.

**The US and China generated almost half the total comparator country retail telecoms revenue in 2014**

The US continued to have the highest retail telecoms revenue of all the comparator countries, at £172bn in 2014, followed by China (£110bn) and Japan at £79bn (Figure 5.15). Between them, the US and China generated almost half (48%) of total retail telecoms revenue for all the comparator countries in 2014.

Over the five years to 2014, total retail telecoms revenue increased in the majority of comparator countries; the highest average growth was in China, at 10% per year. The UK had a slight increase over the same period, up by £1bn to £29bn in 2014 (an increase of less than 1% per year on average). Total retail telecoms revenues fell in most European comparator countries; the largest fall was in Spain, down by an average of 9.3% per year over the five years to 2014. The other European comparator countries where telecoms revenues declined over the period were Italy (down 8.2%), France (down 5.2%), Poland (2.3%) and Germany (1.3%).

**Figure 5.15 Telecoms service retail revenues, by country and sector: 2009 and 2014**



Source: IHS / industry data / Ofcom

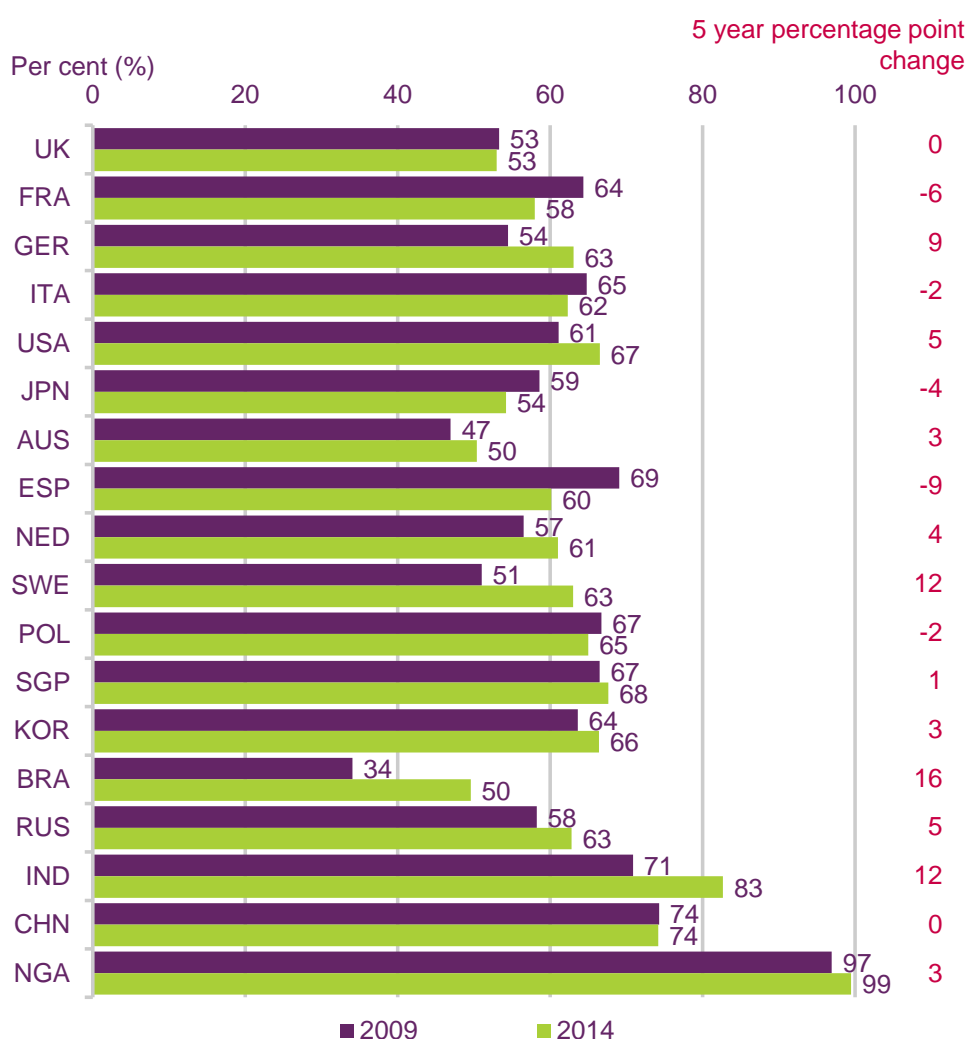
Note: Fixed voice revenues include managed VoIP revenues. All figures expressed in nominal terms.

### Mobile services generated at least half of total telecoms revenues in all comparator countries in 2014

Mobile services (comprising data, messaging and voice services) contributed at least 50% of total telecoms revenues in all of our 18 comparator countries in 2014 (Figure 5.16). Nigeria had the highest proportion of total telecoms revenues generated by mobile services, at 99%, followed by India (83%) and China (74%). This is probably a result of the rapid expansion of mobile markets in these countries and the low number of fixed lines, 0.10 and 2.14 per 100 population in Nigeria and India respectively (Figure 5.48). In the UK, mobile services generated 53% of total telecoms revenues in 2014.

Changes in the proportion of retail telecoms revenue generated by mobile services ranged from a 9pp decrease in Spain (to 60%) to a 16pp increase in Brazil (to 50%) in the five years to 2014. The UK and China were the only two comparator countries in which revenues remained stable, at 53% and 74% respectively.

**Figure 5.16 Mobile as a proportion of total telecoms revenues: 2009 and 2014**



Source: IHS / industry data / Ofcom

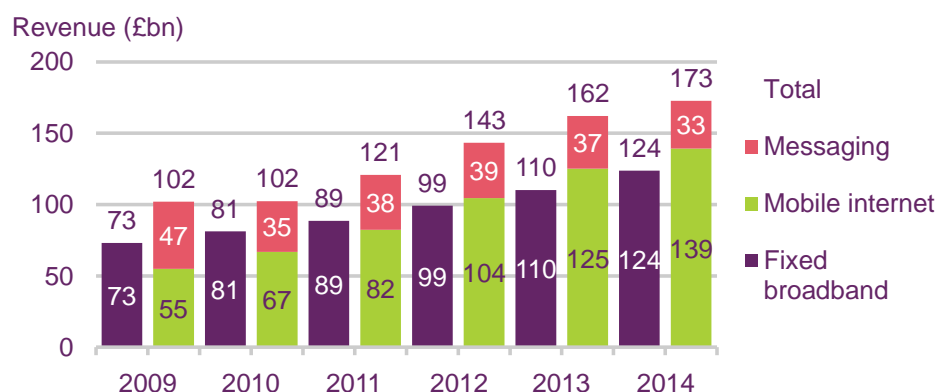
**Combined revenues for mobile internet and mobile messaging continued to be higher than fixed broadband revenues**

Combined revenues for mobile internet and mobile messaging increased by £11bn to £173bn in 2014, and continued to be higher than fixed broadband revenue (£124bn in 2014) (Figure 5.17).

Mobile internet revenue (excluding messaging) was up by £14bn (11.2%) to £139bn in 2014 and contributed 80.6% of the combined revenues for mobile internet and mobile messaging. By comparison, fixed broadband services generated £124bn in 2014, up £14bn (12.3%) compared to 2013. This increase in fixed broadband revenue was partly due to the growth in fixed broadband connections in 17 of our comparator countries between 2009 and 2014 (Figure 5.27).

The total revenue generated by mobile messaging (including SMS and MMS), which fell for the first time in 2013, continued to drop in 2014, down by £4bn (9.3%) to £33bn. The main reasons for this decline are the substitution of OTT (over-the-top) messaging services for network-based services, and increasing smartphone take-up, as more sophisticated handsets enable mobile users to access alternative communication methods, such as email, instant messaging and social networking sites.

**Figure 5.17 Total fixed broadband and mobile data revenue across all comparator countries: 2009-2014**



Source: IHS / industry data / Ofcom

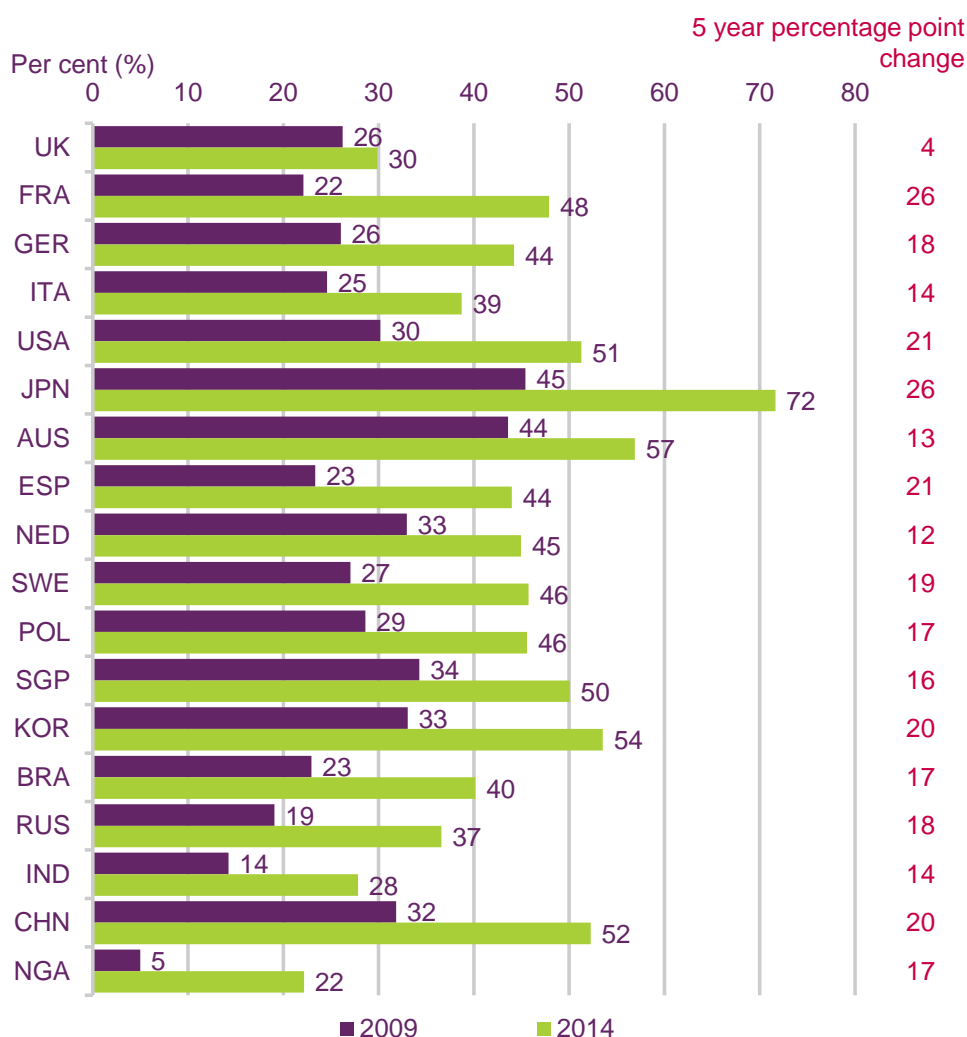
Note: Messaging includes SMS and MMS. All figures expressed in nominal terms.

### Data revenue as a proportion of total telecoms revenue was highest in Japan in 2014

Of all the comparator countries, Japan had the highest proportion of total telecoms revenue generated by data services (72%) in 2014, followed by Australia, at 57%, and South Korea, at 54% (0). Nigeria had the lowest proportion, at 22%. The UK had the third lowest data revenue in 2014, at 30%. This is partly because data revenue for bundled mobile data and messaging services in the UK are recorded as mobile voice revenue.

Data revenue increased in all our comparator countries between 2009 and 2014, with the fastest growth rates in Japan and France, both up by 26pp (data revenue in France has more than doubled in the five years to 2014). Growth in data revenue in less developed countries has been comparable to growth in developed ones. For example, revenues in India in 2014 were up 14pp, while in Nigeria, data services have grown rapidly over the five years to 2014; revenues are up by 17pp, from 5% in 2009 to 22% in 2014. The UK was the only comparator where the proportion of revenue generated by data services grew by less than 10pp in the five years to 2014 (by just 4pp). This is partly because in the UK bundled mobile data and messaging revenue is recorded as mobile voice revenue, as stated above.

**Figure 5.18 Data revenue as a proportion of total telecoms revenue: 2009 and 2014**



Source: IHS / industry data / Ofcom

### 5.2.2 Fixed voice services

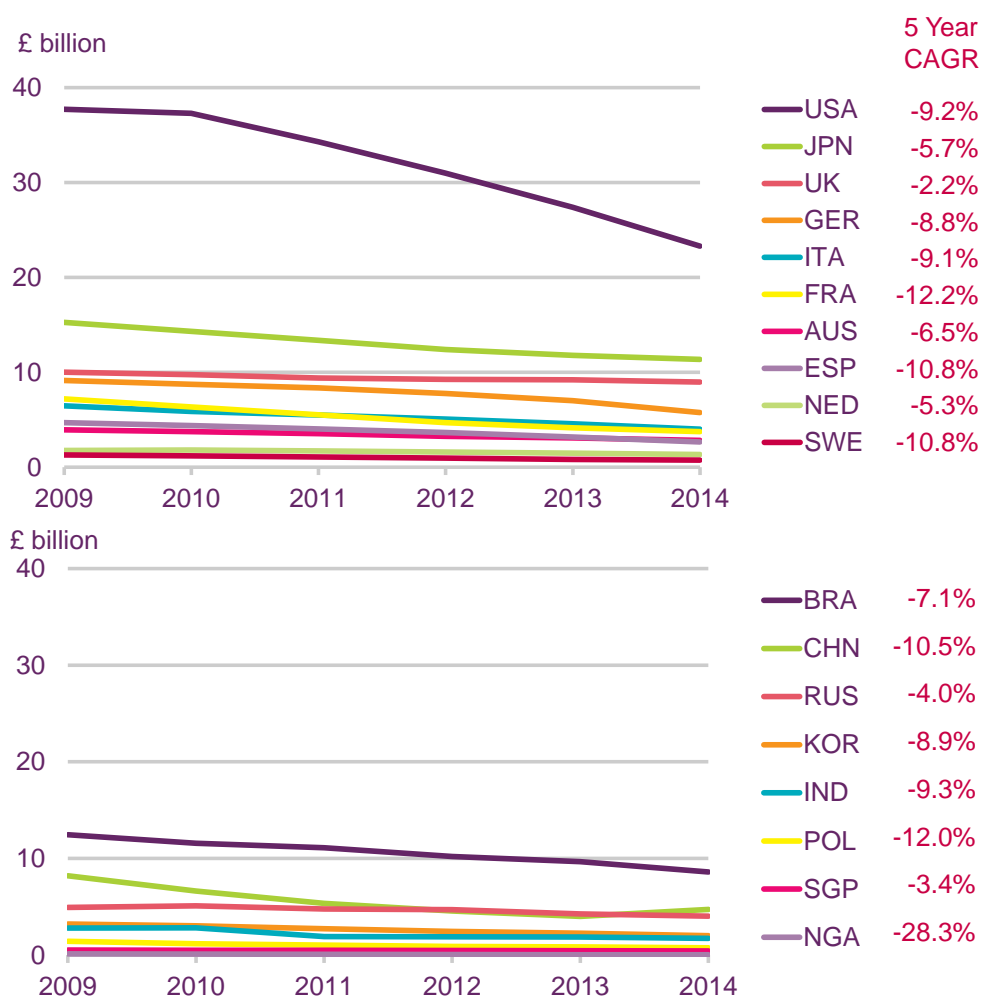
#### Total retail fixed line voice revenues generated across all comparator countries continued to fall in the five years to 2014

Total retail fixed line voice revenues across all comparator countries fell by £9.08bn (9.5%) between 2013 and 2014 (£86.81bn). This continuing decline has been observed since 2009 (over the five years to 2014, retail fixed line voice revenues have fallen at an average rate of 7.9% per year across all countries). The decline in retail fixed-line voice revenue is primarily due to increasing fixed-to-mobile substitution, as well as the growing use of alternative voice and non-voice communication methods such as email and instant messaging.

The US had the highest fixed voice revenue at the end of 2014 (£23.28bn), although revenue has been falling over the last five years at an average annual rate of 9.2%, with a sharp decrease since 2010 (Figure 5.19). Nigeria experienced the fastest rate of decline over the five-year period, down on average by 28.3% per year (although the fixed market in this country is very small), followed by France, at an average rate of 12.2%. In the UK, retail fixed-line voice revenues fell on average by 2.2% per year to £8.93bn in the five years to 2014, the lowest rate of decline among the comparator countries. This drop was mainly due to the decrease in fixed voice call volumes, which fell by an average annual rate of 6.9% (Figure 5.20).



**Figure 5.19 Retail fixed line voice revenues: 2009-2014**



Source: IHS / industry data / Ofcom

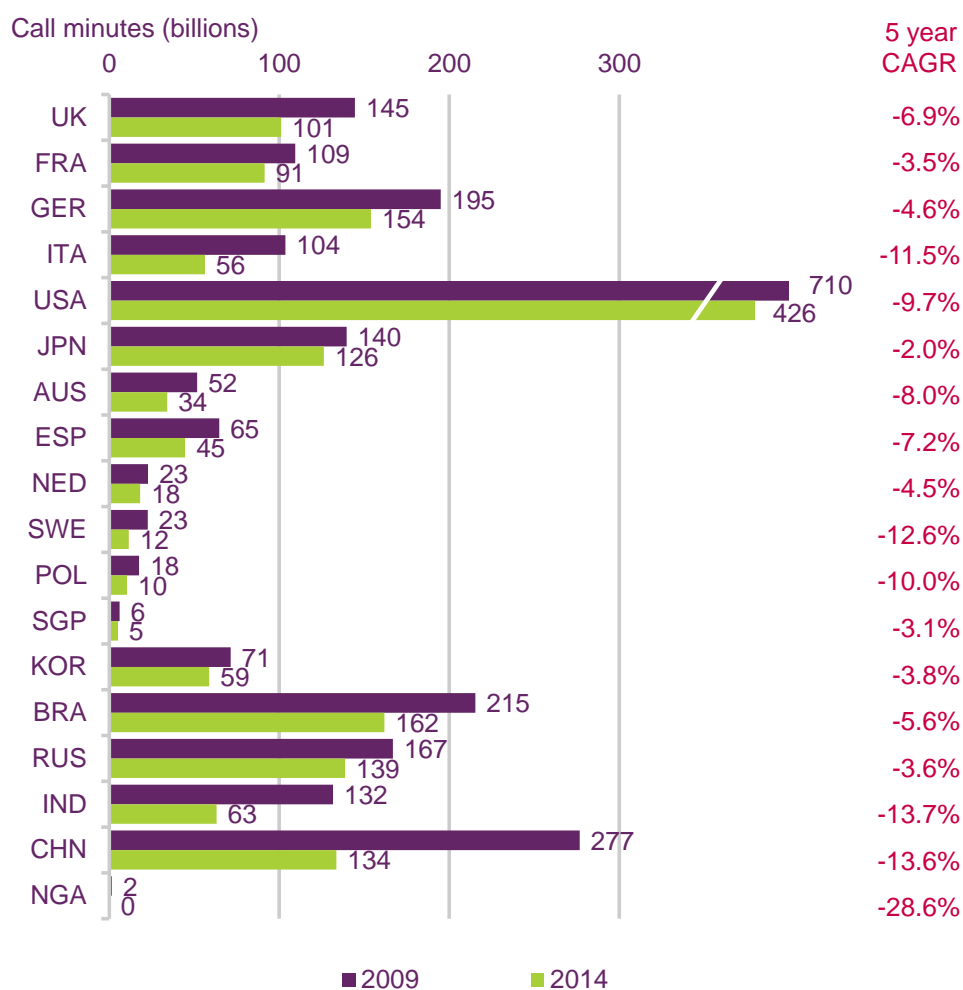
Note: Includes managed VoIP revenues. All figures expressed in nominal terms.

### Fixed-line voice call volumes fell in all comparator countries in the five years to 2014

The total fixed voice call volumes across all the countries fell by an average annual rate of 7.8% to 1636 billion (1.6 trillion) minutes in the five years to 2014. This was primarily due to the decrease in fixed voice call minutes, down by an average of 11.3% annually, which was partially offset by increasing managed VoIP call volumes, up by 8.1% a year (further information regarding managed VoIP services can be found in Section 5.1.4 of this report).

In the UK, total fixed line call volumes decreased by an average annual rate of 6.9% to 101 billion minutes between 2009 and 2014 (Figure 5.20). Nigeria had the steepest fall in fixed-line voice call volumes, down on average by 28.6% per year over the period (although this decrease represents only small changes in the absolute figures: call volumes in Nigeria were less than 0.3 billion minutes in 2014), followed by India and China (down on average by 13.7% a year and 13.6% per year respectively). Potential reasons for falling fixed call volumes include consumers migrating from fixed voice services to mobile, as well as an increase in other communication methods, such as social networking and instant messaging.

**Figure 5.20 Fixed line voice call volumes: 2009 and 2014**



Source: IHS / industry data / Ofcom  
 Note: Includes managed VoIP calls.

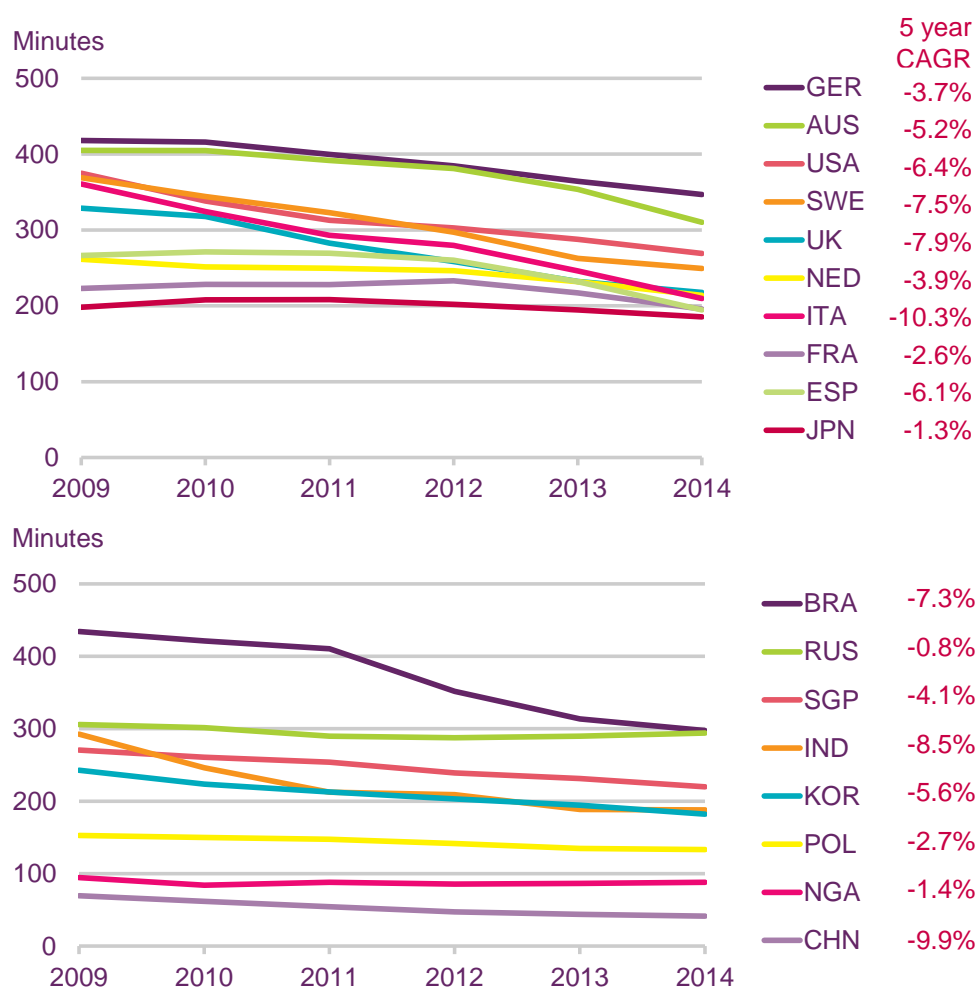
**The number of outgoing minutes per fixed line has fallen in all countries in the five years to 2014**

The total number of outbound voice call minutes per fixed line fell by an average of 7.5% a year to 213 minutes per month between 2009 and 2014 (Figure 5.21). As stated previously, the main driver behind this decline was growing fixed-to-mobile substitution; fixed voice call minutes fell by an average of 11.3% annually, while mobile minutes increased by an average of 9.5% per year.

The number of outgoing minutes per fixed line was highest in Germany in 2014, at 347 minutes per month, and lowest in China at 41 minutes per month. By comparison, the UK had 218 outgoing minutes per fixed line in 2014.

In the five years to 2014, Italy experienced the largest percentage decrease in outgoing minutes per fixed line, falling on average by 10.3% per year. China followed, with outgoing minutes dropping on average by 9.9% a year over the same period. By comparison, the number of outgoing call minutes per fixed line in the UK fell at an average rate of 7.9% per year in the five years to 2014. This was the fourth highest rate of decline among our comparator countries.

**Figure 5.21 Monthly outbound minutes per fixed line: 2009-2014**



Source: IHS / industry data / Ofcom

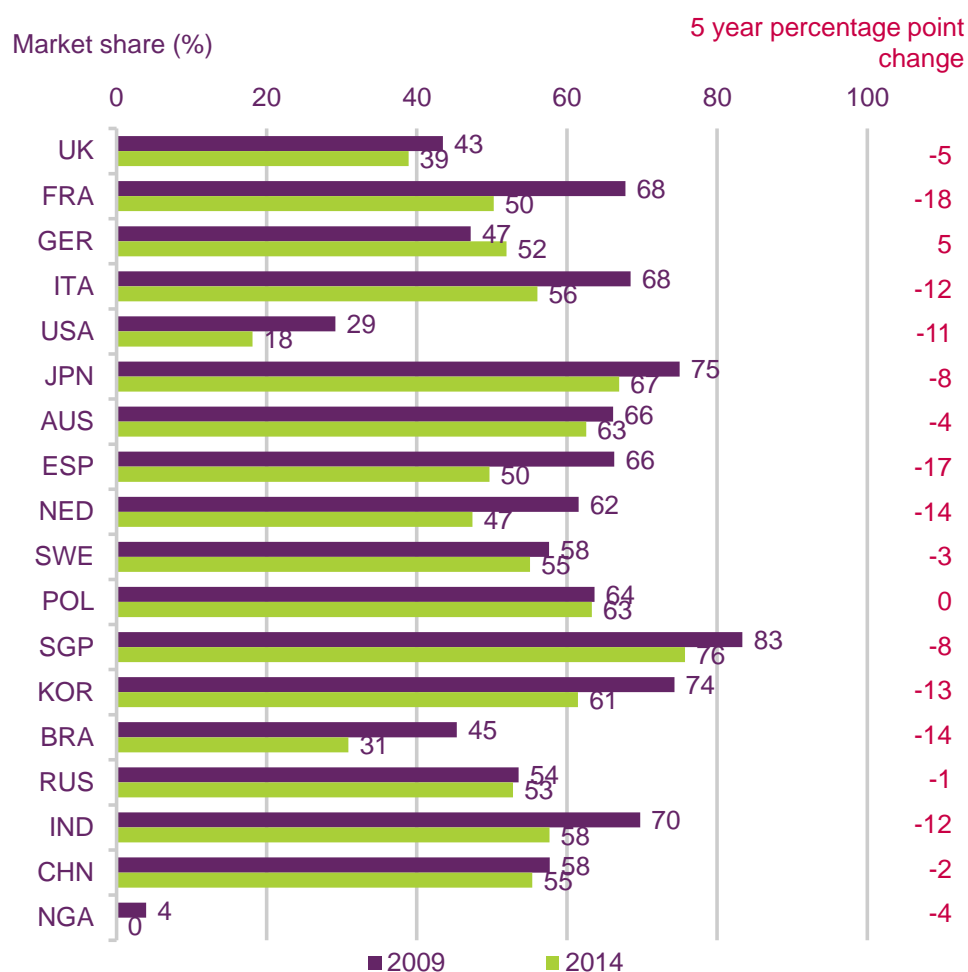
Note: Includes managed VoIP calls.

**Germany was the only country in which the incumbent operator’s share of fixed voice call volumes increased in the five years to 2014**

The incumbent operator’s share of fixed call volumes fell in all of our comparator countries with the exception of Germany, where the incumbent’s share increased by 5pp to 52% in the five years to 2014, primarily due to growth in its VoIP customer base (Figure 5.22). France experienced the largest decline over the same period; the incumbent’s market share fell by 18pp to 50%. Spain’s incumbent was also at 50% in 2014, down by 17pp over the last five years.

In the UK, BT’s share of fixed voice call volumes decreased by 5pp to 39% over the five-year period. Only in three comparator countries was the respective incumbent’s share lower: Brazil (31%), the US (18%) and Nigeria, where Nitel was declared inactive in 2014 due to being financially unviable and insufficient to support quality of service. The incumbent operator’s share of fixed voice call volumes was highest in Singapore in 2014 (at 76%), followed by Japan (67%), due to the late liberalisation of the fixed-line markets in these countries.

**Figure 5.22 Incumbent operator's share of fixed voice call volumes: 2009 and 2014**



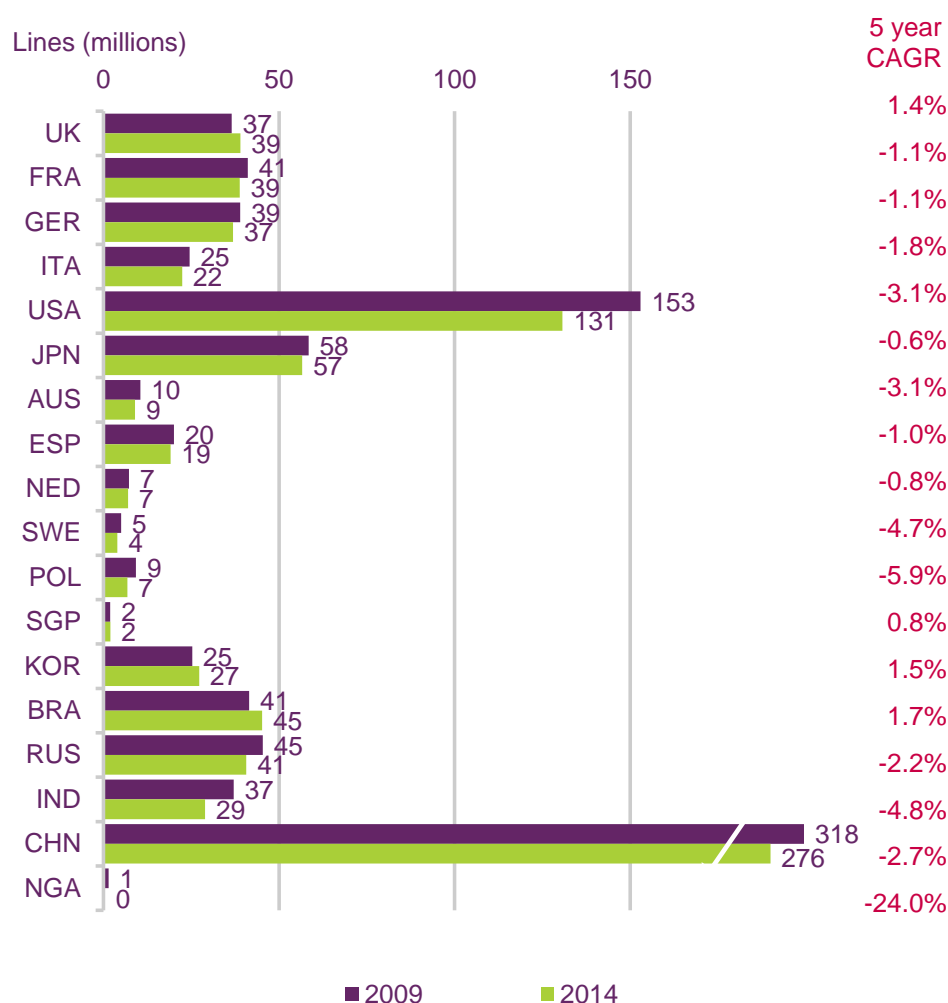
Source: IHS / industry data / Ofcom

**The UK was one of four comparator countries to experience an increase in the number of fixed exchange lines in 2014**

The total number of fixed exchange lines (including PSTN lines and managed VoIP connections) fell at an annual average rate of 2.0% in the five years to 2014 and decreased by 3 million (0.3%) to 791 million compared to 2013 (Figure 5.23). This was mainly due to the continued substitution of fixed voice services by mobile services and alternative communication methods.

The UK was one of four countries (along with Singapore, South Korea and Brazil) where the number of fixed exchange lines increased in the five years to 2014, up by 2 million to 39 million (an average increase of 1.4% annually). The UK increase was due to strong demand for xDSL access (requiring a fixed exchange line). Over the same period, Brazil had the largest increase up by an average of 1.7% annually. Nigeria had the steepest average annual decline, at 24.0% a year, with the number of fixed lines falling to less than 0.5 million in 2014. The UK was one of two comparator countries (along with Italy) where the number of fixed exchange lines increased in 2014, up by 3.1% compared to a year previously. In the majority of our comparator countries, the number of lines was unchanged during the year.

**Figure 5.23 Fixed exchange lines: 2009 and 2014**



Source: IHS / industry data / Ofcom  
 Note: Includes managed VoIP connections

### 5.2.3 Fixed broadband services

#### The US, Japan and China generated over two-thirds (67%) of the total comparator countries' fixed broadband revenue in 2014

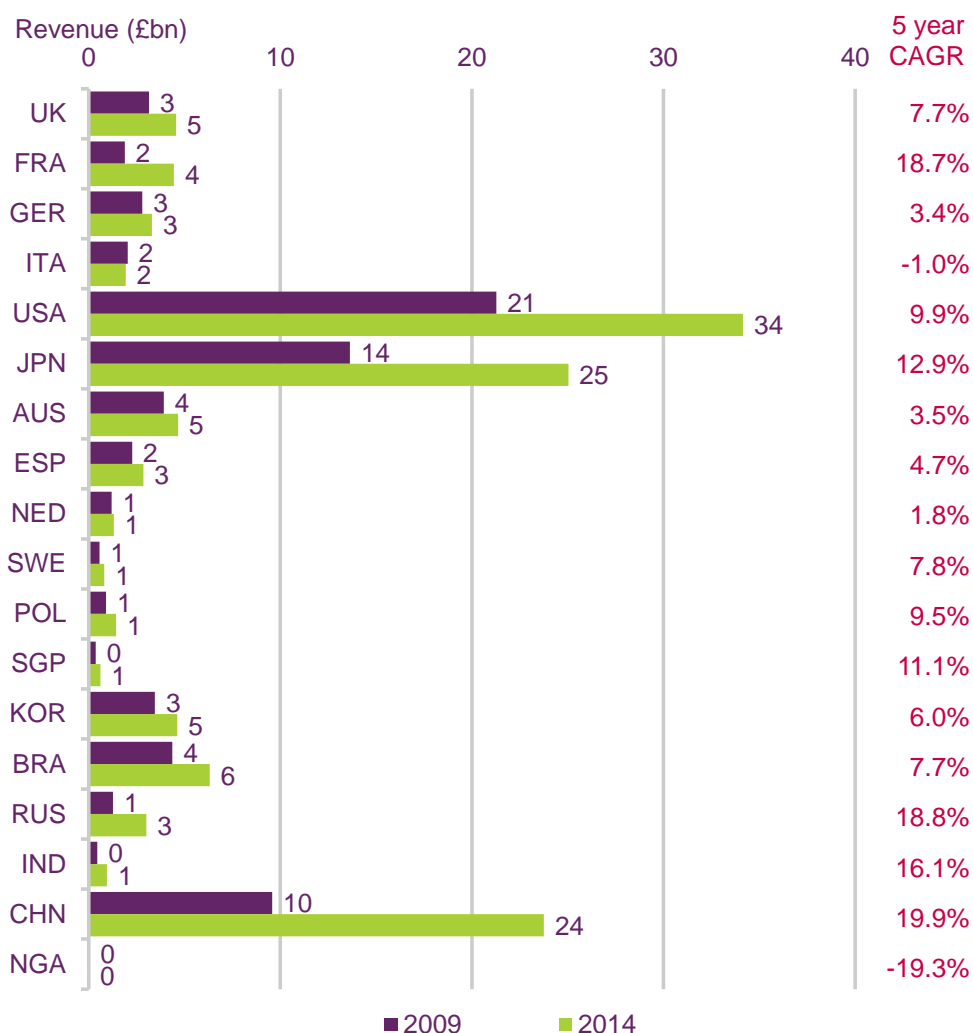
Fixed broadband revenues were highest in the US at £34bn, followed by Japan and China (at £25bn and £24bn respectively). Combined, these three countries accounted for 67% of total comparator country fixed broadband revenue. The UK had the seventh-highest fixed broadband revenue of all the comparator countries in 2014, at £5bn (in line with Australia and South Korea), and the highest among the EU5 countries.

In the five years to 2014, total fixed broadband revenues increased at an average annual rate of 11.1%, from £73bn to £124bn. China had the highest average annual growth, at 19.9% per year, followed by Russia (up on average by 18.8% a year). France experienced the third highest increase, at 18.7% a year, over the period; it also had the second highest year-on-year increase (after Nigeria) in 2014 at 82.6% (partly due to the launch of VDSL services by France Telecom in mid-2013). By comparison, total fixed broadband revenue in the UK went up at an average rate of 7.7% per year in the five years to 2014.

Italy and Nigeria were the only comparator countries in which fixed broadband revenue fell in the five years to 2014, down on average by 1.0% and 19.3% per year respectively (although

these decreases were small changes in absolute terms) (Figure 5.24). Nevertheless, revenue increased in both countries in 2014; in Nigeria it was up by 86.1% (although in absolute terms this was still very low, below £10m), and in Italy it was up by 0.6%.

**Figure 5.24 Fixed broadband revenues: 2009 and 2014**

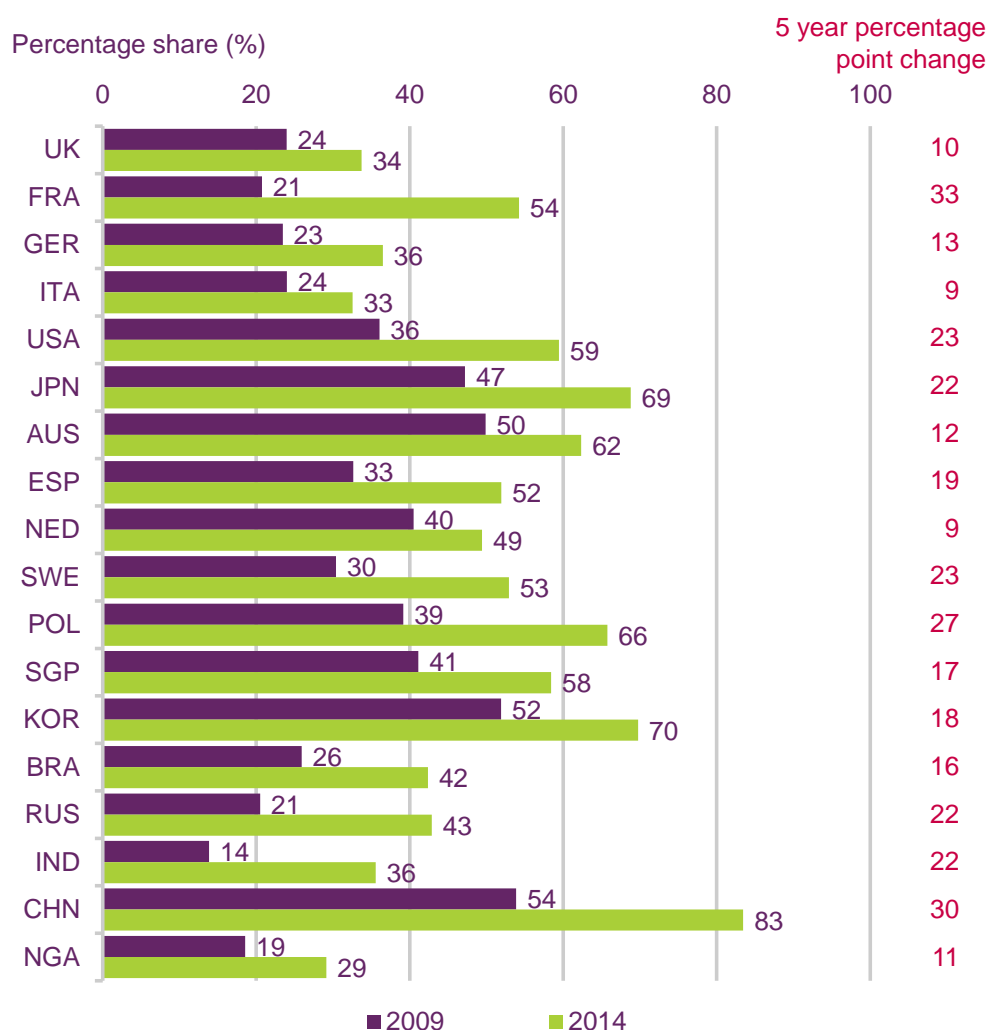


Source: IHS / industry data / Ofcom  
 Note: All figures expressed in nominal terms.

**The proportion of total comparator country fixed telecoms revenues that were generated by fixed broadband services was 59% in 2014**

The proportion of total fixed telecoms revenues generated by fixed broadband services across our 18 comparator countries increased by 23pp to 59% in the five years to 2014. In China, fixed broadband accounted for 83% of total fixed revenues (the highest of all the comparator countries). China also experienced the second highest increase in this proportion in the five years to 2014, up by 30pp. France had the highest increase of all our comparator countries, up 33pp to 54% due to declining fixed voice and VoIP revenues (down by 12.2%) and increasing fixed broadband revenues (up 18.7% - see Figure 5.24). By comparison, in the UK the proportion of total fixed revenues generated by fixed broadband increased by 10pp to 34% over the five years to 2014.

**Figure 5.25 Fixed broadband as a proportion of total fixed revenues: 2009-2014**



Source: IHS / industry data / Ofcom

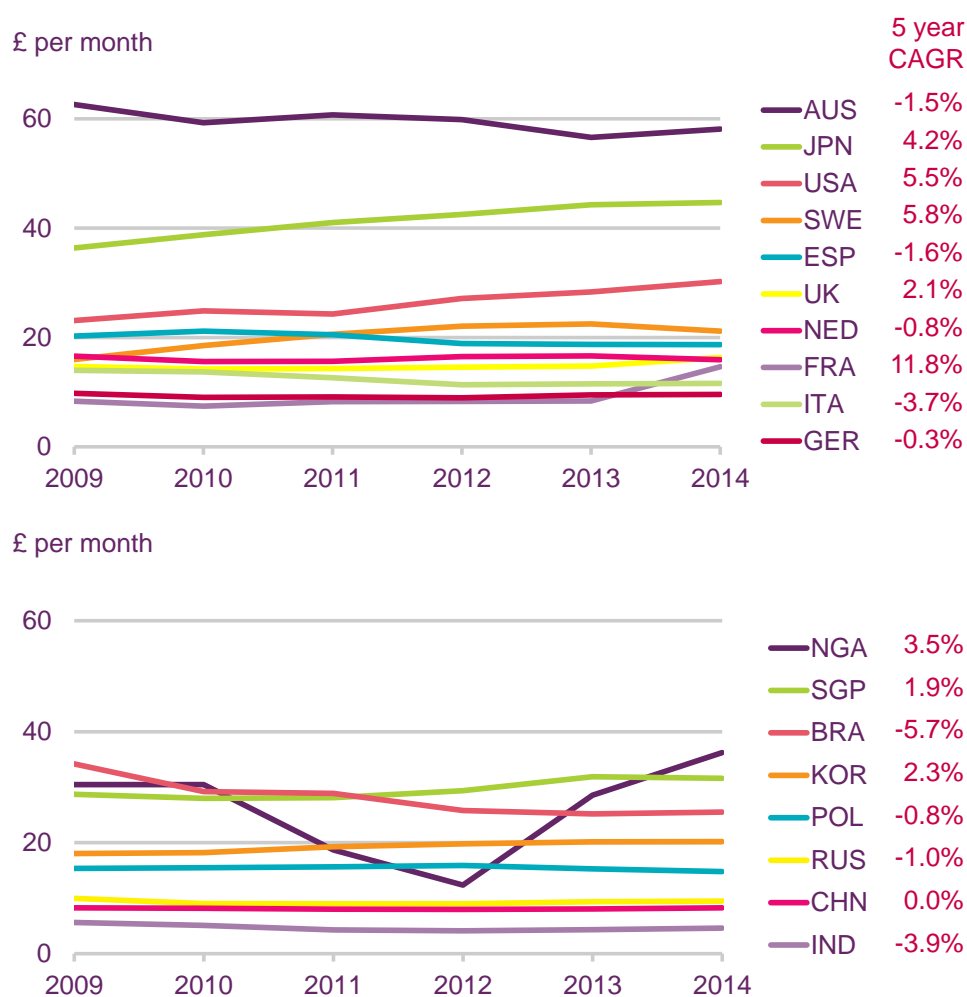
**Australia had the highest average monthly retail revenue per fixed broadband connection in 2014, at £58.13**

Average monthly retail fixed broadband revenue per connection was up 3.7% to £17.36 across our comparator countries in 2014.

Fixed broadband revenue per connection was highest in Australia in 2014, at £58.13 per month, followed by Japan at £44.68. Nigeria had the third highest average revenue per connection, at £36.24, although it is important to note that this market is highly unstable (for example, revenue dropped to £12.37 in 2012 only to go up by 131% to 28.58 in 2013). Average revenue per connection was lowest in India, China and Russia (at £4.61, £8.26 and £9.49 respectively).

In the five years to 2014, average monthly fixed broadband revenues per connection increased in eight of our 18 comparator countries. France experienced the largest increase over this period, up on average by 11.8% a year to £14.63 (almost double the rate in Sweden, which had the second highest average annual increase, at 5.8% a year). In the UK, revenues grew by an average of 2.1% to £16.34 between 2009 and 2014. Brazil had the largest decrease in monthly retail fixed broadband revenues per connection over this period, down by an average of 5.7% per year, followed by India (down by 3.9% per year).

**Figure 5.26 Retail fixed broadband average revenue per connection: 2009-2014**



Source: IHS / industry data / Ofcom  
 Note: All figures expressed in nominal terms.

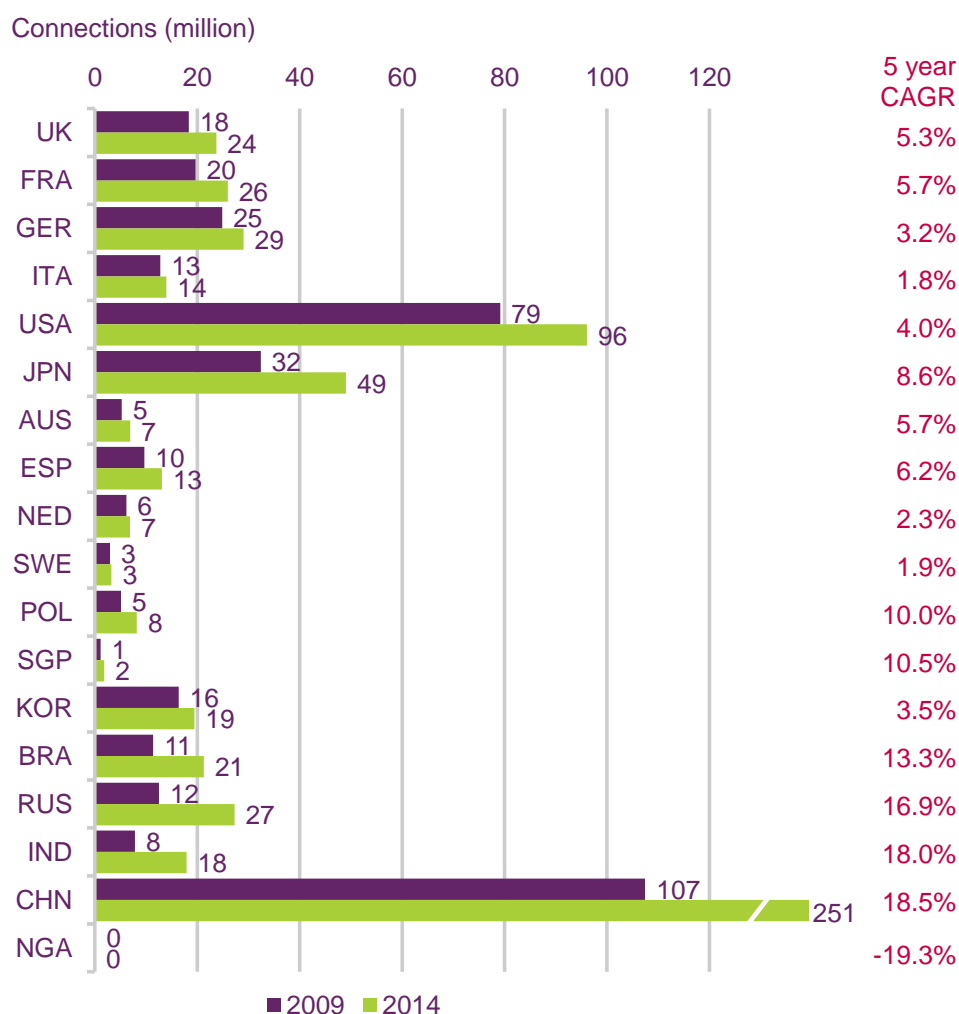
**China had the highest annual average growth rate of total fixed broadband connections in the five years to 2014**

The total number of fixed broadband connections across the comparator countries increased by 242 million to 615 million in the five years to 2014, an average increase of 10.5% a year. The average annual growth rate was highest in the BRIC comparator countries, ranging from 13.3% a year in Brazil to 18.5% a year in China. In the UK, the number of connections increased on average by 5.3% a year to 24 million over the same period. Nigeria was the only comparator country where fixed broadband connections declined over the five years to 2014, down on average by 19.3% per year (although the number of connections is very low; less than 1 million). This fall is probably due to low fixed broadband availability and rapid growth in the use of mobile data services.

China had the largest number of fixed broadband connections in 2014, at 251 million (accounting for 41% of the total fixed broadband connections among our comparator countries); this was more than twice the number of connections in the US, which had the second highest number of connections (96 million). Nigeria had the lowest number of connections, at less than 1 million, followed by Singapore at 2 million.



**Figure 5.27 Fixed broadband connections: 2009-2014**



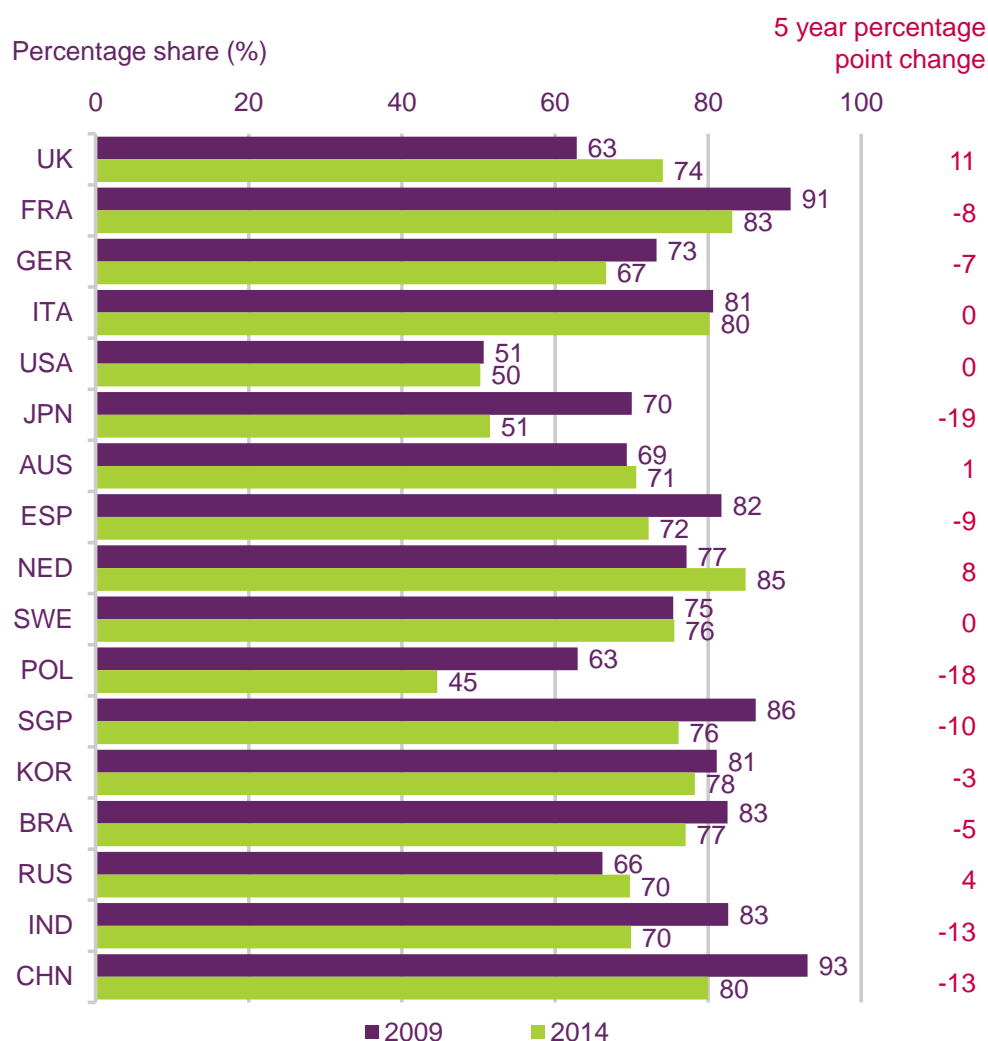
Source: IHS / industry data / Ofcom

**The retail connection share of the three largest fixed broadband providers, for each comparator country, was highest in the Netherlands in 2014**

The retail connection share of the three largest fixed broadband providers ranged from 45% in Poland to 85% in the Netherlands in 2014. In four of the 18 comparator countries (China, Italy, France and the Netherlands), the share of the three largest fixed broadband providers was 80% or higher. Poland was the only country in which the three largest providers accounted for less than half of connections.

In the five years to 2014, only five of the 17 comparator countries for which data were available saw an increase in the combined fixed broadband connection share of the three largest providers (the UK, the Netherlands, Russia, Sweden and Australia). The largest increase in share was in the UK, up by 11pp in the five years to 74%, mainly as a result of Sky’s success of selling bundled packages and its acquisition of O2 in 2013. Market share fell in all the other comparators; the largest decrease was in Japan (down 19pp to 51%), followed by Poland (down 18pp to 45%).

**Figure 5.28 Retail connection share of the three largest fixed broadband providers: 2009-2014**



Source: IHS / industry data / Ofcom

### 5.2.4 Mobile voice and data services

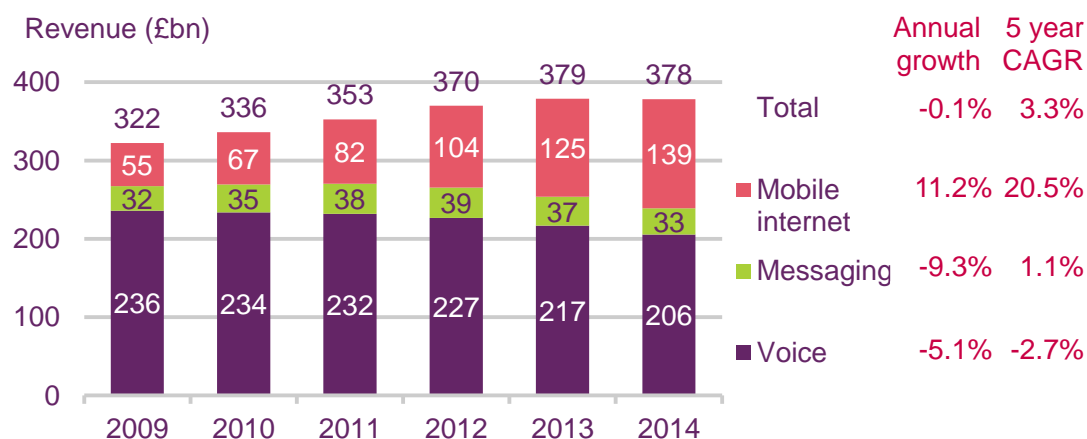
#### Total comparator country mobile revenues remained relatively stable in 2014

Total mobile telecoms revenues generated in our comparator countries (including voice, messaging and mobile internet services) remained relatively stable in 2014, at £378bn (down 0.1%). The decline was due to falling voice and messaging revenue, which was partially offset by increasing mobile internet revenue, up by 11.2% during the year (Figure 5.29). Total mobile messaging revenue (including SMS and MMS) experienced the largest percentage decrease, down by £3bn (9.3%) to £33bn in 2014, while total voice revenues fell by £11bn (5.1%) to £206bn.

In the five years to 2014, total mobile internet revenue almost tripled, from £55bn in 2009 to £139bn, increasing at an average rate of 20.5% per year. Mobile internet was also the only service to have increased since 2013, up by £14bn (11.2%). The main reason behind this rapid growth was increasing total mobile data volumes, which were up 83.6% a year across our comparator countries in the same period, largely as a result of increasing smartphone use. By comparison, total mobile voice revenues continued to fall, down by an average of 2.7% per year. While total mobile messaging revenue experienced the steepest decline in

2014 (down 9.3%), it increased slightly in the five years to 2014, up on average by 1.1% per year.

**Figure 5.29 Total comparator country retail mobile telecoms revenue, by sector: 2009-2014**



Source: IHS / industry data / Ofcom

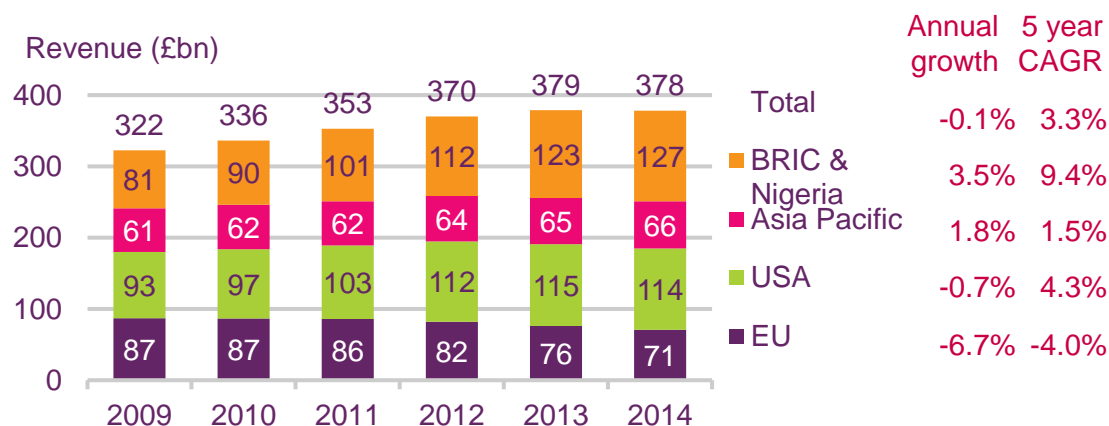
Note: Messaging includes SMS and MMS. All figures expressed in nominal terms.

**Total retail mobile telecoms revenue in Europe declined by 6.7% in 2014**

The decrease in total comparator country retail mobile telecoms revenues in 2014 was mainly due to a decline in revenues among our EU comparator countries (down by 6.7%), as well as a smaller fall in the US (down 0.7%). In contrast, total retail mobile telecoms revenues continued to increase in the BRIC countries and Nigeria (up 3.5%) and in Asia Pacific comparator countries (up 1.8%).

In the five years to 2014, the only fall in mobile telecoms revenue was in the EU comparator countries, down on average by 4.0% annually. By comparison, the BRIC countries and Nigeria experienced a rapid increase, averaging 9.4% per year over the same period. Mobile telecoms revenues also increased in the US (up 4.3% on average per year) and in Asia Pacific (up 1.5% a year on average) over the same period. This was mainly as a result of increasing mobile internet revenues in these countries.

**Figure 5.30 Total comparator country retail mobile telecoms revenue, by country type: 2009-2014**



Source: IHS / industry data / Ofcom

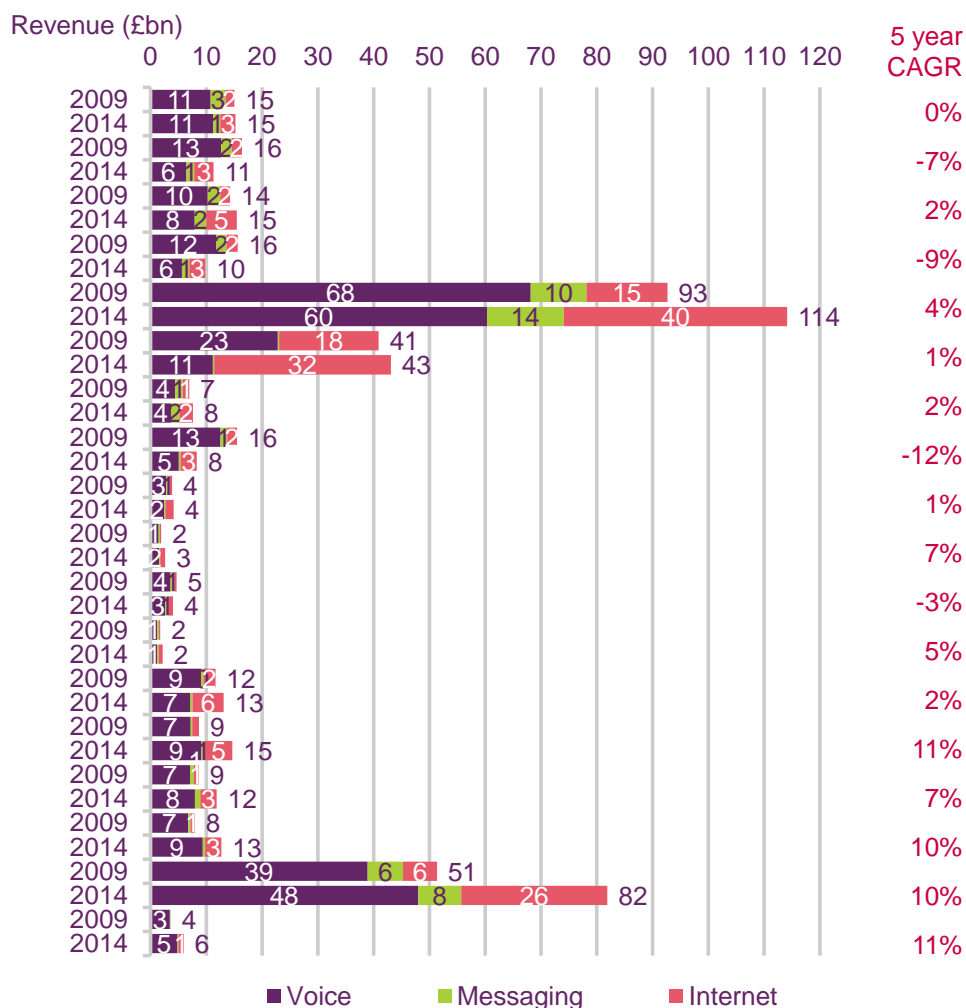
Note: All figures expressed in nominal terms.

## The US, China and Japan generated 63% of total retail mobile revenues in 2014

In most of our comparator countries, mobile revenues grew in the five years to 2014 (Figure 5.31). The highest average annual increases over this period were in Brazil and Nigeria (both at 11%), followed by China and India (both at 10%). This was mainly due to large increases in the number of mobile connections, which were up over 12% per year in India, China and Nigeria in the five years to 2014 (see Figure 5.37). Total retail mobile revenues fell in four of our 18 comparator countries (including three of the EU5 countries) over the five years to 2015. The steepest fall was in Spain (down on average by 12% per year), followed by Italy, France and Poland (down on average by 9%, 7% and 3% a year respectively). In the UK, total revenues remained stable over the five years to 2014, at £15bn.

Voice services generated the majority of total mobile revenues in all of our comparator countries, except for Japan, where mobile internet revenue accounted for almost three-quarters (73%) of total revenue. But mobile voice revenue as a proportion of total retail revenue has decreased in 17 of our 18 comparator countries over the five years to 2014 (despite absolute mobile voice revenues having increased in nine comparator countries over the same period). The UK was the exception - voice revenues as a proportion of total revenues were up by 2% in the five years to 2014 (although this is partly because UK voice revenues include revenues from bundled internet and messaging services). By comparison, mobile data revenue increased sharply in all comparator countries in the five years to 2014.

**Figure 5.31 Retail mobile revenues, by service and country: 2009 and 2014**



Source: IHS / industry data / Ofcom

Note: Messaging includes SMS and MMS. All figures expressed in nominal terms.

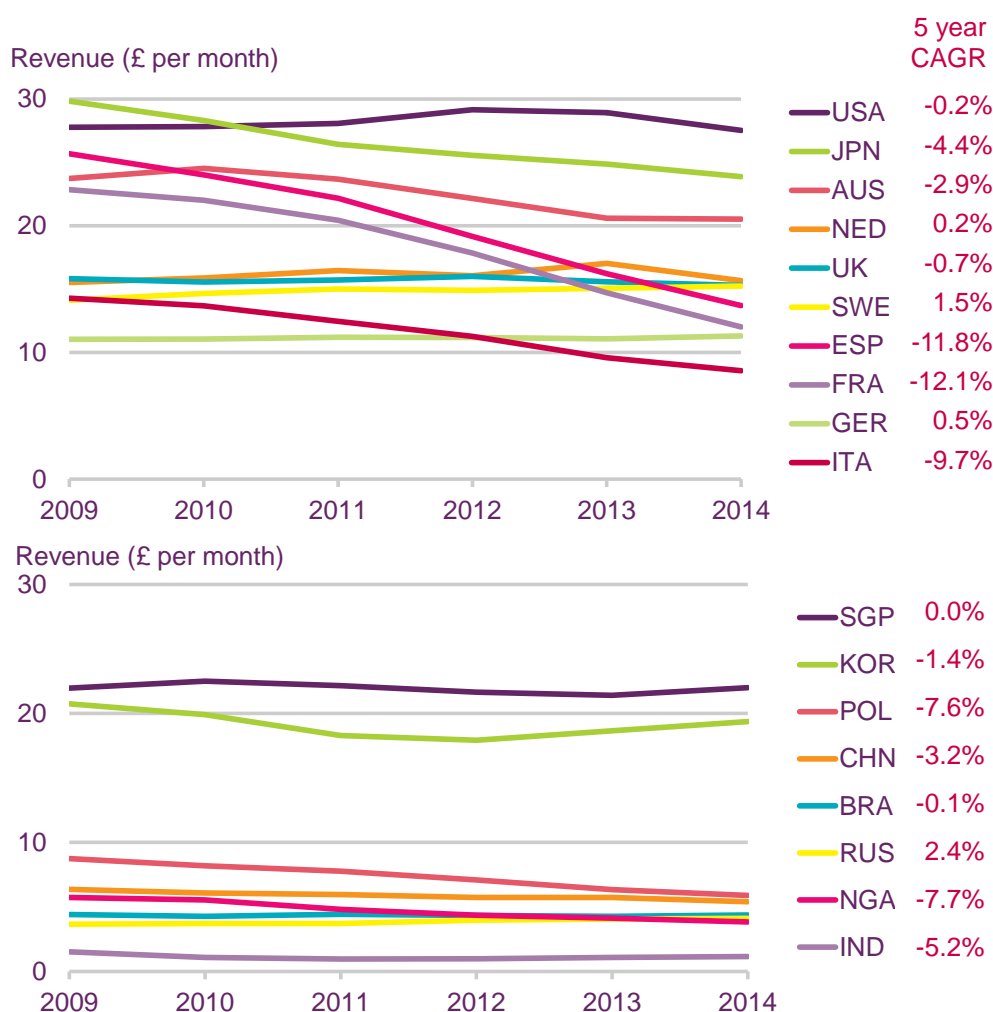
### Average monthly revenue per mobile connection in the UK remained relatively stable in the five years to 2014, at £15.27

The average monthly revenue per mobile connection ranged from £1.16 in India to £27.52 in the US in 2014 (Figure 5.32). The UK had the seventh highest average monthly revenue per connection, at £15.27, remaining relatively stable in the five years to 2014.

Average monthly revenue per mobile connection fell in most of our comparator countries in the five years to 2014, with France experiencing the largest decline over this period (down on average by 12.1% per year), followed by Spain and Italy (down on average by 11.8% and 9.7% a year respectively). These countries also had the steepest year-on-year falls in 2014, down 18.3% in France, 15.5% in Spain and 10.6% in Italy.

Average monthly revenues per connection increased in four of our comparator countries (Russia, Sweden, Germany and the Netherlands) in the five years to 2014. Russia had the highest growth, with revenue going up at an average annual rate of 2.4%, followed by Sweden (increasing on average by 1.5% a year). Singapore was the only comparator country where revenues remained relatively stable in the five years to 2014.

**Figure 5.32 Average monthly revenue per mobile connection: 2009-2014**



Source: IHS / industry data / Ofcom

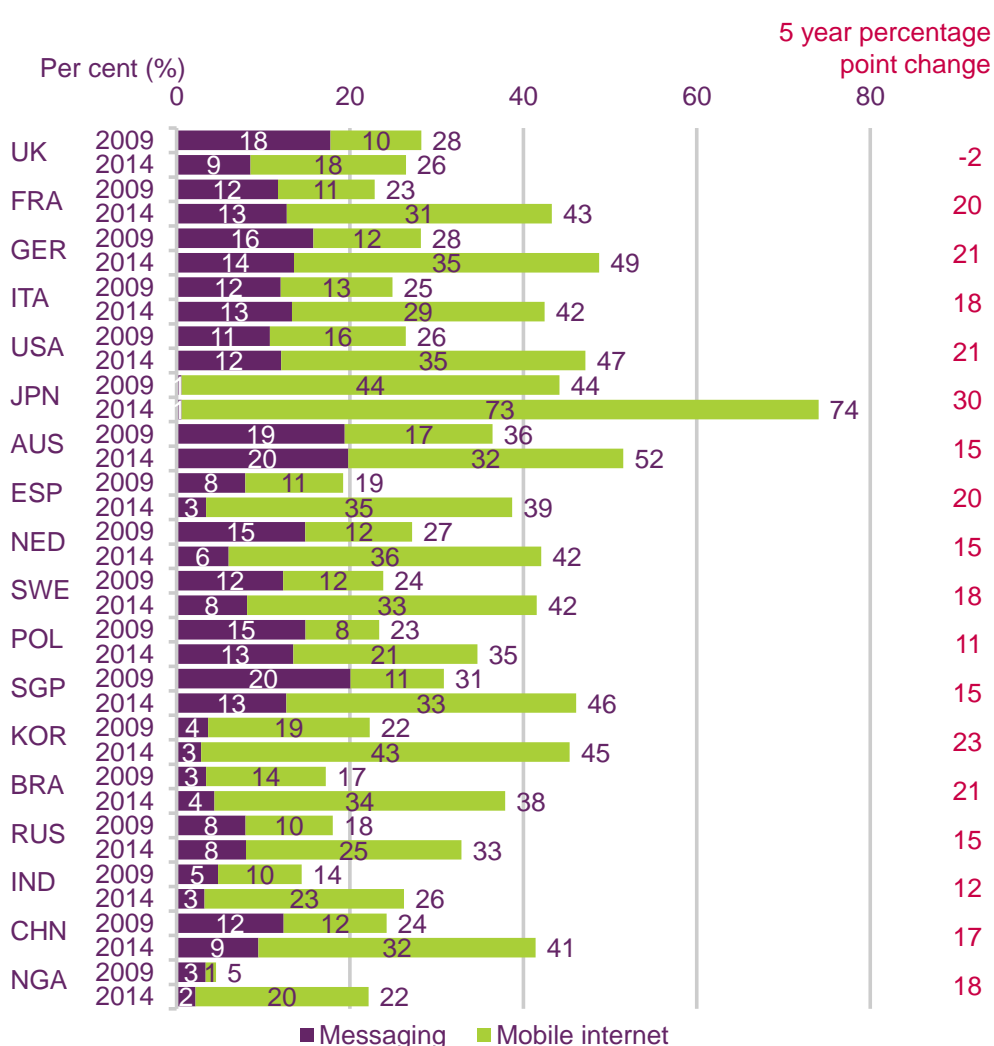
Note: All figures expressed in nominal terms.

## All of our comparator countries experienced an increase in mobile internet's contribution to total mobile revenue in the five years to 2014

The proportion of mobile revenue generated by data services (including mobile messaging and mobile internet) ranged from 22% in Nigeria to 74% in Japan in 2014 (Figure 5.33). The UK was the only comparator country where revenues generated by data services fell in the five years to 2014, dropping 2pp per year. It is important to note, however, that figures for the UK will be understated as they exclude revenues relating to SMS and data allowances that are bundled in with monthly line rental fees.

All of our comparator countries experienced an increase in mobile internet's contribution to total mobile revenue in the five years to 2014. Japan had the largest increase in mobile internet's share of total mobile revenue; up by 30pp to 73%. The slowest growth in mobile internet revenues was in the UK, up by 7pp to 18% between 2009 and 2014.

**Figure 5.33 Data as a proportion of total mobile service revenues: 2009 and 2014**



Source: IHS / industry data / Ofcom

Note: Messaging includes SMS and MMS.

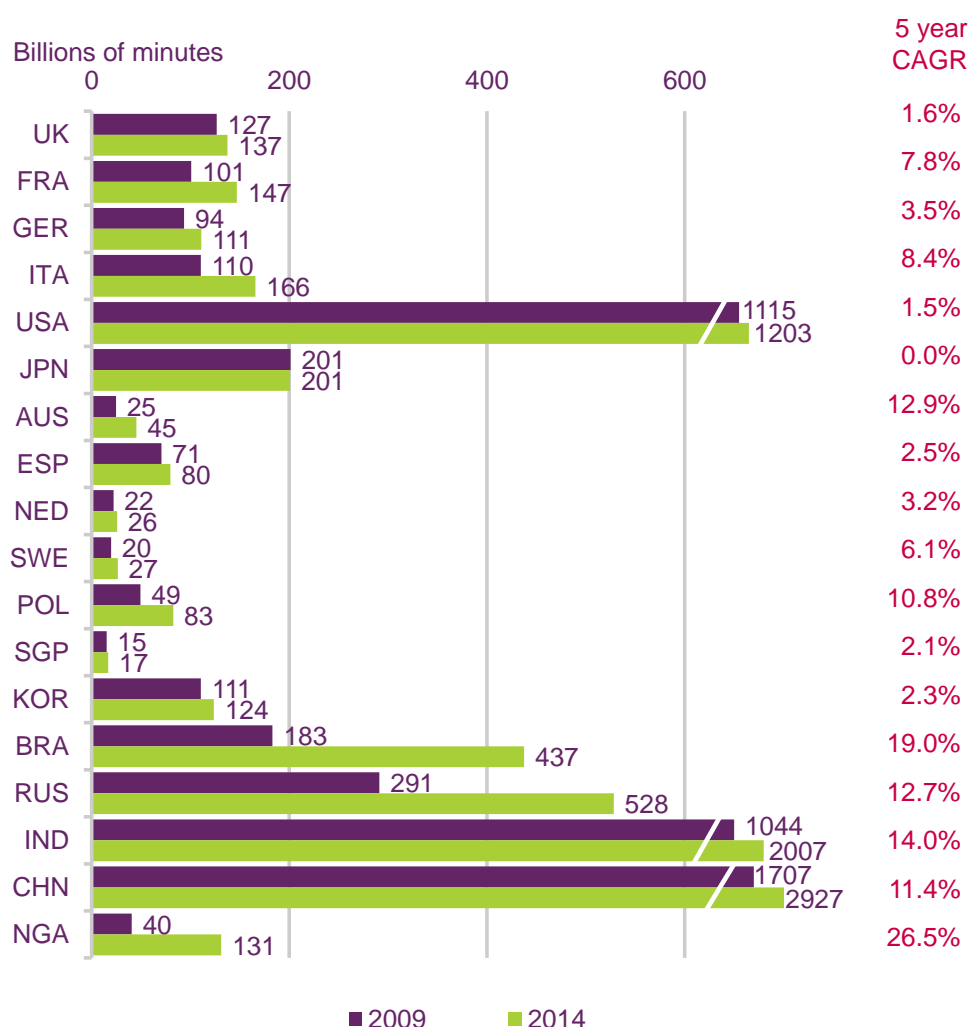
## China and India generated 59% of total mobile voice call volumes in 2014

Over the five years to 2014, total mobile voice call volumes increased by an average annual rate of 9.5% across our comparator countries, to 8.4 trillion minutes. China had the highest

mobile voice call volumes in 2014, at 2.9 trillion minutes, followed by India at 2.0 trillion (Figure 5.34). Combined, these countries accounted for more than half (58.8%) of total comparator country mobile voice call volumes in 2014. Mobile voice call volumes were lowest in Singapore at 17 billion minutes. The UK was ninth highest of our comparator countries, with 137 billion mobile voice minutes in 2014.

Mobile voice call volumes increased in all of our comparator countries over the five years to 2014, except for Japan where volumes remained stable (at 201 billion minutes). The UK had the second lowest growth in voice call volumes (after the US), up by an average of 1.6% per year in the five years to 2014. Nigeria and Brazil had the fastest increases in mobile voice call volumes, up on average by 26.5% and 19.0% per year respectively. This is likely to be due to the increasing number of mobile connections.

**Figure 5.34 Mobile voice call volumes: 2009 and 2014**



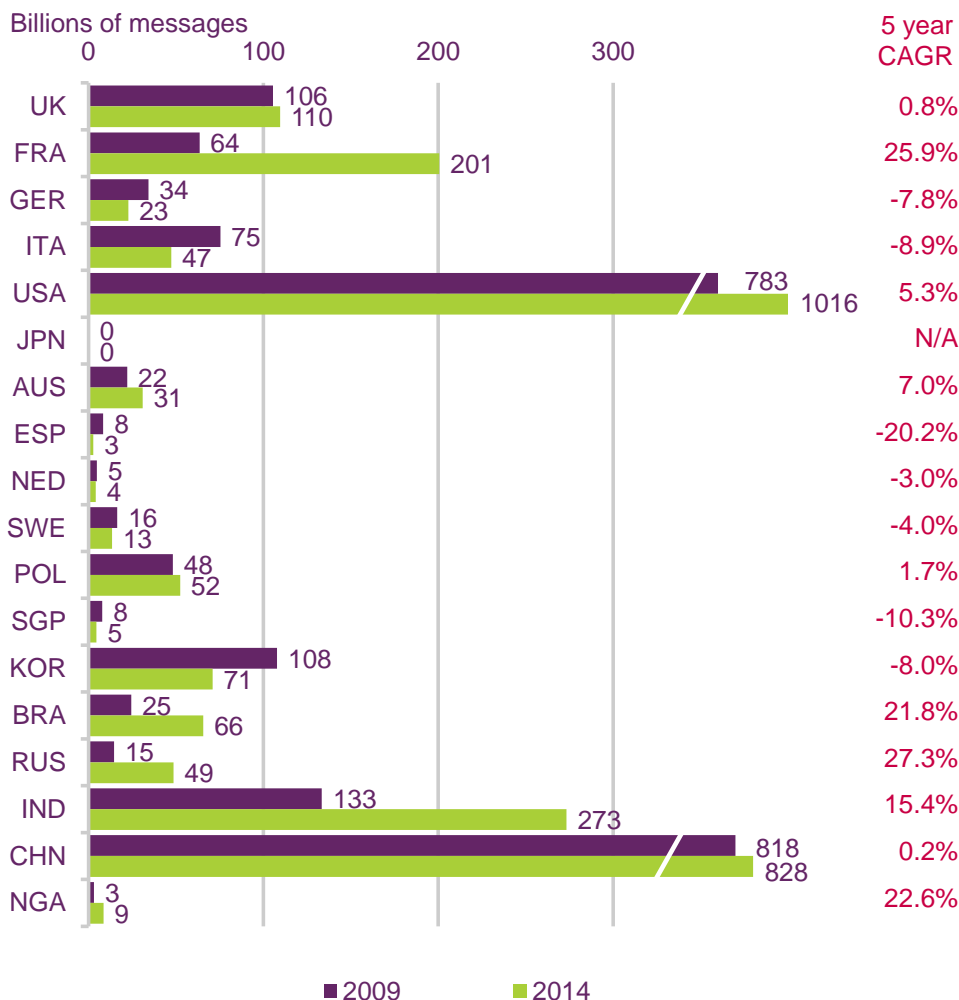
Source: IHS / industry data / Ofcom

### The US and China generated 66% of total mobile messaging volumes in 2014

Across all of our comparator countries, the total number of traditional mobile messages (including SMS and MMS) increased by an average annual rate of 4.3% to 2.8 trillion in the five years to 2014. There were variations in growth between the comparator countries, ranging from a 27.3% per year average increase in Russia to a 20.2% per year average decrease in Spain over the period (Figure 5.35). The UK had the second lowest increase in volumes in the five years to 2014, up on average by just 0.8% per year.

The number of mobile messages was highest in the US, at just over one trillion in 2014, followed closely by China, at 828 billion. Combined, these two countries accounted for 65.9% of the total mobile messaging volumes. Japan had the lowest messaging activity (less than 1 billion messages) as consumers there tend to use email and instant messaging rather than traditional mobile messaging services (see Figure 5.57). Mobile messaging volumes declined in 13 out of the 18 comparator countries in the year to 2014, including the UK (down 15.3%). Six countries had decreases of more than 20% in 2014 (Germany, Italy, Spain, the Netherlands, Singapore and South Korea). This fall was a result of increasing use of non-traditional communication methods, such as instant messaging.

**Figure 5.35 Mobile messaging volumes: 2009 and 2014**



Source: IHS / industry data / Ofcom

Note: Includes SMS and MMS messages; CAGR for Japan is negligible due very low messaging activity as consumers prefer email and instant messaging services rather than traditional services.

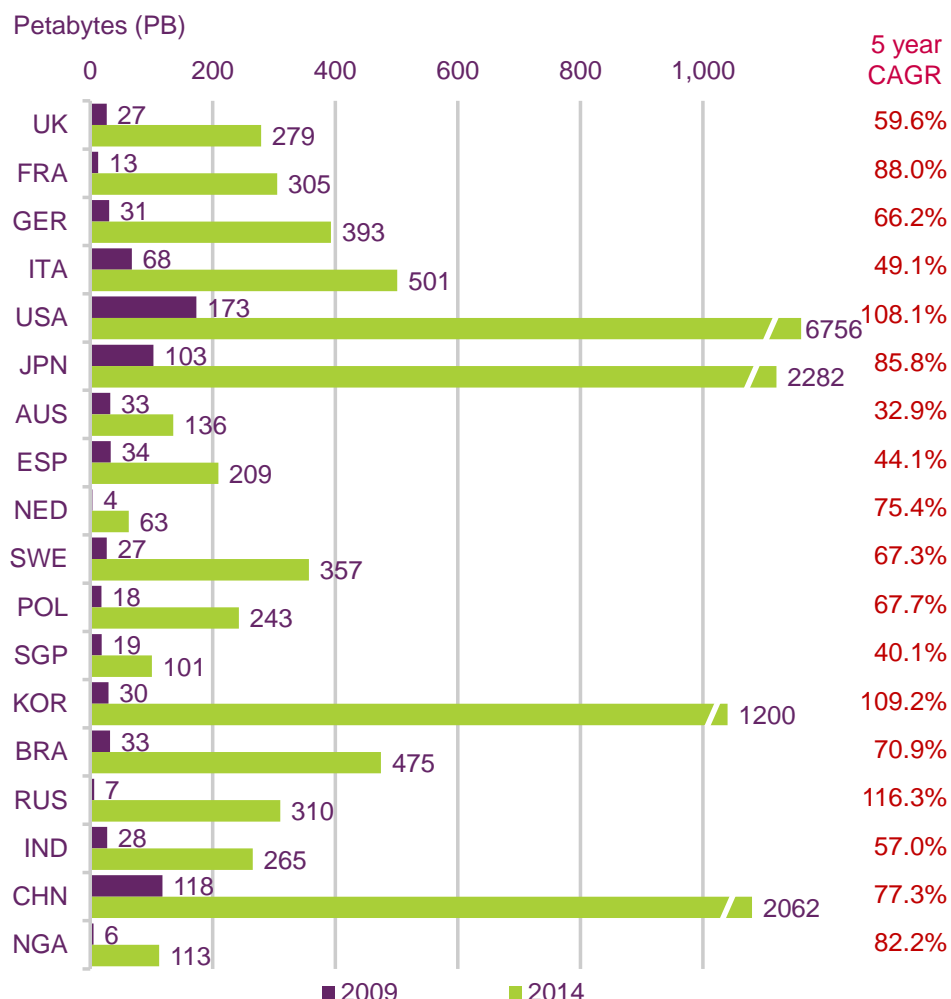
### Total comparator countries' mobile data volumes increased by 76% in 2014

According to data provided by IHS, mobile data use among our comparator countries totalled 16,049PB (16.0EB) in 2014, an increase of 6.9EB (75.8%) since 2013 (Figure 5.36). This rate of increase was slightly lower than the average annual increase in the five years to 2014 (83.6%), suggesting that the rate of growth in mobile data use may be slowing as smartphone take-up begins to plateau in some countries (more details regarding smartphone take-up can be found in Section 1.5.4 of this report).



In the UK, mobile data volumes increased ten-fold, from 27PB to 279PB, in the five years to 2014, representing an average annual rate of growth of 59.6% over this period. This was the sixth-lowest average rate of growth among our comparator countries: the average annual rate of growth during this period ranged from 32.9% in Australia to 116.3% in Russia. Information regarding average per-capita mobile data use can be found later in this chapter of the report (see Figure 5.61).

**Figure 5.36 Mobile data volumes: 2009 and 2014**



Source: IHS

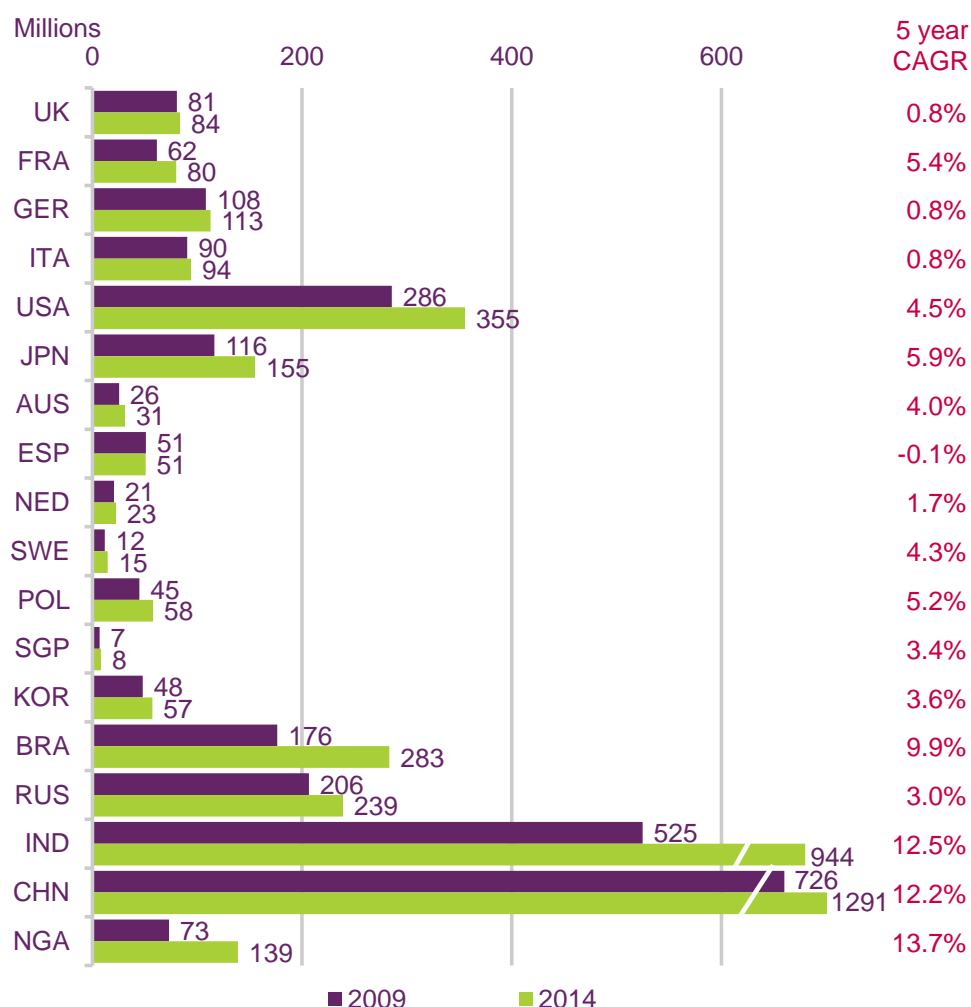
**Spain was the only country where mobile connections declined in the five years to 2014**

China had the highest number of mobile connections, at 1.3 billion, followed by India, at 944 million. Combined, these countries accounted for 55.6% of total mobile connections in 2014. The US had the highest number of mobile connections, among the developed countries, at 355 million. Singapore had the lowest number of mobile connections in 2014, at 8 million, up on average by 3.4% per year in the five-year period.

The total number of mobile connections increased by an annual average rate of 8.6% to four billion across our comparator countries in the five years to 2014 (Figure 5.37). The average annual increases were highest in Nigeria, India and China (at 13.7%, 12.5% and 12.2% respectively). Among our other comparator countries, where mobile markets tend to be more mature, the increases were much smaller over the same period. The UK (together with Germany and Italy) had the lowest average compound annual growth rate in the five years to

2014 among the comparator countries, at 0.8% a year, to 84 million connections, while Spain was the only country to have a slight decrease (down on average by 0.1% per year).

**Figure 5.37 Mobile connections: 2009 and 2014**



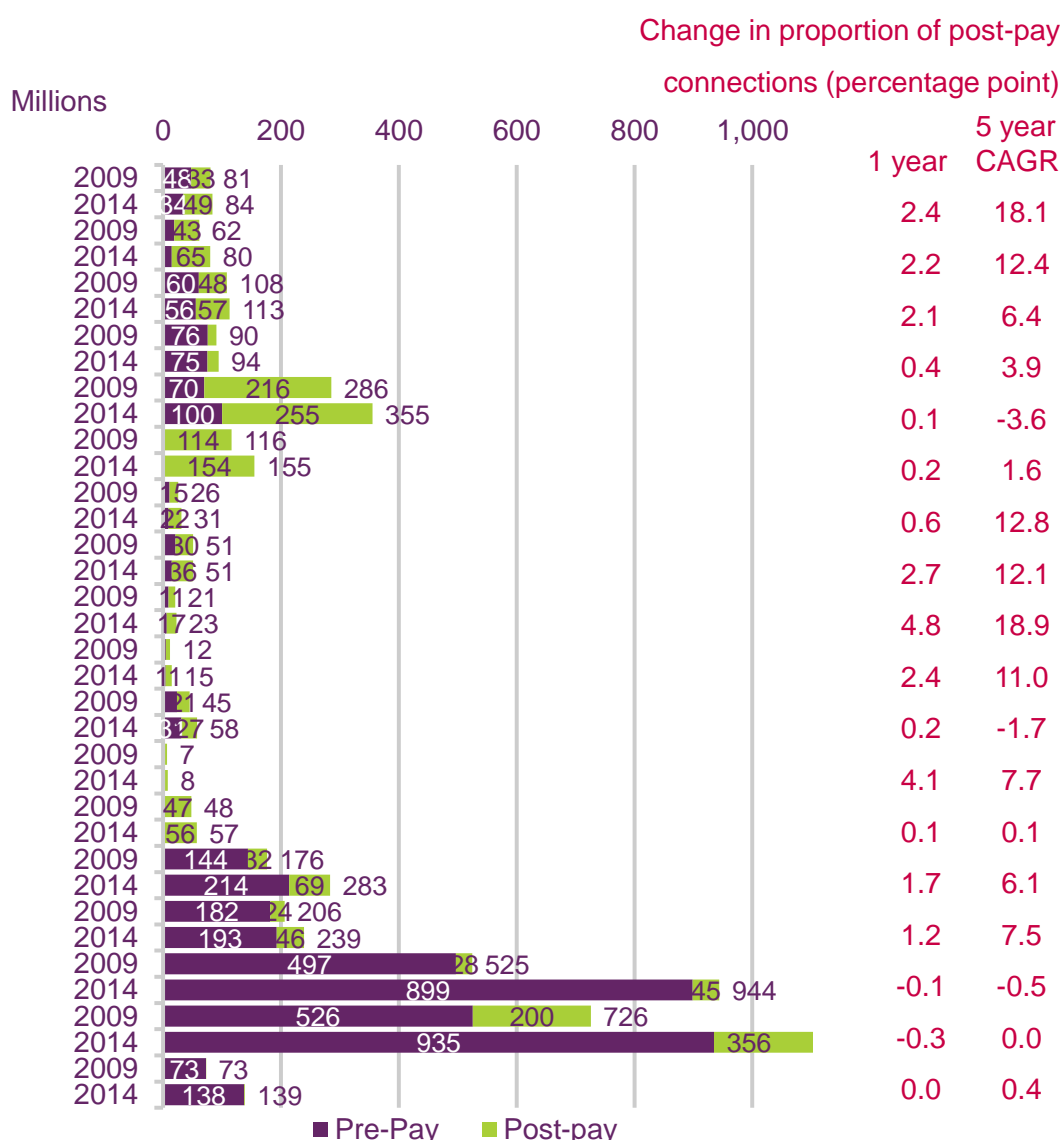
Source: IHS / industry data / Ofcom

### The UK had the second largest increase in the proportion of post-pay mobile connections in the five years to 2014

The proportion of mobile subscribers with post-pay (monthly) contracts grew in most of our comparator countries in the five years to 2014 (Figure 5.38). This proportion was highest in Japan, at 99.4% in 2014, followed by South Korea, at 98.0%. In the five years to 2014, the Netherlands had the largest increase in the proportion of mobile connections that were post-pay, up on average by 18.9pp a year to 74%. The UK had the second largest increase in the proportion of connections that were post-pay over the same period, up on average by 18.1pp per year.

The proportion of mobile connections that were pre-pay (pay-as-you-go) was highest in Nigeria, at 99.1% in 2014, followed by India, at 95.2%. In general, pre-pay connections tend to be more popular among developing countries, possibly because they give consumers more flexibility due to the lack of an ongoing financial obligation, as well as the increased likelihood of consumers not having easy access to a bank account.

**Figure 5.38 Mobile connections, by type: 2009 and 2014**



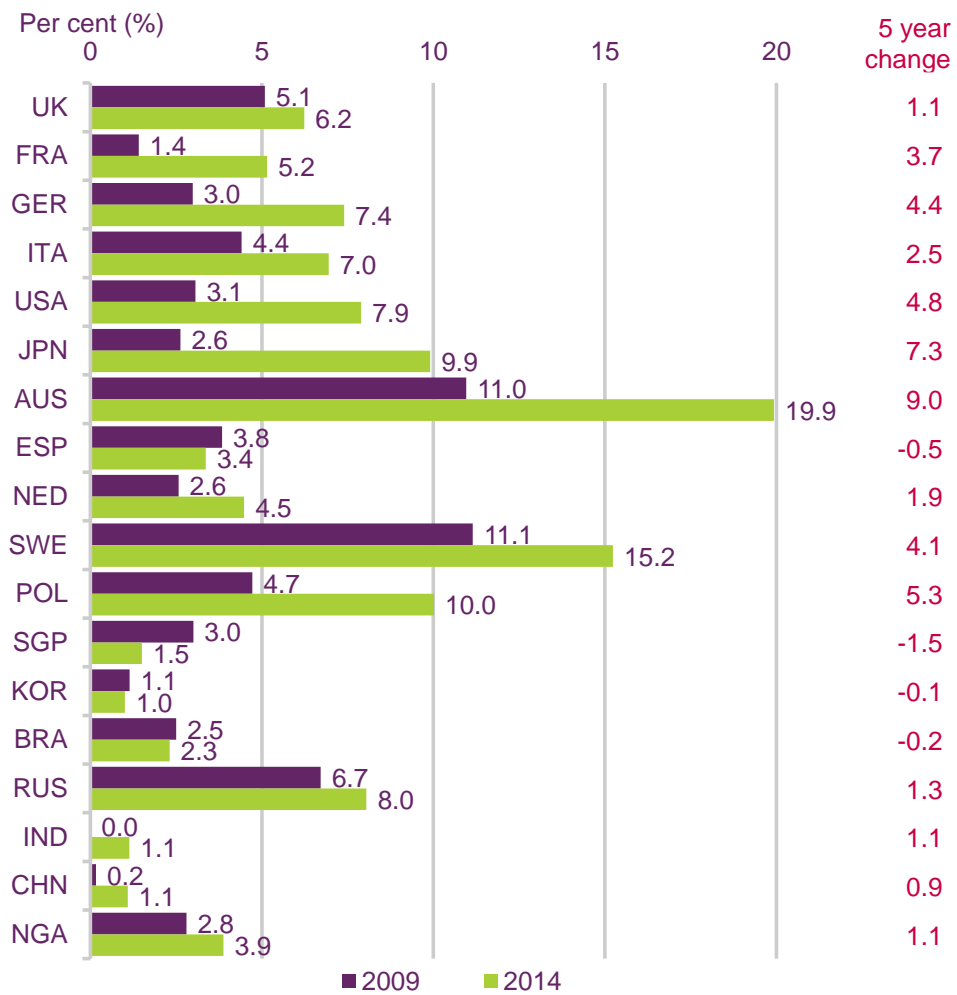
Source: IHS / industry data / Ofcom

**Australia had the highest proportion of mobile connections that were dedicated mobile broadband connections in 2014, at 19.9%**

The total number of dedicated data-only mobile broadband connections (such as mobile dongles and data-only SIMs) increased by an annual average rate of 20.8%, to 141 million, across our comparator countries in the five years to 2014. As a proportion of total mobile connections, dedicated mobile broadband connections increased from 2.1% in 2009 to 3.5% in 2014 in the comparator countries.

The proportion of mobile connections that were data-only was highest in Australia in 2014, at 19.9%, followed by Sweden, at 15.2%. Australia had the largest increase in data-only connections in the five years to 2014, up by 9.0pp, followed by Japan at 7.3pp. In the UK the proportion of dedicated mobile broadband connections increased by 1.1pp to 6.2% over the same period. By comparison, data-only mobile connections decreased in four countries over this period (Singapore, Spain, Brazil and South Korea). The largest decline was in Singapore, where the proportion of mobile connections that were dedicated mobile broadband connections halved between 2009 and 2014.

**Figure 5.39 Dedicated mobile broadband as a proportion of total mobile connections: 2009 and 2014**



Source: IHS / industry data / Ofcom

## 5.3 The telecoms user

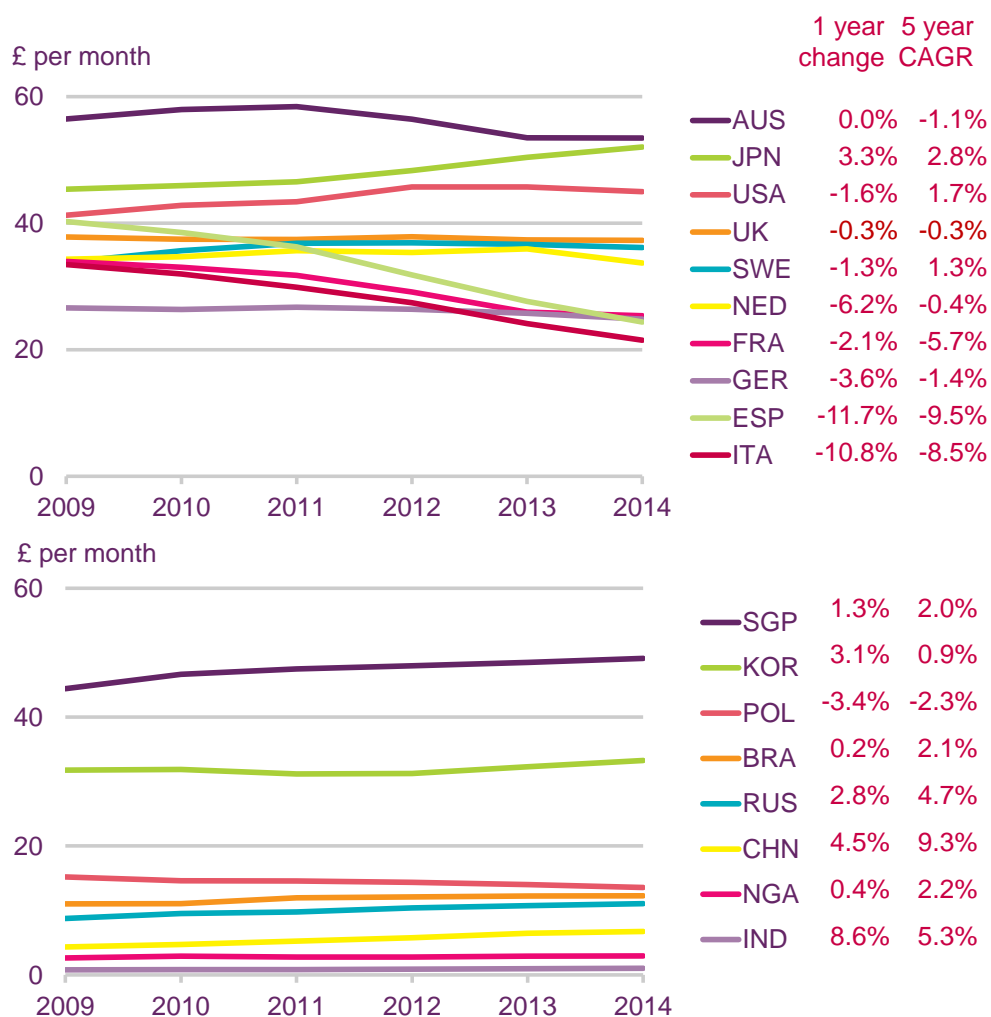
### 5.3.1 Overview

#### Per-capita monthly telecoms service revenues in the UK fell on average by 0.3% a year in the five years to 2014

The average monthly telecoms spend per person ranged from £1 in India to £53 per person in Australia among our comparator countries in 2014 (Figure 5.40). Average spend per month fell in nine out of our 18 countries during the year; the largest decline was in Spain, where average per-capita monthly spend fell by 11.7% to £24. Although average spend per head fell in the UK (by 0.3%) it was the fifth highest of all our countries, at £37 per person.

The BRIC comparators were the only countries in which revenues increased both over one year and over the five years to 2014. However, in absolute terms, revenues remained low in these countries. Revenues in the UK were down by an annual average rate of 0.3% over the five years to 2014.

**Figure 5.40 Per-capita monthly telecoms service revenue: 2009-2014**



Source: IHS / industry data / Ofcom

Note: Includes spend by businesses, and is therefore not representative of average consumer spend. All figures expressed in nominal terms.

## Regular use of mobile services was highest in Spain at 91% in 2015

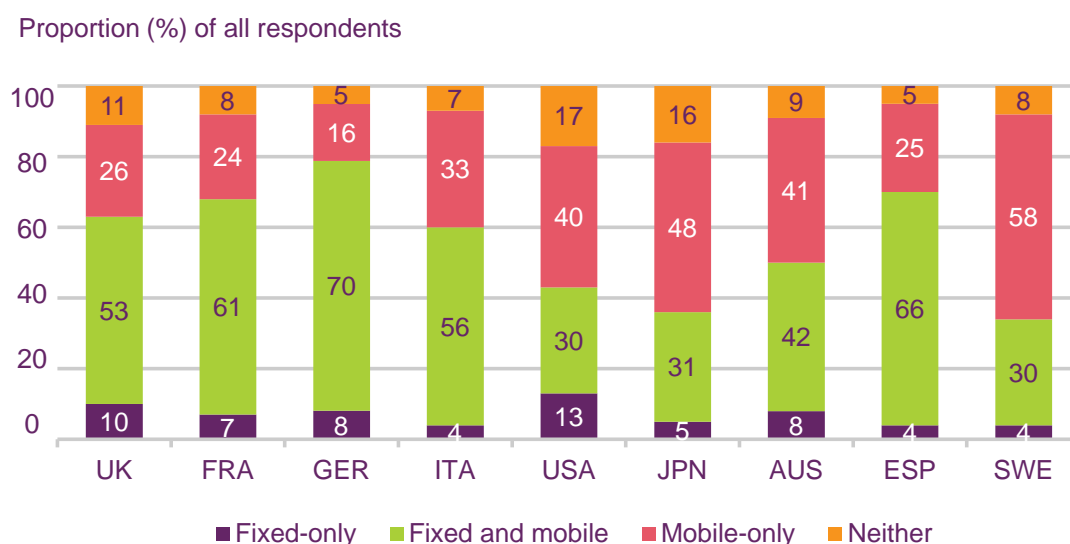
Out of the nine comparator countries in which our consumer research took place, the proportion of respondents who regularly used mobile services (either 'fixed and mobile' or 'mobile-only') was highest in Spain (91%) and lowest in the US (70%). By comparison, in the UK, 79% of respondents regularly used mobile services (in line with Japan).

The use of landline services (either 'fixed-only' or 'fixed and mobile') was highest in Germany (78%), followed by Spain (70%) and France (68%). This figure was 63% in the UK (the fourth highest out of the comparator countries). Only in three countries did less than half of respondents use landline services regularly in 2015: the US (43%), Japan (36%) and Sweden (34%). More respondents regularly used 'mobile-only' services in these countries than in the other comparator countries (at 40%, 48% and 58% respectively).

Regular use of both fixed and mobile voice services ranged from 30% in Sweden and the US to 70% in Germany which, along with Spain (66%), had a significantly higher proportion of use than any of the other comparator countries. Sweden had the highest proportion of 'mobile-only' users, at 58% (this was significantly higher than all other comparator countries). In the UK, just over twice as many respondents regularly used 'fixed and mobile' (53%) services as used 'mobile-only' (26%) in 2015.

The proportion of respondents who used neither fixed nor mobile services was significantly higher in the US and Japan than all other comparator countries, at 17% and 16% respectively. In the UK 11% of respondents did not use either service in 2015. In all other comparator countries, this figure was less than one in ten respondents.

**Figure 5.41 Regular use of fixed and mobile telephony services**



Source: Ofcom consumer research September – October 2015

Base: All respondents, UK=1006, FRA=1003, GER=1007, ITA=1003, USA=1009, JPN=1006, AUS=1000, ESP=1002, SWE=1004

Q.6 Which of the following do you regularly do (at least once a week?)

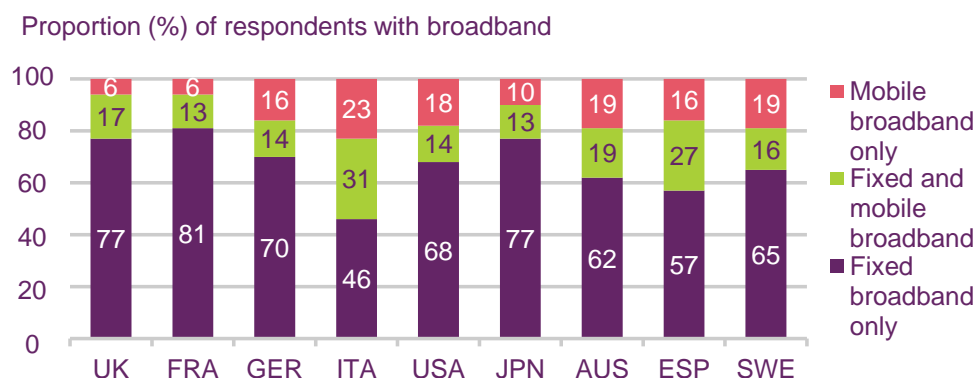
## Over half (54%) of broadband households in Italy used mobile data services in 2015

Italy was the only country out of the nine comparator countries where less than half of broadband households (46%) were 'fixed broadband only'. Instead, the majority (54%) of broadband households in Italy used mobile broadband services (either 'fixed and mobile

broadband' or 'mobile broadband only'). By comparison, use of mobile broadband services was lowest in France and the UK, at 19% and 23% of broadband households respectively.

The proportion of broadband households that were 'fixed broadband only' was greatest in France at 81% (significantly higher than all other comparator countries), followed by the UK and Japan (at 77% each). The UK and France had the lowest proportion of households that were 'mobile broadband only', both at 6% (significantly lower than all other comparator countries). By comparison, in Italy this figure is significantly higher than all other comparator countries, at 23%.

**Figure 5.42 Household take-up of fixed and mobile broadband data connections**



Source: Ofcom consumer research September – October 2015

Base: All respondents with broadband, UK=915, FRA=930, GER=842, ITA=861, USA=723, JPN=740, AUS=894, ESP=879, SWE=915

Q.3b Which of the following services do you have in your home?

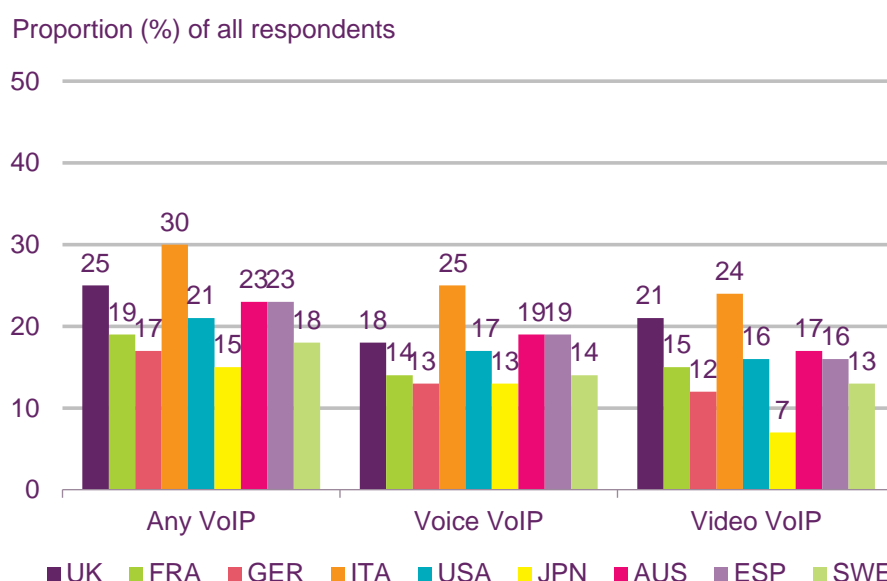
### A quarter of UK respondents used any OTT VoIP service at least once a week in 2015

Out of our nine comparator countries, the levels of use of any OTT VoIP services<sup>126</sup> at least once a week was highest in Italy, at 30% of respondents, with 25% for OTT voice VoIP and 24% for OTT video VoIP. The proportion of respondents in Italy who used any OTT VoIP services, and OTT voice VoIP, was significantly higher than in all other comparators in 2015.

In the UK, a quarter of respondents used any OTT VoIP services at least once a week, while more used video than voice (21% compared to 18% respectively). The UK and Italy had significantly higher proportions of respondents who used OTT video VoIP at least once a week than in any of the other comparator countries.

<sup>126</sup> Excludes managed VoIP services

**Figure 5.43 Use of OTT VoIP services at least once a week**



Source: Ofcom consumer research September – October 2015

Base: All respondents, UK=1006, FRA=1003, GER=1007, ITA=1003, USA=1009, JPN=1006, AUS=1000, ESP=1002, SWE=1004

Q.8 How often do you use an internet connection on any of your devices for each of the following activities? Making Voice/VoIP calls (e.g. Skype), Making video calls (e.g. Skype, Face Time): At least once a week.

### 5.3.2 Fixed voice services

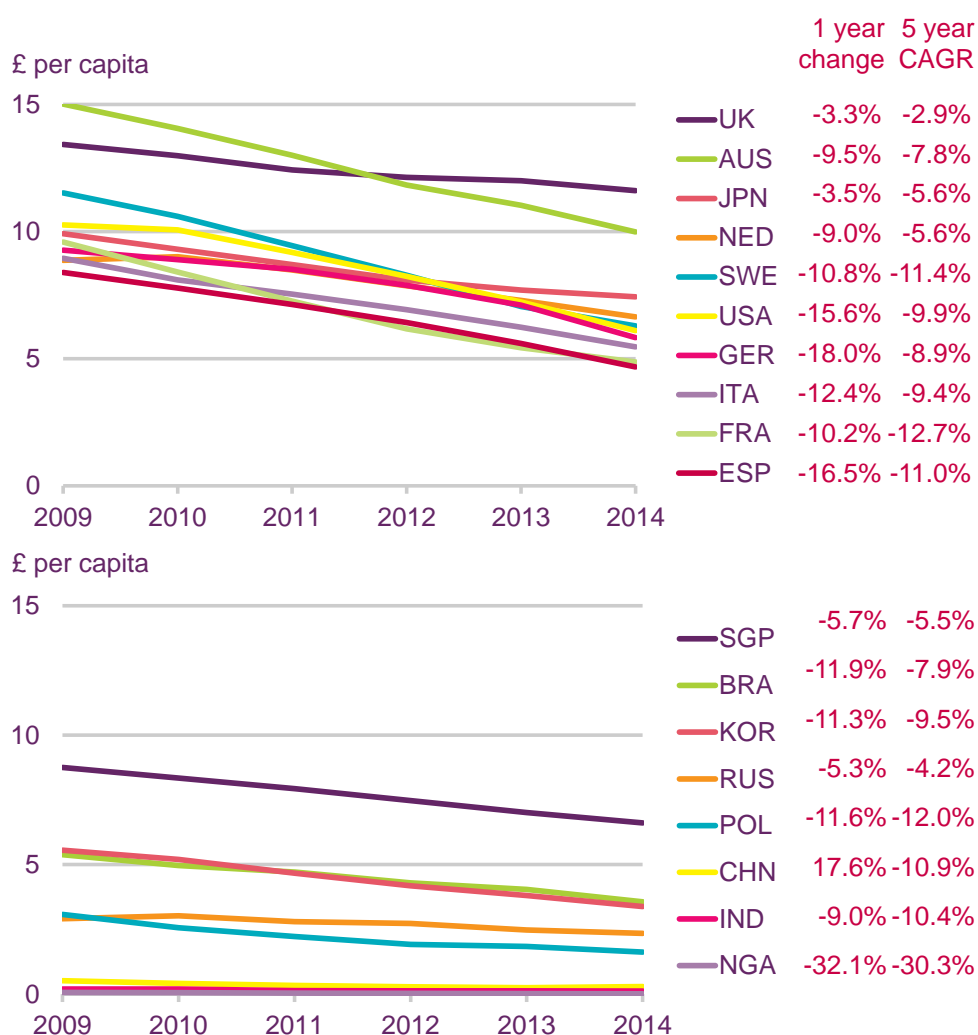
**The UK had the highest average per capita revenue for fixed voice services in 2014, at £11.57 per person per month**

Average per-capita spend on fixed voice services (including managed VoIP) declined in all of our comparator countries in the five years to 2014, with average rates of decline ranging from 2.9% per year in the UK to 30.3% per year in Nigeria (Figure 5.44). Average per-capita spend also fell year on year in all countries (the largest decline was in Nigeria, at 32.1%), except in China, where there was a 17.6% increase (although in absolute terms average per-capita fixed voice revenue in China is very low, at just £0.29 per month). This increase was mainly due to an increase in VoIP connections in 2014 (42.3%) (see Figure 5.10) and an increase in the average revenue per VoIP call minute (Figure 5.8).

The UK had the highest average per-capita revenue for fixed voice services among our comparator countries in 2014, at £11.57 per person per month, down 39 pence (3.3%) year on year. Average monthly fixed voice spend was lowest in Nigeria, at just 1 pence per person, because of low fixed voice service availability and take-up.



**Figure 5.44 Average monthly per-capita fixed voice revenue: 2009-2014**



Source: IHS / industry data / Ofcom

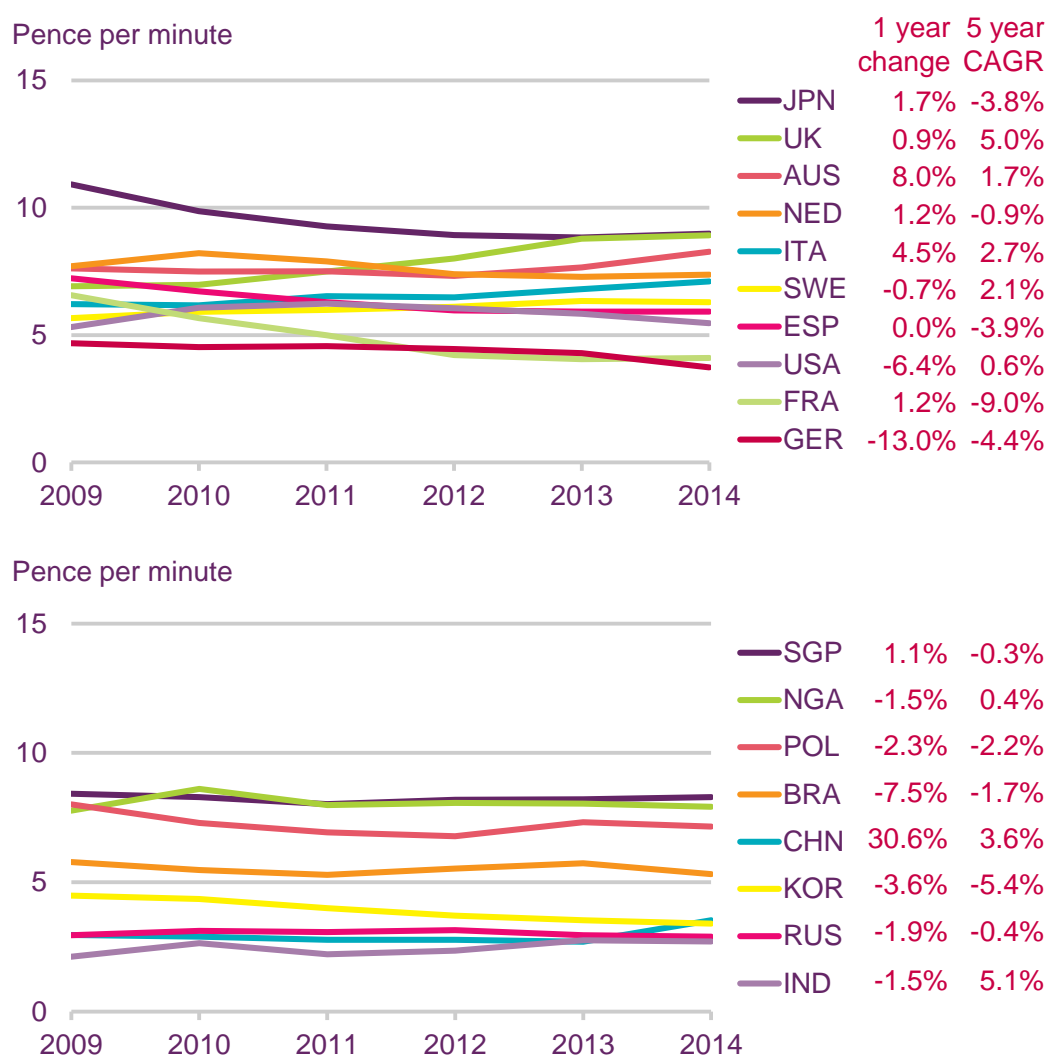
Note: Includes managed VoIP revenues. All figures expressed in nominal terms.

**The UK had the second highest average cost per fixed voice call minute among our comparator countries, at 8.8 pence per minute in 2014**

The average price per fixed voice call minute ranged from 2.7 pence in India to 9.0 pence in Japan in 2014 (Figure 5.45). The UK had the second highest average cost per fixed voice call minute among our comparator countries, at 8.8 pence per minute, up 0.9% compared to 2013. China had the largest increase in fixed voice prices in 2014 (up 30.6% to 3.5 pence), while Germany had the largest decline (down 13.0% to 3.7 pence per minute).

In the five years to 2014, India experienced the highest growth in fixed voice call prices among our comparators, up on average by 5.1% per year. The UK had the second highest average growth rate, at 5.0% per year over the same period. France had the steepest rate of decline in fixed voice prices, with the cost of a fixed call minute falling by an average of 9.0% a year. France's decline is due to a fall in both PSTN and VoIP volumes, as consumers shift to mobile services. Further information on communications service pricing can be found in Section 2.1 of this report.

**Figure 5.45 Average price of a fixed voice call minute: 2009-2014**



Source: IHS / industry data / Ofcom

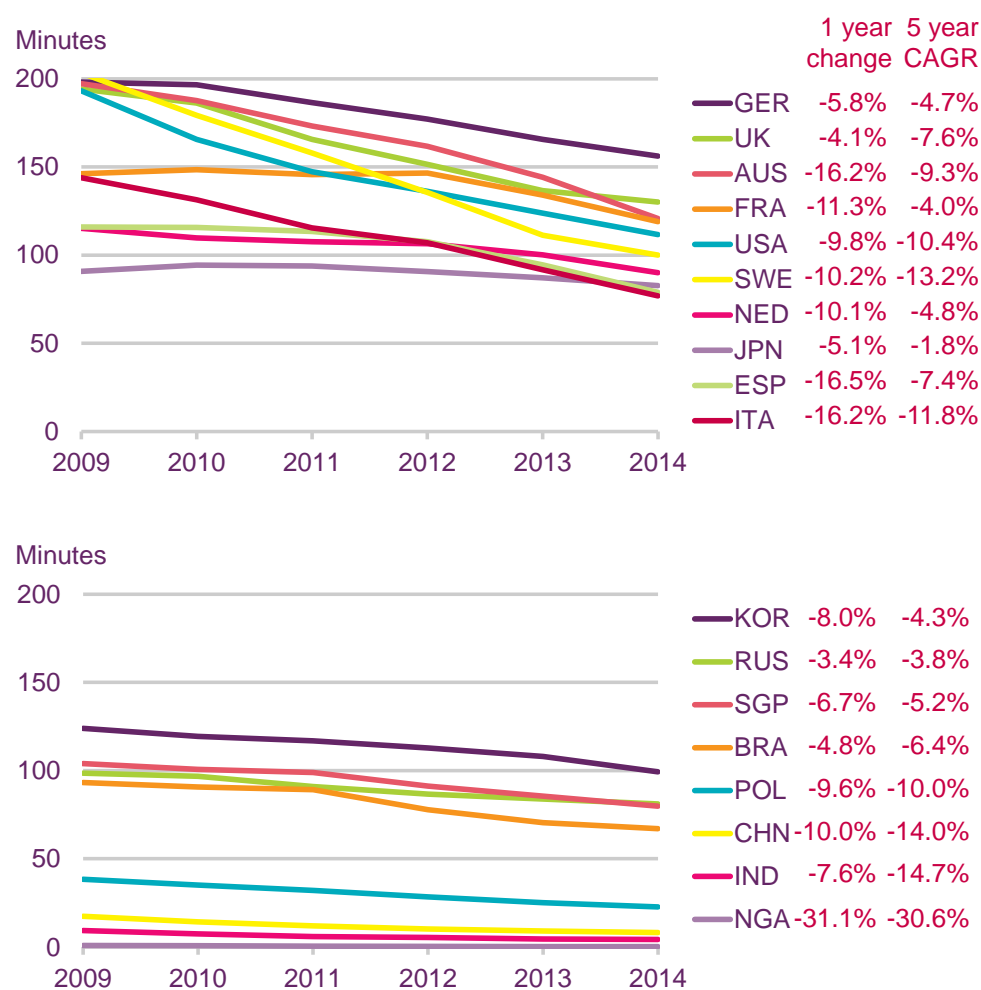
Note: Includes managed VoIP calls. All figures expressed in nominal terms.

### Average per-capita monthly fixed voice call minutes fell across the comparator countries

The average number of outgoing fixed call minutes per person ranged from less than one minute in Nigeria to 156 minutes in Germany in 2014 (Figure 5.46). The UK had the second highest average volume of outgoing fixed voice call minutes per person, at 131 minutes, down by six minutes (4.1%) compared to 2013.

Nigeria experienced the largest percentage decrease since 2013 in average per-capita fixed call use (down 31.1%). It also had the highest average annual decline in the five years to 2014 (down 30.6% per year). It is important to note, however, that as the average monthly fixed call use per person did not exceed one minute per month in Nigeria in that period, the large percentage decrease represents a very small decline in absolute terms. Out of all the comparator countries, Japan experienced the smallest average annual decline in per-capita fixed call volumes in the five years to 2014, at just 1.8% (to 83 minutes), while in Sweden volumes fell by 13.2% per year to 100 minutes over the same period.

**Figure 5.46 Per-capita monthly fixed voice call minutes: 2009-2014**



Source: IHS / industry data / Ofcom

Note: Includes managed VoIP calls.

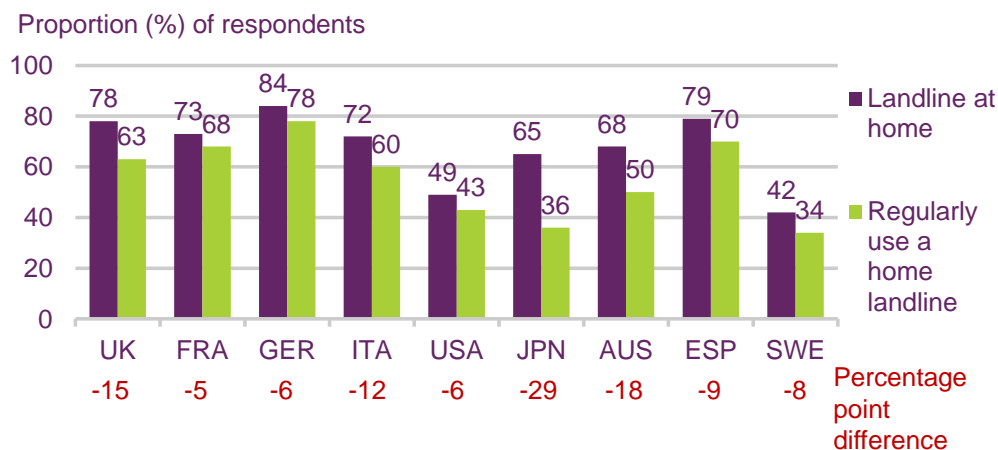
### **Fifteen per cent of respondents in the UK do not regularly use their household landline in 2015**

Figure 5.47 shows the proportion of respondents who had a fixed voice connection at home and those who were regular users of fixed telephony services. The difference between the two is indicative of the proportion of consumers who own a landline service in their household but do not regularly use it. In many countries a landline is often required to buy fixed broadband services, so many people may subscribe to a landline service even if they do not use it (or use it only infrequently). In the UK, Virgin Media (which offers cable broadband services to just under half of UK premises) is the only major ISP to offer fixed broadband without the requirement for a fixed voice connection, whereas in some countries (such as France) naked DSL and fibre services (which do not require a landline of any description) are available.

The proportion of internet users who had a home landline ranged from 42% in Sweden to 84% in Germany, among the nine comparator countries (the UK had the third highest proportion, at 78%). At the same time, the proportion of internet users who regularly (i.e. at least once a week) used landline services at home ranged from 34% in Sweden to 78% in Germany (in the UK it was 63%). Japan had the largest difference (29pp) between the proportion of people who had a home landline and used it regularly, while in France this

difference was just 5pp, implying that a large majority of those who had a landline used it regularly. In the UK, the difference between the proportion of people who had a home landline and who used it regularly was 15pp.

**Figure 5.47 Household take-up and personal use of fixed telephony services**



Source: Ofcom consumer research September - October 2015

Base: All respondents, UK=1006, FRA=1003, GER=1007, ITA=1003, USA=1009, JPN=1006, AUS=1000, ESP=1002, SWE=1004

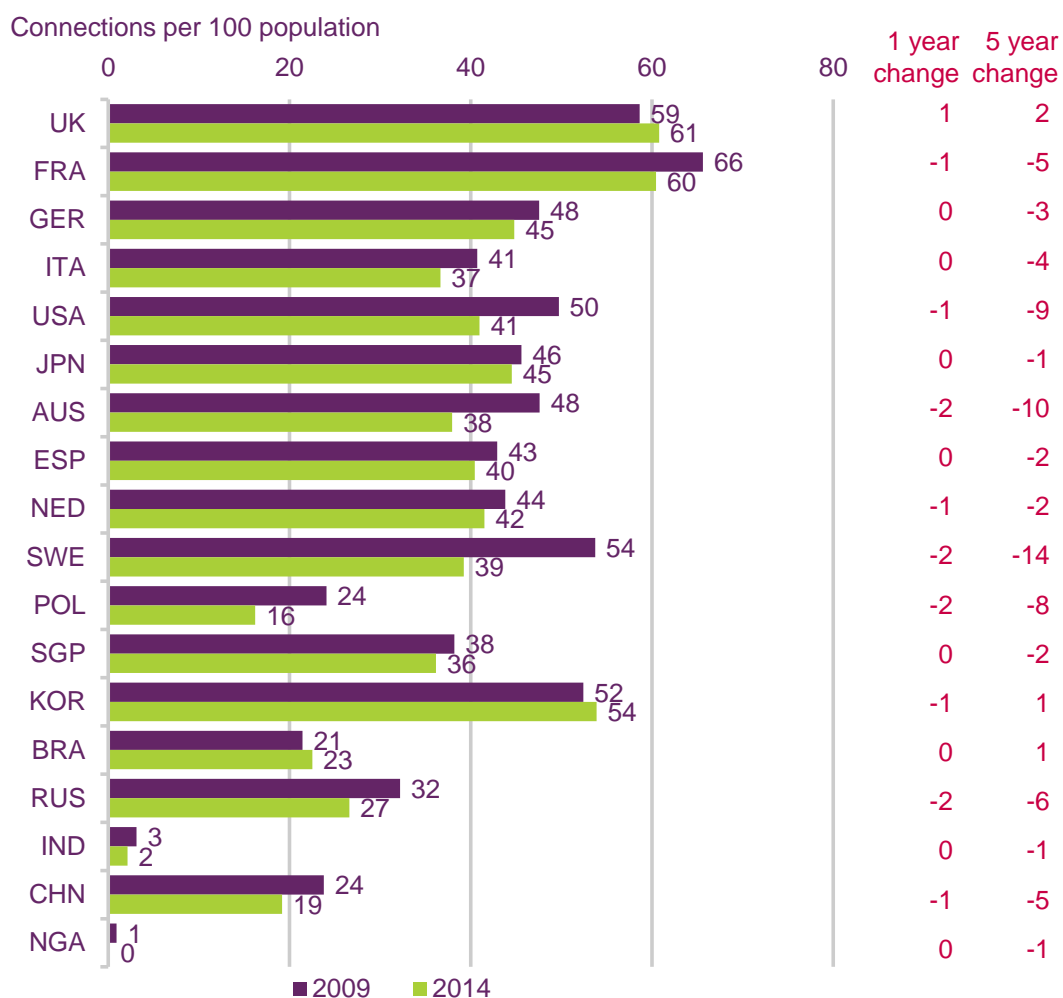
Q.3b Which of the following services do you have in your home? Q.6: Which of the following do you regularly do (at least once a week)?

**The UK had the highest number of fixed voice connections per 100 people out of all the comparator countries in 2014**

The UK had the highest number of fixed voice connections per 100 people (including PSTN lines and managed VoIP connections) of all the comparator countries at the end of 2014, at 61 connections, up by one connection since 2013 (Figure 5.48). This places it ahead of France, which fell by six connections since 2009 to 60 connections per 100 people in 2014.

Nigeria had the lowest take-up of fixed voice services at the end of 2014, with less than one connection per 100 people, followed by India with just over 2 connections. This is likely to be due to the lower availability of fixed telecoms infrastructure in these countries. The UK was the only EU5 country, and one of three comparator countries (together with South Korea and Brazil), where the number of fixed voice connections per 100 people increased in the five years to 2014 (up by two connections). Sweden experienced the largest fall; the number of fixed voice connections fell by 14 connections per 100 people to 39 connections during this period, mainly as a result of the increasing use of mobile services.

**Figure 5.48 Fixed voice connections per 100 population: 2009 and 2014**



Source: IHS / industry data / Ofcom  
 Note: Includes managed VoIP connections

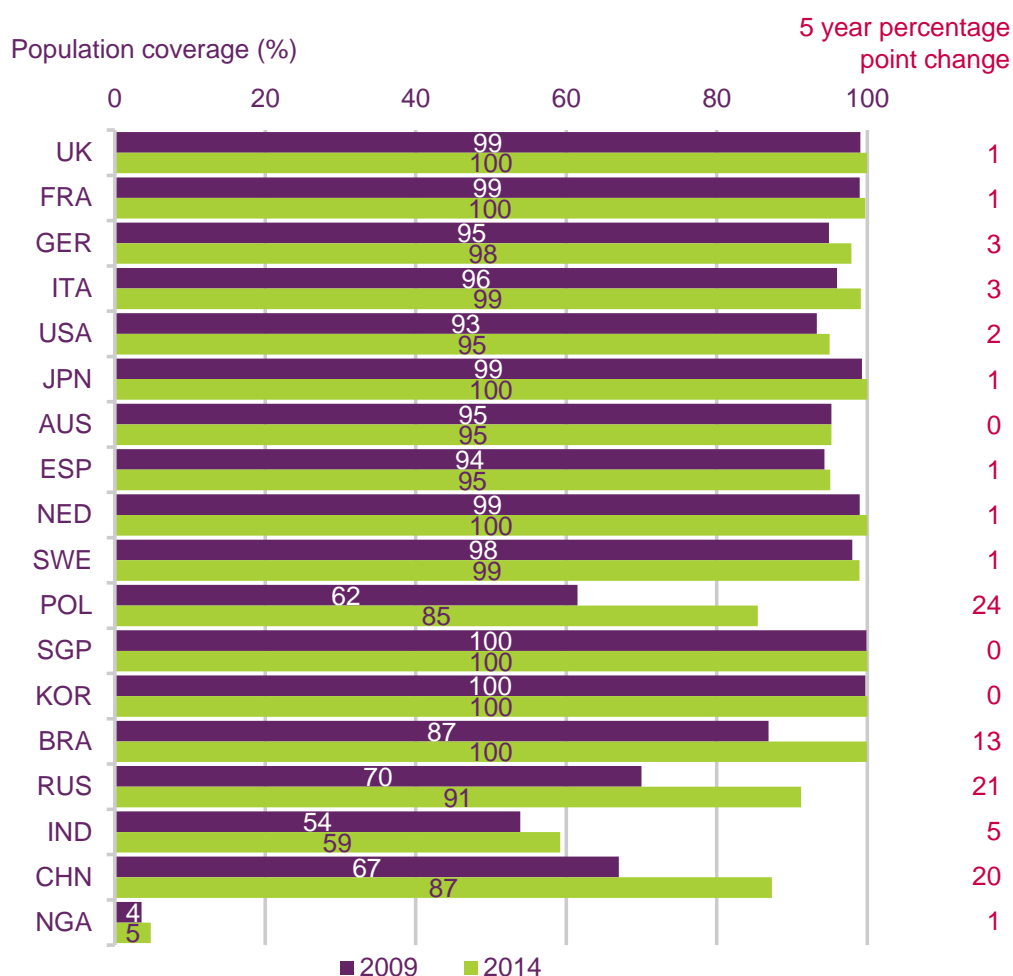
### 5.3.3 Fixed broadband services

#### Fixed broadband services were available to at least 95% of the population in most of our comparator countries in 2014

In most of our comparator countries, broadband services were available to the majority of the population at the end of 2014. The exception was Nigeria, where broadband was available to just 5% of the population. The UK was one of seven of our 18 comparator countries (along with France, Japan, the Netherlands, Singapore, Korea and Brazil) where broadband was available to over 99% of the population in 2014.

Fifteen comparator countries experienced an increase in fixed broadband availability in the five years to 2014, while availability in Australia remained unchanged over this period (at 95%). Fixed broadband population availability increased by over 20pp in Poland, Russia and China between 2009 and 2014; the largest increase during this period was in Poland, up by 24pp to 85%.

**Figure 5.49 Fixed broadband availability: 2009 and 2014**



Source: IHS / industry data / Ofcom

**With the exception of Italy and Nigeria, average per-capita fixed broadband revenue increased in all of our comparator countries in the five years to 2014**

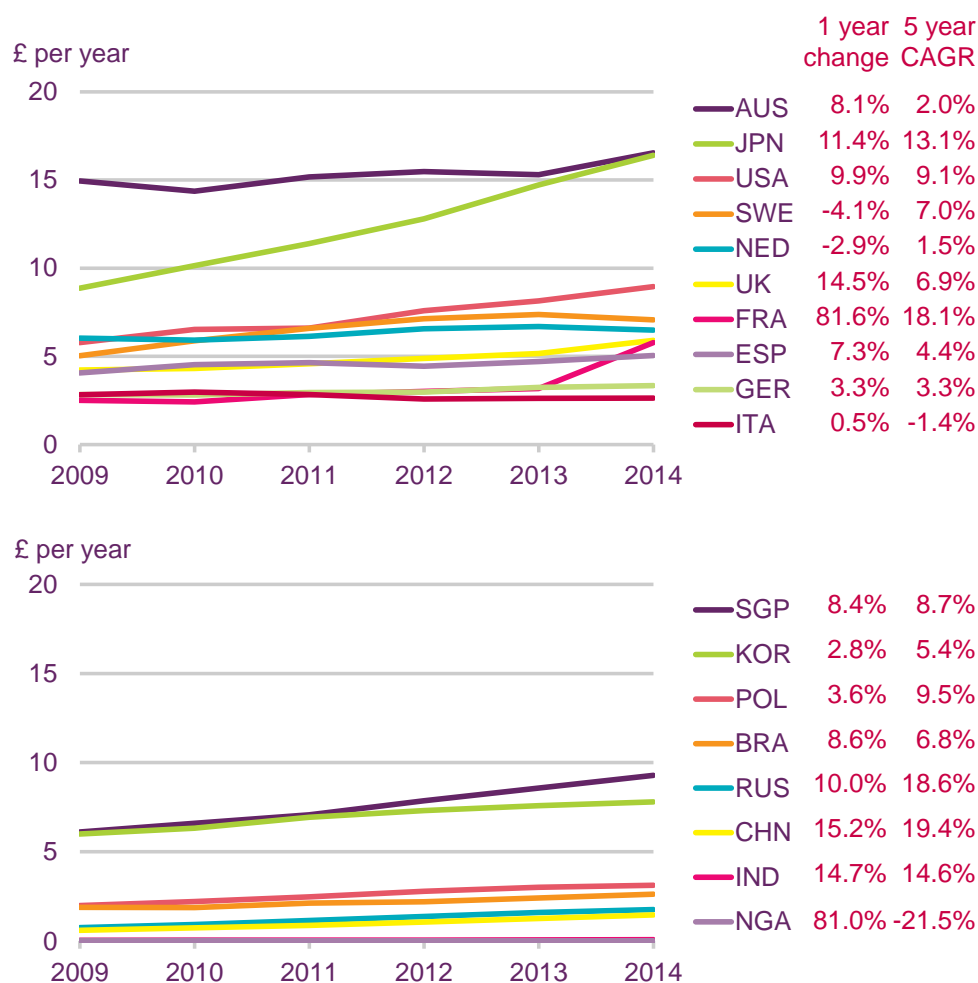
Average per-capita monthly fixed broadband revenue was highest in Australia at £17 per person in 2014, closely followed by Japan at £16 per person. In the UK, average fixed broadband revenue averaged £6 per person, equal with France and the Netherlands.

In the five years to 2014, average per-capita fixed broadband revenues increased in 16 of our 18 comparator countries. China had the greatest increase, up on average by 19.4% per year, although in absolute terms per-capita revenue was still very low, at just over £1 per person. In the UK, average spend per person on fixed broadband services increased by an average of 6.9% per annum over the same period. Average per-capita fixed broadband spend fell in Italy in the five years to 2014, down by an average of 1.4% per year. This was mainly due to the population increasing at a higher rate than the fixed broadband revenue. Average spend also fell in Nigeria, at an average rate of 21.5% per year over the same period.

The majority of comparator countries had an increase in average per-capita fixed broadband spend in 2014, with the largest increase in France, up 81.6% , followed by Nigeria at 81.0% (although in absolute terms this was still less than 1 pence per person). By comparison, the UK had a 14.5% increase in average per-capita revenue in 2014. Sweden and the

Netherlands were the only two comparator countries where average per-capita revenue fell in 2014 (at 4.1% and 2.9% respectively).

**Figure 5.50 Average per-capita fixed broadband revenue: 2009-2014**



Source: IHS / industry data / Ofcom  
 Note: All figures expressed in nominal terms.

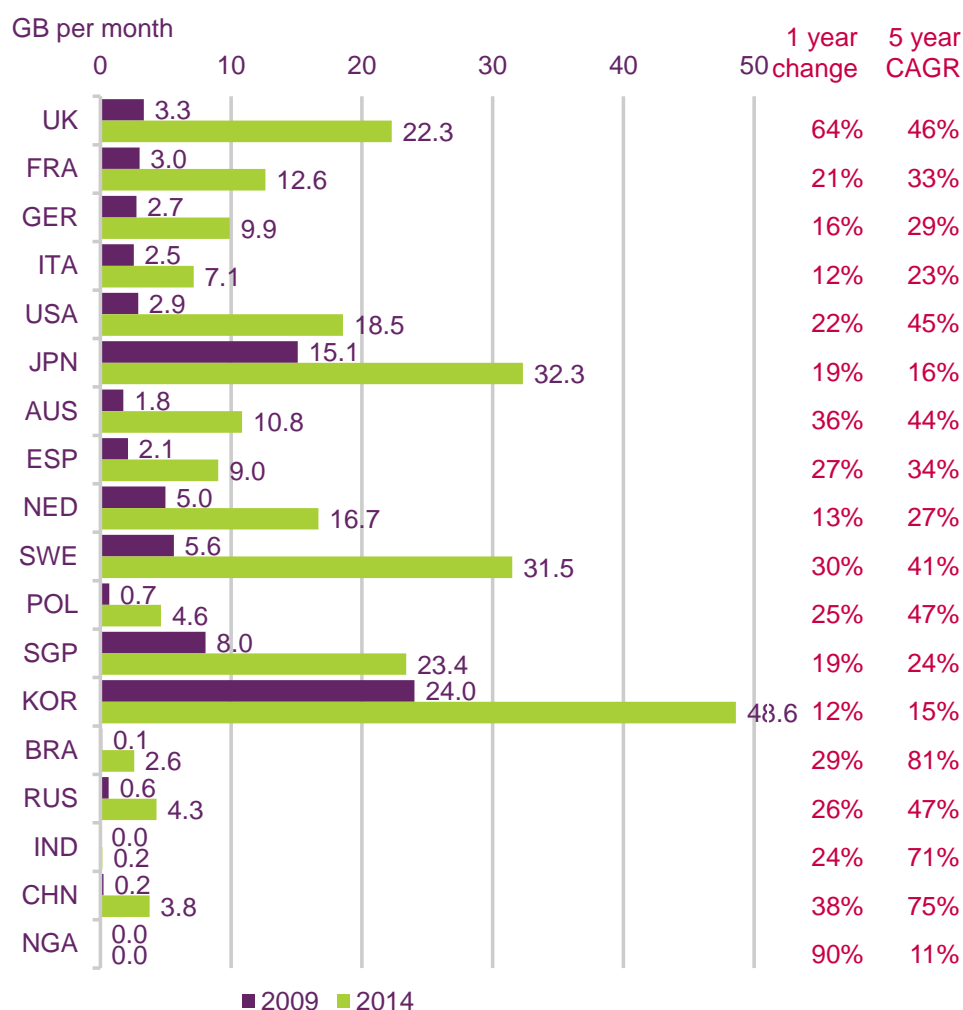
**Average monthly fixed broadband data volumes per person increased in all comparator countries in 2014**

Average monthly per-capita fixed broadband data use was highest in South Korea at 48.6GB per person in 2014 (over twice that in 2009), followed by Japan at 32.3GB per person (also more than double the 2009 average) and Sweden at 31.5GB per person. Of our 18 comparator countries, the UK had the fifth highest average data volumes in 2014, at 22.3GB per person, up 64% on the previous year. Although Nigeria had the greatest increase in volumes in 2014, at 90.0%, in absolute terms this equates to less than 1MB per person (the lowest volume of all our comparator countries).

All of our comparator countries recorded an increase in average per-capita data use in the five years to 2014. Growth was highest in Brazil (averaging 81% per year) and in China (75% per year); although in absolute terms this translates to low volumes of data use in these countries (2.6GB per person and 3.8GB per person respectively). In the UK, use of data increased by an average of 46% a year per person over the same period. This is likely due to the increasing popularity and availability of video-on-demand (VOD) services, both

free to access services (for example, BBC iPlayer and All4), and subscription services (such as Netflix and Amazon Prime Instant Video).

**Figure 5.51 Average monthly fixed broadband data volume per person: 2009-2014**



Source: IHS / industry data / Ofcom

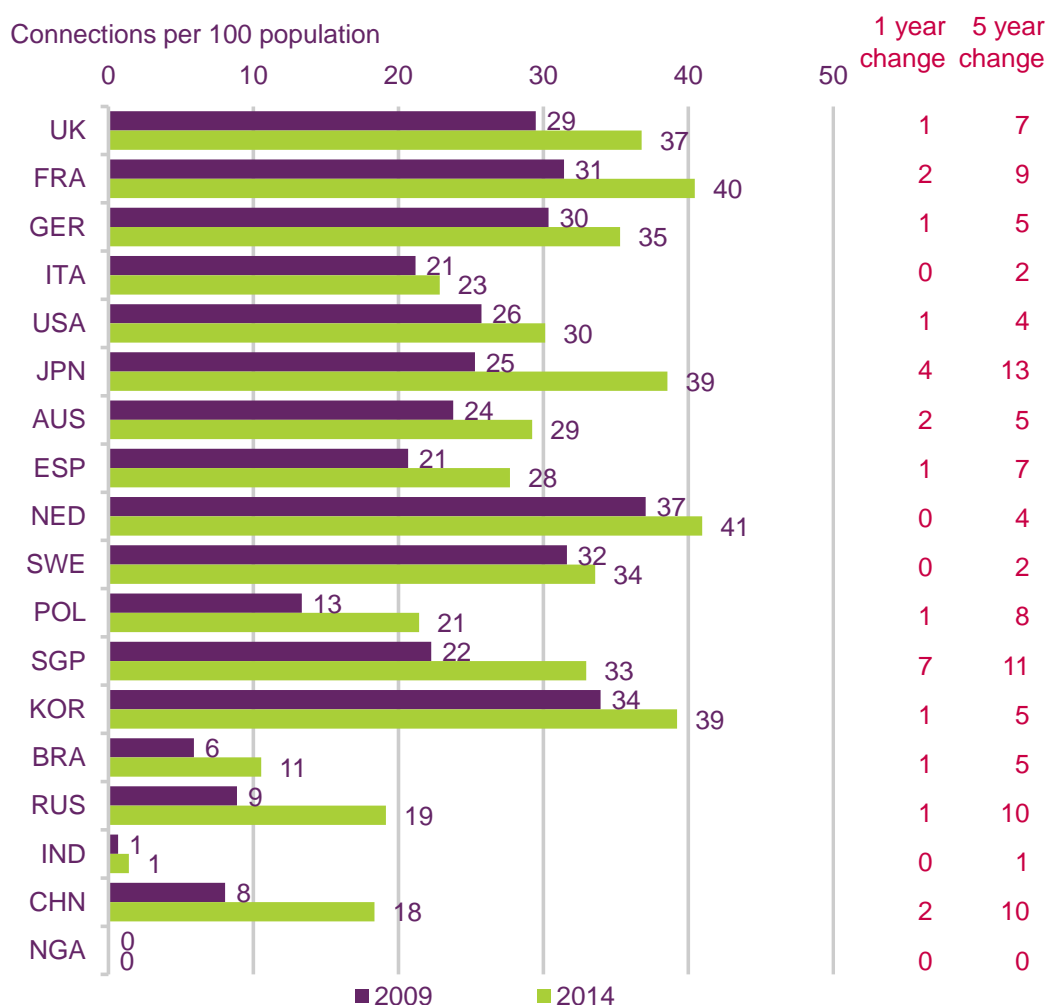
**The number of fixed broadband connections per 100 people increased in all comparator countries between 2009 and 2014**

In 2014, the number of fixed broadband connections per 100 population was lowest in Nigeria (less than one connection), and highest in the Netherlands (at 41 connections). The comparatively low take-up in Nigeria is a result of the low availability of fixed broadband services and Nitel being declared inactive. In the Netherlands, fixed broadband take-up has been the highest among our comparator countries for some time, partly as a result of high cable coverage and take-up. The UK had the fifth highest number of fixed broadband connections out of our 18 comparator countries in 2014, at 37 connections per 100 people (up by one connection per 100 people in a year to 2014), behind Japan and South Korea (both at 39 connections), and France, the second highest, (at 40 connections).

The number of per capita fixed broadband connections increased in all of our comparator countries in the five years to 2014, with the highest growth between 2009 and 2014 being in Japan, up 13 connections, from 25 to 39 connections per 100 population over this period. In the UK, the number of per capita connections increased by seven connections over the same period.



**Figure 5.52 Fixed broadband connections per 100 population: 2009-2014**



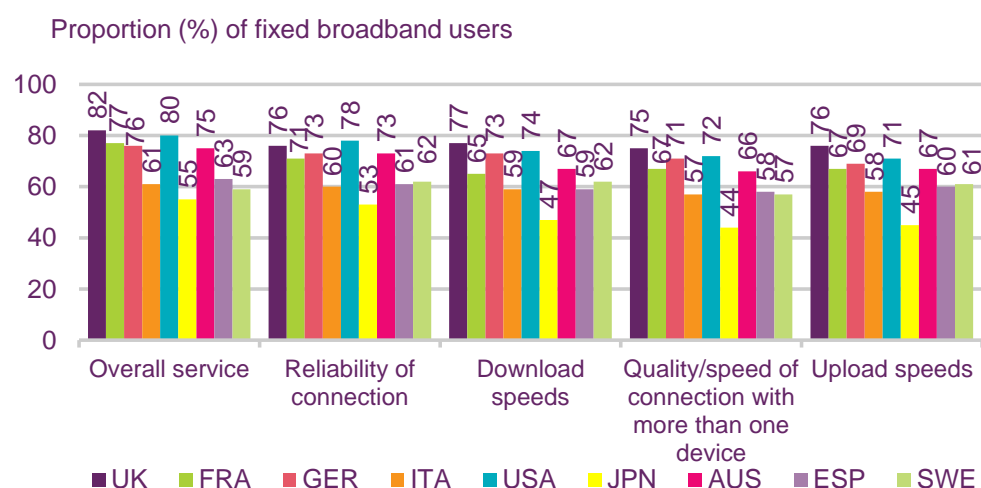
Source: IHS / industry data / Ofcom

**Out of all our comparator countries, satisfaction with the overall service of household fixed broadband service was highest in the UK in 2015, at 82%**

Figure 5.53 shows the proportion of fixed broadband users in nine of our comparator countries who said that they were either ‘very’ or ‘fairly’ satisfied with various aspects of their service. In the UK, 82% of respondents were satisfied with their overall service, the highest proportion among these countries. At least three-quarters of respondents in the UK were also satisfied with every other measure of fixed broadband service.

Among these nine countries, respondents in Japan were the least satisfied; just over 50% of respondents were satisfied with their service overall and with the reliability of their connection (55% and 53% respectively), while less than half of respondents were satisfied with download and upload speeds and the quality/speed of their connection when using multiple devices at the same time.

**Figure 5.53 Satisfaction with fixed broadband service**



Source: Ofcom consumer research September – October 2015

Base: All respondents with fixed broadband, UK=862, FRA=874, GER=704, ITA=661, USA=588, JPN=663, AUS=727, ESP=735, SWE=741

Q.30 To what extent are you satisfied or dissatisfied with the following aspects of your current home broadband service?

### 5.3.4 Mobile voice and data services

#### South Korea and the Netherlands were the only comparator countries where all three main mobile technologies covered 100% of the population

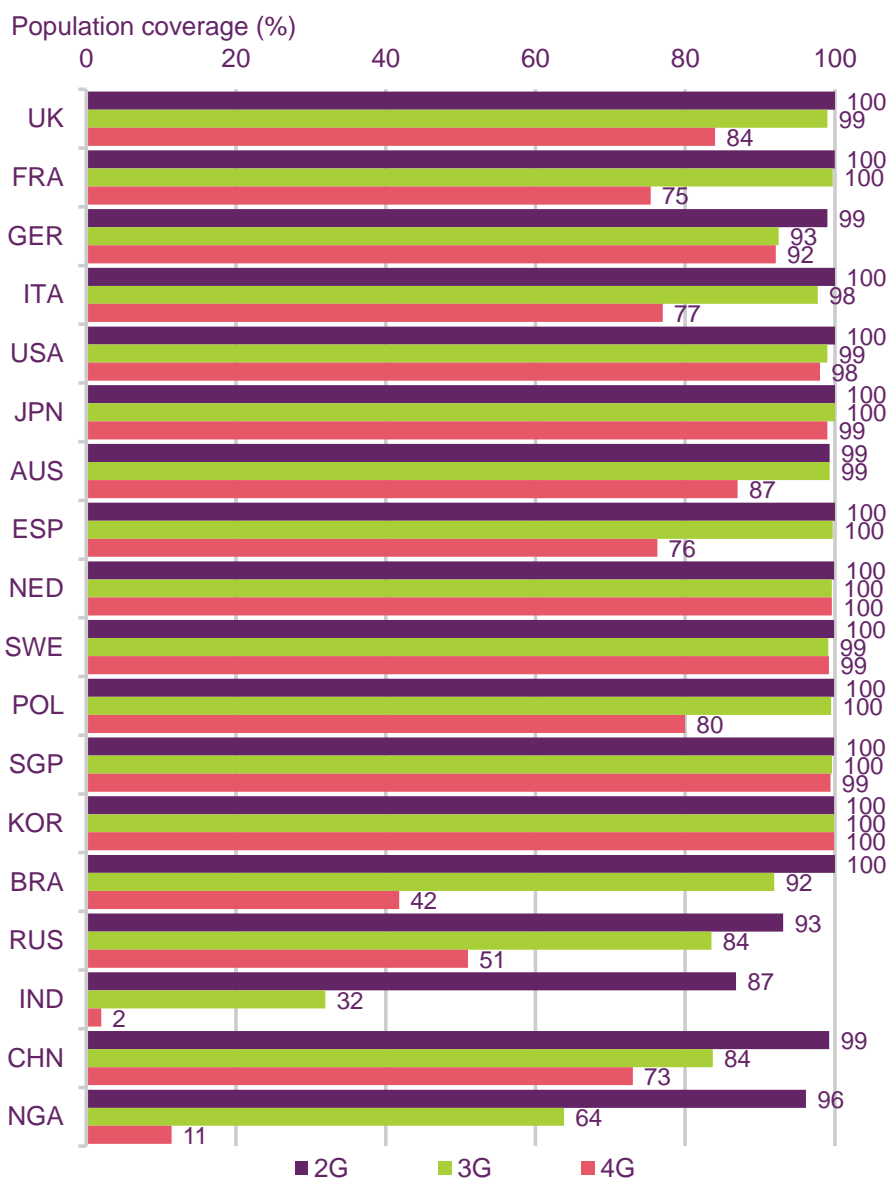
Mobile network availability varied widely across our comparator countries at the end of 2014, with five countries (South Korea, the Netherlands, Japan, Sweden and Singapore) having 99% or higher population coverage of all three mobile network technologies (2G, 3G and 4G; see Figure 5.54). Fifteen of our 18 comparator countries had 2G population coverage at 99% or higher: only in India, Russia and Nigeria was 2G availability lower, at 87%, 93% and 96% of their respective populations.

Third-generation (3G) mobile availability was also high in the majority of comparator countries, with seven countries having population coverage of over 99% at the end of 2014 (it was 99% in the UK<sup>127</sup>). Only in India was 3G coverage available to less than half of the population (at 32%). In Germany, 3G coverage was lower compared to other developed countries (at 93%) as each 3G licence holder has an obligation to cover only 50% of the population, and there is no guidance regarding network overlap.

The availability of 4G long term evolution (LTE) mobile services varied more widely than that of 2G and 3G services, ranging from 2% coverage in India to 100% in the Netherlands and South Korea. This variance is mainly due to the fact that 4G technology is still being deployed in many countries. The UK had the ninth highest 4G population coverage, at 84%. Further information on 4G services can be found in Section 1.5.

<sup>127</sup> This was based on coverage by at least one operator

**Figure 5.54 2G, 3G and 4G mobile network availability: 2014**



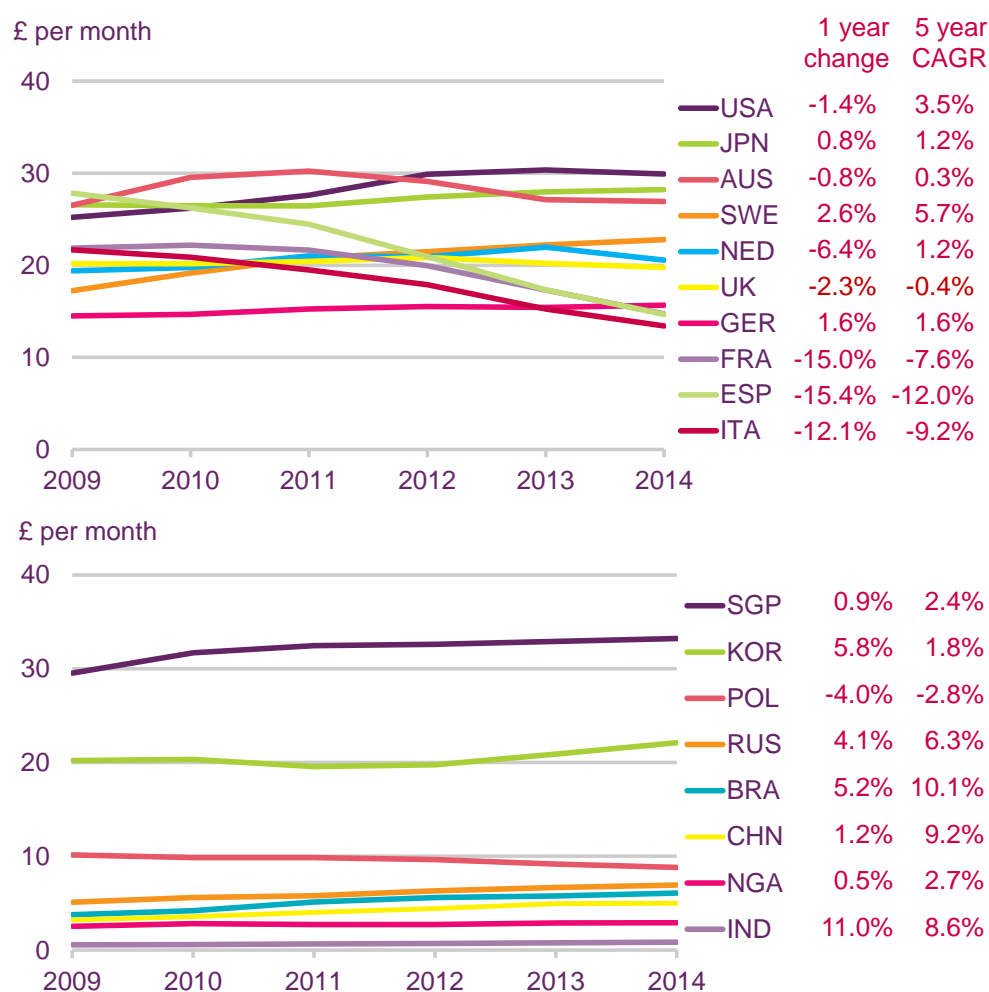
Source: IHS / industry data / Ofcom

**Average per-capita retail mobile spend was highest in Singapore in 2014, at £33 per month**

Per-capita spend on mobile services ranged from less than £1 per month in India to £33.22 per month in Singapore in 2014 (Figure 5.55). In the UK, spend was £19.75 in 2014, the eighth highest spend out of our comparator countries.

The average annual growth of mobile spend per person varied widely over the five years to 2014, ranging from a 12.0% per year average decrease in Spain to a 10.1% year-on-year average increase in Brazil. In the UK, revenues fell by an average of 0.4% per year over the same period. The UK was one of eight comparator countries where average monthly mobile retail revenue per person decreased since 2013, down 2.3% since 2013. The decrease in the UK was likely to be due to declining messaging revenue (down 28%) and falling data prices. The largest annual decrease in 2014 was in Spain (down 15.4%), while India had the largest increase (up 11.0%).

**Figure 5.55 Average per-capita monthly retail mobile revenue: 2009-2014**



Source: IHS / industry data / Ofcom

Note: All figures expressed in nominal terms. All figures expressed in nominal terms.

### Japan had the highest per-capita mobile data revenue, 99% of which came from mobile internet

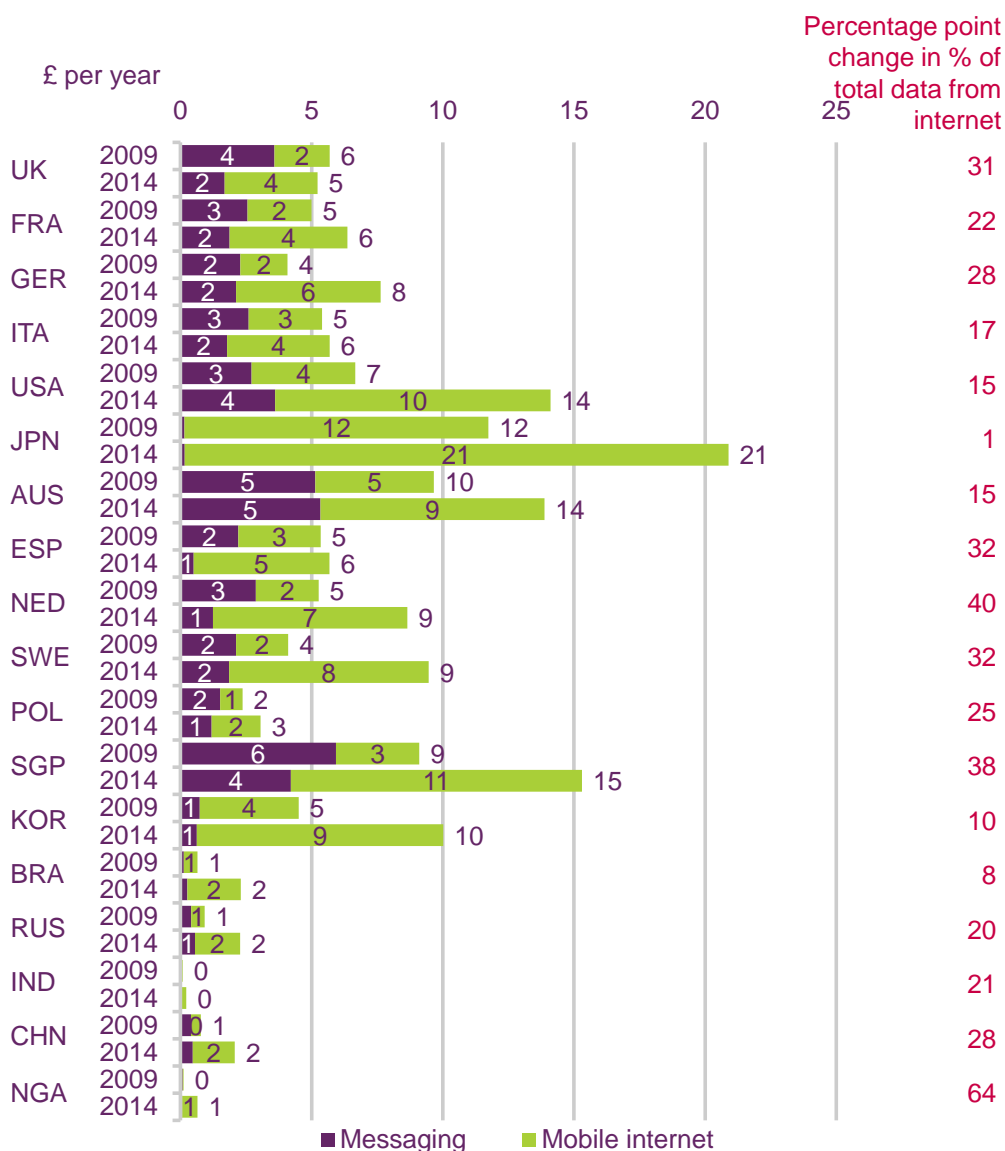
Average per-capita mobile data revenue (which includes spend on mobile messaging and other mobile data services, referred to here as ‘mobile internet’ services) increased in all of our comparator countries in the five years to 2014, except the UK (Figure 5.56). It is important to note, however, that figures for the UK will be understated as they exclude revenues relating to SMS and data allowances that are bundled in with monthly line rental fees.

Average per-capita spend on traditional messaging services (SMS and MMS) fell in 11 of our comparator countries in the five years to 2014, including the UK where it was £2 per person in 2014, half the average in 2009. In contrast, average spend per person on mobile internet services increased in all of our comparator countries over this period, as a result of growing smartphone and mobile broadband take-up, and by 2014 average per-capita spend on mobile internet services ranged from £0.19 per month in India to £21 per month in Japan. In the UK it was £4 per month, although this figure is understated for the reason outlined previously.

The proportion of total mobile data spend that was generated by mobile internet services ranged from 61.2% in Poland to 99.2% in Japan in 2014. In the five years to 2014, mobile

internet revenues increased in all of our comparator countries; the lowest average growth was in Japan (where spend on traditional messaging services has always been low), at 1pp. By comparison, growth was highest in Nigeria (where, in monetary terms, total spend was less than £1 per month), at 64pp. In the UK, revenue generated by mobile internet services accounted for 67.8% of the total mobile data revenue (up by 31pp since 2009), the third lowest proportion among comparator countries.

**Figure 5.56 Per-capita mobile data average revenue: 2009 and 2014**



Source: IHS / industry data / Ofcom Note: Messaging includes SMS and MMS.

**Email and instant messaging were the most popular activities undertaken on a mobile handset across the comparator countries in 2015**

With the increased popularity of smartphones (see Section 1.5) many mobile users are able to use their mobile handset to access data services beyond traditional text and instant messaging, such as email and social networking sites (Figure 5.57). Ofcom research, which was conducted in nine of our comparator countries, shows that more than half of mobile

users in these countries used text messaging and email on their mobile handset in September/October 2015.

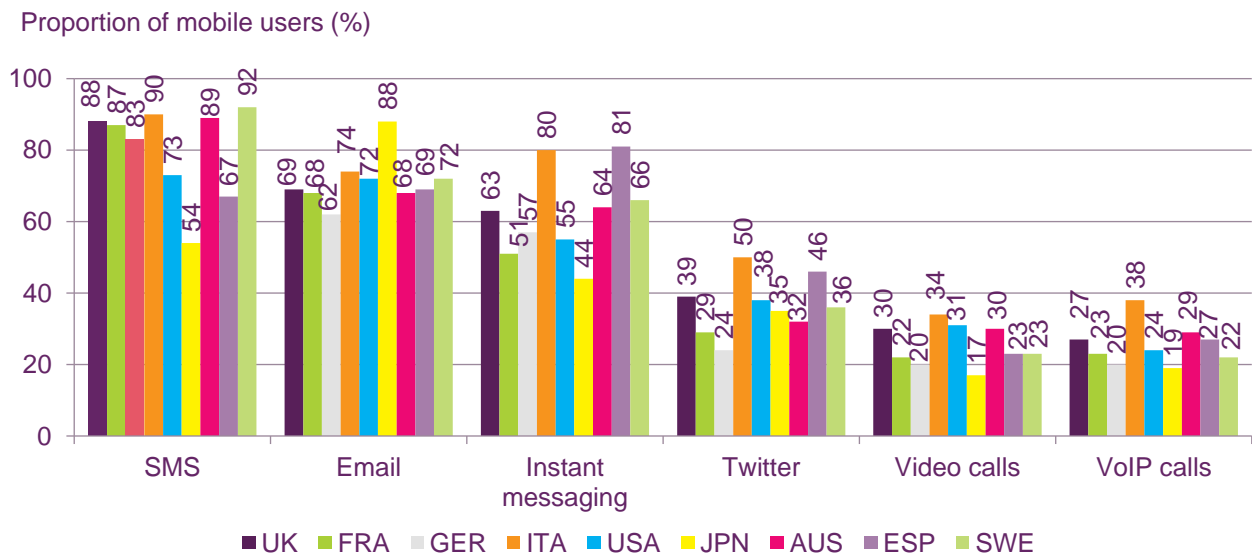
SMS use was high in the majority of comparator countries, at more than eight in ten respondents; the highest reported use was in Sweden (92%). The US was an exception, at 73%. This is probably due to the historically slow adoption of SMS among mobile users in the US compared to other developed markets (partly because operators previously charged for SMS messages to be received as well as sent), as well as the use of alternative forms of texting among mobile users (such as push notifications). Spain was also an exception (67%); sending SMS messages in Spain is relatively expensive. Japan had the lowest text messaging use overall, at 54%. However, the majority of mobile users in Japan use email on their mobile phone (88%, the highest use out all our comparators). In the UK, 88% of respondents said they used their mobile handsets to send texts.

Use of a mobile to send email was also a popular activity, with at least six in ten respondents across all comparator countries claiming to do this. Mobile users in Germany used email services less than any of the other comparator countries, at 62%. Email services were used by just under seven in ten (69%) mobile users in the UK. This is in line with Spain (69%), France and Australia (both 68%).

The percentage of mobile users claiming to use instant messaging services on their handsets ranged from 44% in Japan to 81% in Spain. In the UK, 63% of mobile users claimed to use instant messaging (broadly in line with Australia, at 64%). Data from ComScore shows that in 2015, WhatsApp was one of the most popular instant messaging services among the EU5 comparator countries (most popular in Spain, Italy and Germany (with reach of 41.9%, 40.1% and 31.6%, respectively), second in popularity in the UK (44.5%) and third in France (7.4%). However, in the US other services such as Kik (11.2%), Skype (12.2%) and Messenger (44.0%) were more popular (compared with reach of 8.2% for WhatsApp). Messenger was also the most popular instant messaging service in the UK, with 47.6% reach.

The use of mobile phones for Twitter, video and VoIP calls were all highest in Italy (at 50%, 34% and 38% respectively). Germany had the lowest use of Twitter (24%), while Japan had the lowest use of video and VoIP calls (at 17% and 19% respectively). In the UK, 39% of mobile internet users used their mobile handset to access Twitter (the third highest proportion out of our comparator countries), while 30% used it for video calls and 27% used it for VoIP calls.

**Figure 5.57 Activities undertaken on a mobile phone**



Source: Ofcom consumer research September – October 2015

Base: All respondents who use a mobile or smartphone/ All respondents who access the internet with each device, UK=SMS 839/ Other services 594, FRA=SMS 853/ Other services 568, GER=SMS 882/ Other services 623, ITA=SMS 865/ Other services 779, USA=SMS 751/ Other services 523, JPN=SMS 815/ Other services 573, AUS=SMS 843/ Other services 610, ESP=SMS 886/ Other services 803, SWE=SMS 882/ Other services 678.

Q. 9b Which, if any of the following ways of communicating over the internet do you use each of your devices for?

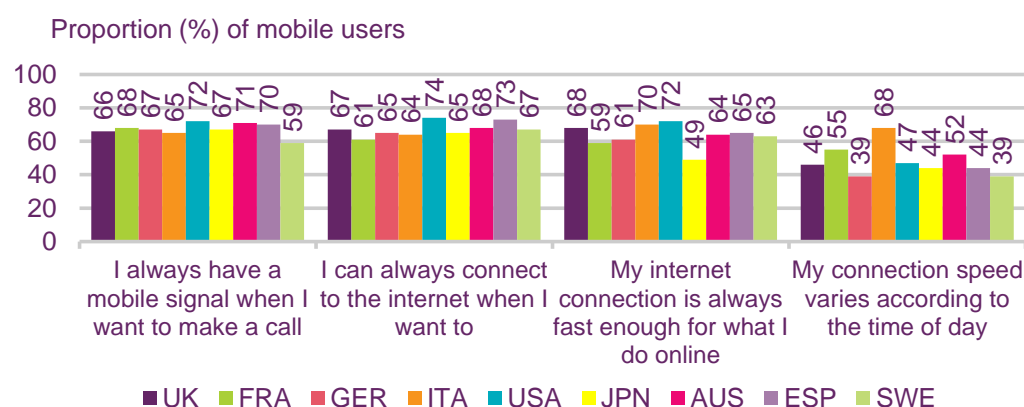
Q. 9e Which, if any, of the following do you use your mobile phone or smartphone for?

**Two-thirds of respondents in the UK claimed that they always had mobile signal, internet connectivity and a fast enough internet connection in 2015**

Figure 5.58 shows the proportion of mobile users who said that they did not experience difficulties in connecting to voice and data services over their mobile network. The proportion of mobile users who said they always had a signal when they wanted to make a voice call ranged from 59% in Sweden to 72% in the US. Similarly, the proportion of mobile users who said they could access the internet on their mobile network whenever they wanted ranged from 61% in France to 74% in the US. The US, along with Italy, had the highest percentage of mobile users who said that their mobile internet connection was always fast enough (at 70% and 72% respectively).

In the UK, around two-thirds of mobile users claimed that they always had mobile signal, internet connectivity and a fast enough internet connection in 2015 (at 67%, 66% and 68% respectively). Italy had the highest percentage of mobile users who found that speeds varied according to the time of the day (68%), while this proportion was lowest in Germany and Sweden, at 39%. In the UK, 46% of respondents said that connection speeds varied based on the time of the day.

**Figure 5.58 Mobile phone connectivity**



Source: Ofcom consumer research September - October 2015

Base: All respondents who use a smartphone or mobile phone (Statement 1) / use a smartphone (Statements 2,3 and 4), UK=839/677, FRA=853/666, GER=882/713, ITA=865/791, USA=751/580, JPN=815/779, AUS=843/690, ESP=886/829, SWE=882/748

Q.10 Thinking about when you use your mobile phone, please select an answer to each of the following...

### The US had the highest average per-capita monthly mobile voice call minutes, at 315 minutes in 2014

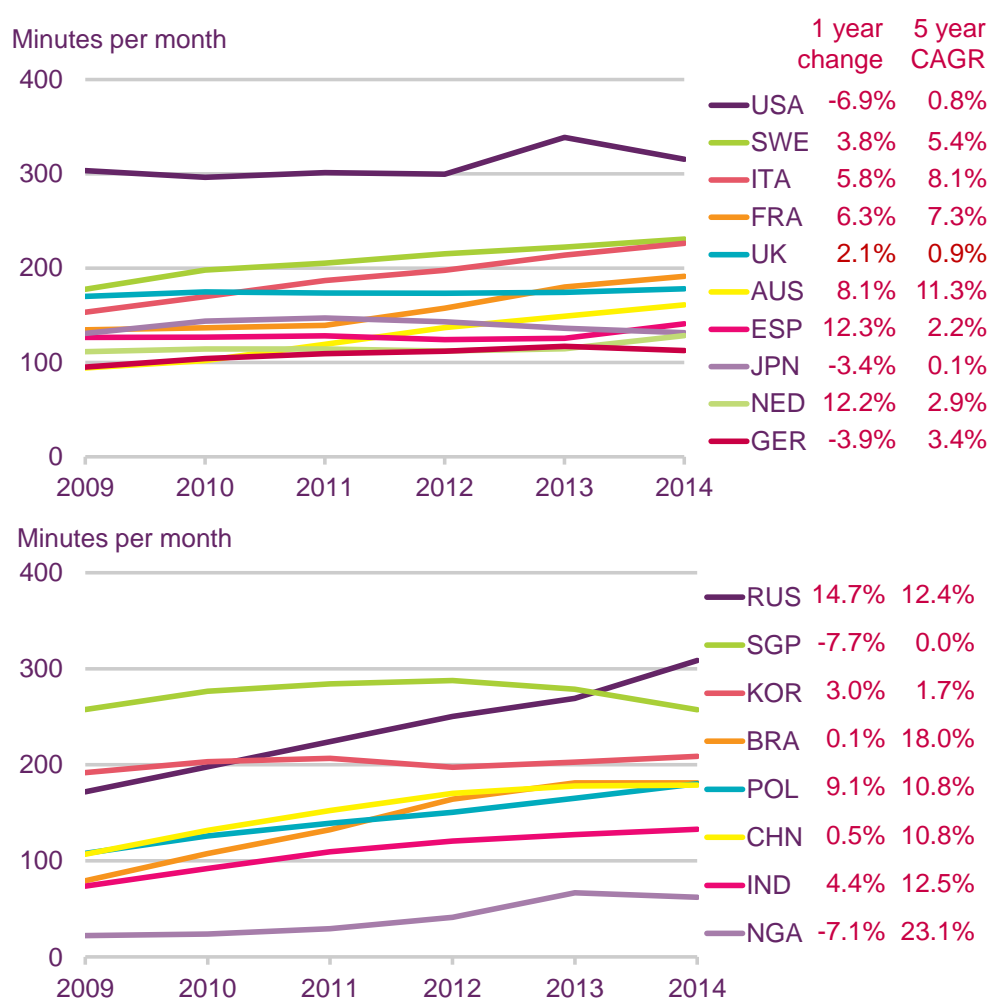
Average per-capita mobile call minutes ranged from 62 minutes per month in Nigeria to 315 minutes per month in the US in 2014 (this excludes incoming calls) (Figure 5.59). Russia had the largest increase in outgoing monthly mobile calls per person in 2014 (up by 14.7%), followed by Spain (up 12.3%). In the UK, average call minutes per person increased by 2.1% during the year to 178 minutes per month.

Average per-capita call minutes fell in five countries in 2014, with Singapore experiencing the largest decrease (down 7.7%). This is probably due to the increasing use of non-voice communication methods. For example, instant messaging volumes were up by 55% since 2013 in Singapore.

The average mobile call minutes per person increased in all of our comparator countries in the five years to 2014, with the exception of Singapore (where this remained stable). The largest increase was in Nigeria, where average call minutes per person increased on average by 23.1% per year (although, in absolute terms, volumes per person were the lowest of all our comparators), followed by the BRIC countries, among which Brazil had the largest average annual increase, at 18.0% a year.



**Figure 5.59 Average per-capita monthly mobile voice call minutes: 2009-2014**



Source: IHS / industry data / Ofcom

**Monthly mobile messaging use was highest in the US, at 266 messages in 2014, although it has decreased since 2013**

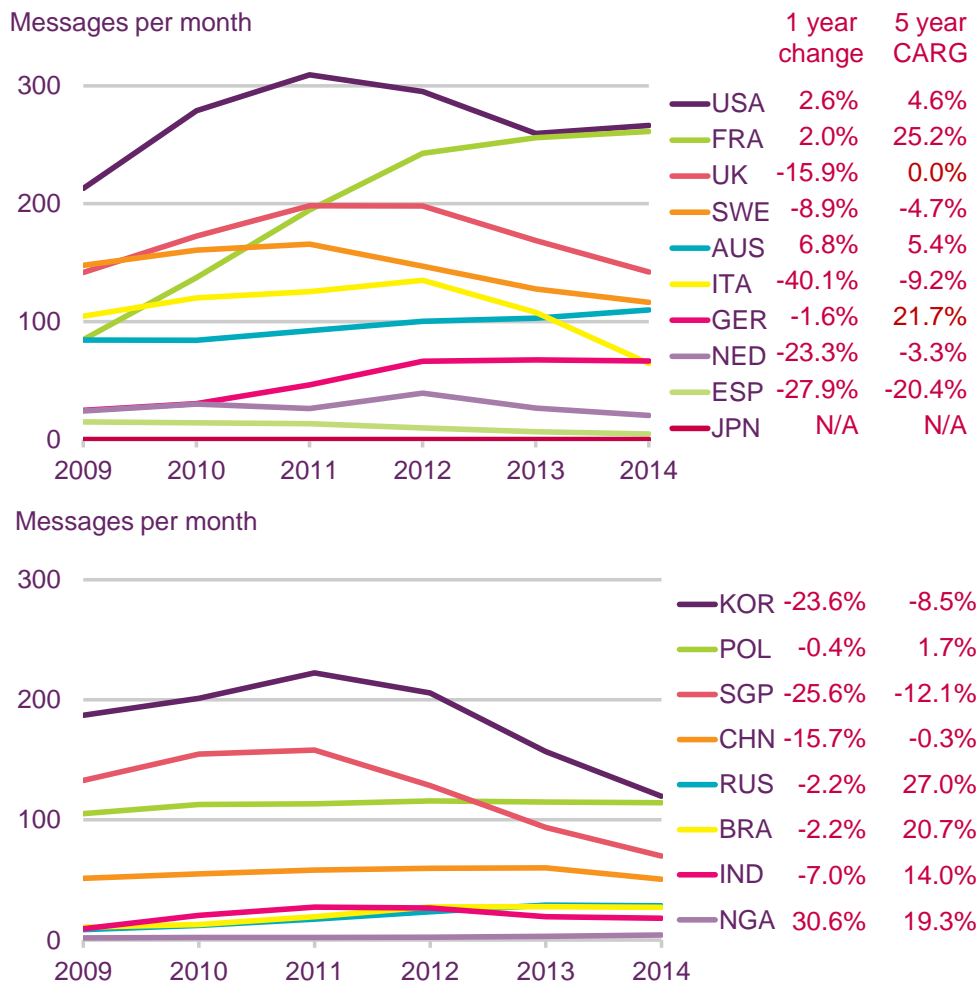
The average number of monthly mobile messages per person (including SMS and MMS messages) ranged from no messages in Japan (where consumers tend to use email and instant messaging rather than traditional mobile messaging services) to 266 messages per month in the US (Figure 5.60). The UK had the third highest average mobile messaging use among the comparator countries, with 142 messages per person per month; however, it was also one of the few more-developed nations to experience a decline in mobile messaging use.

Average SMS and MMS use per person fell in 13 of our 18 comparator countries in 2014. This decline was mainly due to increasing smartphone take-up, as these devices enable consumers to access alternative services, such as email and instant messaging. Italy experienced the largest decline in average messaging use in 2014 at 40.1%. Out of all the comparator countries, Nigeria had the largest increase in average messaging use, up by 30.6%. However, the average number of outgoing messages per person was very low, at just four per month. In the UK, the average number of monthly outgoing messages fell by 15.9% in 2014.

The average number of mobile messages per head decreased in seven of our comparator countries in the five years to 2014; the largest decline was in Spain (down 20.4% year on

year). The largest increase was in Russia (up 27.0% a year), while in the UK, monthly mobile messaging remained stable over this period.

**Figure 5.60 Average number of monthly mobile messages per head: 2009-2014**



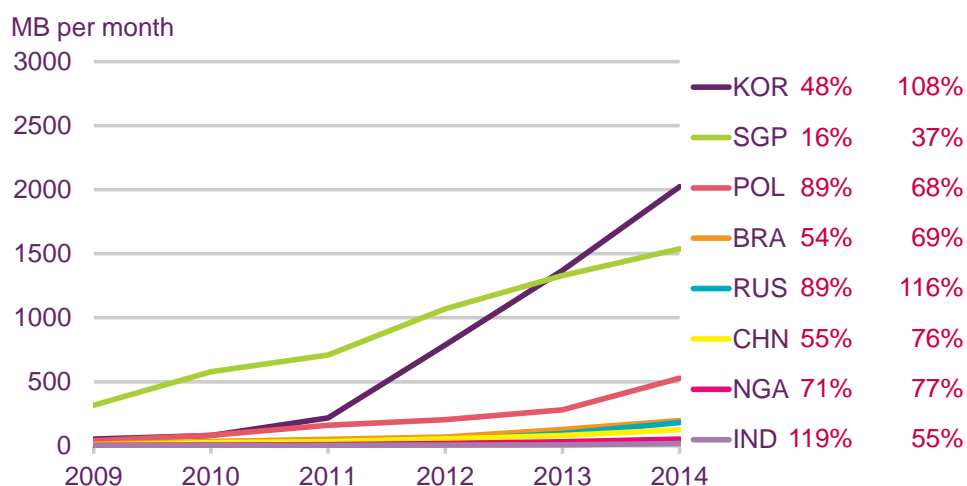
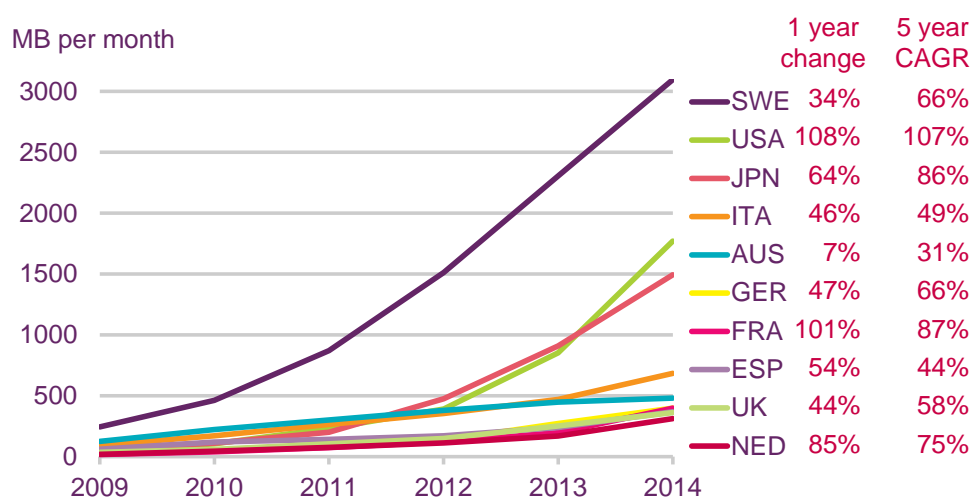
Source: IHS / industry data / Ofcom

**Average per-capita data use continued to increase in all of the comparator countries**

Average monthly mobile data use per person ranged from 18MB per month in India to 3,097 MB (i.e. 3.1GB) per month in Sweden in 2014. South Korea had the second highest average mobile data use at 2.0GB, 1.1GB (53%) lower than Sweden. Mobile data use in the UK was 362MB per person in 2014.

India had the highest growth in average mobile data use in 2014, up from 8MB in 2013 to 18MB per month in 2014 (up 119%). Australia had the slowest growth rates, with average data use per person increasing by just 7% in 2014, and by an average of 31% a year in the five years to 2014. The fastest growth was in Russia, up by an average of 116% annually over the five-year period. In the UK, average data use increased by 44% in 2014, and was up by an average of 58% a year in the five years to 2014.

**Figure 5.61 Average per-capita monthly mobile data use: 2009-2014**



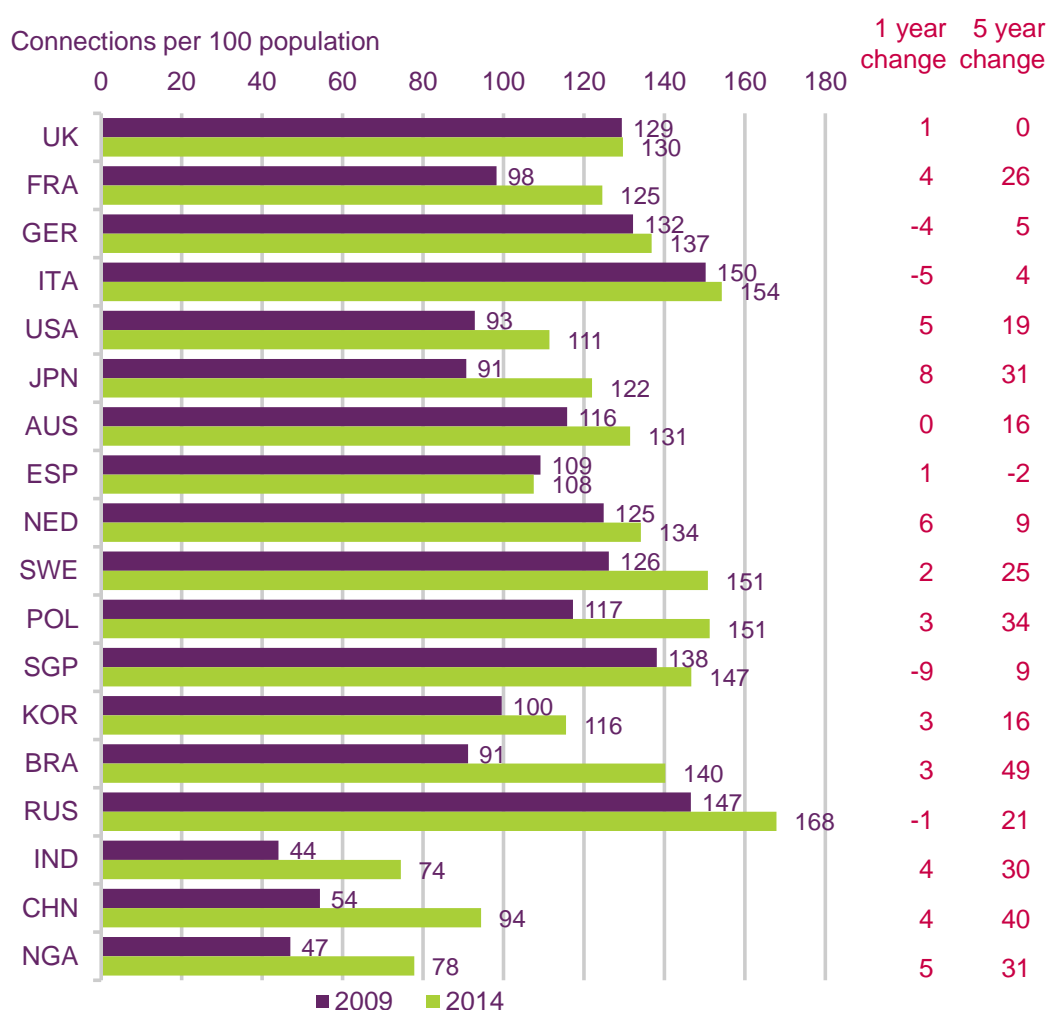
Source: IHS / industry data / Ofcom

### Most countries had more mobile connections than people in 2014

The number of mobile connections per 100 people ranged from 74 in India to 168 in Russia in 2014, although Russia was one of four comparator countries (with Singapore, Italy and Germany) where the number of mobile connections per 100 people fell in the year to 2014. Singapore had the largest decline, down by nine connections to 147 connections in 2014, while Japan had the largest increase (up by eight connections). The UK had 130 mobile connections per 100 people at the end of 2014, up by one connection since 2013.

In the five years to 2014, Brazil had the largest increase, up by 49 connections, while Spain was the only country where there was a decrease in the number of connections per 100 people (down by two connections). In the UK, the number of mobile connections per 100 people remained mostly stable during the five-year period.

**Figure 5.62 Mobile connections per 100 people: 2009-2014**



Source: IHS / industry data / Ofcom

**Mobile internet (excluding messaging) connections per 100 people increased in all of the comparator countries in the five years to 2014**

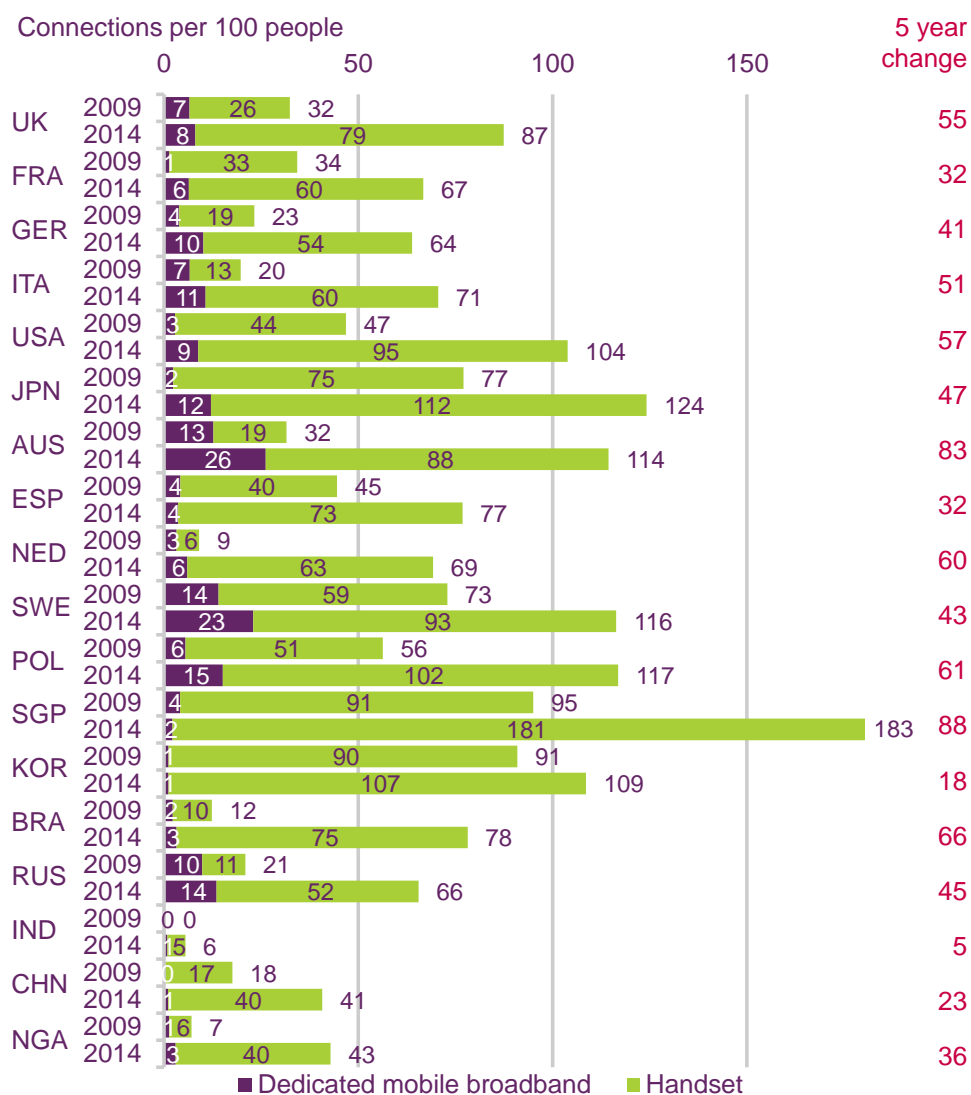
Singapore had the highest number of mobile internet (excluding messaging) connections per 100 people in 2014, at 183 connections. India had the lowest, at six connections, due to low levels of 3G and 4G availability, and because access to mobile data networks is concentrated in metropolitan areas. By comparison, the UK had 87 connections per 100 people, ranking eighth among our comparator countries.

The number of mobile connections per 100 people increased in all of our comparator countries in the five years to 2014. As well as having the largest absolute number of mobile data connections per 100 people, Singapore also had the largest increase, up by 88 connections per 100 people since 2009. India had the smallest increase, up by five connections in the five years to 2014. In the UK, take-up increased by 55 connections per 100 people over the same period.

Australia had the highest number of dedicated mobile broadband connections per 100 people at the end of 2014, at 26, followed by Sweden with 23 connections. Take-up was lowest in India, China and South Korea, where there was less than one connection per 100 people. In the UK there were eight dedicated mobile broadband connections per 100 people at the end of 2014 (up by one connection since 2009).

The number of mobile handset internet connections increased rapidly in most of the comparator countries in the five years to 2014. The number of connections ranged from five connections per 100 people in India to 181 in Singapore in 2014. In the UK there were 79 connections per 100 people, up by 53 connections over the five years to 2014. The main reason for this rapid increase is increasing smartphone take-up.

**Figure 5.63 Mobile internet connections per 100 people: 2009 and 2014**



Source: IHS / industry data / Ofcom

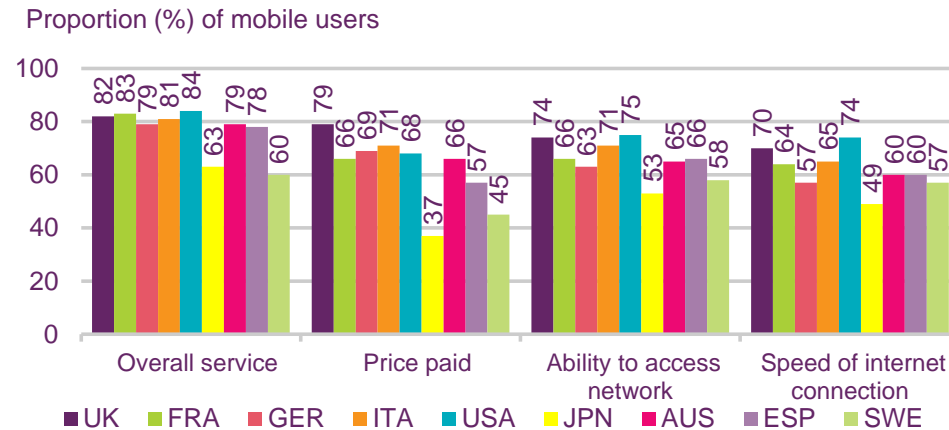
Note: Mobile internet excludes messaging services such as SMS and MMS

**The UK had the highest proportion of respondents satisfied with the price paid for their mobile service in 2015, at 79%**

Figure 5.64 shows the proportion of mobile data users who were either 'very' or 'fairly' satisfied with the four aspects of their mobile service. Overall satisfaction with mobile services was high in all countries, and was over 80% in four of the nine comparator countries (the UK, France, Italy and the US). The UK had comparatively high satisfaction levels for all four aspects, in particular for price paid, where satisfaction was significantly higher than in the other countries, at 79%.

Satisfaction levels with all of the service aspects asked about were lower in Japan and Sweden than in all other comparator countries, particularly in relation to satisfaction with price paid (at 37% and 45% respectively). While mobile users in Germany had comparatively high levels of satisfaction with overall services (79%), they demonstrated low satisfaction with the speed of their internet connection (57%), the joint second lowest proportion among our comparator countries, with Sweden.

**Figure 5.64 Satisfaction with mobile service**



Source: Ofcom consumer research September - October 2015

Base: All respondents who access the internet access via a mobile handset, UK=277, FRA=356, GER=323, ITA=546, USA=246, JPN=190, AUS=371, ESP=501, SWE=374

Q.25 To what extent are you satisfied or dissatisfied with the following aspects of your mobile phone service?