International Communications Market Report 2012

6 Telecoms and networks

Contents

6.1 Telecoms key market developments

6.1.1 Overview

The telecoms section of this report looks at the fixed and mobile voice markets and those for fixed broadband and mobile data services among our 17 comparator countries. As such, the analysis excludes narrowband internet and corporate data services.

The section is split into three parts:

- **Key market developments** –provides an overall context and highlights key developments in international telecoms markets in 2011 and 2012, including headline revenue, subscriber and volume metrics and an analysis of key trends related to superfast broadband, SMS and mobile data.

- **The telecoms industry** – provides a 'top-down' approach by looking at the telecoms sector from the point of view of operators, 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, mobile and broadband use.

6.1.2 Introduction

Internet access has become commonplace across the globe, as increasing numbers of consumers use the internet to access online services. Figures from the United Nations' International Telecommunications Union (ITU) show that by the end of 2011 2.3 billion people (around a third the world's population) accessed the internet globally, almost double the 1.2 billion figure recorded in 2006. Over this period growth in internet use was fastest among developing countries, and by 2011 62% of internet users were located in developing countries, an increase from 44% in 2006.[79]

There was rapid growth in the take-up of fixed broadband services across the 17 countries that feature in our analysis in the five years to 2011, during which time fixed broadband take-up almost doubled to reach 42 connections per 100 homes. Despite significant growth in fixed broadband take-up over recent years, revenues from mobile data services exceeded those from fixed broadband connections for the first time among our 17 countries in 2011.

Just five years after the launch of the Apple iPhone, smartphones have become commonplace in most advanced economies: in October 2012 Everything Everywhere, the UK's largest mobile network operator, announced that 74% of its post-paid customer base were smartphone users and 92 per cent of new post-paid customers were opting for a smartphone handset.[80] While increasing smartphone take-up is a key driver behind growing mobile data use and revenues in developed countries, it is likely that this is not the case globally, as in less affluent countries the cost of these advanced handsets will be prohibitively high for many people.

Developing countries are also more likely to have limited availability of fixed telephony networks, meaning that mobile data services are the only viable option for those wishing to

[79] http://www.itu.int/ITU-D/ict/statistics/at_glance/keytelecom.html
[80] http://explore.ee.co.uk/our-company/newsroom/ee-results-third-quarter-30-september-2012

go online (by 2011 90% of the world's population had 2G mobile coverage and 45% had 3G coverage).[81] Where this is the case, mobile data services are vital to consumers, and while mobile data users are benefiting from the transition to faster mobile technologies globally (including LTE[82], or 4G), it is consumers, who are dependent on mobile networks for internet access, who stand to gain the most from such upgrades.

Increasing take-up of fixed broadband and mobile voice and data services have contributed to an accelerating decline in the use of traditional fixed telephony services in most of the countries featured in this report. Competition between mobile providers has led to falling call prices in most markets, which in turn has resulted in increasing use of mobile voice services, often at the expense of fixed-originated calls. Additionally, growing take-up of both fixed and mobile data services has led to increasing use of data-based substitutes for traditional voice calls, such as VoIP, SMS, instant messaging services and communication over social media.

In this section we examine three of the key developments which are transforming the global telecoms market, both in terms of industry structures and consumer behaviour:

- **The mobile data explosion.** This analysis describes the growth in mobile data, with key volume, subscriber and revenue statistics, and sheds some light on the transition from large-screen PCs to small screen smartphone mobile data use.

- **Continued growth in superfast broadband networks.** We look at the deployment of superfast technologies across countries, and the extent to which consumers are migrating to these services.

- **Increased use of text messaging.** This key market development section analyses the contrasting levels of use and expenditure related to texting, and examines attitudes towards texting, with data from Ofcom's consumer research

Figure 6.1 summarises key telecoms indicators across the 17 comparator countries included in this report.

[81] http://www.itu.int/ITU-D/ict/facts/2011/material/ICTFactsFigures2011.pdf

[82] LTE, or long term evolution, is a fourth-generation mobile telecommunications standard that brings fast data rates to mobile devices. Other fourth-generation mobile telecommunications standards exist, particularly outside Europe, but in this report we use LTE and 4G interchangeably.

Figure 6.1 Key telecoms indicators: 2011

	UK	FRA	GER	ITA	USA	CAN	JPN	AUS
Telecoms service revenues (£bn)	27.3	31.2	35.6	23.7	186.0	21.4	90.3	17.2
Telecoms revenues per capita (£)	436	476	437	389	598	629	708	790
Fixed lines per 100 population	53.0	28.4	52.2	27.4	45.8	53.5	32.9	48.5
Monthly outbound fixed minutes per capita	154	143	196	112	137	-	54	170
Mobile connections per 100 population	130	105	140	159	103	80	98	136
Share of mobile post-pay connections	49	71	44	17	85	79	99	49
3G connections per 100 population	-	42	35	61	57	32	97	83
Monthly outbound mobile minutes per capita	164	135	109	186	615	344	95	329
Fixed broadband connections per 100 population	32.6	34.7	34.3	22.2	28.9	33.1	27.4	25.9
DSL as a proportion of fixed broadband connections	78%	92%	84%	97%	36%	38%	20%	81%
FTTx as a proportion of fixed broadband connections	0.6%	2.2%	0.5%	2.6%	7.9%	0.2%	58.0%	0.3%
Mobile broadband connections per 100 population	8.0	4.8	6.6	10.1	47.1	3.5	7.8	25.2
VoIP subscriptions per 100 population	6.6	31.4	11.4	14.3	11.5	12.9	21.8	22.0

	ESP	NED	SWE	IRL	POL	BRA	RUS	IND	CHN
Telecoms service revenues (£bn)	19.2	9.0	4.5	2.2	5.6	35.6	18.7	10.7	71.4
Telecoms revenues per capita (£)	411	534	499	471	145	180	134	9	53
Fixed lines per 100 population	42.1	27.2	58.4	37.8	17.8	21.7	31.7	2.7	21.3
Monthly outbound fixed minutes per capita	114	106	163	120	32	76	95	-	11
Mobile connections per 100 population	126	121	153	123	131	123	164	75	74
Share of mobile post-pay connections	65	55	66	37	47	18	4	3	34
3G connections per 100 population	79	37	92	90	41	17	9	3	10
Monthly outbound mobile minutes per capita	126	123	213	197	138	131	214	72	312
Fixed broadband connections per 100 population	23.6	41.0	32.7	22.9	16.8	8.4	17.1	1.1	11.7
DSL as a proportion of fixed broadband connections	78%	50%	51%	68%	44%	63%	40%	87%	74%
FTTx as a proportion of fixed broadband connections	0.5%	3.4%	20%	0.9%	0.4%	0.1%	21%	0.2%	10%
Mobile broadband connections per 100 population	7.2	6.3	21.3	12.7	8.7	-	-	-	-
VoIP subscriptions per 100 population	3.1	24.7	14.5	4.5	2.2	-	-	-	-

Source: IDATE / industry data / Ofcom
Note: Fixed voice figures for CAN and USA exclude local calls; fixed lines cover only exchange lines and exclude "pure" VoIP accesses; USA, CAN and CHN mobile use includes both outbound and inbound calls; 3G includes W-CDMA and CDMA20000 1xEV-DO but not CDMA2000; Revenues for Brazil, Russia, India and China exclude fixed broadband

6.1.3 Mobile data use continued to grow rapidly in 2011

In the European Union, Sweden had the highest proportion of mobile data users

In 2011, several metrics indicated high use of mobile data services by a large number of users. Much of this use was driven by the prevalence of smartphones, which, compared to feature phones, make accessing the internet from a mobile device much quicker and more effective.

At the end of 2011, the highest proportion of mobile data users[83] was in Sweden, with 97.5 per 100 people. Sweden was followed – at some distance – by Spain, the UK and Ireland (65 per 100, 64 per 100 and 60 per 100 respectively, see Figure 6.2).

The high proportion of mobile data users in Sweden may be partly due to the early roll-out of LTE in that country, which has led to a widespread availability of fast mobile networks. There were no commercial LTE networks at the end of 2011 in Spain, the UK or Ireland.

Italy, Germany and France are the three nations with the lowest proportion of mobile data users – at between 31 mobile data users per 100 population and 39 per 100, these are all below the EU average of 43%. By the end of 2011, Germany had commercially-launched LTE networks from at least one operator, though the commercial launch of its first network occurred in 2010 – the year after commercial launch in Sweden. The fact that Germany is near the bottom of the list is perhaps not surprising: although Germany has a reasonably high penetration of mobile subscribers (there are 1.40 mobile connections per head of the population) there is a low volume of use (just 80 minutes of voice minutes per mobile connection in 2011 – the lowest of our comparator countries).

Mobile broadband subscribers

As well as having the highest proportion of mobile data users, Sweden also has the highest proportion of mobile broadband subscribers[84], with one in five of its population connecting their PC or tablet to the internet via a cellular network.

Ireland is again near the top of the table – it is in second place with 13.2 mobile broadband subscribers per 100 population. This is likely to be partly due to Ireland's National Broadband Scheme, a project co-funded by the Irish government and the European Union to roll out 3G mobile broadband to large parts of the country. This increased availability may have acted as a stimulus for demand.

Italy is in third place with ten mobile broadband subscribers per 100 population; the country offers many mobile broadband tariffs that are charged according to time spent online – an approach which is highly unusual elsewhere. Advocates of this approach argue that per-hour pricing stimulates demand more than per-megabyte pricing because subscribers find it difficult to understand the size of a megabyte. In most other countries, the volume of data is the main unit that subscribers are billed by.

The UK is fifth of the nine EU comparator countries for mobile broadband penetration, with one mobile broadband connection per 12 citizens. Growth in penetration levels in the UK has

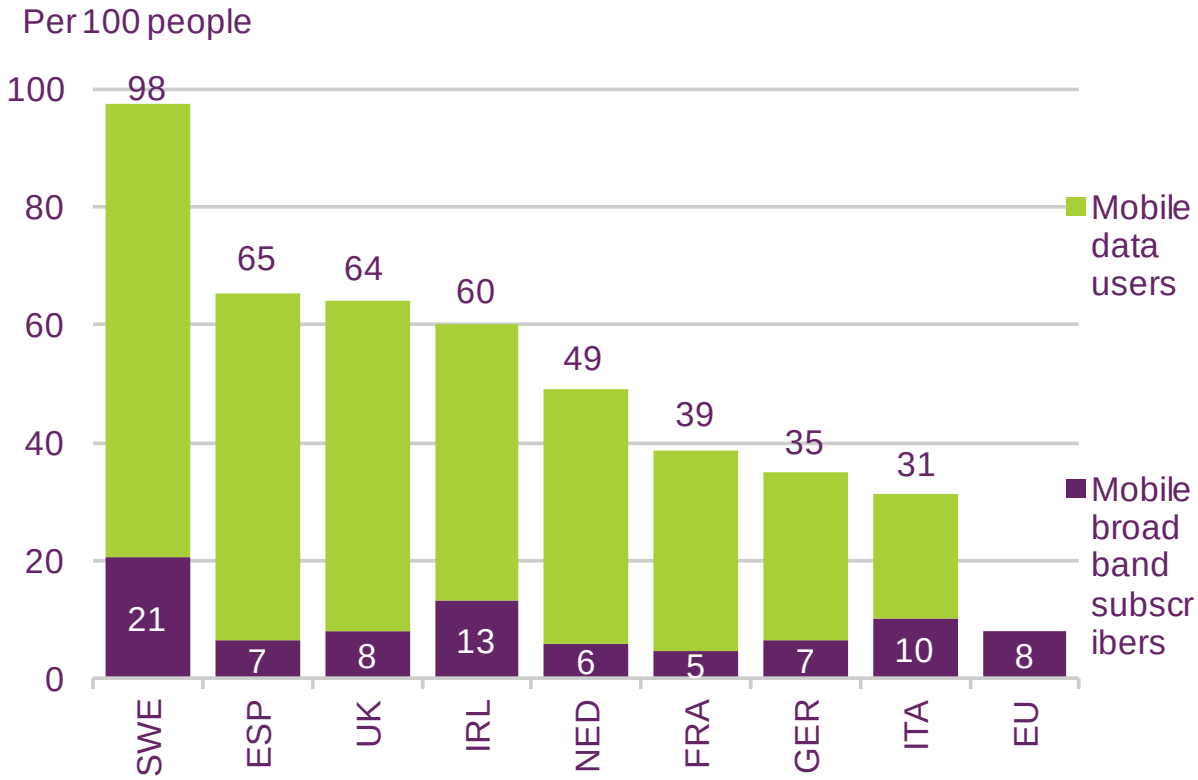
[83] In this section, the term 'mobile data users' is the European Commission definition (that it calls 'mobile broadband'), and is the total of: the number of subscribers who use their handset to access mobile data services, the number of mobile broadband subscribers (as defined by Ofcom, among others) and the number of data subscriptions that are bought separately to voice. The European Commission publishes the total for each Member State.

[84] Mobile broadband refers to users accessing the internet via a cellular network from a tablet or PC, and excludes mobile handset use.

slowed: the number of active subscribers increased by just 4.9% in 2011, compared with the number of subscribers who use a mobile handset to access the internet, which increased in 2011 from 32% to 39% of the population.

Ofcom's consumer research[85] shows that mobile broadband in the UK has not reached high levels of penetration in all market segments. It is particularly low among older citizens (just 3% of those aged 65-74 and 1% of those aged over 75 use mobile broadband). Mobile broadband penetration may also be low due to the lack of LTE connectivity and the much higher speeds and reliability of fixed broadband. Conversely, the high penetration of fixed broadband may have acted to limit subscriptions to mobile broadband services.

Figure 6.2 Mobile broadband subscribers and mobile data users, per 100 people: 2011



Source: European Commission Digital Agenda Scoreboard. 'Mobile broadband subscribers' refers to connections made over a mobile network by a PC or tablet with a dongle or with an embedded SIM. 'Mobile data users' includes mobile broadband subscribers and is the total of the three bulleted items in the footnote above.

[85] Ofcom *Communications Market Report 2012*
http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr12/CMR_UK_2012.pdf

UK downloaded more data per connection than the other comparator countries

The volume of mobile data consumed continued to increase rapidly in 2011, driven by the increased take-up of smartphones. For example, in the UK the number of smartphone data users increased by 9.9 million in 2011, according to Ofcom's figures.[86]

An often-quoted source of information on the volume of mobile data traffic is Cisco Systems' *Visual Networking Index (VNI)*[87]. Cisco's VNI bases its figures for mobile traffic on a broad range of sources from analyst companies to consultancies and telecommunications suppliers.

The VNI showed that the quantity of data consumed per UK mobile connection[88] increased by 58% in December 2011 to 424MB per connection per month (Figure 6.3).

This increase meant that the UK became the highest consumer of mobile data among our comparator countries, pushing Japan into second place with 392MB per connection per month. The global figure was 92MB per connection per month in December 2011.

Drivers that have propelled the UK to the top of the table may include the availability of tariffs offering unlimited mobile data or a large data allowance. The ongoing large-scale conversion of subscribers from feature phones to smartphones during 2011 is also likely to have contributed to this growth. Because smartphones have larger screens that make it quicker to use online services and applications, an increasing penetration of smartphones tends to go hand-in-hand with increased data use.

Subscribers who sign up to contract tariffs are more likely to use a smartphone, and the proportion of subscribers on contract tariffs increased by 3.5 percentage points (to 49%) in the UK in 2011. Contract tariffs in the UK often include a data allowance, which has encouraged mobile data use.

The deployment of faster mobile networks may also be a driver for higher mobile data use, but there appears to be little correlation between the headline speed[89] of a mobile network and the data consumed. All four UK mobile network operators have deployed 3.5G services, with theoretical downstream speeds of 42Mbit/s available in some areas. This compares to much faster headline speeds of around 100Mbit/s or more for LTE (4G), although the five countries (the US, Germany, Japan, Australia and Canada) where commercial LTE networks had been deployed by the end of 2011 did not necessarily have the highest, or fastest growing, levels of data consumption.

[86] Ofcom *Communications Market Report 2012*, http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr12/

[87] Cisco Systems' *Visual Networking Index,* http://www.cisco.com/en/US/netsol/ns827/networking_solutions_sub_solution.html

[88] Average mobile data volumes reported by Cisco Systems for the UK are higher than figures published by Ofcom, due to different definitions. Ofcom's *Infrastructure Report 2012* shows that UK cellular data throughput per active SIM was 246MB for a 30-day period from mid-June 2012. This figure should not be compared to the 2011 Infrastructure Report, which reported data throughput per active 3G SIM. See http://stakeholders.ofcom.org.uk/market-data-research/other/telecoms-research/broadband-speeds/infrastructure-report-2012/

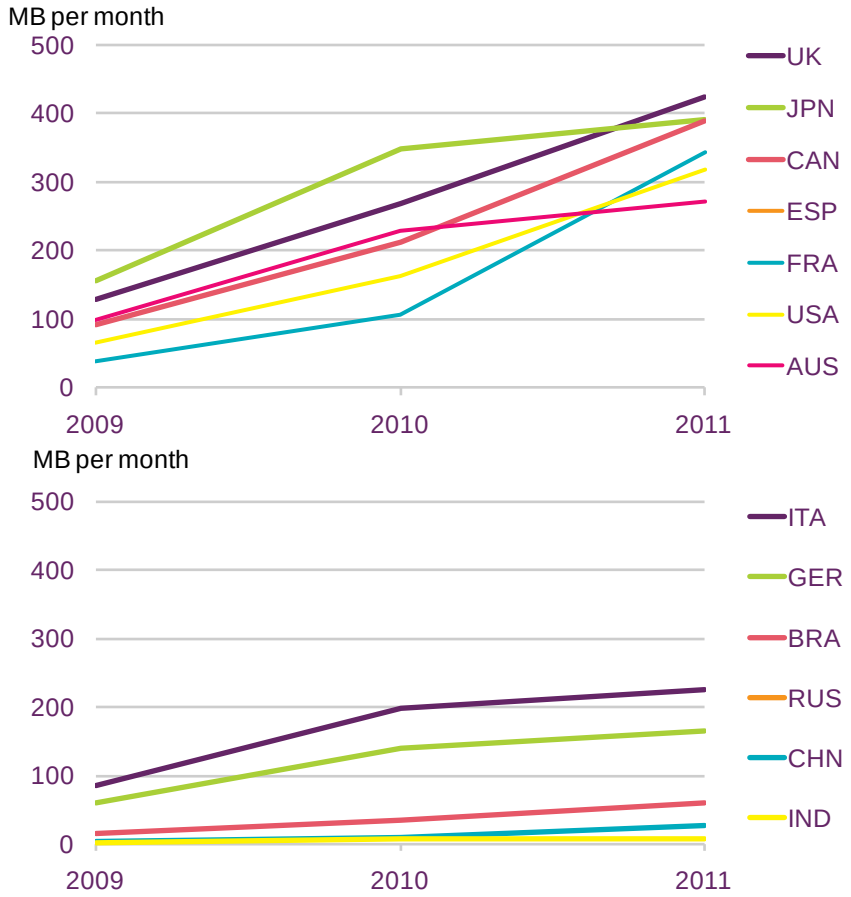
[89] Theoretical, or headline speeds, are the top speed achievable on that network. In reality, consumers will experience far slower speeds, due a range of factors, including the number of other users in the cell and distance from the base station. Therefore comparing headline speeds between countries is unlikely to offer much insight into the actual speeds experienced by users.

For example, the country with the largest number of LTE subscribers, the US, consumed only the sixth highest amount of mobile data per connection in December 2011 among our comparator countries, with the third highest year-on-year growth rate.

Germany's mobile data consumption was lower, placing it in ninth place for data consumed per connection and eighth in terms of growth in 2011.

France and China had the fastest year-on-year growth rates in 2011, with 224% and 189% respectively. Annual growth in Japan slowed to 12% in 2011. Global growth was 133%.

Figure 6.3 Mobile traffic volume per connection: 2009-2011



Source: Cisco Systems' Visual Networking Index. 2009 and 2010 data as provided to Ofcom by Cisco Systems in November 2011; 2011 data as published on the Cisco VNI microsite, October 2012. Data are for December of the year stated.

Mobile broadband traffic growth slowed in 2011

It became clear in 2011 that the growth in mobile traffic was being driven by the uptake of smartphones, rather than mobile broadband devices[90]. Mobile broadband was the driver behind rapid mobile traffic growth when these devices became commercially available in the second half of the last decade.

[90] Mobile broadband devices commonly include dongles, mobile WiFi devices (which connect to the internet via a cellular network and the user via WiFi) and tablet PCs with embedded SIMs. Mobile broadband is used to connect PCs and tablets to the internet.

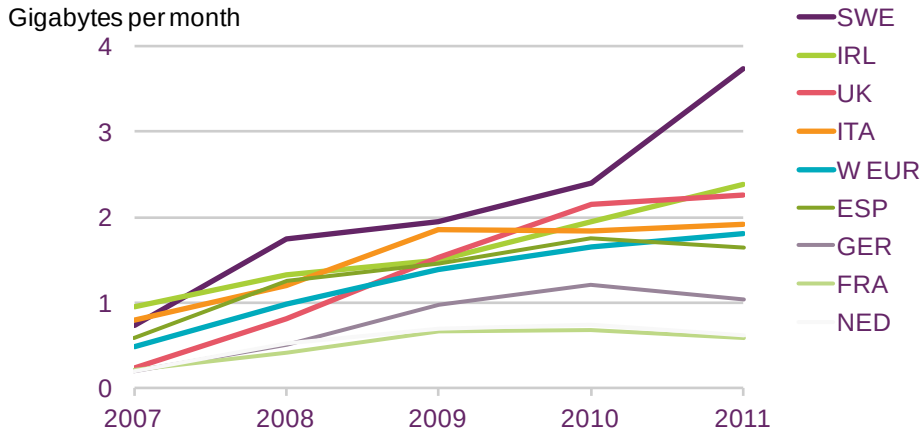
However, in 2011, in contrast to double-digit and triple-digit growth in mobile traffic, mobile broadband growth was much slower. According to Analysys Mason, the volume of traffic consumed per mobile broadband SIM increased by 9% in Western Europe in 2011, to 1.80GB. The UK experienced slower growth than Western Europe: up 5% in 2011 to 2.25GB per mobile broadband SIM (see Figure 6.4).

These increases are markedly slower than for mobile broadband in previous years: from 2007-2010 the UK achieved a compound annual growth rate (CAGR) of 108% from 2007-2010, and Western Europe a CAGR of 50% over the same period. Subscribers in some countries are now consuming less mobile broadband data per connection. According to Analysys Mason, in 2011 four of the eight Western European comparator countries saw a decline in traffic per mobile broadband SIM. Use in Germany (the largest nation in Western Europe) declined by 0.17GB per month to 1.04GB in 2011.

The reduction in growth is likely to be due to the fact that many consumers now access mobile data services from handsets, which are not included in the mobile broadband figures. Some users are tethering their handset to their PC, using the handset's data connection as an alternative to using a mobile broadband connection

Slowing mobile broadband traffic growth may also be a sign that the mobile broadband market is well past early adopter stage and nearing maturity, with most consumers who are interested in the service aware of the technology and services available. Many mobile broadband subscribers may now be using mobile broadband as a complement to a fixed broadband service, rather than a substitute, and some of these may only use the service as a back-up when their fixed broadband service is down.

Figure 6.4 Mobile broadband data use per SIM: 2007-2011



Source: Analysys Mason, May 2012, Wireless Network Traffic Worldwide: forecasts and analysis 2012-2017

Japan had the highest revenue per user from mobile handset data services

In 2011, the growth in mobile data consumption was reflected in all our comparator countries by increasing handset data revenues. Annual growth in mobile data revenue per user ranged from 8% in Canada to 51% in Poland. High rates of growth were also found in the Netherlands (42%) and Sweden (29%; one of the first countries to roll out LTE (4G) services).

Japan had the highest revenue per user for mobile data services, at £20.58 per month, with mobile subscribers in Canada (despite the low growth rate) spending the second highest

amount, at £11.05 per user per month. Revenue per user in the UK was the third lowest among the comparator countries (greater than Poland and Italy), at just £2.06 per month (Figure 6.5).

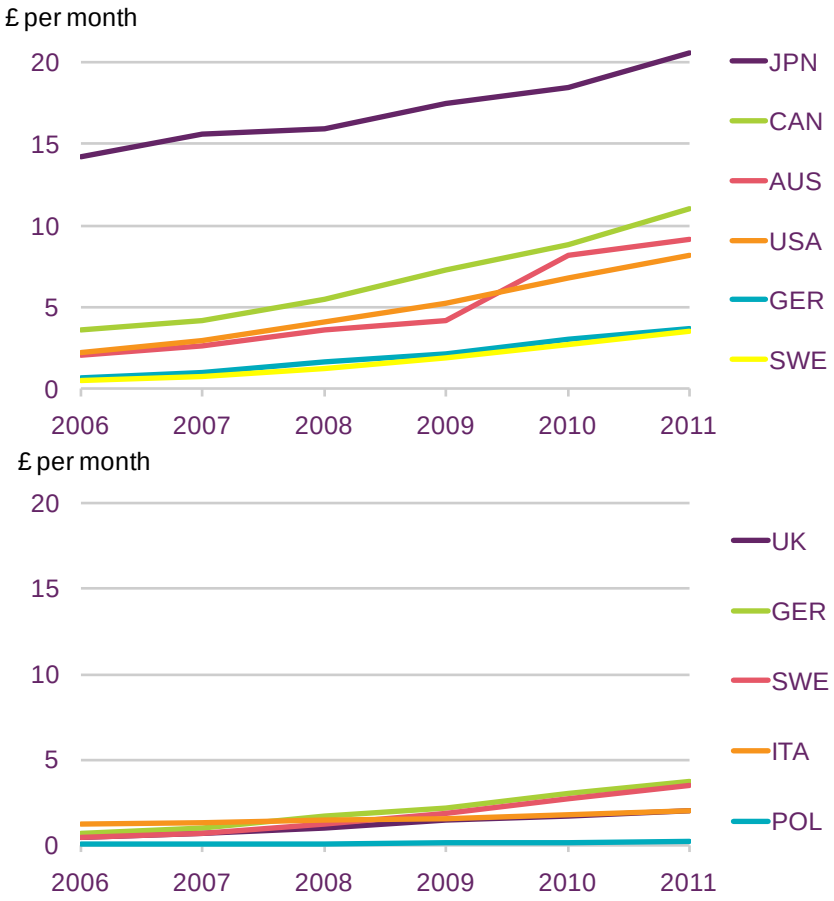
From a low base, the UK figure has increased at over 10% compound annual growth rate (CAGR) over the period 2006 to 2011 (and at 18% in 2011).

The increase in Japan was 8% CAGR between 2006 and 2011: perhaps a reflection of the length of time mobile data services have been available in that country, and a reflection of high adoption levels in a relatively mature market.

Of the eight comparator countries for which we have mobile data revenue figures and were covered by the VNI, seven saw mobile data volumes increase faster than mobile handset data revenues, meaning that the price per megabyte of data fell in these countries. Germany was the exception.

Our mobile data revenue figures do not include SMS or mobile broadband revenues, and do not include revenue from bundles that include voice. These figures represent expenditure on stand-alone handset data. The low figure for the UK can be largely explained by the fact that subscription revenues account for a sizeable 44% of mobile retail revenues – with many of these tariffs including data - and because separate data packages have low levels of take-up in the UK.

Figure 6.5 Mobile data average revenue per user: 2006-2011



Source: IDATE/ industry data / Ofcom

LTE revenues and subscriber numbers remained low in our comparator countries, while the US led the pack

By the end of 2011, LTE (4G) services had been commercially launched in seven of our comparator countries: Canada, Germany, Japan, Poland, Sweden, the US and Australia. The percentage of households and businesses covered by these networks varies between nations, and some of these networks are at an early stage of roll-out. Consequently, the percentage of the mobile subscriber base that had taken up LTE services was below 2% in each of the seven countries at the end of 2011, according to data from analyst firm IDATE (Figure 6.6).

The leading country, both in terms of the absolute number of LTE subscribers, and the percentage of subscribers that use LTE services, was the US. Much of this is attributable to the early and quick roll-out by mobile network operator Verizon Wireless. The other six countries with LTE services all have less than 1% of their mobile subscribers on LTE, including Sweden, which launched LTE commercially in 2009.

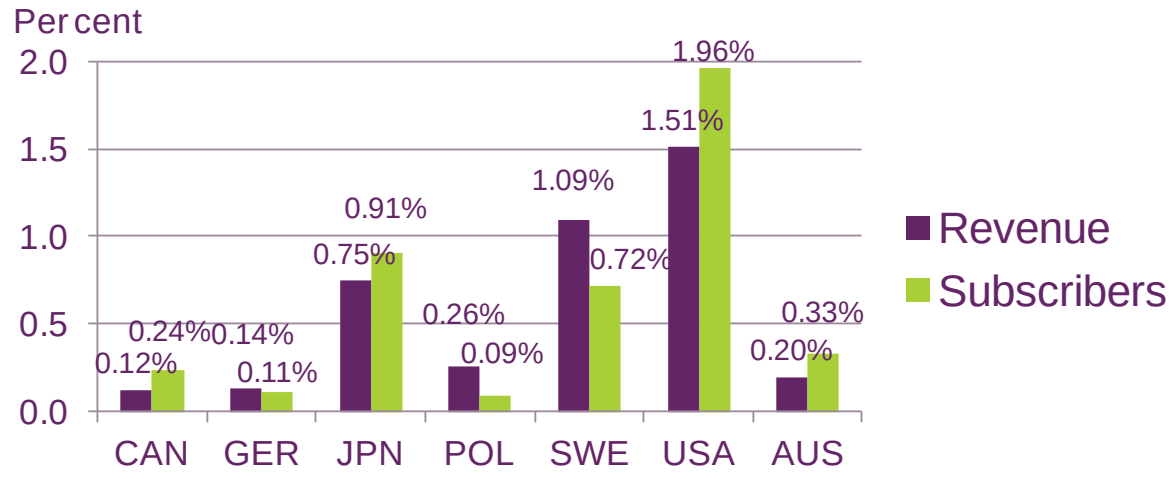
In line with the low take-up figures, the percentage of revenues that were contributed by LTE subscribers was also below 2% in every comparator country. The US realised the highest LTE revenues in 2011, with 1.51% of total mobile service revenues.

Japan had the highest LTE revenues per LTE subscriber, at £28.93 per month, compared with £22.54 per month for Sweden and £21.18 per month for the US. For the US and Japan, this figure is below mobile ARPU across all services, although this may be because some LTE subscribers spend money separately on 3G services, with their LTE spend being purely on mobile broadband. However, in Sweden, LTE revenues per LTE subscriber exceeded mobile ARPU (£15.38 in 2011): high pricing could explain the low uptake mentioned above.

Other nations, including the UK, saw LTE launches in 2012. In October 2012, Everything Everywhere was the first MNO to launch LTE commercially in the UK, with the other three MNOs expected to launch commercial services in 2013 following the auction of radio spectrum.

LTE revenues are dependent, among other variables, on the level of availability, so should be treated with some caution in comparing nations.

Figure 6.6 Percentage of revenues and subscribers attributable to LTE: 2011



Source: IDATE. Subscriber figures are for the end of 2011. Revenue figures are for the whole of 2011.

6.1.4 Continued growth in superfast broadband networks

Fixed broadband services are available to nearly all consumers in the majority of our comparator countries. As a result, government and operators are switching their focus onto superfast broadband services, which are defined as those with a headline speed of 30Mbit/s or more. Most of our comparator countries have set targets for achieving higher levels of superfast broadband availability and/or take-up over the coming years. For EU member states, the European Commission has set a target that all households should have access to superfast broadband by 2020, with at least half of European households subscribing to services offering speeds higher than 100Mbit/s by the same year.

ADSL broadband over legacy copper telephone networks is unable to deliver superfast broadband. To deliver superfast speeds networks need to be upgraded to an optical fibre-based architecture. We can categorise these superfast capable networks into three broad types:

- Fibre-to-the-home (FTTH) or fibre-to-the-premises (FTTP), where a fibre-optic cable is installed all the way from the telephone exchange to the consumer's premises. Copper wiring is often used inside the buildingfor the final part of the delivery.

- Fibre-to-the-cabinet (FTTC), where fibre is run from the local exchange to the street cabinet from which VDSL, a fast form of DSL, is used to transmit data to the consumer's premises over the 'sub loop' (the copper wire which runs from the cabinet to the consumer's premises, typically less than 500 metres long).

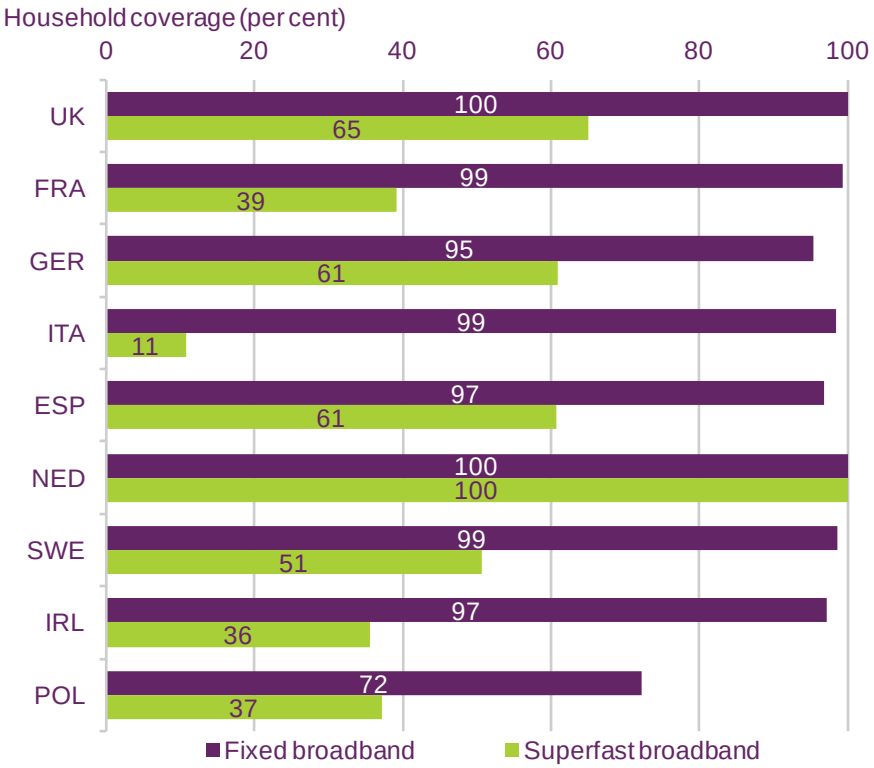
- Hybrid fibre/co-axial cable networks (HFC), via a DOCSIS 3.0 upgrade to an existing cable TV (CATV) system. From a network point of view, HFC is similar to FTTC in that it uses a street cabinet with fibre-optic cables on one side and co-axial cable on the consumer premises side. The technology used in HFC networks is often referred to as fibre-to-the-last amplifier (FTTLA).

There were wide variations in the availability of superfast broadband among our European comparator countries in July 2012

Data published by the European Commission show that fixed broadband availability was high in most of our European comparator countries in July 2012, with Poland (where 72% of homes were covered by these services) being the only such country where less than 95% of households were able to access one or more provider's fixed broadband network (Figure 6.7). Separate figures provided by IDATE show that the population coverage of fixed broadband services was also high in Canada, Japan and the US at the end of 2011 (at 99%, 99% and 98% respectively), and slightly lower in Australia at 91%.

The availability of superfast broadband services (i.e. those with an advertised speed of 30Mbit/s or above) varied significantly among our European comparator countries in July 2012, ranging from 11% in Italy (where cable broadband services are not available) to 100% (to the nearest percentage point) in the Netherlands, where there is high availability of these services; the Netherlands benefits from having a geographically-concentrated population, which makes network deployment relatively cheap. In the UK an estimated 65% of homes were able to receive superfast broadband by July 2012, mainly provided using BT's FTTC network and Virgin Media's DOCSIS3.0 cable network.

Figure 6.7 Fixed broadband availability

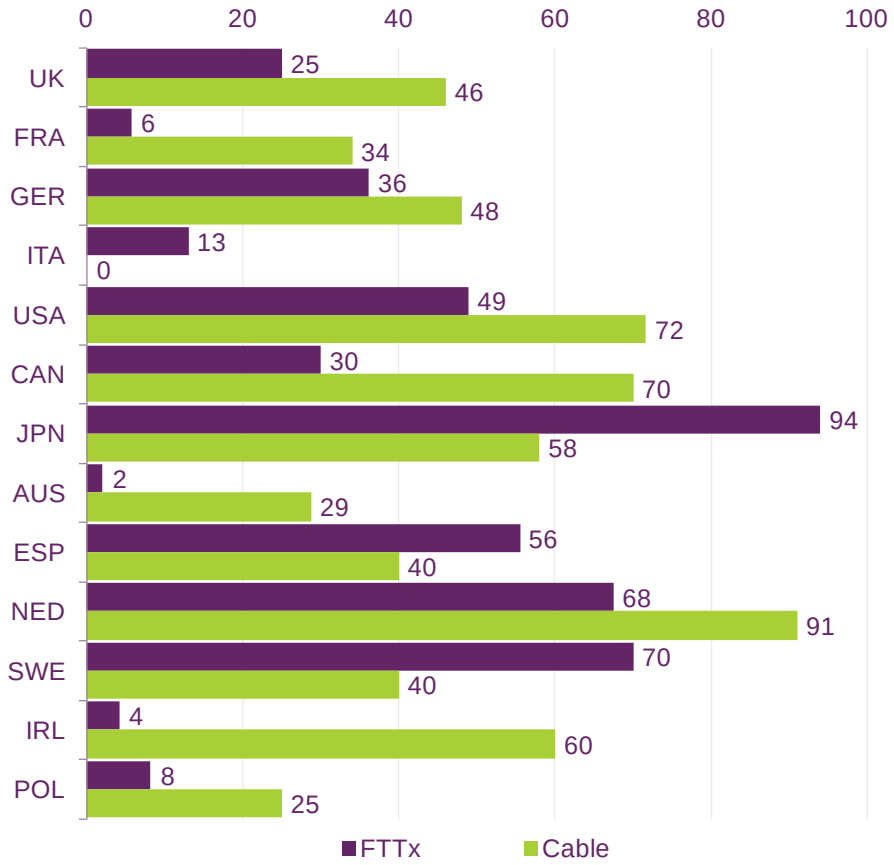


Source: European Commission Study on broadband coverage 2011, November 2012 / Ofcom.
Note: Figures are rounded to the nearest 1%, therefore an availability figure of 100% does not mean that coverage is available to all households.

Japan still leads on availability of broadband networks capable of delivering superfast speeds but others are catching up.

Figure 6.8 shows FTTx and superfast cable broadband availability for 13 of our comparator countries at the end of 2011. Japan has had a significant lead over our other comparator countries, in terms of the availability of networks capable of delivering superfast broadband, for a number of years, with 94% of premises having access to fibre-based broadband in 2011. For the first time in 2011, other countries showed comparable levels of availability to those in Japan. The Netherlands was closest, with 91% of premises having access to a superfast cable broadband connection, whereas in Sweden, Canada and the US, at least 70% of premises were able to access superfast broadband services. In the UK just under half of all homes (46%) could receive superfast cable broadband services at the end of 2011, while a quarter could receive fibre-based superfast services.

Figure 6.8 Availability of FTTx and cable networks: end 2011



Source: Analysys Mason, FTTX rollout and CAPEX in developed economies, forecasts 2012-2017, March 2012 / Ofcom
Note: UK figures are household availability

Take up of superfast broadband connections is still low in many countries

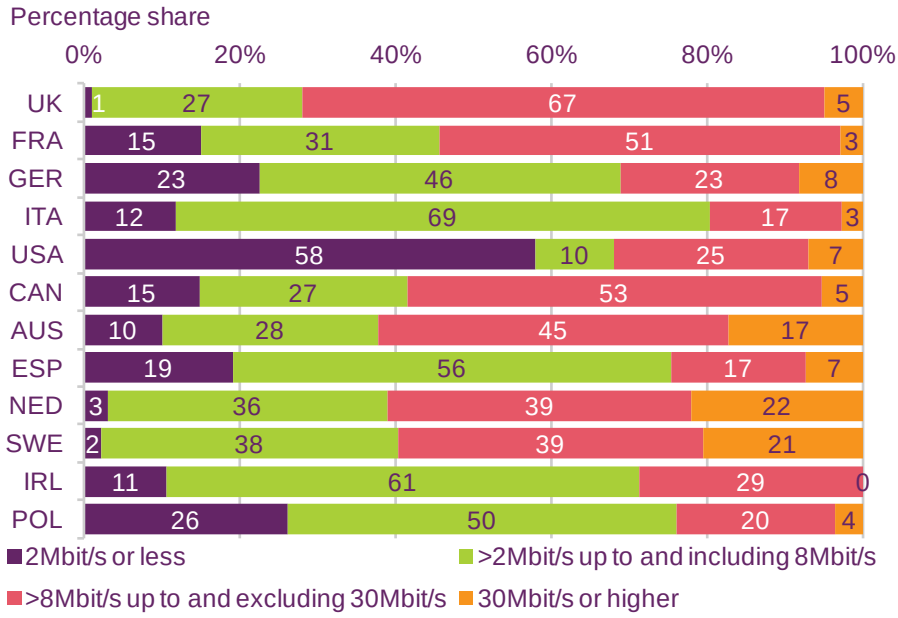
While availability is now significant in many countries, the proportion of broadband subscribers who choose to take up a superfast connection is generally low across our comparator countries. Figure 6.9 shows fixed broadband connections at the end of 2011 split out by headline speed. In the Netherlands and Sweden just over a fifth of broadband connections were superfast at the end of 2011, while Australia is just behind them on 17%. In the rest of our comparator countries less than 10% of broadband connections had headline speeds of 30Mbit/s or higher. The US had the highest proportion of connections with a headline speed of 2Mbit/s or less, at 58%, while in the UK, where this proportion was lowest, just 1% of connections fell into this category.

The UK had the highest proportion of lines with a headline speed above 8Mbit/s, at 72%; this is to a large extent because most BT local exchanges having been upgraded to offer ADSL2+, which has a maximum theoretical speed of 24Mbit/s (although, following changes to UK advertising guidelines which came into force in April 2012,[91] these are most frequently advertised as being 'up to' 16Mbit/s). In Italy, just 20% of broadband connections had a headline speed above 8Mbit/s at the end of 2011, the lowest proportion among those countries for which figures were available.

[91] Available at http://www.cap.org.uk/Media-Centre/2012/New-Telecoms-Help-Notes-get-up-to-speed.aspx.

It should be noted that Japan has not been included in this data set, due to lack of appropriate data points. Japan has high take-up of fibre-based broadband connections, with nearly two-thirds of broadband connections fibre-based (see Figure 6.10). It is not possible to infer directly that the headline speed of a broadband connection is above 30Mbit/s just because it is fibre-based, as operators may offer lower speeds over fibre-based connections as part of a wider product and pricing strategy.

Figure 6.9 Proportion of total fixed broadband connections, by headline speed



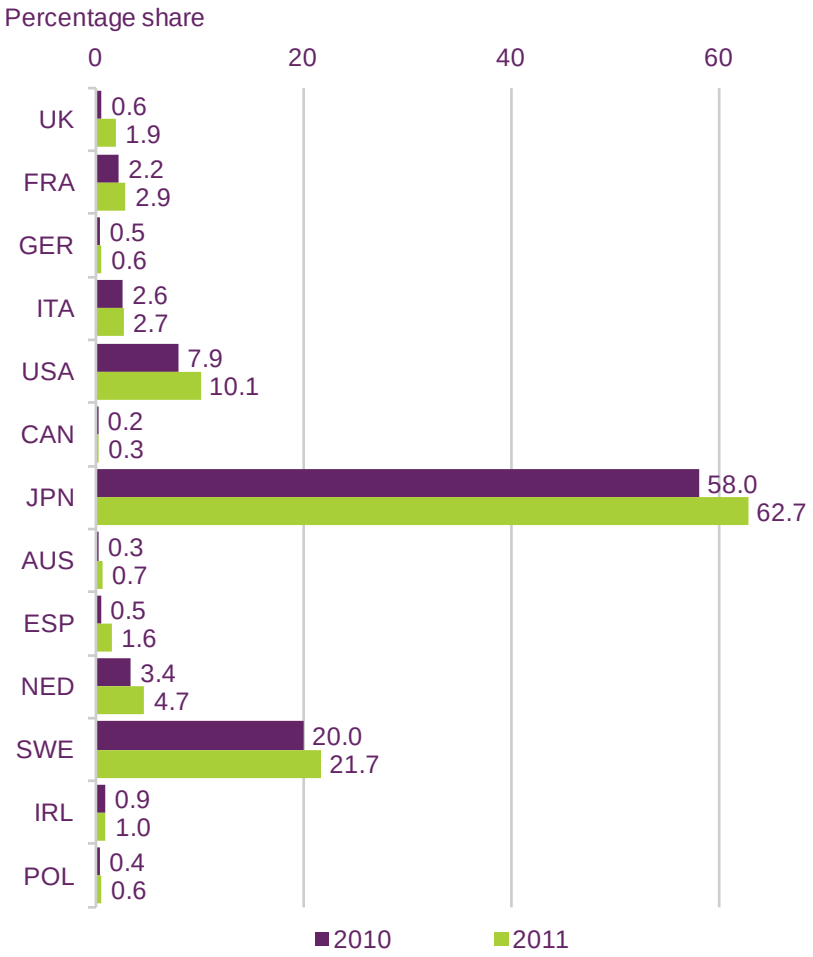
Source: IDATE / industry data / Ofcom
Note: UK data is for residential connections only as at November 2011

Take-up of fibre-based broadband services is increasing across all our comparator countries but still varies significantly between them

In all of our comparator countries, the proportion of lines that were fibre-based increased between 2010 and 2011.There was a mixed picture in terms of the absolute proportion of fixed broadband connections using a fibre-based technology such as fibre-to-the-cabinet (FTTC), fibre-to-the-home (FTTH) and fibre-to-the-premises (FTTP) at the end of 2011 (Figure 6.10). Fibre broadband take-up was highest in Japan at the end of the year, where 62.7% of fixed broadband connections were fibre-based, up from 58.0% a year previously.

In five of our comparator countries (Canada, Australia, Germany, Ireland and Poland) less that 1% of connections used a fibre technology, and Japan, Sweden and the US were the only countries where more than 5% of broadband connections used fibre (in the UK the figure was 1.9%, up from 0.6% at the end of 2010).

Figure 6.10 Fibre-based connections as a proportion of all fixed broadband connections: 2010 and 2011



Source: IDATE / industry data / Ofcom

6.1.5 Use of text messaging continued to increase rapidly in many countries

UK among leaders in 2011 in SMS growth, which went into reverse for some

Since the sending of the first SMS, or text message, in 1992[92], the success of SMS has been remarkable, achieving year-on-year growth in most countries. In the UK, the average person sent 200 text messages per month in 2011 - or over six per day - making the UK the third highest sender of text messages per person of 13 comparator countries. In the US, the leader among our comparator countries, the volume of texts sent is higher, at 614 per month per person – or nearly one per hour (although this does include push-to-text messages, so direct comparison with the other countries is not possible). Ireland is the second of the comparator countries, with 218 texts sent per month per person.

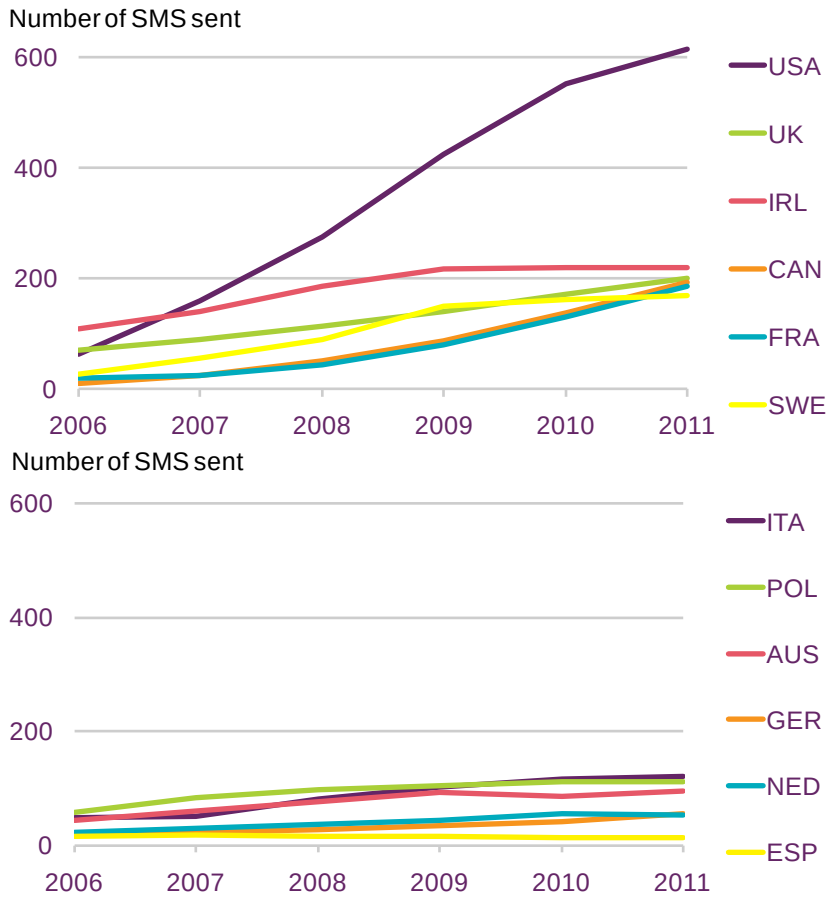
However, these figures mask contrasting growth rates (see Figure 6.11). In two of our comparator countries – Spain and the Netherlands – SMS volumes fell in 2011. This is a

[92] The first text message was sent in the UK on 3 December 1992. See Mobile Data Association: http://www.text.it/mediacentre/facts_figures.cfm

new phenomenon: these are the only comparator countries to have experienced annual decreases in SMS volumes[93].

In all the other comparator countries for which we have data, volumes increased. In the UK, France, Germany, the US, Canada and Australia the volume of texts sent increased by over 10% in 2011 – with an increase of 17% for the UK.

Figure 6.11 Volume of SMS (text messages) sent per person per month: 2006-2011



Source: IDATE / industry data / Ofcom
Note: USA figures include push-to-text and are not directly comparable to figures for the other countries.

Young women are driving the increase in SMS use

Although these volume figures describe total SMS use, they do not illustrate which segments of a population send them. We consider this in Figure 6.12, using data from Ofcom's consumer research in September 2012.

[93] In the UK, the volume of SMS messages declined quarter-on-quarter for two consecutive quarters from the fourth quarter of 2011 to the second quarter of 2012. We do not make further comment on this in this report because the report focuses on 2011 data. However, these data are published quarterly by Ofcom and interested readers can find further information at http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/tables/

The research found that in every country in which the survey took place, more women than men regularly sent text messages. The research also found that a much higher proportion of people between 18 and 35, than those aged 65 and over, regularly sent texts.

Over half of all women in the UK (52%), Italy (60%) and China (52%) – the three leading countries - send text messages at least once a day. This compares with 35% of men in the UK, 44% in Italy and 47% in China.

Including any frequency of sending text messages, in the UK 93% of women sent texts, compared with 87% of men. The largest gender gap was in France, where 90% of women sent texts, but only 82% of men.

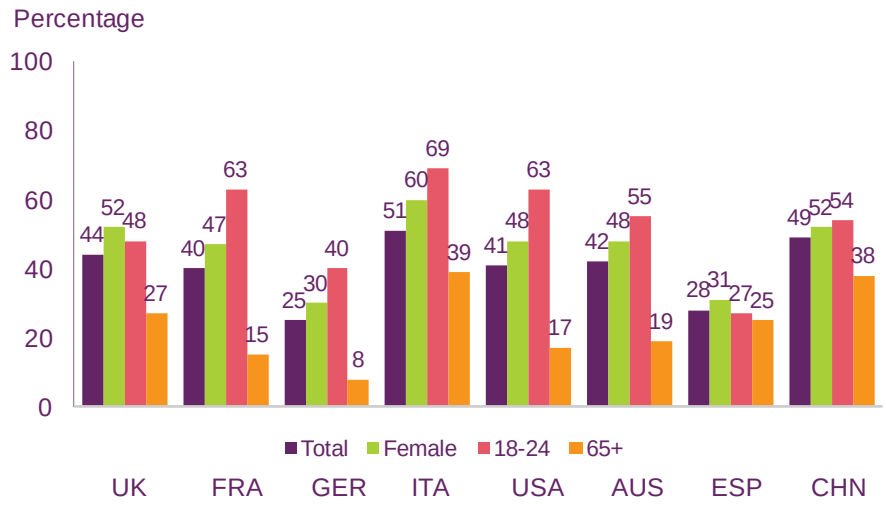
Those sending text messages are typically in the 18-24 and 25-34 age groups, the research showed. Forty-nine per cent of the first age group and 45% of the second send texts every day. This compares with just 18% of over-65s.

However, in the UK, older consumers were more actively engaged in sending text messages than the average for our comparator countries: over a quarter (27%) of UK over-65s sent texts every day.

Even though the US sends more text messages (including push-to-text messages) per person than any other country, just one in six (17%) of over-65s in the country send texts every day.

Ownership of a smartphone appeared to be a key driver for sending texts. Over half (51%) of those who regularly used a smartphone sent texts on a daily basis. This compared with about a third (34%) of those who regularly used a feature phone, suggesting that the large-screen interface usually found with smartphones is encouraging subscribers to text (although another reason may be that the average smartphone user is younger than the average feature phone user). The type of tariff – post-paid or pre-paid – was also a factor in the frequency of texts sent (with post-paid subscribers sending texts more frequently) – but was less significant as a factor than smartphone ownership.

Figure 6.12 Percentage of respondents who sent texts at least once a day, including splits by female, 18-24 years old and 65 years and older



Source: Ofcom consumer research.
Note: Due to sample sizes, age splits should be treated with caution.

Ease of use drove younger consumers towards texting and away from making phone calls

The same Ofcom research appears to suggest that a high proportion of consumers commonly sent texts because it was easier than making phone calls. Ease of use appeared to be a driver behind falling voice volumes and rising SMS volumes in some countries.

Over half of UK smartphone users (second highest at 56%) said that the statement "I send text messages instead of making phone calls because it's easier" applied or totally applied to them (see Figure 6.13). The highest proportion was in the US, at 58%. It is perhaps not a coincidence that the US is the largest sender of text messages in our comparator countries, having seen a compound annual growth rate (CAGR) in the volume of texts sent of 58% over the period 2006-2011.

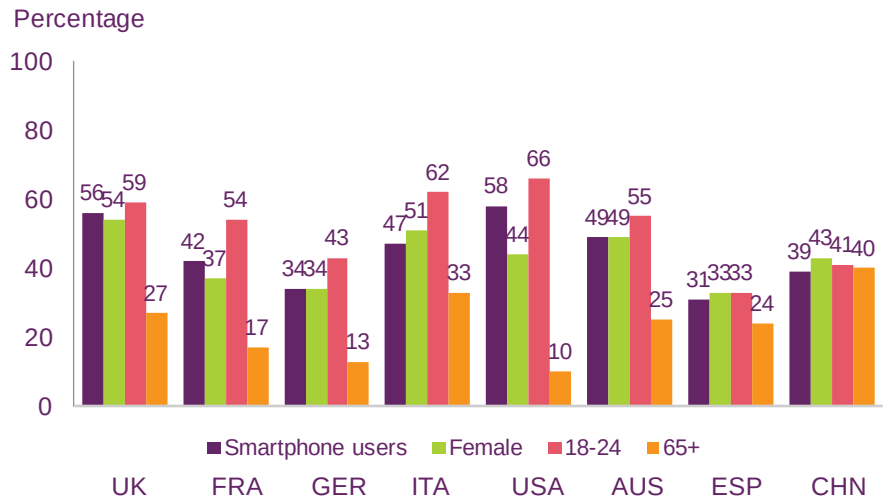
The youngest age group – 18 to 24 year-olds – were more likely to say that the statement applied or totally applied to them: with two-thirds (66%[94]) of US respondents, 62% of respondents in Italy and 59% of respondents in the UK. Over-65s were far less likely to agree, with 10% in the US, 33% in Italy and 27% in the UK. This apparent difference between age groups in attitudes towards adopting texting instead of phone calls could be because of differences in the familiarity with texting, differing attitudes of peers (discussed below), differing values placed on verbal versus electronic communication and the greater penetration of smartphones among younger consumers.

In all comparator countries, a greater number of women said the statement applied or totally applied to them, including 54%[13] of UK women (the highest of all comparator countries) and 51% of women in Italy. The corresponding figures for men were 43% and 39% respectively. This may reflect the higher frequency of text messaging by women.

Across the comparator countries as a whole, respondents with a feature phone – normally older devices on which it typically takes longer to type a text message – felt that the statement was less applicable to them.

[94] Sample size is the total base in the country concerned – different to the base of smartphone users cited above. Therefore figures for smartphone users cannot be directly compared with the other statistics cited.

Figure 6.13 Proportion of users who said the statement that they sent texts instead of making phone calls because it was easier 'applied' or 'totally applied' to them



Source: Ofcom consumer research.
Note: Due to sample sizes, age splits should be treated with caution.

Low price and influence by friends and family drove UK increase in SMS volumes

In trying to understand the reasons for growth in text messaging, Ofcom's consumer research asked consumers who sent more texts than two years ago why they were texting more.

Across all comparator countries, consumers said the two major factors were 'convenience' and (backing up the findings above) because texting was 'easy'. (see Figure 6.14)

However, there were two categories which UK respondents selected more than respondents in most other countries. The first one indicates that UK mobile phone users are being influenced heavily by their peers: nearly half (48%) of mobile phone subscribers who sent more texts than two years ago said they were doing so because texting "was what their family and friends were using". Only the US (53%) showed a stronger peer impact on the increase in text volumes.

The second category is price. Over one-third (36%) of UK mobile phone subscribers who sent text messages more than they did two years ago said it was because it was 'cheaper than the alternative'. Only Australia's consumers offered this reason more (37%). For simplicity, we did not specify in the survey what the alternative might be: however, in the majority of cases it can be assumed to be phone calls – either fixed or mobile.

One key reason why UK respondents felt that text messaging was relatively cheap may be because many UK mobile tariffs – post-paid and pre-paid – include very large bundles of texts within the subscription / top-up price, making texting effectively free. For example, in October 2012 all four UK mobile network operators offered post-paid tariffs including at least 5,000 texts per month.

Figure 6.14 Most frequently-cited reasons for increasing SMS use

	Top reason	%	Second reason	%	Third reason	%	Fourth reason	%	Fifth reason	%
UK	Easy	59	Convenient	58	Immediate	56	Friends	48	Cheaper	36
FRA	Convenient	56	Immediate	54	Easy	53	Cheaper	36	Friends	27
GER	Convenient	55	Easy	50	Friends	31	Cheaper	21	Immediate	19
ITA	Immediate	57	Easy	51	Friends	33	Convenient	29	Cheaper	24
USA	Convenient	67	Immediate	60	Easy	56	Friends	53	Interactive	26
AUS	Convenient	67	Easy	64	Immediate	57	Friends	43	Cheaper	37
ESP	Convenient	52	Immediate	49	Easy	45	Friends	27	Cheaper	23
CHN	Easy	64	Convenient	61	Immediate	61	Cheaper	35	Interactive	30

Source: Ofcom consumer research.
Base: all respondents who said they send more text messages than two years ago. Options given were: It's convenient, It's easy to use (in table: "Easy"); It's immediate; It's what my friends and family are using (in table: "Friends"); It's cheaper than the alternative; It's interactive; It's more personal; It's the only method available to me; Other; Don't know.

The price of text messaging continues to fall

The UK is one of only two countries among our comparator nations that has seen falling SMS revenues and increasing SMS volumes, with the result being falling price paid per SMS. SMS revenues decreased by nearly 4% in 2011 – the third consecutive year of decline - while the number of SMS sent increased by 17%.

The unusual combination of increasing use and falling revenues exists because many UK post-paid and pre-paid tariffs include large quantities of SMS within the price of the bundle. Previously, text messages were usually charged individually at around 10 pence per message, and despite the lower volumes were a large revenue stream for operators.

Figure 6.15 shows that the average revenue per SMS sent by UK subscribers was just 1.6 pence in 2011. This is equivalent to approximately only 11 seconds of an average mobile phone call, providing a strong incentive to text instead of speak.

Canada, the other country with falling SMS revenues and rising SMS volumes, realised just 0.8 pence per SMS in revenue in 2011. These prices marked a compound annual growth rate between 2006 and 2011 of -19% and -30% respectively.

The US realised just 0.4 pence in revenue per SMS in 2011 (having taken into account push-to-text) but because of volume growth it achieved a 13% annual increase in total SMS revenue.

Some caution should be used in comparing the price of SMS in countries other than the UK, because of differing ways of treatment of messaging revenues. For example, some of these countries include MMS (usually low in volume) and premium SMS (low in volume but relatively high in revenue) within one overall messaging revenue figure, whereas other countries do not. For the UK, the figures include premium SMS but not MMS. Caution should also be shown in comparing figures between countries, because the inclusion of SMS messages within bundles is more common in some countries than others: revenue from these bundles is not counted as SMS revenue.

Figure 6.15 Average revenue per SMS message

Country	Pence per message
UK	1.6
FRA	2.1
GER	5.9
ITA	2.4
USA	0.4
CAN	0.8
AUS	5.3
ESP	14.5
NED	5.9
SWE	1.4
POL	1.8

Source: IDATE / industry data / Ofcom
Note: USA figures include push-to-text and so should not be compared with the other countries.

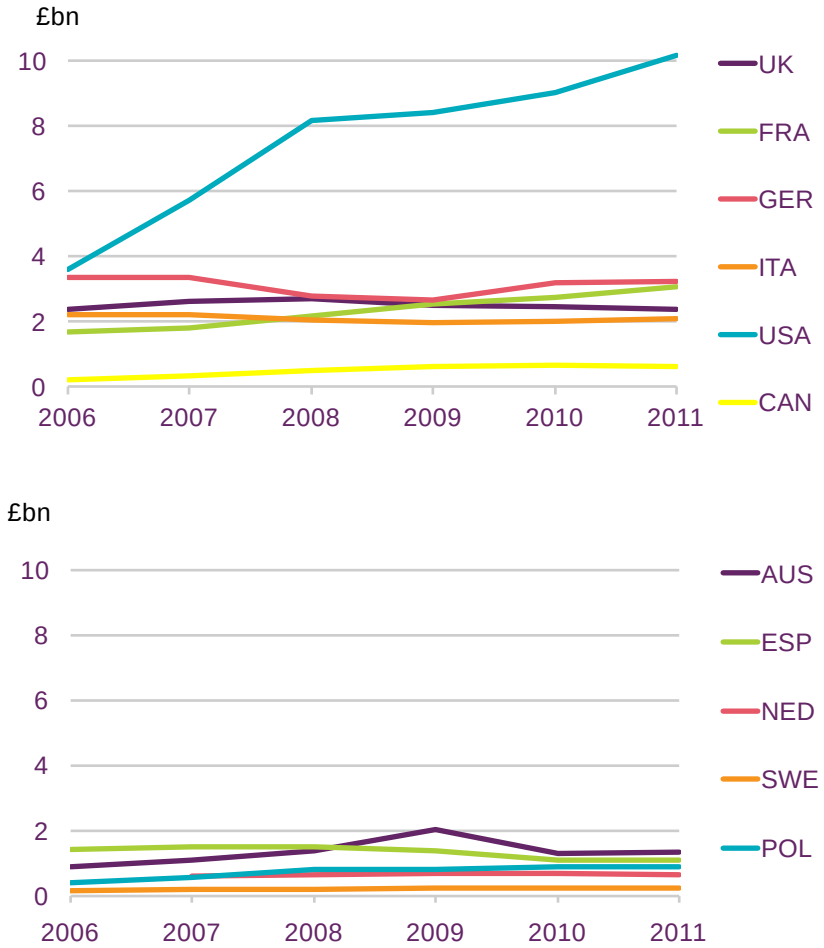
Revenues from SMS showed very different trends across our comparator countries

Spain remained unusual among European countries in that it realised substantial revenues from SMS despite relatively low usage. Unlimited SMS offers are available within some post-paid bundles in Spain, but aside from this operators have managed to gain revenue from SMS by offering add-on SMS-only bundles (for example, at the time of writing Vodafone Spain offered one such bundle for €3 per week). Consequently Spain saw increasing SMS revenue per message in 2011, to 14.5p per message, though total SMS revenues fell as subscribers reduced their usage in a challenging economic environment (Figure 6.16).

In 2011, SMS revenues fell by the highest percentage in the Netherlands, the country where over-the-top messaging pioneer *What's App* was founded. Volumes also fell, by over 4% during the year. Spain and the Netherlands are the only two of our comparator countries where the volume of SMS decreased in 2011.

Over-the-top messaging applications are most commonly installed by subscribers on their handsets. These applications use the mobile data connection of the subscriber and are likely to be a substitute for text messaging, yet operators rarely realise any revenue from them. Social networking may be another substitute for SMS.

Figure 6.16 SMS revenues: 2006 to 2011



Source: IDATE / industry data / Ofcom
Note: US figures include push-to-text and so should not be compared to other countries.

6.2 The telecoms industry

6.2.1 Introduction

In this section we consider the major trends in telecommunications markets in the 17 nations covered by this report from an industry and operator perspective. In general, we have looked at trends over the five years to 2011, although we provide year-on-year analysis where trends have changed significantly over the period.

In the first part of this section we provide an overview of the industry as a whole, considering recent trends in revenue growth. We then look at each market individually and in more depth, starting with fixed voice, followed by mobile voice and data services and concluding with an overview of fixed broadband services.

Some of the key points highlighted in this section include:

- **Fixed voice revenues fell in all our comparator countries in 2011.** Across all 17 comparator countries, fixed voice revenues fell by an average of 7.3% in 2011, a slight increase on the 7.1% average in 2010. Fixed voice revenues fell by 5.2% in the UK during the year, a higher rate than the 3.3% average in the five years to 2011.

- **Fixed voice call volumes fell in all of the comparator countries for which figures were available in 2011, except France.** Growth in the fixed voice market in France is largely a result of high take-up of managed VoIP services, often provided as part of a triple-play bundle of fixed broadband and IPTV services. In the UK, fixed voice call volumes fell by 10.0% in 2011, the fourth highest fall among our comparator countries.

- **Mobile voice call volumes fell by 1.1% in the UK between 2010 and 2011, from 125 billion minutes to 124 billion; the first annual fall.** Japan was the only other country to witness a decline in 2011, with mobile voice volumes falling from 147 billion minutes to 145 billion.

- **Fixed broadband accounted for 39% of total fixed telecoms revenues in 2011.** There was a wide range in the proportions of fixed revenues attributed to fixed broadband service among our comparator countries, from 25% in Ireland to 55% in France, while in the UK over a quarter (27%) of fixed revenues were from fixed broadband services.

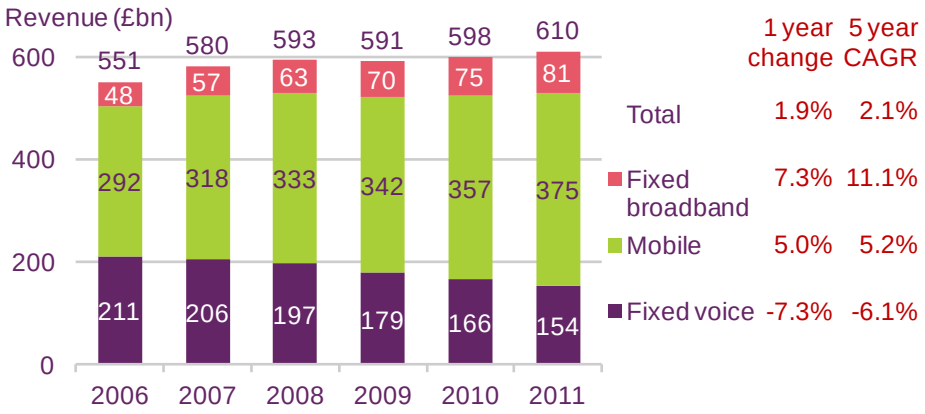
- **Five per cent of UK broadband connections were superfast at the end of 2011.** The proportion of connections classed as being superfast (i.e. with a headline speed of 30Mbit/s or more) ranged from 0% (to the nearest percentage point) in Ireland to 22% in the Netherlands at the end of 2011. Poland and the UK had the lowest fixed broadband revenue per person in 2011.

6.2.2 Overview

Telecoms revenues increased by 2% across the comparator countries in 2011

Across our 17 comparator countries, retail telecoms revenue grew by £11bn to £610bn in 2011, marking a second consecutive year of growth (Figure 6.17). Mobile services contributed an £18bn increase and fixed broadband a £5bn increase, with fixed voice decreasing by £12bn. Mobile services contributed 61% of retail revenues in 2011, up from 60% in 2010 and 53% in 2006.

Figure 6.17 Total comparator country retail telecoms revenue by sector: 2006 to 2011



Source: IDATE/ industry data / Ofcom. Note: Excludes revenue from narrowband internet and corporate data services and broadband revenues for BRA, RUS, IND and CHN; covers only the 17 countries in the analysis.

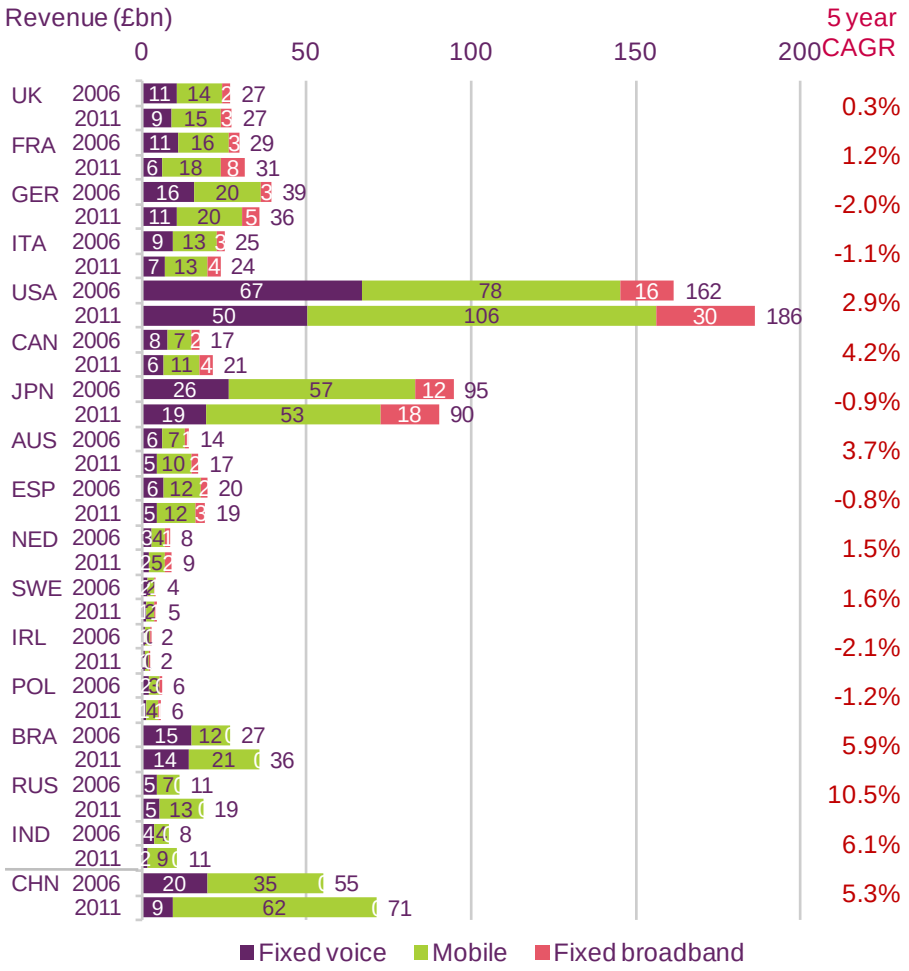
The US contributed the largest proportion of telecoms service revenues

The US continued to contribute the largest proportion of telecoms service revenues, with £186bn in 2011. Japan remained the second largest market of our comparator countries, with £90bn, although it faced a compound annual growth rate (CAGR) of -0.9% over the five years from 2006 to 2011.

The Chinese market expanded rapidly, with a CAGR of 5.5% taking its market size to £71bn in 2011. Only the retail revenues of Russia and India increased faster over the five-year period.

The UK is the third largest of our European nations – behind Germany and France - with a 0.2% CAGR decline in its retail revenues to £27bn in 2011 (see Figure 6.18).

Figure 6.18 Telecoms service retail revenues by sector: 2006 and 2011



Source: IDATE / industry data / Ofcom. Note: Total service revenue excludes revenue from narrowband internet and corporate data services and broadband revenues for BRA, RUS, IND and CHN

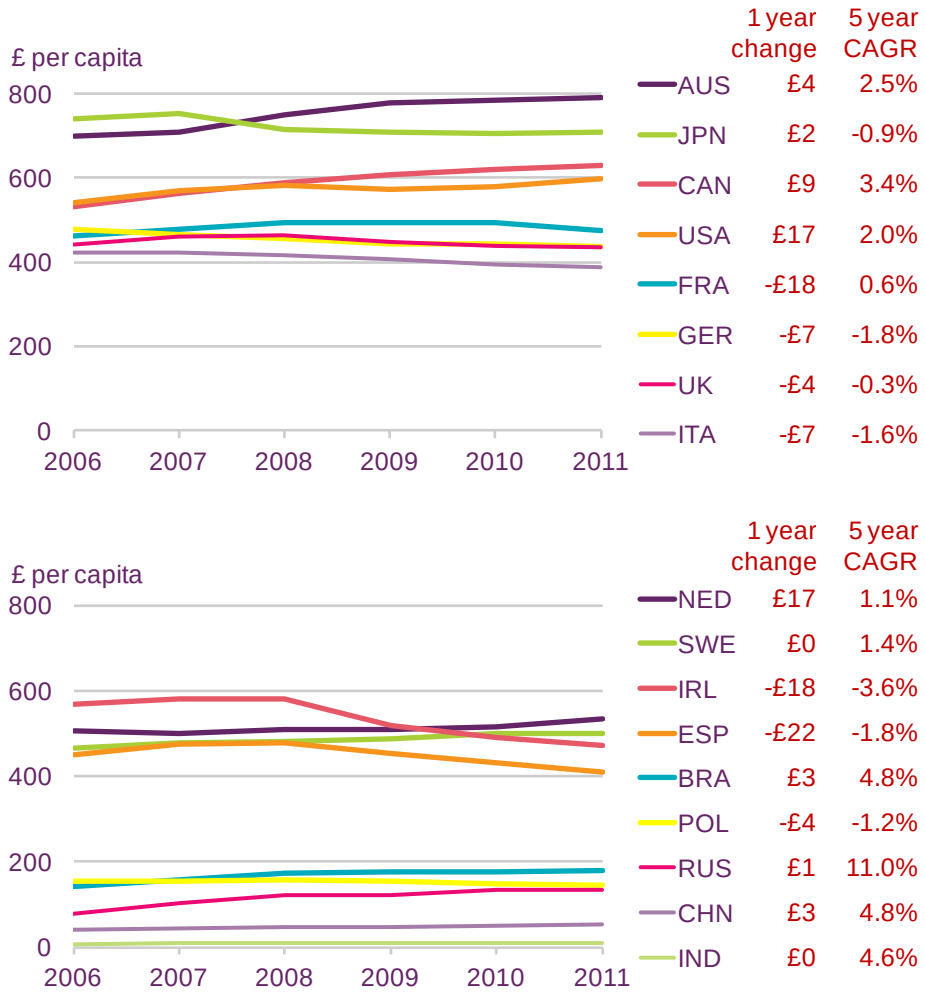
Australia's consumers contributed the highest revenue per head

Australia's consumers spent the most per head on telecoms services, with an increase of £4 in 2011 to £790: more than Japan (£708 per capita) and Canada (£629 per capita). In the UK, the figure was £436 – lower than France and Germany (see Figure 6.19).

UK service retail revenue per capita has fallen year on year since 2008, outweighing two previous years of growth in 2006 and 2007 and leading to an overall decline for the five-year period. This contrasts with Australia and nine other comparator nations, which have recorded overall increases over the five-year period.

Brazil, Russia, India and China – often called the BRIC nations – registered the highest growth rates in revenue per capita. However, in the case of India, its CAGR of 4.6% comes on the back of very small revenues per capita compared with the rest of our comparator countries; consequently, its contribution to the total revenue of our comparator countries is small. One of the contributing factors towards such low revenue may be the level of competition in India's mobile market; calls cost on average less than 1p per minute – the lowest of the 17 nations. Other contributors may be the low cost per subscriber (because of the large number of subscribers in one country) and low average incomes, relatively to the other comparator countries.

Figure 6.19 Total telecoms service revenue, per capita: 2006-2011



Source: IDATE / industry data / Ofcom

Mobile data revenues exceeded fixed broadband revenues for the first time

In the past five years, the relationship between voice revenue and data revenue has changed substantially, with voice revenue decreasing and data revenue (the sum of fixed broadband revenue, mobile messaging revenue and mobile data revenue) increasing as a total of all the comparator countries.

However, within the data category[95], there are substantial differences in growth rates (see Figure 6.20). As a total across our comparator countries (excluding the BRIC nations for which we do not have relevant data), mobile data has seen the fastest growth rate (CAGR)

[95] When considering data revenues, it is worth noting that both mobile data and fixed broadband are often sold as part of a bundle. Where mobile data is bundled with a subscription, that revenue is realised as subscription revenue, not mobile data revenue. Mobile data revenue is typically recognised only when data is sold separately to voice. Therefore, if mobile data figures are compared between countries, some caution should be used. Mobile data revenue does not include mobile broadband revenues; i.e. from dongles and datacards. Where fixed broadband is sold in a bundle, the revenue from that bundle may be apportioned using one of a number of methods between fixed broadband and the other service(s) in question, and therefore some caution should be applied in making international comparisons.

of 25.4% between 2006 and 2011 meaning that, for the first time in 2011, mobile data revenues (£82bn) exceeded fixed broadband revenues (£81bn, CAGR of 11.1%).

This growth in mobile data revenue has been driven by a rapid increase in the adoption of smartphones, from which it is much easier and quicker to access the internet.

However, at the country level, in only three of our comparator countries does mobile data revenue exceed fixed broadband revenues – the US, Japan and Australia – but the difference between these countries is substantial. Japan has been an early adopter of high-speed mobile services and the US has the most LTE subscribers of any country in the world – 64% at the end of 2011 according to Telegeography[96] – which may explain the considerable mobile data revenues both countries have achieved.

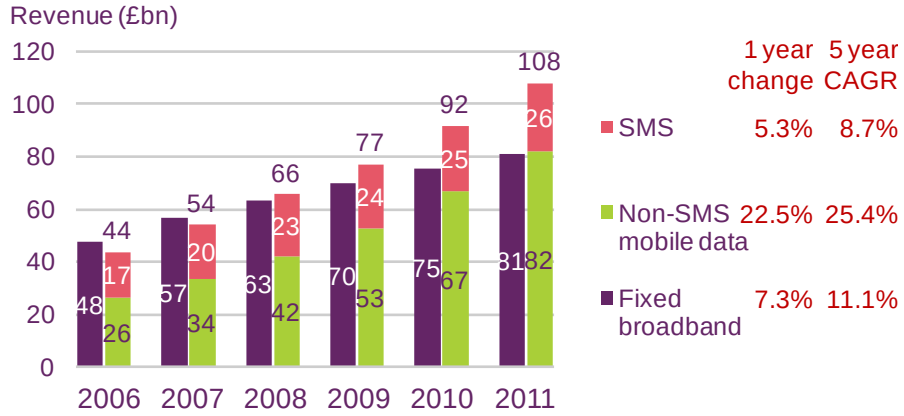
In the UK, mobile data revenues represent only 60% of fixed broadband revenues. However, this is largely a reflection of the fact that mobile data in the UK is often included in a mobile subscription and so is not always reflected directly as revenue.

SMS revenues for the 13 countries increased at a slower CAGR of 8.7% between 2006 and 2011. Although SMS volumes are still growing rapidly in some markets, like the UK, revenues have failed to keep pace as operators have started to offer large bundles of SMS messages as part of subscription packages; this has stimulated use but caused revenue pressure for SMS in many markets. This subject is discussed in greater detail in a key market development (section 6.1.5) in this chapter.

France and the US had the largest increases in fixed broadband revenue between 2006 and 2011, with service providers in the US starting rapidly to roll out fibre-to-the-home and fibre-to-the-cabinet services.

However, much of the revenue growth in fixed broadband in developed countries was realised towards the start of the five-year period when take-up was growing rapidly. Fixed broadband may now be approaching market saturation in many European countries, as the majority of households subscribe to fixed broadband services – limiting revenue growth for the year 2011.

Figure 6.20 Fixed broadband and mobile data revenues - total for the comparator countries: 2006 to 2011



Source: IDATE / industry data / Ofcom. Note: Analysis excludes Brazil, Russia, India and China.

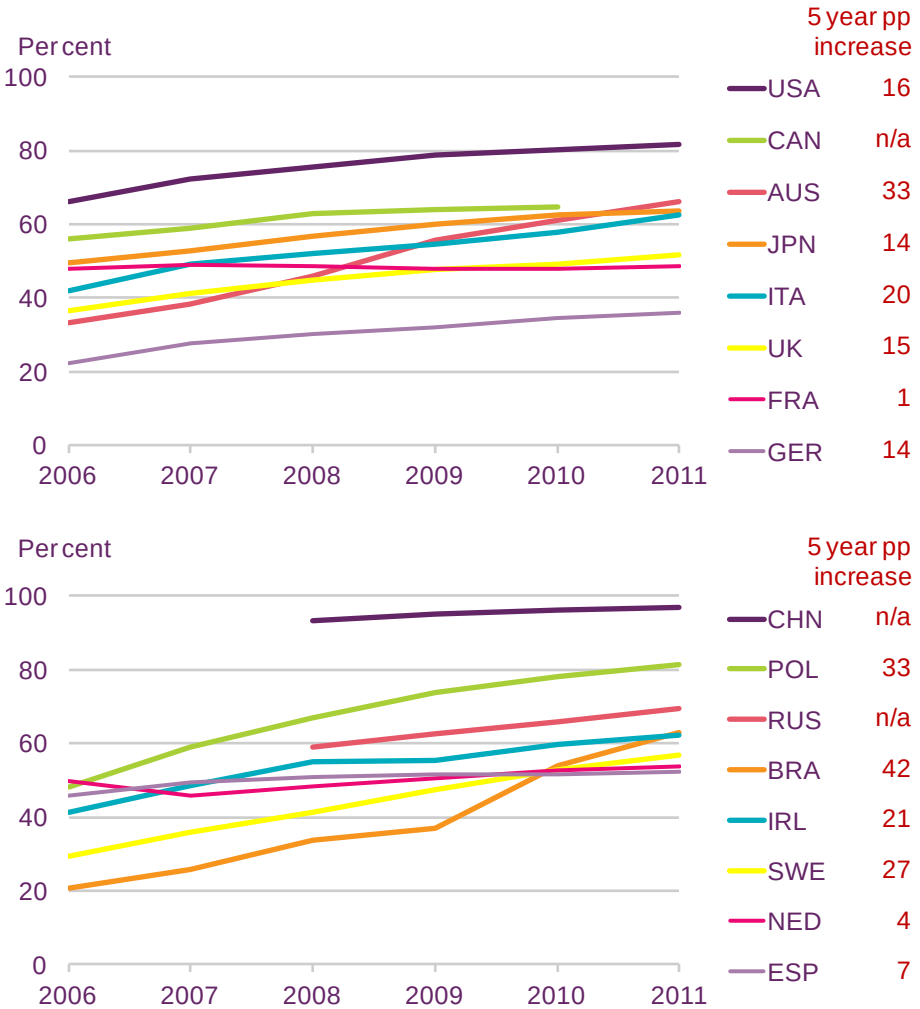
[96] http://www.telegeography.com/products/commsupdate/articles/2012/03/15/us-remains-at-forefront-of-lte-service-adoption/

Mobile call volumes exceed fixed call volumes in the majority of our countries

Figure 6.21 shows the proportion of voice call minutes which originate on mobile networks in each of our comparator countries. The countries where the highest proportion of calls originated on mobiles in 2011 were China (97%), the US (82%) and Poland (81%). In China and Poland this is partly due to the limited availability of fixed telephony networks, while the proportion of calls that are mobile-originated will be overstated in China, the US and Canada as the mobile call volumes used in the calculation include incoming call minutes (and in the US because the fixed call volumes exclude local calls, which are typically unmetered).

Germany and France were the only comparator countries where less than half of voice call minutes originated on mobile networks in 2011 (36% of voice call minutes were mobile-originated in Germany in 2011, while the figure was 49% in France). In each country this can largely be attributed to there being a significant differential between average fixed and mobile voice call costs (as is shown in Figure 6.22, the average cost of a mobile minute was more than twice that of a fixed call minute during the year). Mobile-originated call volumes exceeded those from fixed lines for the first time in the UK in 2011, when 52% of voice call minutes originated on mobile phones.

Figure 6.21 Percentage of voice minutes originating on a mobile: 2006 to 2011



Source: IDATE / industry data / Ofcom. Note: USA, Canada and China – incoming calls to mobile included within mobile figures.

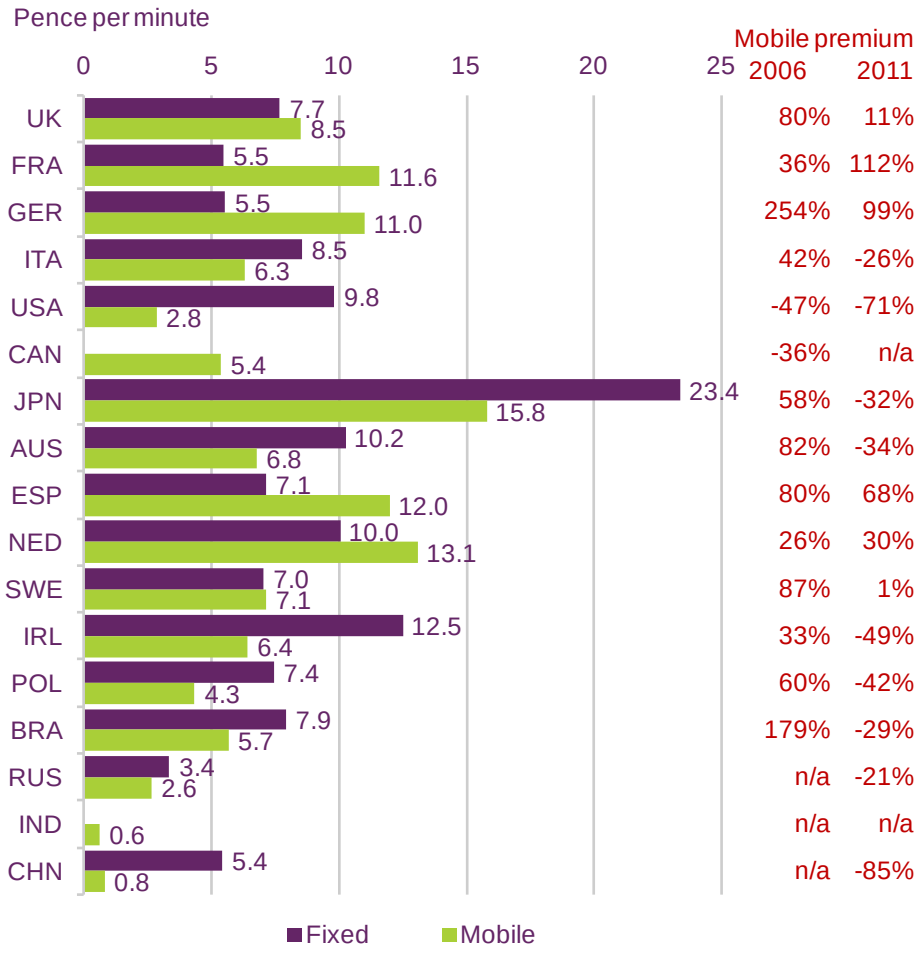
Japan had the most expensive voice calls among our comparator countries in 2011

Japan continued to have the highest average fixed and mobile costs per voice call minute among our comparator countries in 2011, at 23.4 pence per minute and 15.8 pence per minute respectively (Figure 6.22). Across the comparator countries for which figures were available, the average revenues per fixed and mobile voice call were 8.2 pence per minute and 2.3 pence per minute. The latter figure is low because two-thirds of all mobile call volumes made among our comparator countries originated in the BRIC countries, where average incomes and call costs are relatively low (by comparison, just 29% of fixed calls originated in the BRIC countries). In the UK, the average cost of a fixed originated voice call minute was 7.7 pence, slightly lower than the average across all of our countries, while the average cost of a mobile voice call was 8.5 pence per minute.

We refer to the percentage difference between the revenue per minute of mobile calls and fixed calls as the mobile price premium, and where the mobile price premium is negative, mobile-originated calls cost, on average, less than those originating on mobile networks. In 2011 the mobile price premium was lowest in China, which has a flourishing mobile sector (the number of mobile subscriptions in China increased by 15% in 2011), while France had the highest mobile price premium in 2010 as a result of the widespread availability of low-cost VoIP-based fixed voice services, which are typically bundled with fixed broadband and IPTV services over naked-DSL or fibre connections, and do not require a traditional fixed line.

Mobile revenue per minute is calculated by dividing total mobile voice revenues (including subscriptions) by the number of minutes; and the fixed cost per minute is calculated by fixed telephony revenue (including line rental) divided by the number of minutes. As voice services are often bundled with other services, the way in which consumers purchase voice services in each nation will affect the revenue-per-minute figures, and these figures are therefore only a proxy of average call costs in each country.

Figure 6.22 Average cost of a fixed and mobile call minute: 2011



Source: IDATE/Ofcom/operators
Note: Fixed voice figures for CAN and USA exclude local calls; fixed averages include NTS calls which were excluded from the 8.3 pence per minute fixed voice call average published in the 2012 UK Communications Market Report; mobile calculation for CAN, US and CHN includes incoming call minutes.

6.2.3 Fixed voice services

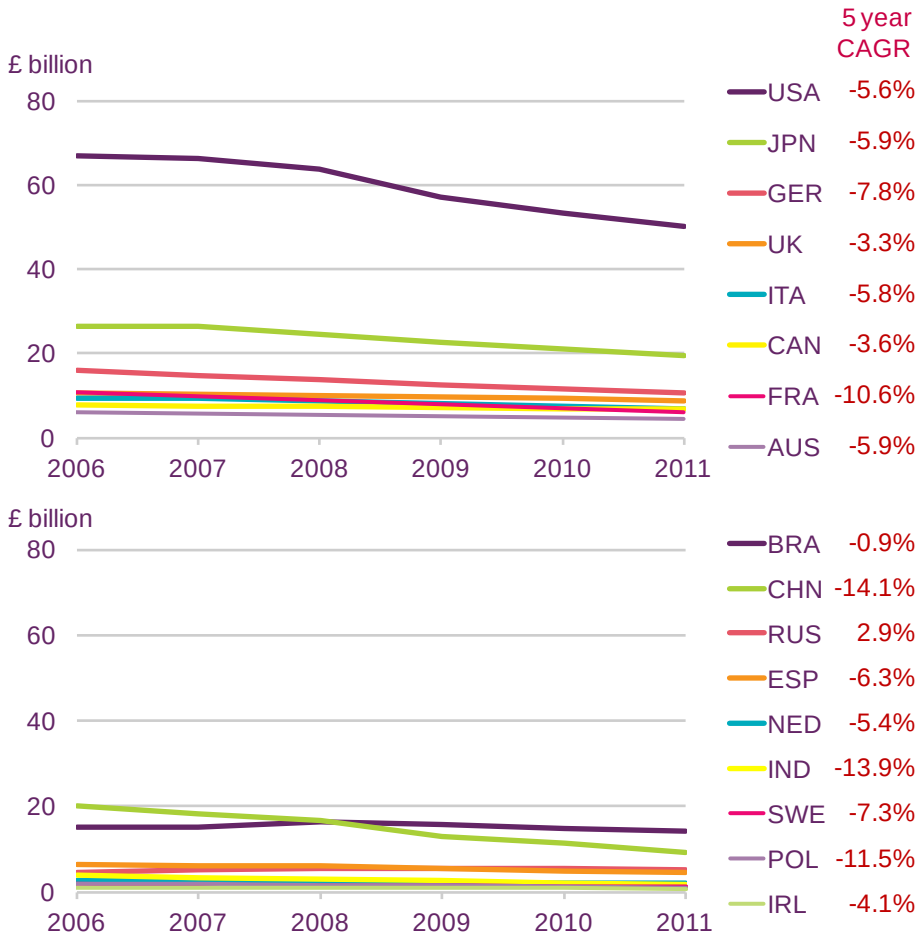
Fixed voice revenues fell in all our comparator countries in 2011

Fixed voice revenues fell in all 17 of our comparator countries in 2011, the fastest rates of decline being found in the BRIC countries, with revenues falling by 17.8% in China and 15.3% in India during the year (Figure 6.23). Among the non-BRIC countries, the annual falls in revenue were highest in Poland (13.3%) and France (13.1%). With the exception of France (where falling fixed voice revenues are related to increasing take-up of managed VoIP services), the availability of fixed-voice services is relatively low in all of these countries, and mobile phones are the predominant form of voice telephony.

Across all 17 comparator countries, fixed voice revenues fell by an average of 7.3% in 2011, a slight increase on the 7.1% average in 2010, with the rate of decline in fixed revenues increasing in eight of our 17 comparator countries. Fixed voice revenues fell by 5.2% in the UK during the year, a higher rate that the 3.3% average in the five years to 2011. Russia was the only comparator country where fixed voice revenues increased between 2006 and

2011, growing by an average of 2.9% a year over the period, whereas the steepest average falls in revenues were, again, found in China and India, at 14.1% and 13.9% respectively.

Figure 6.23 Fixed-line voice retail revenues: 2006 to 2011



Source: IDATE / industry data / Ofcom

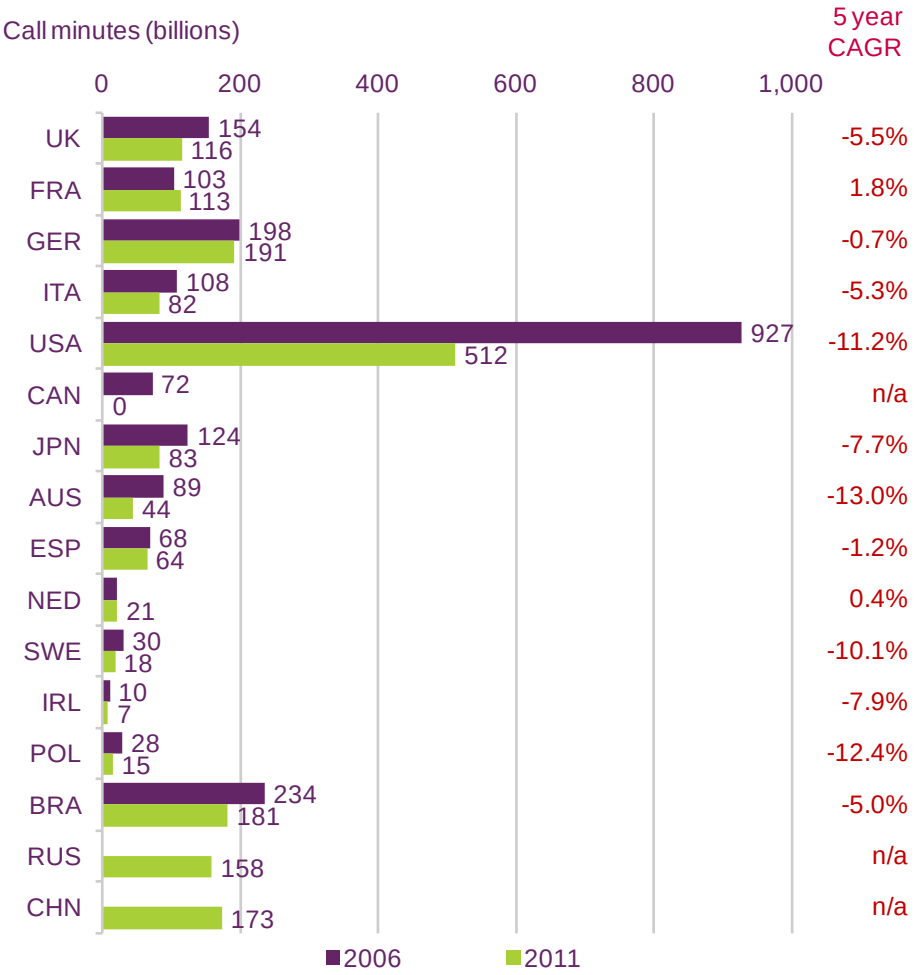
France was the only comparator country where fixed call volumes increased in 2011

Fixed voice call volumes fell in all of the 15 comparator countries for which figures were available in 2011 except France, where they increased by 0.6% to 113 billion minutes during the year (Figure 6.24). The resilience of the fixed voice market in France is largely as result of high take-up of managed VoIP services, often provided as part of a triple-play bundle of fixed broadband and IPTV services over naked DSL. Naked-DSL-based broadband services do not require a standard fixed line, so VoIP over naked-DSL provides a low-cost alternative to voice calls made over traditional fixed networks, as no line rental is paid. It is this which is the primary driver of the 13.1% fall in fixed voice revenues in France in 2011, despite call volumes increasing during the year. In the UK, fixed voice call volumes fell by 10.0% to 116 billion minutes in 2011, this rate of decline being the fourth highest among our countries.

While the use of VoIP services is comparatively low in the UK (see Figure 6.43) the major drivers behind declining fixed call volumes are the low cost of mobile voice and text services and high smartphone take-up, which has contributed to the increasing use of alternative forms of communication such as email and instant messaging. France and the Netherlands (where VoIP use is widespread) were the only comparator countries where fixed call volumes increased in the five years to 2011 (up by 1.8% and 0.4% a year on average,

respectively). Conversely, the highest average annual rate of decline over the period (13.0%) was in Australia, where fixed call volumes halved over the period, largely due to the increasing use of mobile voice services. UK fixed call volumes fell by an average of 5.5% a year between 2006 and 2011, a slower rate than the 7.1% average across the 13 comparator countries for which figures were available.

Figure 6.24 Fixed-line voice call volumes: 2006 and 2011



Source: IDATE / industry data / Ofcom
Note: Figures for USA and CAN exclude local and VoIP calls. Figures for USA, CHN and CAN include incoming mobile calls.

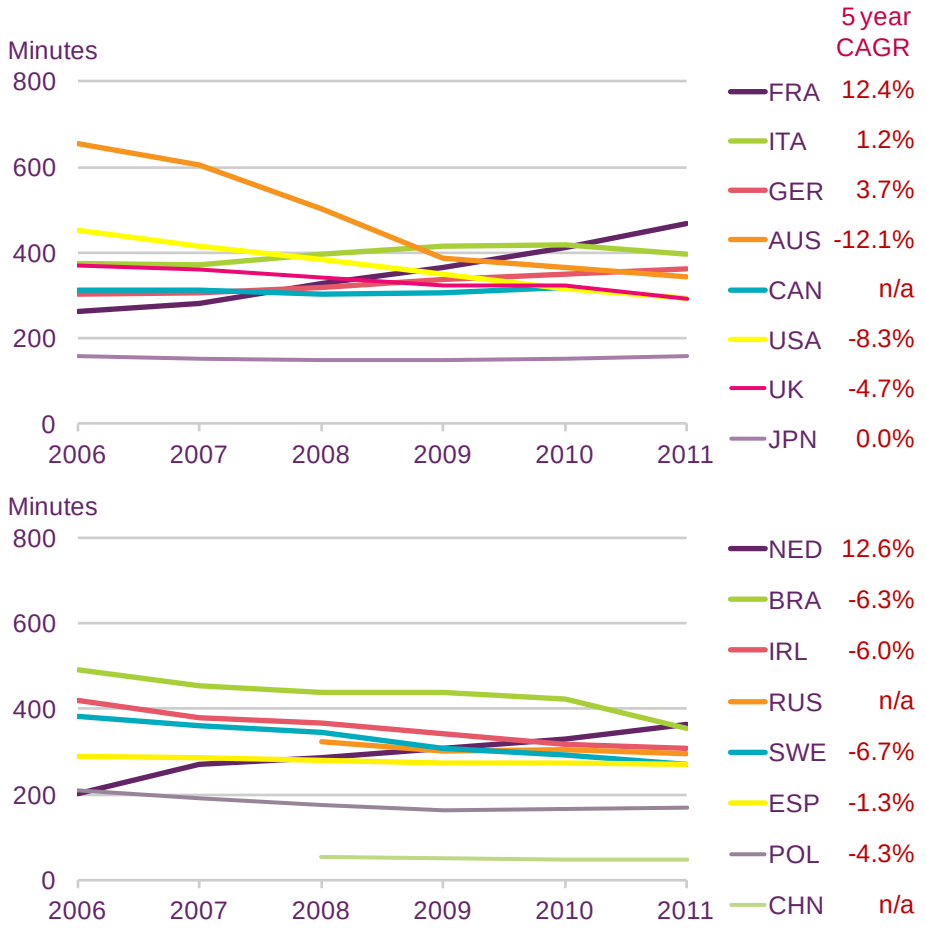
Average call minutes per fixed line were highest in France in 2011

The number of outgoing voice call minutes per fixed line fell by an average of 3.4% a year, to 304 minutes a month in the five years to 2011, across those comparator countries for which time series data were available (Figure 6.25). France had the highest number of call minutes per fixed line in 2011, at 469 minutes a month, more than nine times higher than the 50 minutes per month recorded in China, where use was lowest. Average call volumes per UK fixed line were 9.7% lower in 2011 that they had been in 2010, at 291 minutes per month; a significant acceleration in the rate of decline in the use of fixed-line connections, which has decreased by an average of 4.7% between 2006 and 2011.

The Netherlands, France, Germany and Italy were the only comparator countries where call volumes per fixed line increased during the five-year period, with the highest average annual

rates of growth being in the Netherlands and France at 12.6% and 12.4% a year respectively (over the same period the average annual fall was highest in Australia at 12.1%). Increasing calls per fixed line in France and the Netherlands are related to rapidly falling fixed-line numbers, as consumers switch to VoIP-over- naked-DSL voice services, which do not require a fixed line. As our call volumes include those made over VoIP connections, the fall in the number of fixed lines has an upward effect on the number of call minutes per line, and additionally VoIP users tend to have higher average use as these services offer low-cost or flat-rate calls.

Figure 6.25 Monthly outbound minutes per fixed line: 2006 to 2011



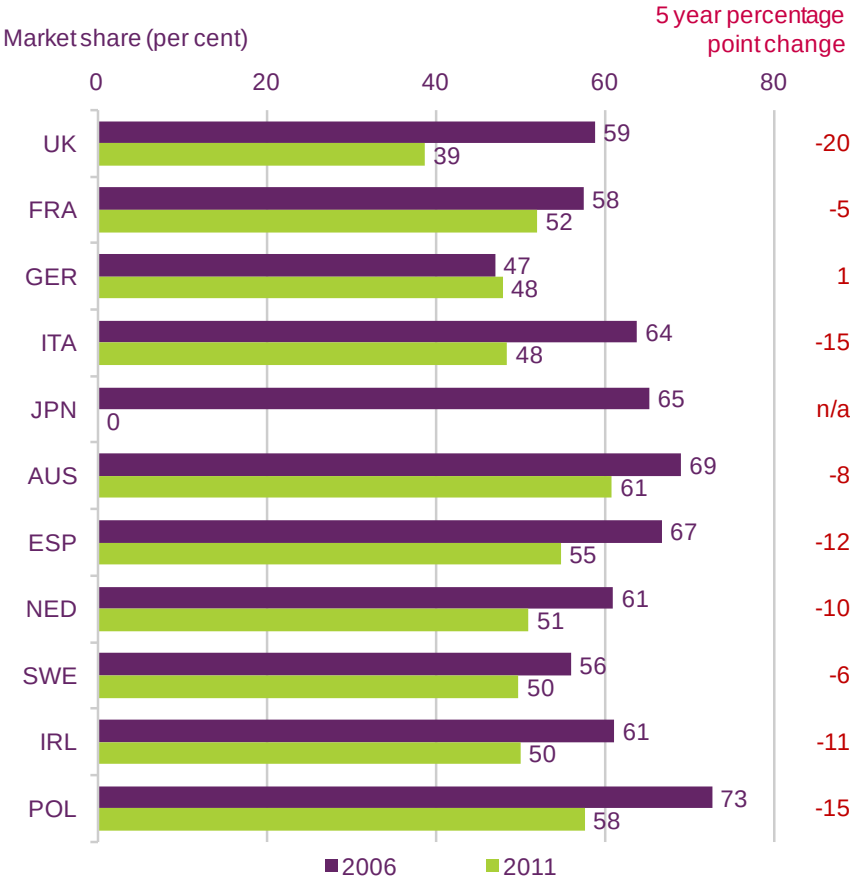
Note: Figures for USA and CAN exclude local and VoIP calls. Figures for USA, CHN and CAN include incoming mobile calls.

Germany was the only country where the incumbent operator's share of fixed call volumes increased between 2006 and 2011

Deutsche Telekom was the only national incumbent operator whose share of fixed voice call volumes in its home market increased in the five years to 2011, growing by one percentage point to 48% over the period (Figure 6.26). The key drivers behind this were its high share of fixed broadband connections (which is over 40%) and the success of its bundled double-play fixed broadband and VoIP services, which have meant that it has benefitted from increasing VoIP call use. There were significant declines in the proportion of fixed call volumes originating on the incumbent's network in all of the other comparator countries for which data were available, with these falls ranging from a six percentage point drop in TeliaSonera's share in Sweden to a 20 percentage point fall in BT's share in the UK.

The rapid fall in BT's share of fixed voice call volumes is largely as a result of competition from operators providing services using full local loop unbundling (LLU) and/or wholesale line rental (WLR) wholesale products (full-LLU and WLR lines accounted for over a third of all UK fixed lines at the end of 2011). BT also had the lowest share of fixed call volumes among the national incumbent operators in our comparator countries in 2011, at 39%. This was nine percentage points lower than that in any of the other comparator countries for which we had data (the next lowest being Deutsche Telekom and Telecom Italia's shares in Germany and Italy respectively, both at 48%), and 22 percentage points lower than Telstra's 61% share in Australia, the highest among our comparator countries.

Figure 6.26 Incumbent operator's share of fixed voice call volumes: 2006 and 2011



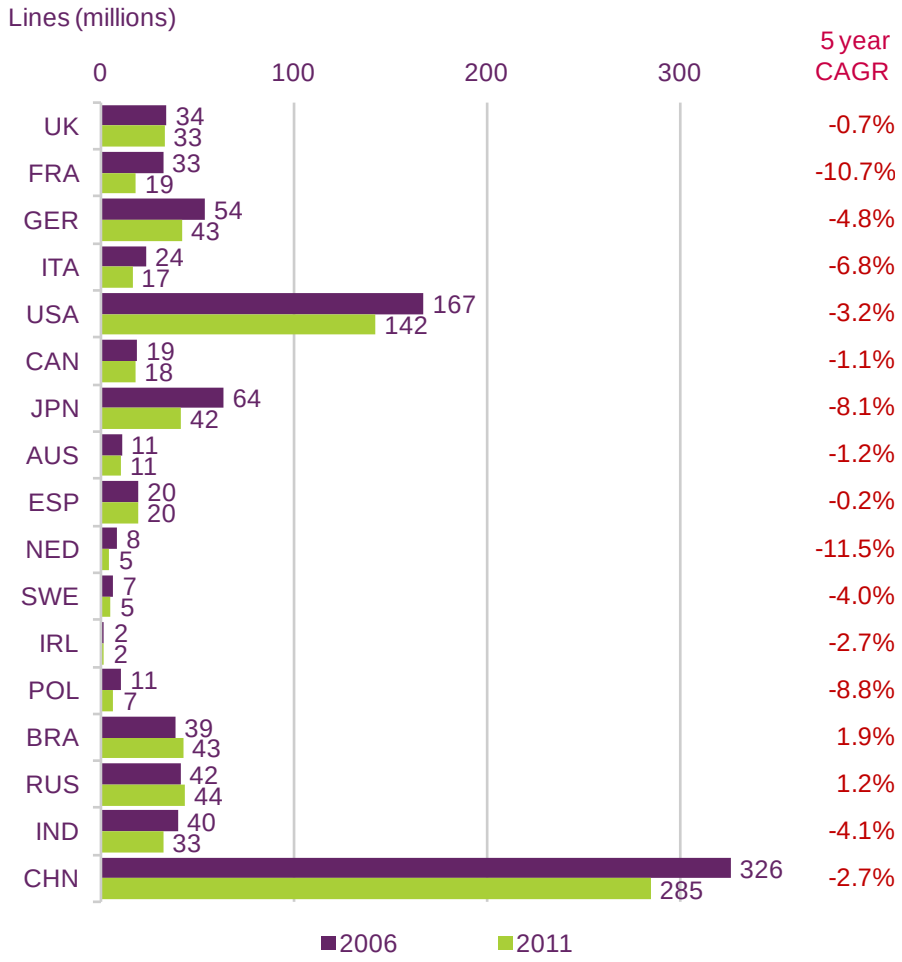
Source: IDATE / industry data / Ofcom

Brazil and the UK were the only comparator countries where the number of fixed lines increased in 2011

The total number of fixed exchange lines among our comparator countries fell by 4.0% to 767 million in 2011 (Figure 6.27). The number of lines fell in all of these countries except Brazil and the UK, where the number of lines increased by 2.0% and 0.2% respectively. In Brazil this increase is related to increasing wealth in a rapidly-developing economy, growth in the number of households (which increased by 5% in the five years to 2011) and falling call costs as a result of the fixed telephony market being highly competitive, and due to increasing VoIP use. In the UK, the increase in the number of lines is likely to be related to the requirement to have a fixed voice line in order to be able to access DSL-based fixed broadband services, combined with a small increase in the number of households. Among the other comparator countries, the fall in the number of fixed lines was highest in France at 13.0% during 2011, driven by the availability of naked DSL.

Brazil and Russia, where the number of fixed lines grew by averages of 1.9% and 1.2% respectively per year over the period, were the only comparator countries in which the number of fixed lines increased in the five years to 2011. The fastest average annual rate of decline in the number of fixed lines over this period was in the Netherlands, at 11.5%, followed by France where it fell by an average of 10.7% a year. Again, increasing take-up of VoIP services where no fixed voice line connection is required (via either 'naked' DSL or fibre), is the main contributor to the rapid decline in both of these countries.

Figure 6.27 Fixed exchange lines: 2006 and 2011



Source: IDATE / industry data / Ofcom

VoIP generated 21% of fixed voice revenues in the Netherlands in 2011

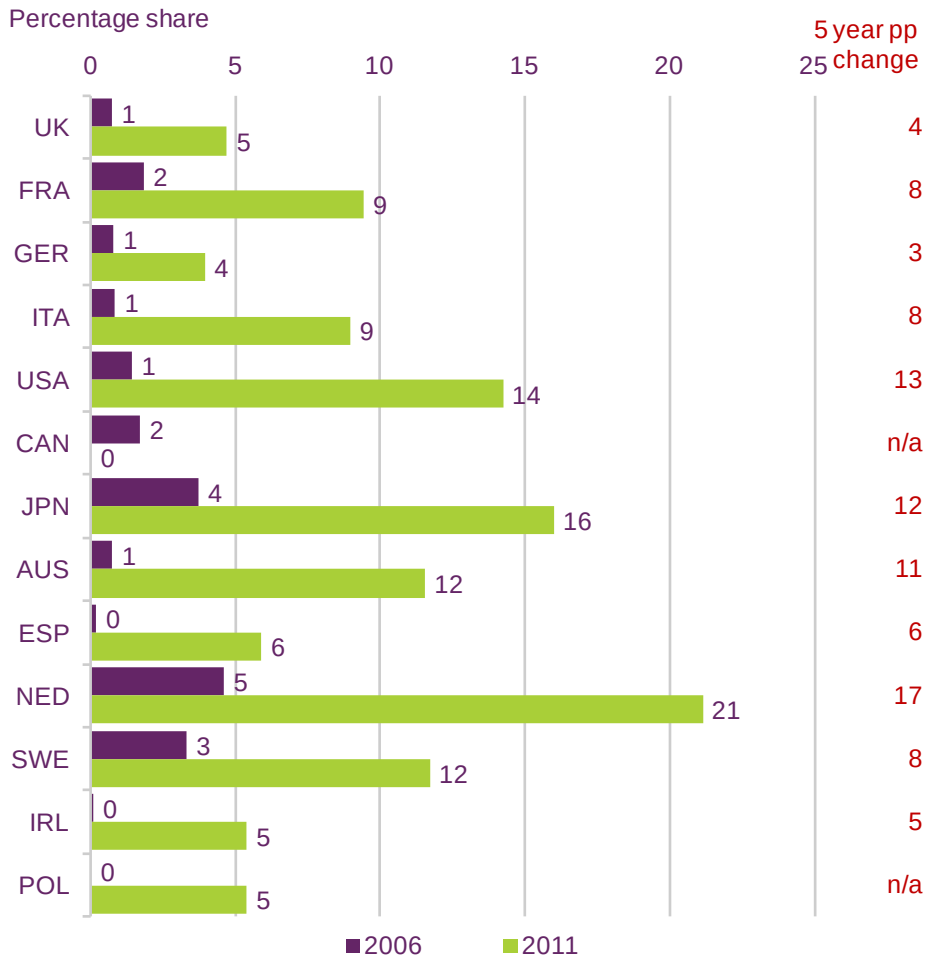
Voice over internet protocol (VoIP) services use the internet, rather than a traditional fixed telephony network, to convey voice calls, and typically enable consumers to make calls at lower rates than is possible over a traditional fixed network. There are two types of VoIP:

- **Managed VoIP services** where an ISP also provides a voice service over the broadband connection. The ISP controls the provision of this voice service and the quality of service for end-to-end calls.

- **Unmanaged VoIP services** where a VoIP provider other than the provider of the broadband connection (such as Skype or Vonage) provides the service on an over-the-top (OTT) basis.

VoIP services generated 5% of total fixed voice revenues in the UK in 2011, and although this was more than five times higher than the 1% figure in 2006, it was the joint second lowest proportion among the 13 countries for which data were available, after Germany (Figure 6.28). Low take-up of VoIP services in the UK is partly a result of the price of traditional fixed line services being relatively low, with many call types typically being included within the monthly access charge (see Section 2.1.3 for more details), and is also due to limited offerings of managed VoIP services by UK ISPs. As such, the majority of UK VoIP use is among business customers. The Netherlands was the comparator country where VoIP contributed the largest proportion of voice call revenues (21%) and was also where the increase in the five years to 2011 was greatest, at 17 percentage points.

Figure 6.28 VoIP revenues as a proportion of fixed voice revenues: 2006 and 2011



Source: IDATE

6.2.4 Fixed broadband services

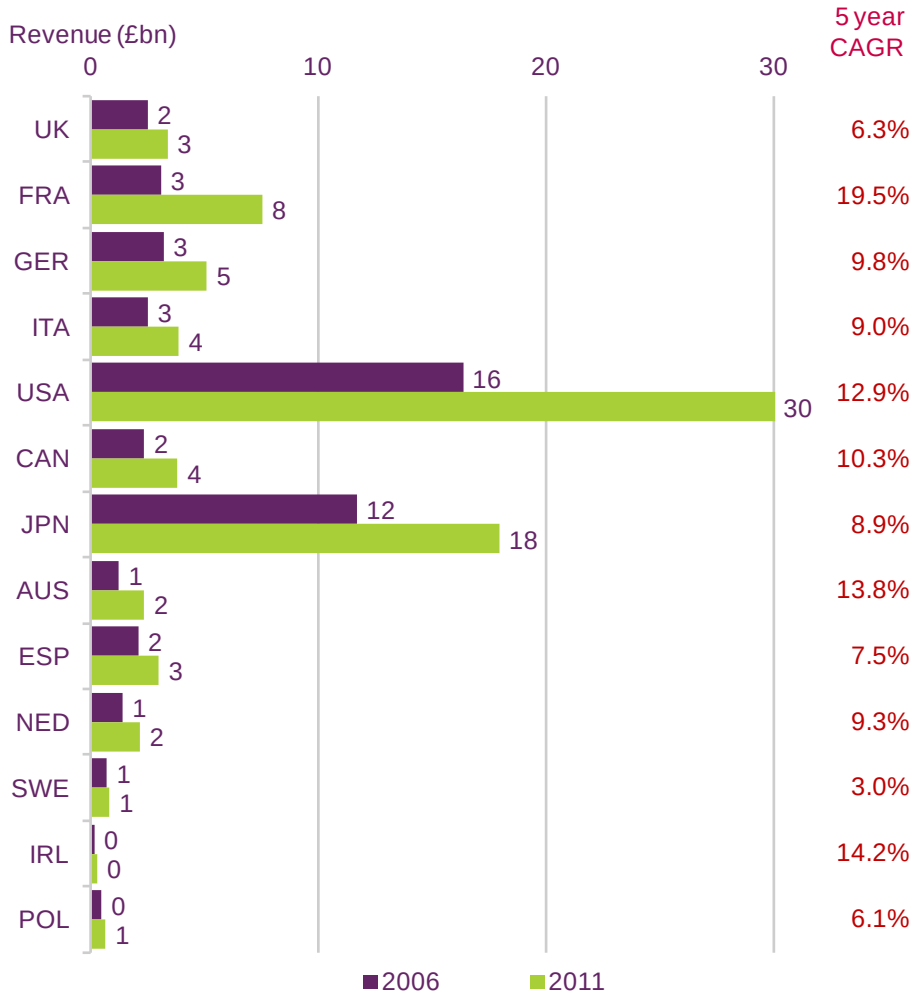
Annual fixed broadband revenue growth averaged 11% between 2006 and 2011

Fixed broadband revenues increased by an average of 11.1% a year to £81bn among the 13 countries for which we have data between 2006 and 2011 (Figure 6.29). Over the period average annual fixed broadband revenue growth ranged from 3.0% in Sweden to 19.5% in France: in Sweden this was due to falling prices, while in France it was as a result of strong connection growth and increasing revenues per line, partly because our broadband revenues for France include those from services that are included within the monthly access

fee, such as VoIP and IPTV. UK fixed broadband revenues increased by an average of 6.3% a year over the period, the third lowest rate of growth after Sweden and Poland.

Having fallen in 2010, UK fixed broadband revenues had the second highest increase among our comparator countries at 8.9% (after the US where there was a 14.0% increase). This increase was as a result of growth in the number of fixed broadband connections, along with an increase in the average revenue per line as a result of some price increases and increasing take-up of higher-speed services, including superfast services (those with a headlines speed of 30Mbit/s or higher). Conversely, fixed broadband revenues fell in both Poland and Spain during the year (by 3.8% and 1.2% respectively), as a result of falling prices.

Figure 6.29 Fixed broadband revenues: 2006 and 2011



Source: IDATE / industry data / Ofcom

Fixed broadband accounted for 39% of total fixed telecoms revenues in 2011

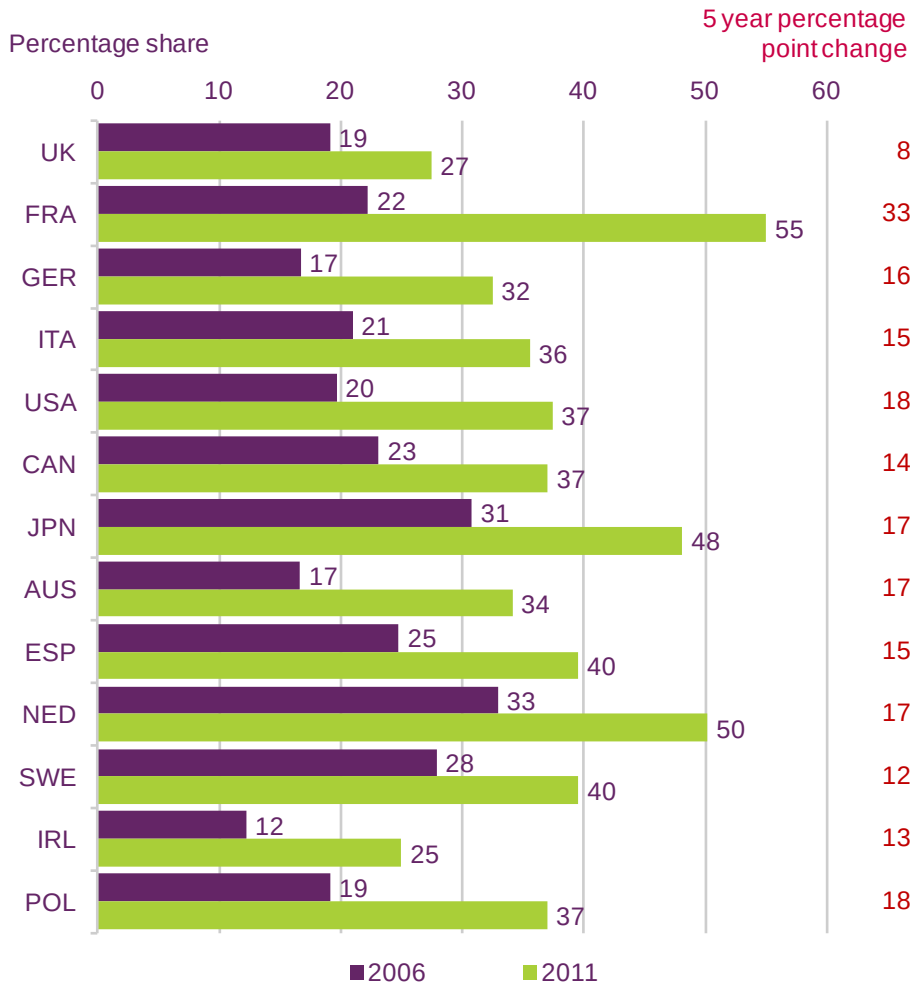
In 2011 the average proportion of total fixed telecoms service revenues that were generated by fixed broadband services was 39% among the comparator countries for which figures were available, an increase from 22% five years previously (Figure 6.30).[97] There was a wide range in the proportion of fixed revenues attributed to fixed broadband services among

[97] In this calculation the fixed line rental fee (if any) is included as voice revenue, even if it is required by the broadband service.

our comparator countries, from 25% in Ireland to 55% in France, while in the UK over a quarter (27%) of fixed revenues were from broadband services.

The largest increase in the proportion of fixed revenues generated by broadband was in France in the five years to 2011, where it increased by 33 percentage points as a result of strong growth in fixed broadband revenues (which includes those from managed VoIP and IPTV services). Conversely, the lowest increase during the period was eight percentage points in the UK, where the decline in fixed voice revenues was slower, and where falling fixed broadband prices have constrained broadband revenue growth during the period.

Figure 6.30 Fixed broadband as a proportion of total fixed revenues: 2006 and 2011



Source: IDATE / industry data / Ofcom

The highest rates of fixed broadband connection growth were in the BRIC countries between 2006 and 2011

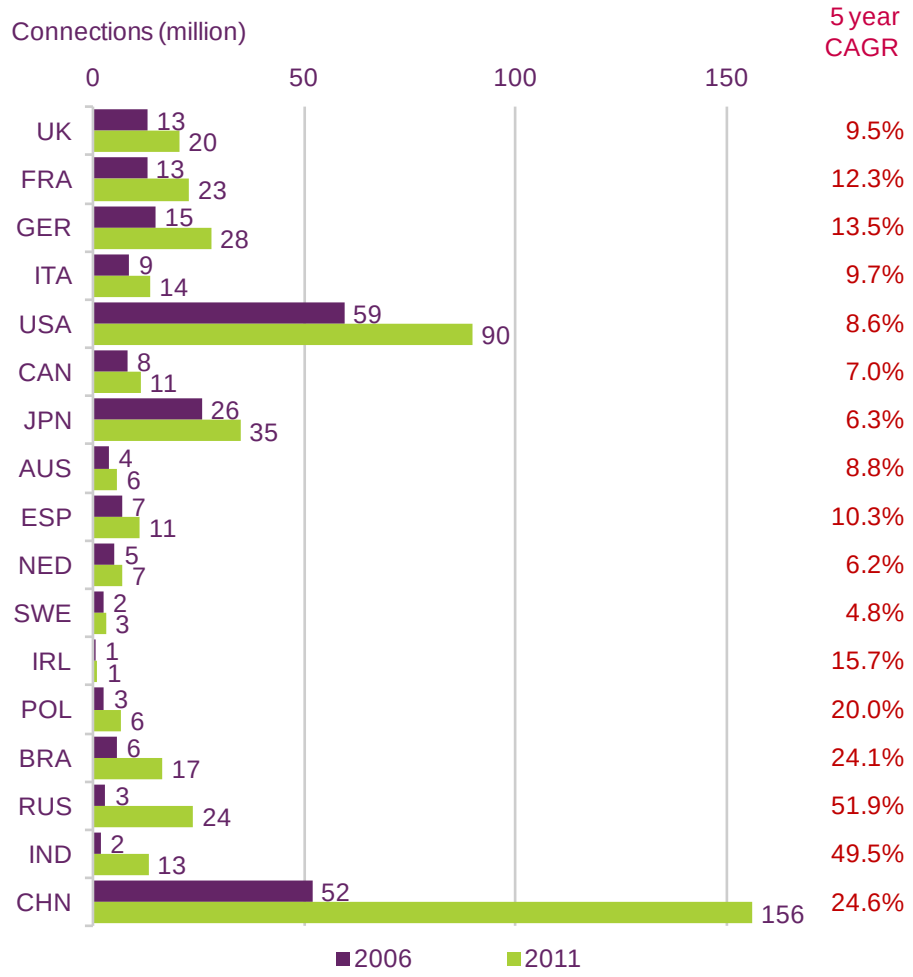
At the end of 2011 there were a total of 464 million fixed broadband connections among our comparator countries, 52 million (12.5%) more than there had been at the end of 2010 and 239 million (106%) more than there were five years previously (Figure 6.31).

Over both the one-year and five-year time periods, the rate of growth in the number of connections was higher in the BRIC countries than in any of our other comparator countries: between 2006 and 2011 the average annual rate of growth in connections in the BRIC countries ranged from 24.1% in Brazil to 49.5% in Russia, while among our non-BRIC

countries the highest average annual rate of growth over the period was in Poland at 20.0%. Similarly, while in 2011 the annual growth rate among the BRIC countries was lowest in Russia, at 21.6%, the highest growth among our non-BRIC comparator countries was (again) in Poland at 7.3%.

The total number of UK fixed broadband connections grew by 6.9% in 2011, the second highest growth rate among our non-BRIC comparator countries after Poland, while the average annual increase between 2006 and 2011 in the UK was 9.5%.

Figure 6.31 Fixed broadband connections: 2006 and 2011



Source: IDATE / industry data / Ofcom

The average market share of the three largest fixed broadband providers across our comparator countries increased in 2011

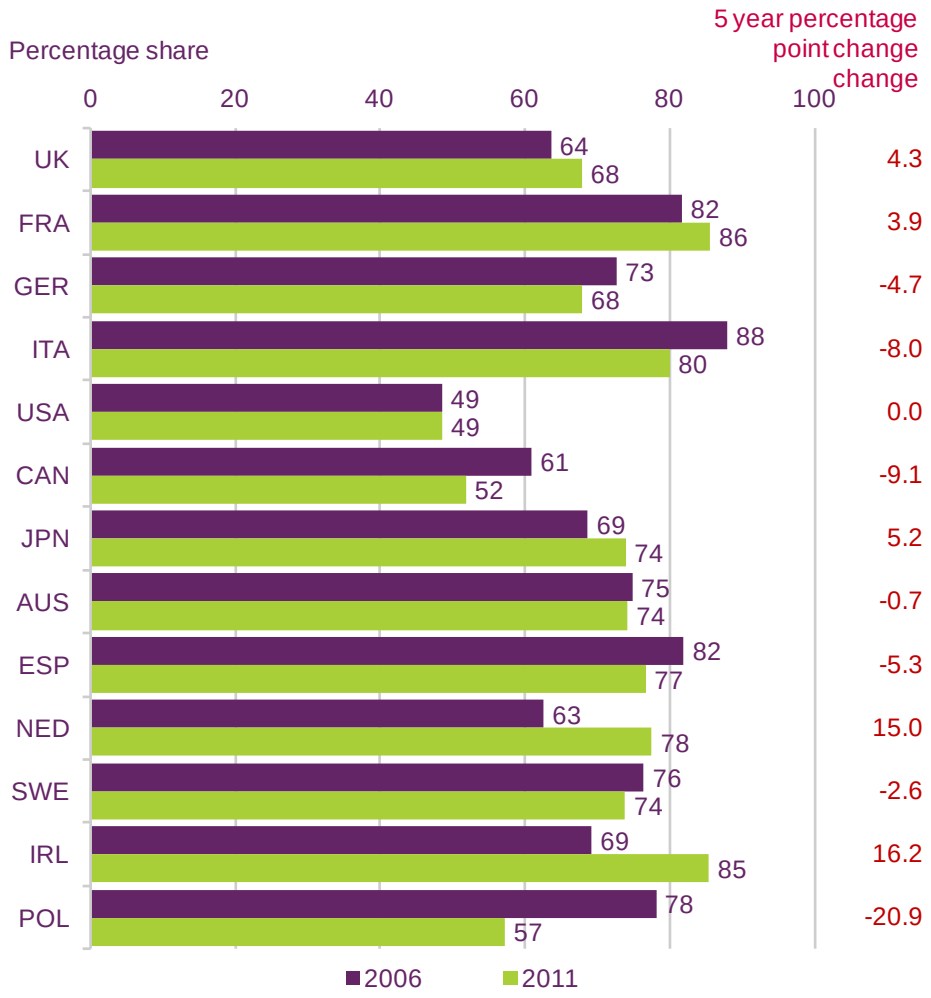
The combined retail connection market share of the three largest broadband providers in each country (as shown in Figure 6.32) can be used as a measure of market concentration, and across the 13 comparator countries for which figures are available, the average share of the largest three providers increased from 64.1% to 65.2% in the year to December 2011.

In the five years to 2011 the change in the combined connection share of the three largest providers in each country ranged from a 20.9 percentage point fall in Poland to a 16.2 percentage point increase in Ireland. In Poland this was as a result of smaller ISPs gaining market share, mainly at the expense of incumbent Telekomunikacja Polska (which saw its market share of fixed broadband connections fall by 34.5 percentage points to 31.1% over the period), while in Ireland a decline in Eircom's share of fixed connections was offset by market share increases for the second and third largest providers, UPC and Vodafone Ireland.

In the UK, the share of the three largest providers increased by 4.3 percentage points to 68% between 2006 and 2011 as a result of BT and TalkTalk Group increasing their connection shares, the latter as a result of its acquisition of Tiscali's UK businesses in 2009. However, the retail connection share of the three largest UK broadband providers (which also includes Virgin Media) has been falling since 2009, to a large extent because pay-TV provider Sky's LLU-based bundled broadband services have been gaining market share.

The most concentrated broadband market at the end of 2011 was France (where the largest providers (Orange, Free and SFR/Neuf) accounted for 86% of connections), followed by Ireland at 85%. Excluding the US and Canada (where infrastructure-based competition between local incumbent telecoms providers and cable operators makes the share of the largest three operators a less useful measure of competition) the least concentrated broadband market among our comparator countries was in Poland, where the three largest providers' combined market share was 57%.

Figure 6.32 Retail connection share of the three largest fixed broadband providers: 2006 and 2011



Source: IDATE / industry data / Ofcom

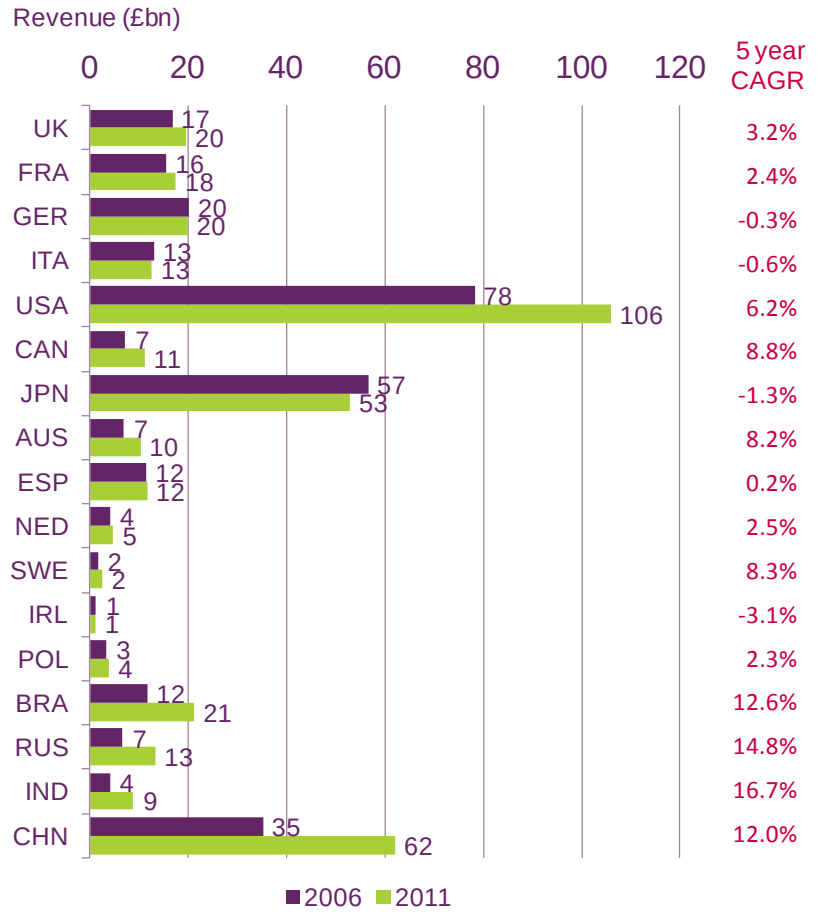
6.2.5 Mobile services

Mobile retail revenues grew quickest in China in 2011

Mobile retail revenues in China increased by 12.5% to £62bn in 2011, exceeding the growth rate of all other comparator countries and extending China's lead over Japan (£53bn) as the second largest mobile market by revenue after the US (Figure 6.33). Revenues grew in India by 8.8% to £9bn and in Brazil by 8.0% to £21bn in 2011. In the US (6.2%), the Netherlands (5.8%) and Australia (4.7%) they grew faster than in Russia (3.5%) and in all other non-BRIC comparator countries in the same period.

While BRIC mobile retail revenues grew faster than those in non-BRIC countries in 2011 (10.1% to 3.1% respectively), growth slowed in the BRIC markets themselves. India's compound annual growth rate (CAGR) between 2006 and 2011 was 16.7%; it grew by just 8.8% between 2010 and 2011. Russia's CAGR was 14.8% between 2006 and 2011, but mobile retail revenue grew by only 3.5% in 2011. While this deceleration was not limited to BRIC countries, it was less pronounced elsewhere than in India and Russia. The CAGR of Poland's revenue was 2.3% between 2006 and 2011, while it grew by 0.6% between 2010 and 2011. Spain saw the greatest decrease in mobile retail revenues in 2011, which fell by 4.1% to £12bn.

Figure 6.33 Mobile retail revenues: 2006 and 2011



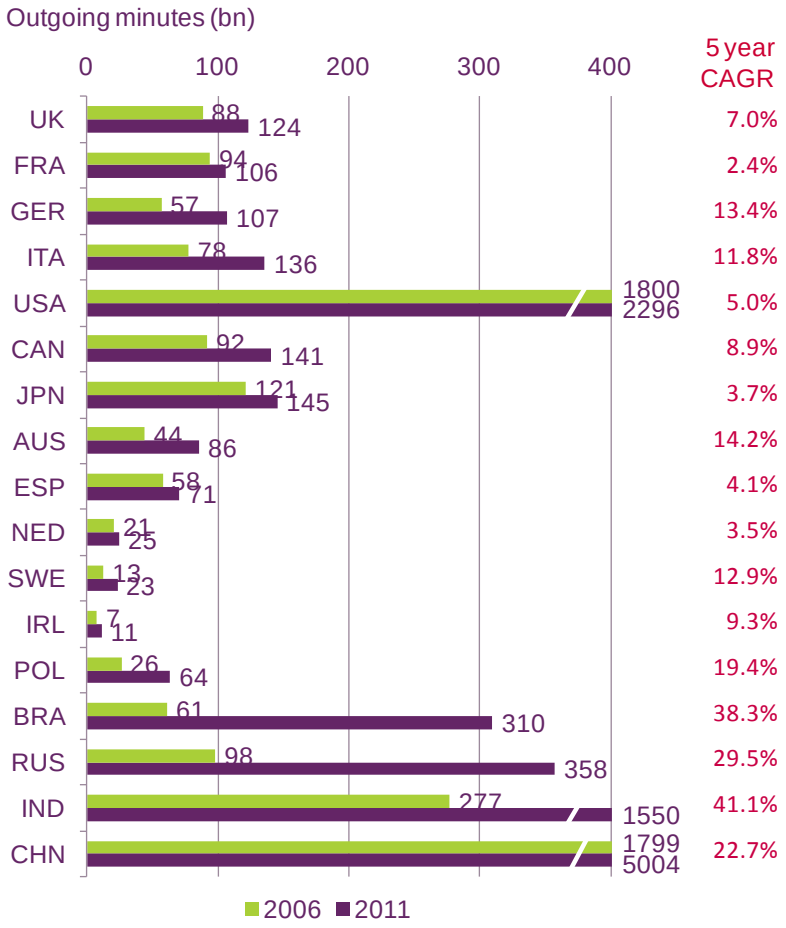
Sources: IDATE / industry data / Ofcom
Note: USA, CAN and CHN data includes revenues from incoming calls

Mobile voice call volumes fell by 1.1% in the UK and Japan

In 2011, mobile voice volumes fell by 1.1% in the UK (from 125 billion minutes in 2010 to 124 billion in 2011) and Japan (from 147 billion minutes to 145 billion). In both countries this was the first year they had fallen. The growth of mobile voice volumes elsewhere also slowed in 2011. Growth in 2011 was less than the compound annual growth rate between 2006 and 2011 in all of our comparator countries except France (Figure 6.34). In France, although the growth of volumes in 2011 (2.7%) was greater than the CAGR of volumes between 2006 and 2011 (2.4%), this was the lowest growth rate of all the comparator countries in that five-year period. The growth of mobile messaging (by 22 billion messages in 2011 in the UK) could account for the diminished number of calls made in some markets (Figure 6.11).

While the deceleration in the growth of voice volumes affected BRIC markets as well as non-BRIC, the highest CAGR in call minutes between 2006 and 2011 were in Brazil (38.3%) and Russia (29.5%), as take-up of mobiles continued to grow. Outside BRIC countries, mobile minutes were growing fastest in 2011 in Poland (19.4%), where fixed-line availability is limited, followed by Australia (14.2% outbound and inbound) and Germany (13.4%).

Figure 6.34 Mobile voice call volumes: 2006 and 2011



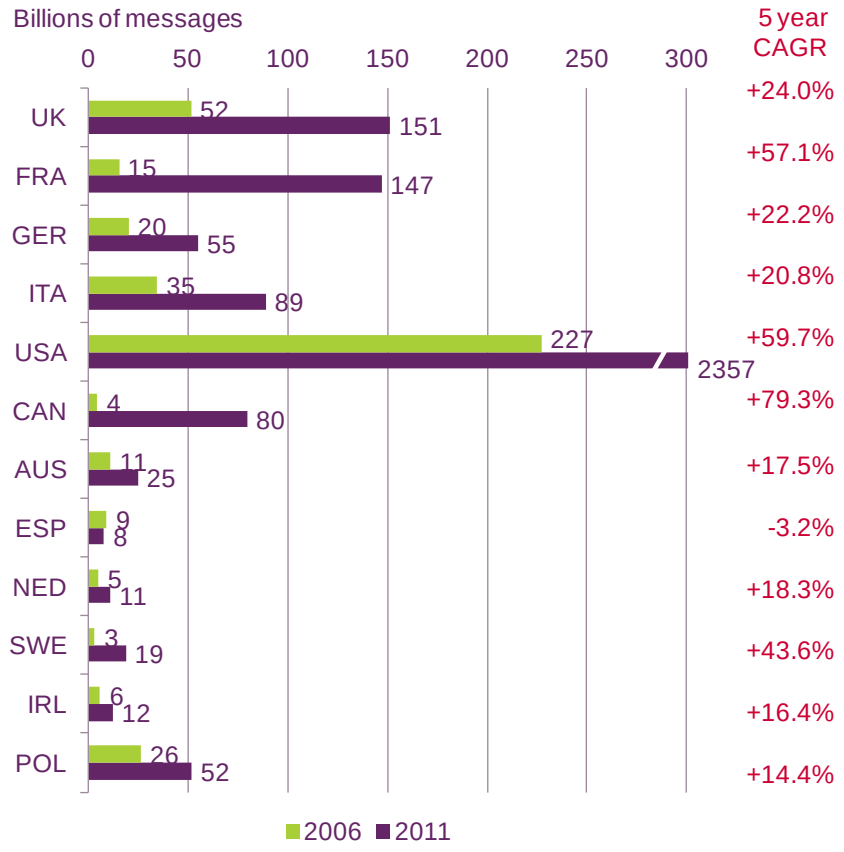
Source: IDATE / industry data / Ofcom
Note: USA, CAN and CHN include incoming calls

US mobile subscribers sent 2,130 billion more mobile messages in 2011 than 2006

Among our comparator countries, the highest compound annual growth rates in SMS and MMS messaging between 2006 and 2011 were in Canada (79.3%), the US (59.7%, including push-to-text) and France (57.1%). However, the growth of mobile message volumes slowed in many countries in 2011, in comparison with 2010. In terms of absolute volumes, the US sent 248 billion more messages in 2011 than in 2010, but 511 billion more messages in 2010 than in 2009 (Figure 6.35). In percentage terms, this represents 10.5% growth in 2011 compared to 24.2% growth in 2010. In the UK, mobile owners sent 22 billion more messages in 2011 than in 2010, but 24 billion more in 2010 than in 2009.

Spain was the only comparator country where message volumes have declined in the five years to 2006 (by -3.2% each year). SMS is not usually included in pay-monthly tariffs in Spain, and their cost to consumers may account for the low volumes.

Figure 6.35 Mobile messaging volumes: 2006 and 2011



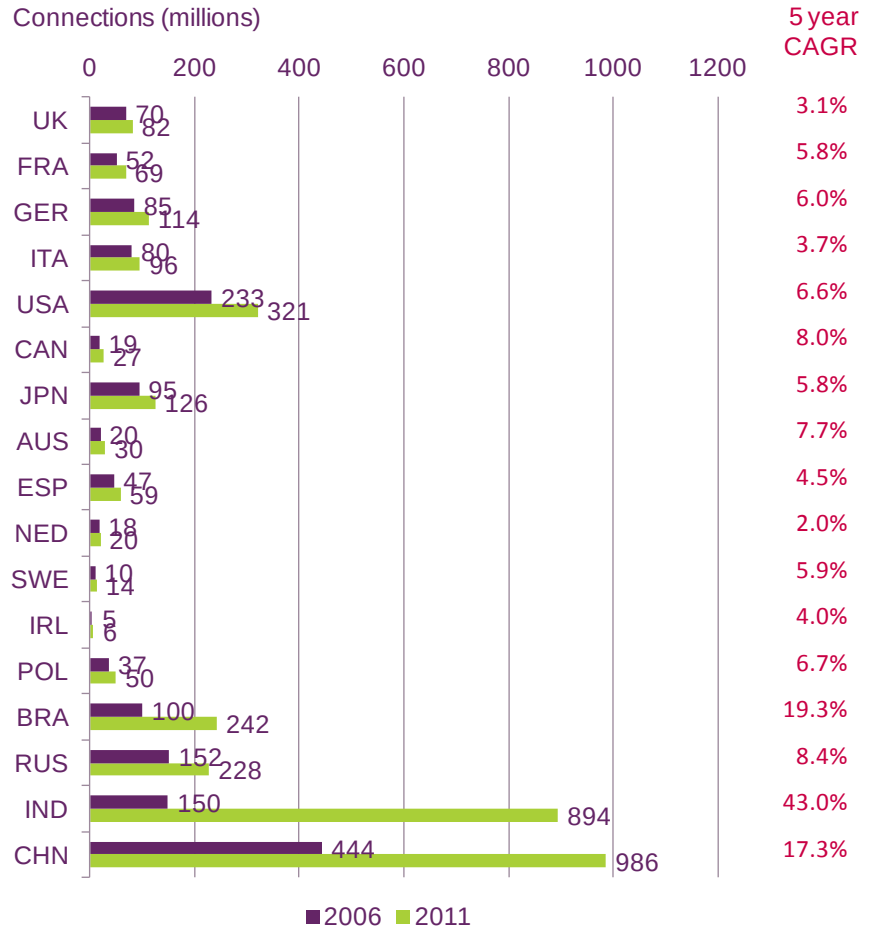
Source: IDATE / industry data / Ofcom
Note: Includes SMS and MMS messages. MMS messaging volume figures unavailable for Italy, Australia and the Netherlands. Figures for the USA include push-to-text and are not directly comparable to those for the other comparator countries

In 2011 the number of mobile connections in India approached China's total

Growth in mobile connections has slowed in recent years as the mobile markets in many of our comparator countries have matured, including even BRIC countries like India. However, increasing numbers of mobile connections per person have contributed to growth in connection rates, as consumers became more likely to own multiple connected devices (Figure 6.36). In BRIC countries, where a smaller proportion of people owned mobiles in 2006 than in Western economies, the compound annual growth of connections (CAGR) was 22.7% between 2006 and 2011.

In non-BRIC countries, the CAGR of connections between 2006 and 2011 was 5.6%. The UK's mobile connections grew at a CAGR of 3.1% in this period, second lowest after the Netherlands (2%). The comparator country with the highest CAGR in mobile connections between 2006 and 2011 was India (43%), though it had 100 million fewer connections than China in 2011 (894 million to 986 million). India's growth also slowed in 2011, adding 85 million fewer mobile connections in 2011 than in 2010.

Figure 6.36 Mobile connections: 2006 and 2011



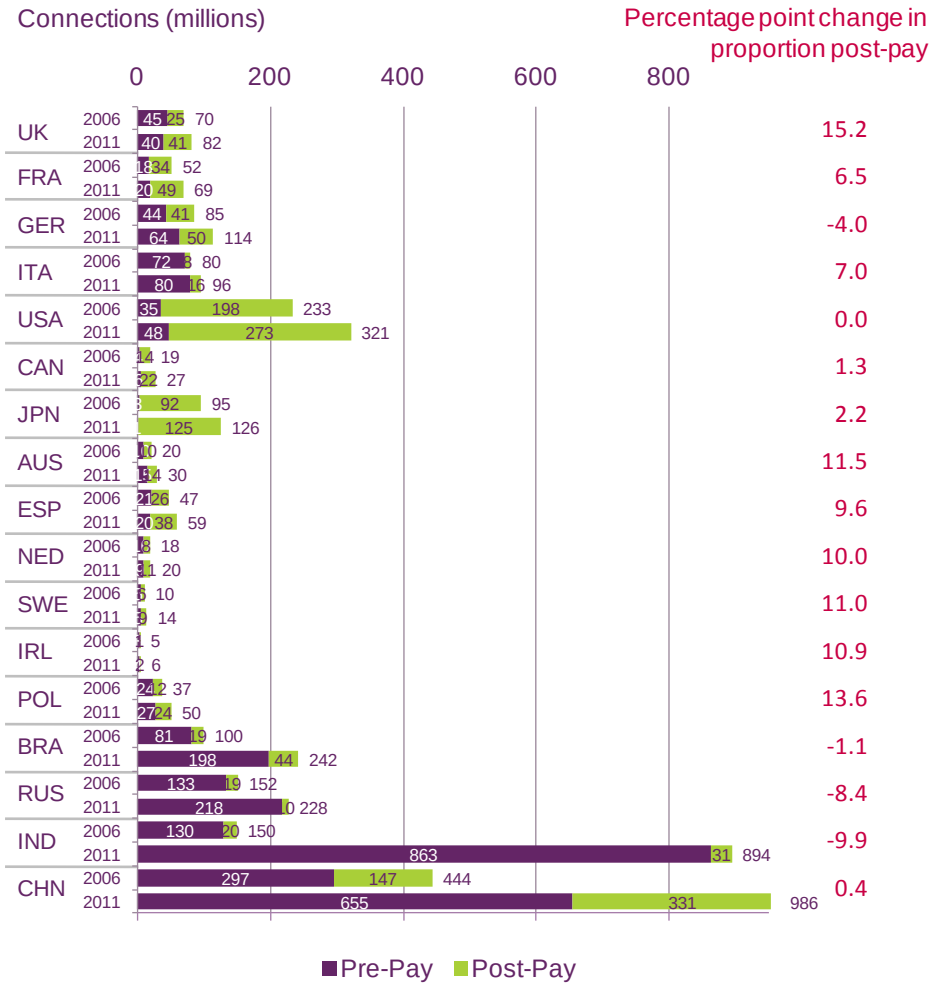
Source: IDATE / industry data / Ofcom

The number of monthly contracts grew in all comparator countries in 2011

In 2011 the number of subscribers with post-pay (monthly) contracts, rather than pre-pay (pay-as-you-go) connections, grew in all of our comparator countries (Figure 6.37). There were more post-pay than pre-pay connections in seven of our 17 comparator countries: France, the US, Canada, Japan, Spain, the Netherlands and Sweden. Where growth in mobile connections is low, operators may aim to increase revenues per user by marketing monthly contracts, which are likely to extract more money from users and discourage churn through minimum term contracts. These countries saw some of the lowest growth rates in mobile connections in 2006-2011 (Figure 6.36), which may have contributed to the predominance of post-pay contracts.

In the five-year period between 2006 and 2011, the proportion of post-pay connections fell in four countries: India (-9.9%), Russia (-8.4%), Germany (-4.0%), and Brazil (-1.1%). In developing markets like India, pre-pay connections may have been more attractive to poorer users taking up connections, who could not commit to monthly contracts or lacked the banking facilities to do so. In Germany, the popularity of pre-pay is perhaps due to its flexibility: the validity of pre-pay subscriptions is not limited and unspent credit must be reimbursed on demand.

Figure 6.37 Mobile connections, by type: 2006 and 2011



Source: IDATE / industry data / Ofcom

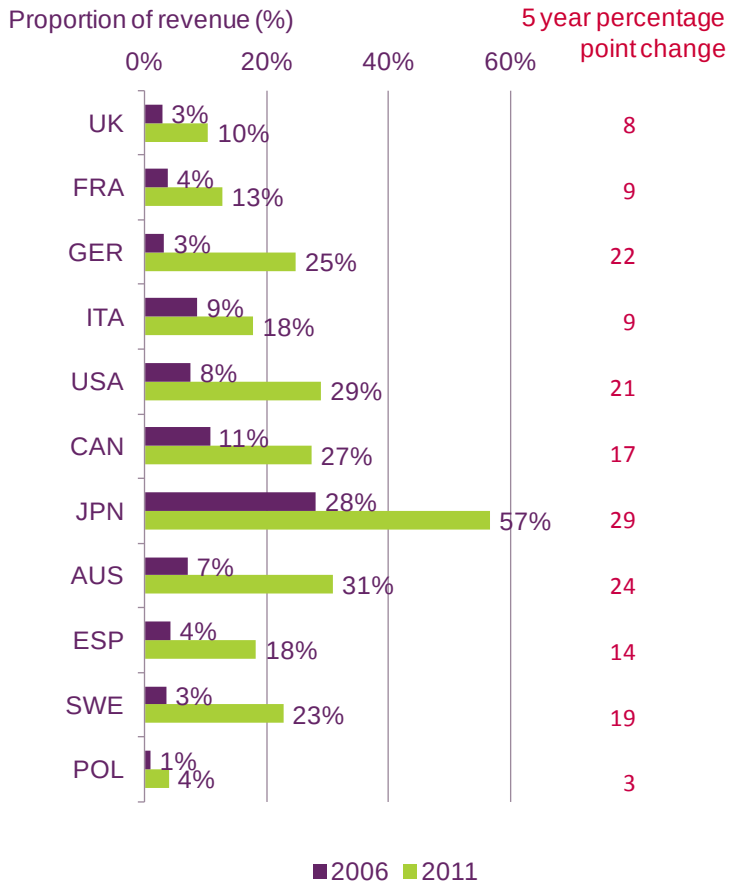
In Japan, data accounted for 57% of mobile revenues in 2011

Between 2006 and 2011 the proportion of mobile revenues that came from data services increased by 13 percentage points (pp) among the comparator countries for which we have figures (Figure 6.38). Data services generate a growing proportion of mobile revenues, as consumers use them for a wider range of activities and, in some comparator countries, make fewer minutes of voice calls (Figure 6.48).

Still, Japan was the only one of our comparator countries where data services contributed over half of mobile revenue in 2011 (57%). Data services contributed the lowest proportion of mobile revenue in Poland (4%) among the comparator countries. Whereas data services have long been available in Japan, in Poland mobile revenues per connection are mainly derived from voice (Figure 6.47).

Between 2006 and 2011, the contribution of data services to total mobile revenue grew most in Japan (by 29pp), and also grew by over 20pp in Australia (24pp), Germany (22pp) and the US (21pp) among the countries for which we have figures. By contrast, the smallest increases were in Poland (3pp), the UK (8pp), France (9pp) and Italy (9pp).

Figure 6.38 Data as a proportion of total mobile service revenues: 2006 and 2011



Source: IDATE / industry data / Ofcom
Note: Excludes SMS revenues. CHN. USA and CAN data for total mobile service revenues includes revenues from incoming calls

Australia saw the fastest increase in mobile broadband penetration between 2008 and 2011

The penetration of mobile broadband (mobile connections to the internet through dongles, datacards and embedded PCs) increased in all our comparator countries for which we have data between 2008 and 2011 (Figure 6.39). It is still a relatively new market, as mobile broadband only became a mainstream proposition in the second half of the last decade. Australia contains the largest number of these mobile broadband connections per 100 people (25.1) and also saw the largest increase in mobile broadband subscriptions between 2008 and 2011, rising by 18.6 per 100 people.

By contrast, Japan saw the smallest increase in mobile broadband subscriptions, by just 0.6 percentage points (pp) between 2008 and 2011. In the UK, the proportion of people with mobile broadband connections rose by 3.9pp to 8.0 between 2008 and 2011, but by 0.3pp in 2011.

Figure 6.39 Mobile broadband penetration: 2008 and 2011

Source: IDATE / industry data / Ofcom

6.3 The telecoms user

6.3.1 Introduction

This section looks at trends in the availability and use of telecoms services in the comparator countries covered by this report.

The analysis is based on Ofcom figures for the UK telecoms market, collected as part of our regular data collection programme, international data that has been compiled for use in this report, and third-party sources. In addition, we commissioned consumer research, undertaken in September 2012, in the UK and eight of our comparator countries (France, Germany, Italy, the US, Japan, Australia, Spain and China).

The key points highlighted in this section include:

- **Russia was the only comparator country where average fixed telecoms spend per person increased in the five years to 2011.** The increase in Russia (from £32 to £38) was due to growth in the number of fixed lines (in the UK average spend fell by 18% to £142 per person over the period).

- **Among our comparator countries, average fixed line use per person was highest in Germany in 2011, at 196 minutes per month.** By way of contrast, average use was lowest, at just 11 minutes per month, in India (in the UK it was fourth highest at 154 minutes per month). High landline use in Germany may be due to mobile calls being significantly more expensive than fixed calls.

- **Voice over Internet Protocol (VoIP) use is relatively high in France.** Ofcom research conducted in seven comparator countries in Q3 2012 suggests that VoIP use is highest in France, where 29% of respondents said that they used the service. The lowest reported levels of VoIP use were in the US (14%) while in the UK the figure was 17%, in line with that reported in 2011.

- **Poland and the UK had the lowest fixed broadband revenue per person in 2011 at £17.** This is partly attributable to GDP per capita being relatively low in Poland. The UK had the second lowest average broadband spend per person in 2011, at £54, which we think reflects how competition between providers has lowered average revenue per connection.

- **In the UK, 36% of respondents used smartphones to access the internet in 2012, second in Europe only to Spain, where 43% did so.** Respondents were least likely to use smartphones to go online in France (where 27% did so) and Germany (30%).

- **The Netherlands had the highest number of fixed broadband connections per 100 households in 2011.** The number of fixed broadband connections per 100 households ranged from just six in India to 92 in the Netherlands among our 17 comparator countries in 2011. In the UK there were 77 fixed broadband connections per 100 households at the end of the year.

- **Average revenue per mobile connection was highest in Japan and Canada, at over £34 per month in 2011.** The figure fell in 15 of our 17 comparator countries in 2011. The UK figure was £15 per month.

- **Mobile call volume per connection fell by 3.7% in the UK in 2011.** The fastest reduction was in India, at 10.4%, while the figure also fell in six other comparator countries.

- **Satisfaction with voice connections was lowest in Germany and satisfaction with mobile internet connections was lowest in Australia.** The UK was joint-sixth best for the former and seventh for the latter out of nine comparator countries.

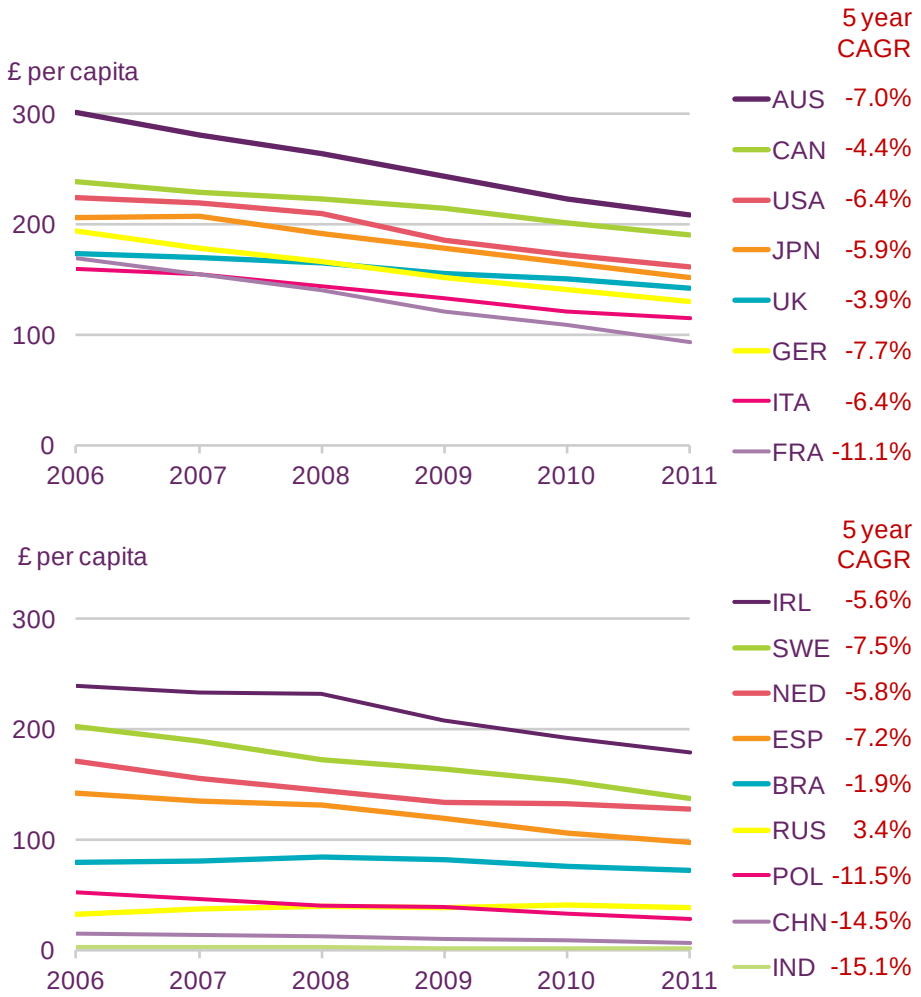
6.3.2 Fixed voice services

Russia was the only country where average fixed telecoms spend per person increased between 2006 and 2011

The average spend per person on fixed voice services fell in all of our comparator countries except Russia in the five years to 2011 (Figure 6.40). The increase in average fixed voice spend per person in Russia during this time (up from £32 to £38) reflected growth in the number of fixed lines over the period. However, the number of fixed lines in Russia has been in decline since 2009, as have fixed originated call volumes, and average fixed voice revenues per person fell by 6.2% in 2011.

In 2011 the average fixed voice expenditure per person ranged from £2 in India (where there were just three lines per 100 people in 2011, as shown in Figure 6.42) to £209 in Australia. Across all of our comparator countries fixed-line spend per person fell by an average of 8.0% to £41 per person in 2011, with the rate of decline during the year being highest in China (down 18.3%) and lowest in the Netherlands, where it fell by 3.6%. In the UK the average spend per person on fixed voice services fell by 5.8% to £142 in 2011, a faster rate than the 3.9% average fall between 2006 and 2011.

Figure 6.40 Average fixed voice revenue per person: 2006 to 2011



Source: IDATE / industry data / Ofcom

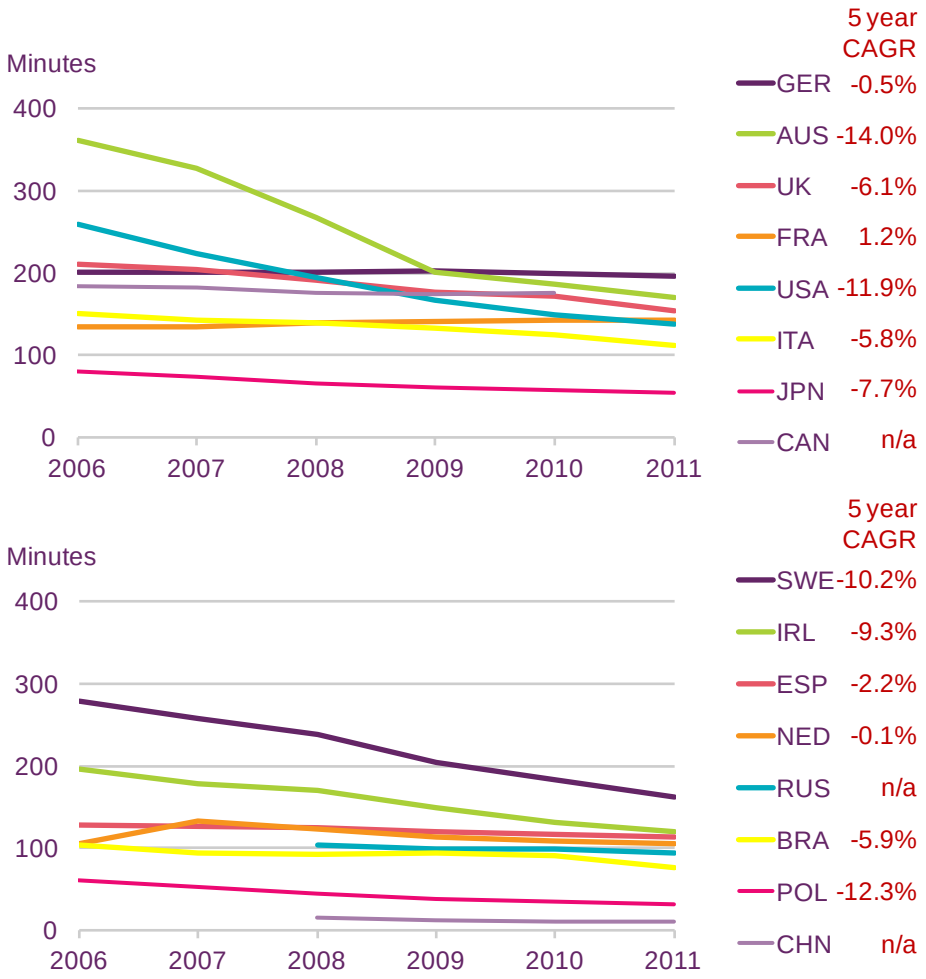
Average fixed line use per person was highest in Germany in 2011

In 2011, the average volume of outgoing calls from fixed lines made per person was highest in Germany (at 196 minutes per month) and lowest in India (11 minutes per month). As mentioned previously, low average use in India reflects low fixed-line take-up (and availability), while in Germany high landline use may be due to mobile calls being more expensive than fixed calls (as is shown in Section 6.2.2).

France was the only comparator country for which time series data were available where the average volume of fixed-originated voice calls per person increased between 2006 and 2011, growing by 1.2% a year to 143 minutes per person per month. During this time use of flat-rate VoIP services in France increased, which has offset falling traditional voice call volumes. However, this 143-minute figure was unchanged on 2010, suggesting that France may soon follow the rest of our comparator countries, and average fixed-line use per person may start to fall (Figure 6.41).

In the UK the average person made 154 minutes of outgoing fixed voice calls per month in 2011, the fourth highest figure after Germany, Australia (170 minutes per month) and Sweden (163 minutes per month). Average use in the UK was 10.5% lower than the 172 minutes per person per month figure for 2010, and 27% lower than the 211 minute average in 2006.

Figure 6.41 Monthly fixed line voice call minutes per person: 2006 to 2011



Source: IDATE / industry data / Ofcom

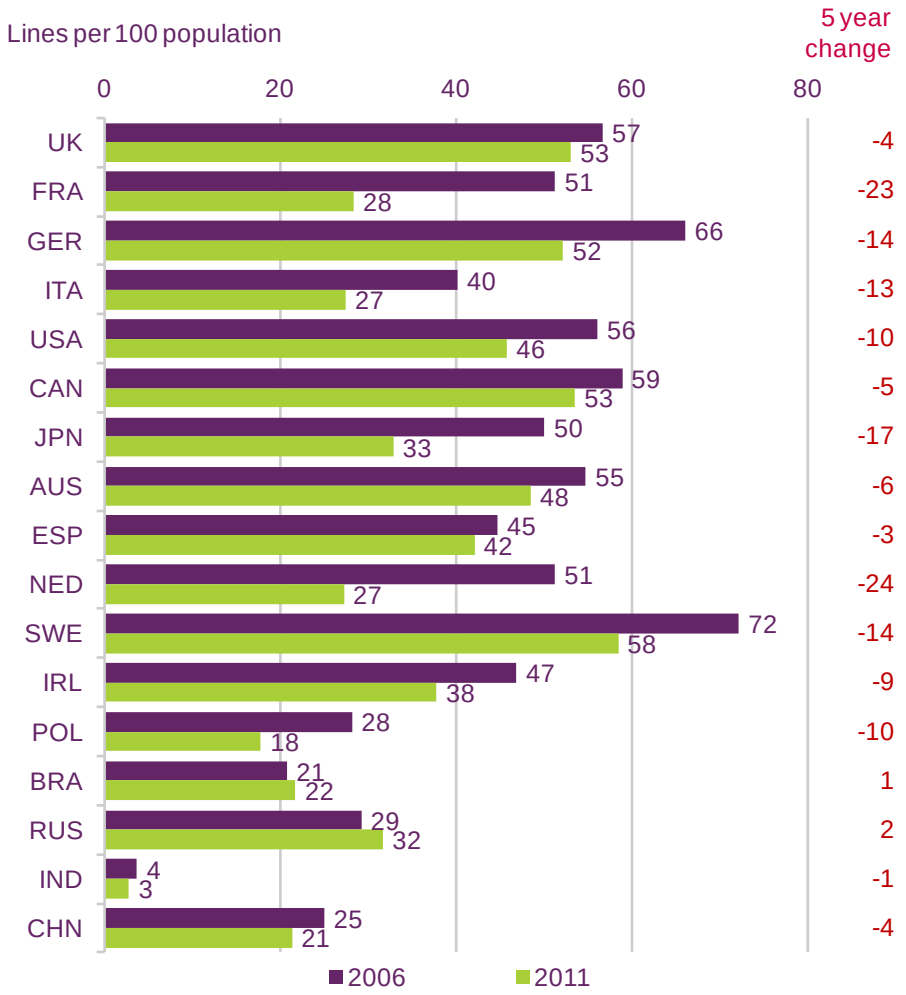
The UK had the joint second highest number of fixed lines per 100 people at the end of 2011

Figure 6.42 shows the number of fixed voice connections per 100 people among our comparator countries, which in 2011 ranged from three per 100 people in India to 58 per 100 people in Sweden. The largest falls in the number of fixed lines per 100 people in the five years to 2011 were in the Netherlands (down 24 lines per 100 people to 27) and France (down 23 lines per 100 people to 28), these both being countries where there is widespread use of managed VoIP services as a substitute for traditional fixed services and where naked-DSL[98] is available, so that a fixed voice line is not required in order to receive fixed broadband services.

In the UK there were 53 fixed lines per 100 people at the end of 2011, four less than five years previously in 2006. The number of lines per 100 people in the UK was, along with Canada, the joint second highest among our comparator nations in 2011, after Sweden.

[98] A naked DSL connection is a DSL connection which is provided without the requirement for a standard fixed line.

Figure 6.42 Fixed lines per 100 population: 2006 and 2011

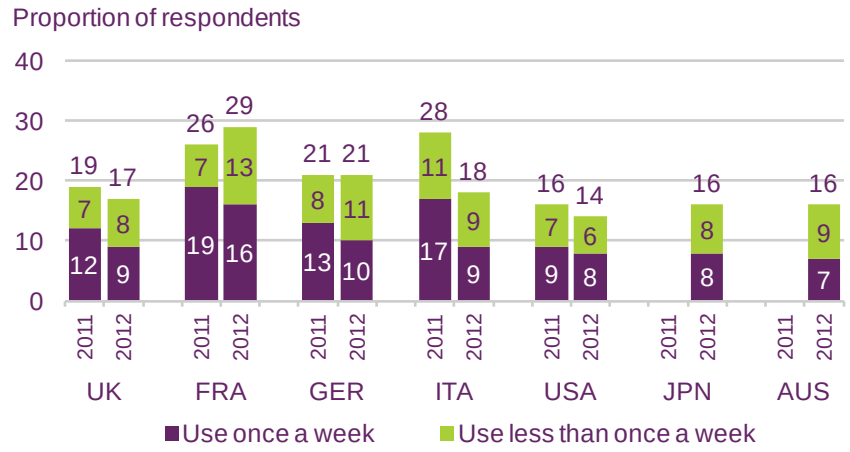


Source: IDATE / industry data / Ofcom

Voice over Internet Protocol (VoIP) use highest in France in Q3 2012

Ofcom research conducted in a number of our comparator countries in September 2012 asked broadband users whether they used their internet connection for making telephone calls. Figure 6.43 shows that claimed levels of VoIP use were highest in France (at 29% of respondents) among the seven countries for which comparable figures were available. The lowest reported level of VoIP use was in the US, where 14% said that they used their broadband connection to make phone calls (in the UK the figure was 17%, in line with that reported in 2011).

Figure 6.43 Use of VoIP among fixed broadband users: September 2012



Source: Ofcom research
Base: UK= 945, FRA= 778, GER= 839, ITA= 890, USA= 788, JPN= 792, AUS= 793
Question: Which, if any, of the following activities do you use your home internet connection for? (multiple choice containing making telephone calls).
Base: all respondents aged 18 to 64

6.3.3 Fixed broadband services

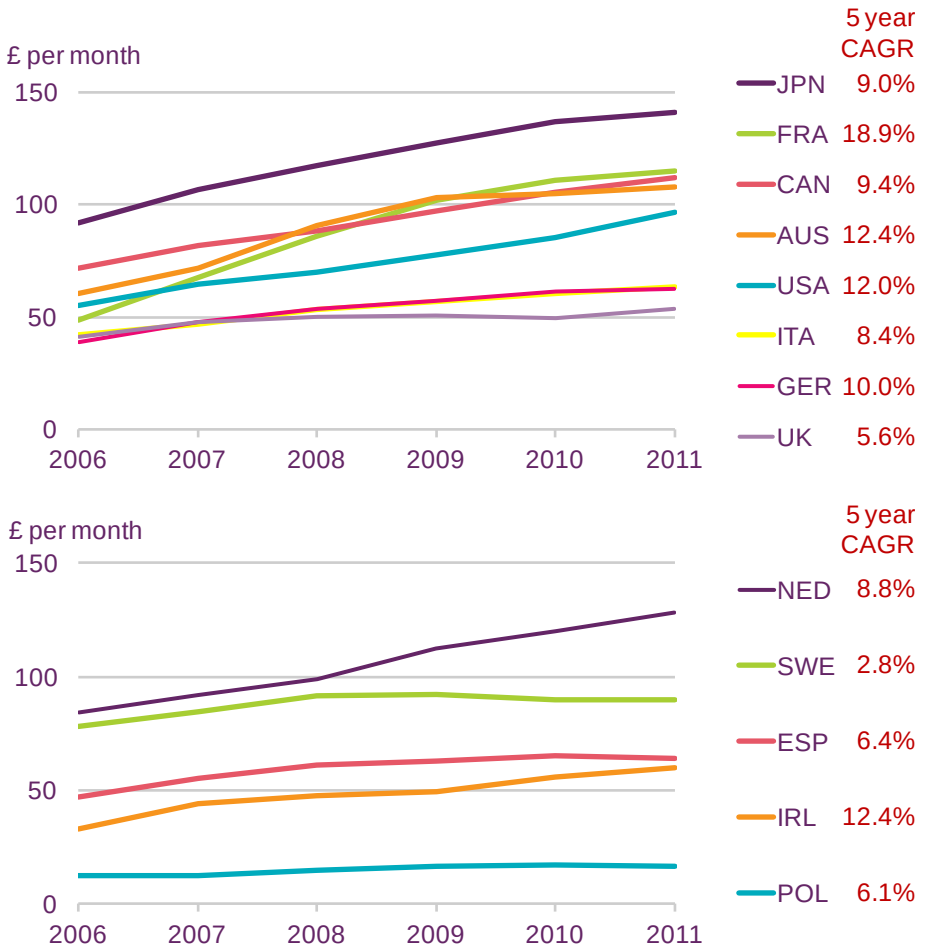
Poland and the UK had the lowest fixed broadband revenue per person in 2011

Average spend per person on fixed broadband services increased in all but two of the 13 comparator countries for which figures were available in 2011, the exceptions being Spain and Poland, where growth in the number of fixed broadband connections was slower than the rate at which the average cost per connection fell during the year (Figure 6.44). The largest increase in spend per person among our comparator countries in 2011 was in the US, as a result of increasing line numbers (up 6%) and average cost per fixed broadband connection (up 8%).

The largest percentage increase in average broadband expenditure per person in the five years to 2011 was in France, where it grew by 137%. However, the broadband revenue figures for France include those from managed VoIP calls and IPTV offered over the connection, and growth in the take-up of these services is high in France (as shown in Figure 6.43). As a result, per-capita broadband revenue per person is artificially high (compared to other countries), and fixed voice revenue per person low (average fixed voice spend per person fell by 44% in France over the period, the largest fall among our comparator countries). Outside France, the largest increase in average spend per person was in Australia, where it was due solely to increasing take-up, as revenue per connection was unchanged between 2006 and 2012.

Average fixed broadband spend per person was lowest in Poland in 2011 at £17, this being the result of relatively low revenue per connection (£9 per month). This can partly be attributed to GDP per capita being relatively low in Poland, and low fixed broadband take-up at 42 connections per 100 households. The UK had the second lowest average broadband spend per person in 2011, at £54, reflecting the fact that the average revenue per line (£14 per month) is the second lowest among the comparator countries for which we have data. We believe that the low revenue per connection in the UK is the result of the downward pressure on pricing created by competition between cable and DSL platforms and LLU providers. The highest spend per person in 2011 was in Japan, where there is widespread adoption of fibre-based services.

Figure 6.44 Average fixed broadband revenue per person: 2006 to 2011



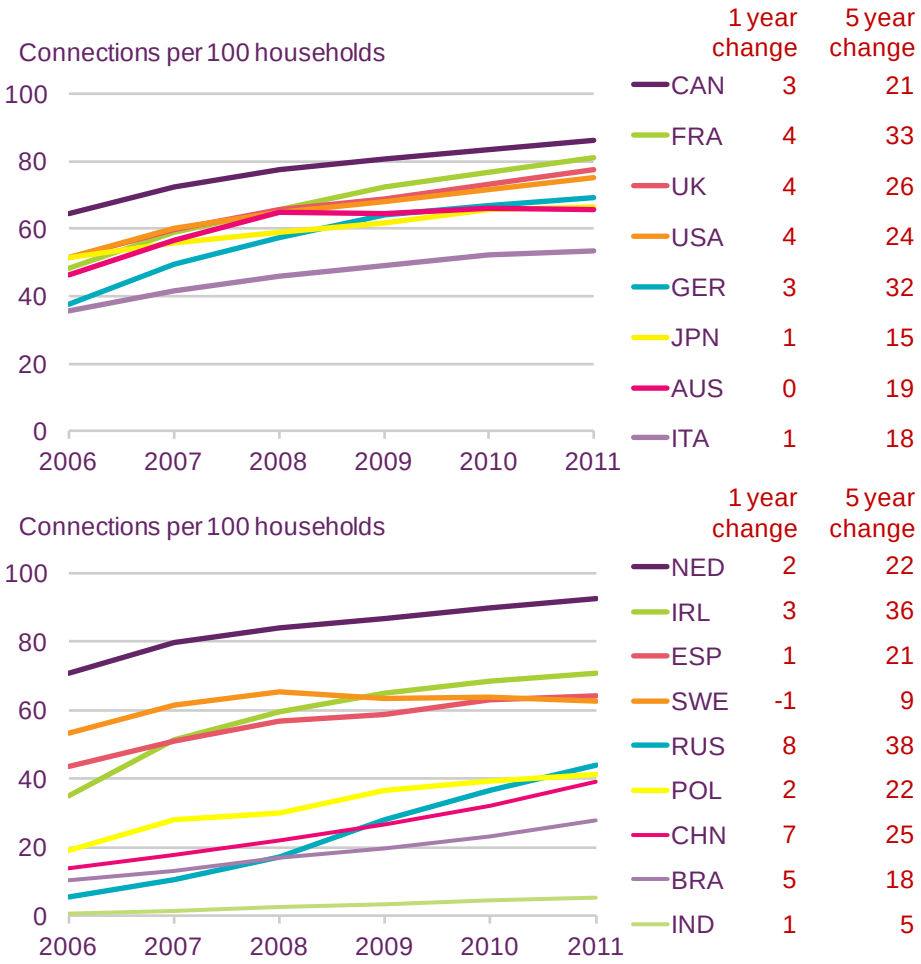
Source: IDATE / industry data / Ofcom

The Netherlands had the highest number of fixed broadband connections per 100 households in 2011

The number of fixed broadband connections per 100 households ranged from just six in India to 92 in the Netherlands among our 17 comparator countries in 2011 (Figure 6.45). (These figures will not equate to household take-up, as the calculation includes some business broadband connections). Fixed broadband take-up in the Netherlands has historically been high, as the Dutch broadband market developed early (broadband provided a way for cable providers to enter the market). In India fixed broadband services tend to be available mainly in urban areas, and there is a large rural population, while affordability is also likely to be a factor. In the UK there were 77 fixed broadband connections per 100 households at the end of 2011, the fourth highest figure after the Netherlands, Canada (with 86 connections per 100 households) and France (81 connections per 100 households).

The number of connections per household increased in every year from 2006 to 2011 in all of our comparator countries except Sweden and Australia, where it fell in 2009 and 2011 in both countries. In both of these countries mobile broadband take-up is high (41 connections per 100 households in Sweden and 64 connections per 100 households in Australia), suggesting that some consumers in these countries may be using mobile broadband as a substitute for fixed broadband services).

Figure 6.45 Fixed broadband connections per 100 households: 2006 to 2011



Source: IDATE / industry data / Ofcom

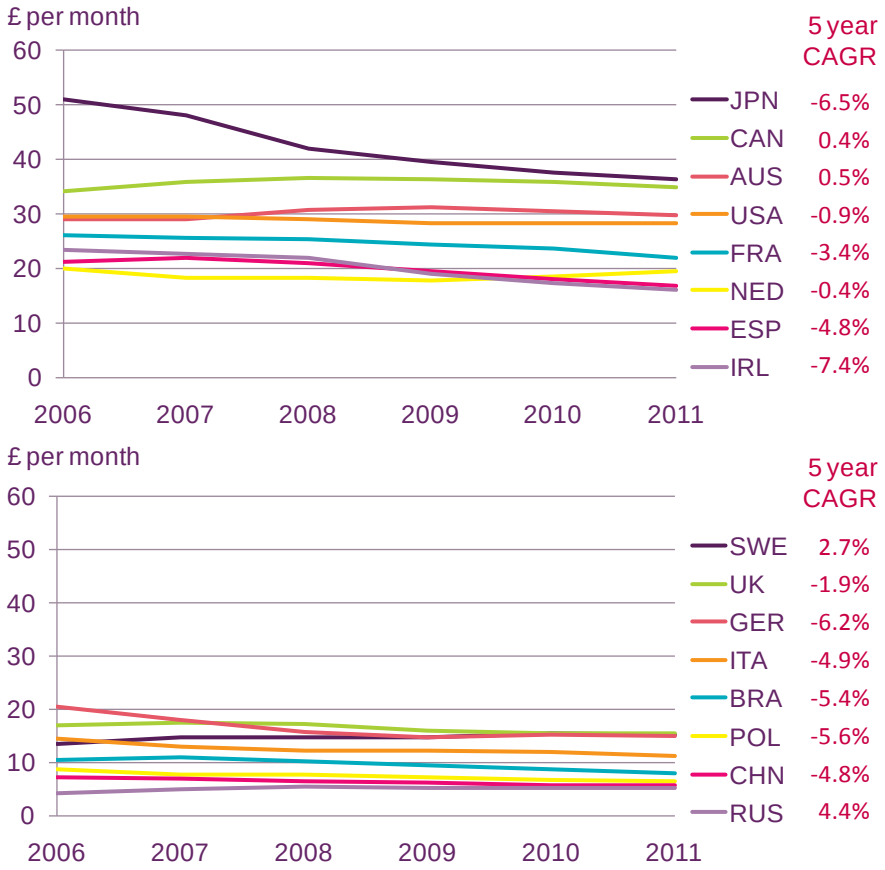
6.3.4 Mobile services

Average revenue per mobile connection was highest in Japan and Canada

Average monthly revenue per mobile connection fell in 15 of our 17 comparator countries in 2011, most steeply in absolute terms in France (from £24 in 2010 to £22 in 2011) and Japan (from £38 in 2010 to £36 in 2011). While revenue per connection is highest among the comparator countries in Japan (£36.55) and Canada (£34.81), average revenue has been falling in Japan, by a compound annual growth rate (CAGR) of -6.5% between 2006 and 2011, whereas revenues grew by a CAGR of 0.4% in Canada in the same period (Figure 6.46).

In 2011, among our comparator countries, revenue per mobile connection increased only in the Netherlands (from £19 to £20) and the US (up by 5 pence at £28). Between 2006 and 2011, CAGR in revenue per mobile connection in India was -21.6%, probably due to increasing ownership of multiple pre-paid SIMs. The second lowest growth rate in this period was in Ireland (-7.4%), perhaps explained in part by the macroeconomic environment. In the UK revenues declined between 2006 and 2011, at a CAGR of -1.9%. In this period, Russia's revenues per mobile connection increased quickest among our comparator countries (CAGR of 4.4%), followed by Sweden (2.7%).

Figure 6.46 Average monthly revenue per mobile connection



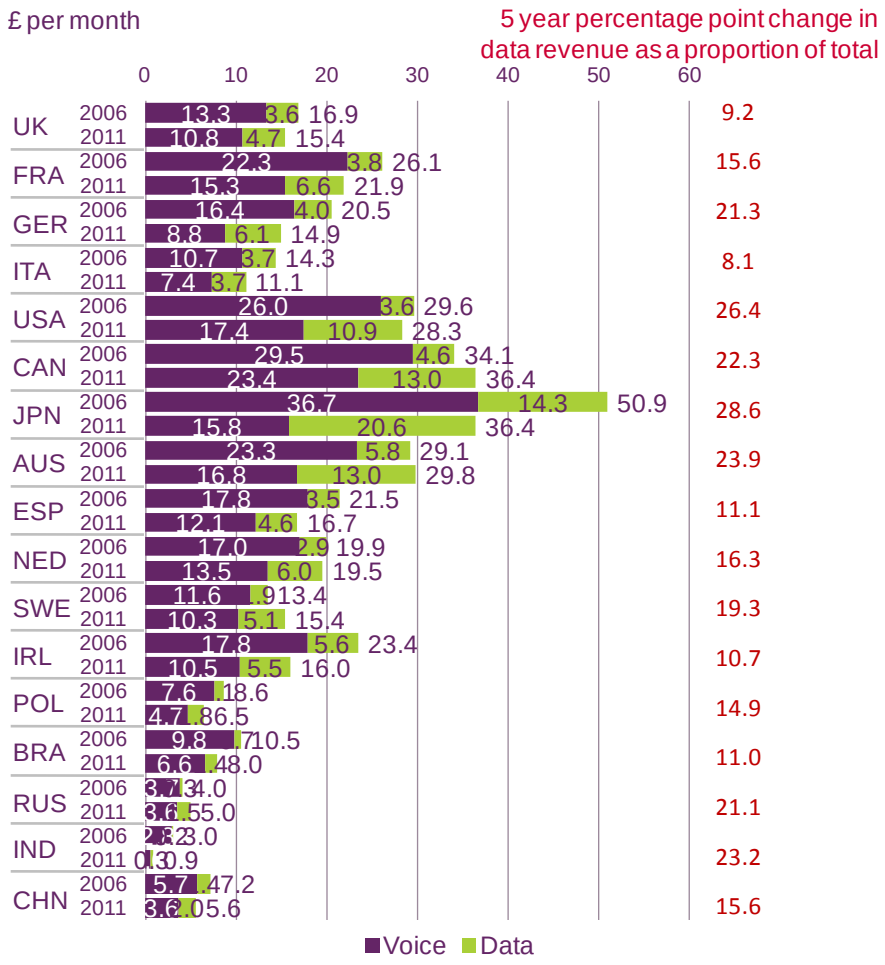
Source: IDATE / industry data / Ofcom
Note: USA, CAN and CHN data includes revenues from incoming calls

Spend per mobile connection on data, including SMS, grew between 2006 and 2011 in every country except Ireland

In 2011, spend on data per mobile connection was highest in Japan (£20.58). Between 2006 and 2011, it grew in every comparator country except Ireland (where it shrank from £5.61 in 2006 to £5.54 in 2011). It increased most in percentage terms in Japan and the US, growing 28.6 percentage points (pp) and 26.4pp respectively in this period (Figure 6.47). Spend also increased by over 20pp between 2006 and 2011 in Australia (23.9pp), India (23.2pp), Canada (22.3pp), Germany (21.3pp) and Russia (21.1pp). By contrast, the smallest increases in data as a proportion of spend per connection between 2006 and 2011 were in Italy (8.1pp) and the UK (9.2pp).

Voice accounted for a higher proportion of mobile spending in BRIC countries than in non-BRIC. In Brazil voice spend was £6.57 per mobile connection per month in 2011, while data spend was £1.39. The lowest voice spend per connection per month among comparator countries was in India, at £0.26.

Figure 6.47 Average monthly voice and data revenue per mobile connection: 2006 and 2011



Source: IDATE / industry data / Ofcom
Note: Data includes messaging revenues. CHN, USA and CAN data includes revenues from incoming calls

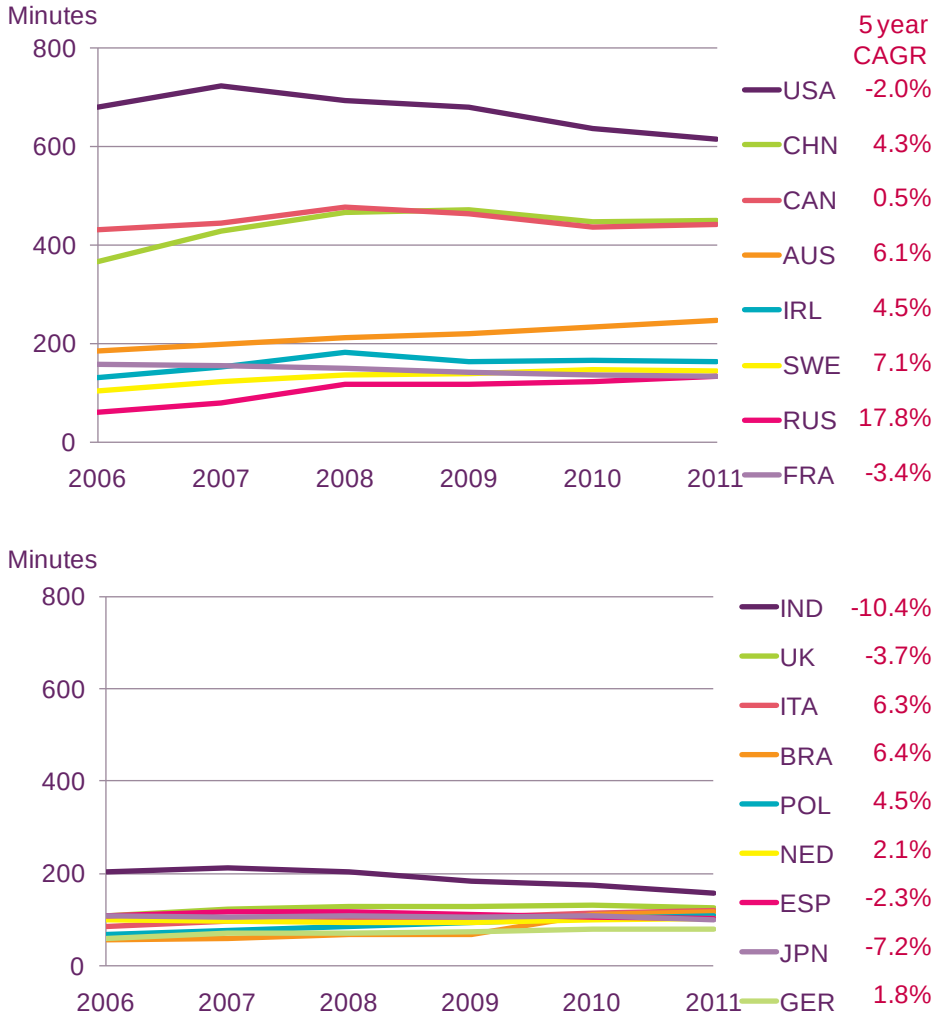
Mobile minutes per connection fell by 3.7% in the UK, from 131 minutes in 2010 to 127 in 2011, and by over 10% in India

In 2011 outbound mobile calls per connection fell in eight comparator countries: India (10.4% outbound and inbound), Japan (7.2%), the UK (3.7%), the US (3.3% outbound and inbound), France (2.7%), Sweden (2.4%) Spain (2.3%) and Ireland (1.5%). While US subscribers accounted for a high number of call minutes per connection (614 outbound and inbound), the compound annual growth rate between 2006 and 2011 for their call minutes was -2.0% (Figure 6.48). In countries where the number of mobile connections exceeds the population, like Italy (Figure 6.49), users are more likely to split their minutes across connections, perhaps helping to explain why Italian mobile subscribers used just 119 minutes of calls per connection in 2011.

Between 2006 and 2011, subscribers increased the minutes they spent on mobile calls fastest in Russia (where mobile minutes per connection grew on average by 17.8% each year from 2006 to 2011), Brazil (16.2%) and Poland (10.2%). In this period, mobile minutes per connection declined most in percentage terms in India, from 205 in 2006 to 157 in 2011. Outside BRIC countries, between 2006 and 2011 mobile minutes declined most in France (on average by 3.4% each year), where VoIP uptake is particularly high (Figure 6.43). Mobile

users spent the least time making calls in Germany, where mobile voice services are relatively expensive, making just 80 minutes of calls per connection in 2011.

Figure 6.48 Voice minutes per month per mobile connection: 2006 to 2011



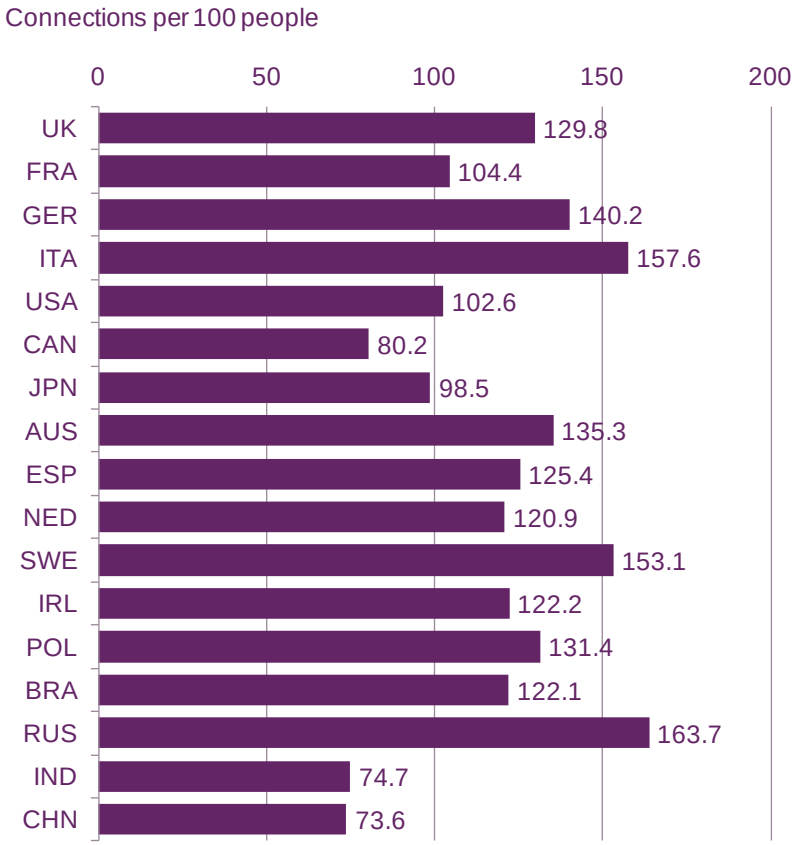
Source: IDATE / industry data / Ofcom
Note: USA, CAN and CHN include incoming calls

In Russia there were 164 mobile connections for every 100 people in 2011

In 2011, the number of mobile connections per 100 people was highest in Russia (163.7), Italy (157.6) and Sweden (153.1) among our comparator countries (Figure 6.49). Russia is one of four comparator countries where the proportion of pre-pay connections rose between 2006 and 2011, to 88% (Figure 6.37). The popularity of pre-pay subscriptions in Russia may help account for its connection density, as subscribers are more likely to obtain multiple SIMs. Mobile penetration in the UK is 129.8 per 100 people.

Mobile penetration is lowest in China (73.6%) and India (74.7%), although connections are growing quickest in India of all our comparator countries (Figure 6.36). Equally, in Canada mobile penetration is lowest among the non-BRIC comparator countries (80.2), while its connection growth rate is highest

Figure 6.49 Mobile take-up: 2011



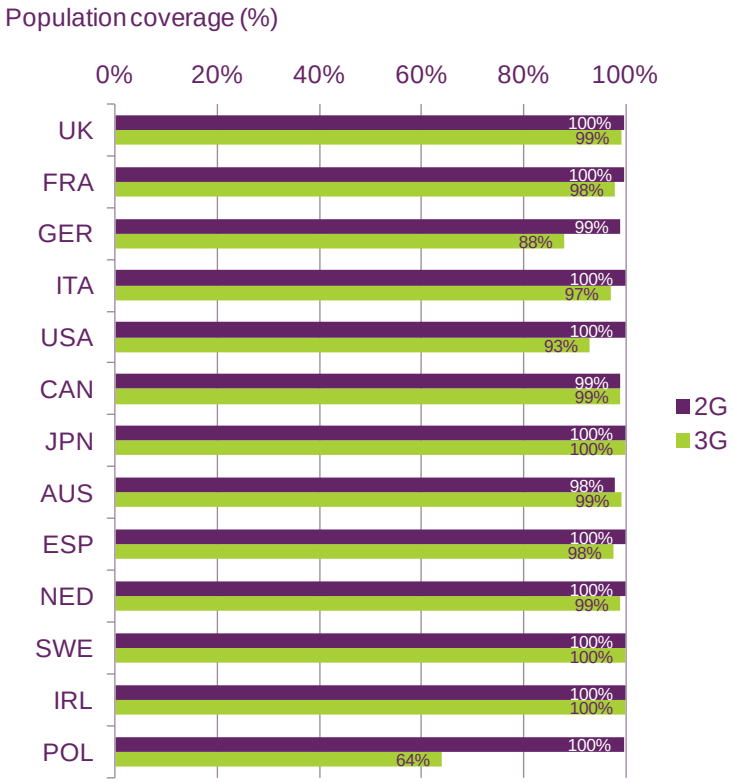
Source: IDATE / industry data / Ofcom

3G coverage was lowest in Poland, Germany and the US

Methodological differences in the way operators and regulators measure mobile coverage mean that it is difficult to compare the figures they provide directly. Using the best information available to Ofcom, we present data on the population coverage offered by the operator in each country covering the largest proportion of the population, to the nearest decimal place. The UK's figures are not directly comparable to those of other countries, not least because they reflect the percentage of premises (homes and businesses) covered by at least one mobile network operator, not the operator with the widest coverage. The way that different countries define signal levels that constitute 'coverage' is another factor that means comparisons between countries should be treated with caution.

The chart shows significant variations between several comparator countries in the levels of 3G coverage available from the largest operators (Figure 6.50). Whereas at least 97% of the population had 3G coverage in most of our comparator countries (to the nearest percentage point), 3G availability was lower in Poland (64%), Germany (88%) and the US (93%). By contrast, the availability of 2G services was near-universal (at least 98% to the nearest percentage point) in all of our comparator countries. In the UK, 100% of premises surveyed have 2G coverage and 99% have 3G coverage from at least one operator.

Figure 6.50 Mobile availability: 2011



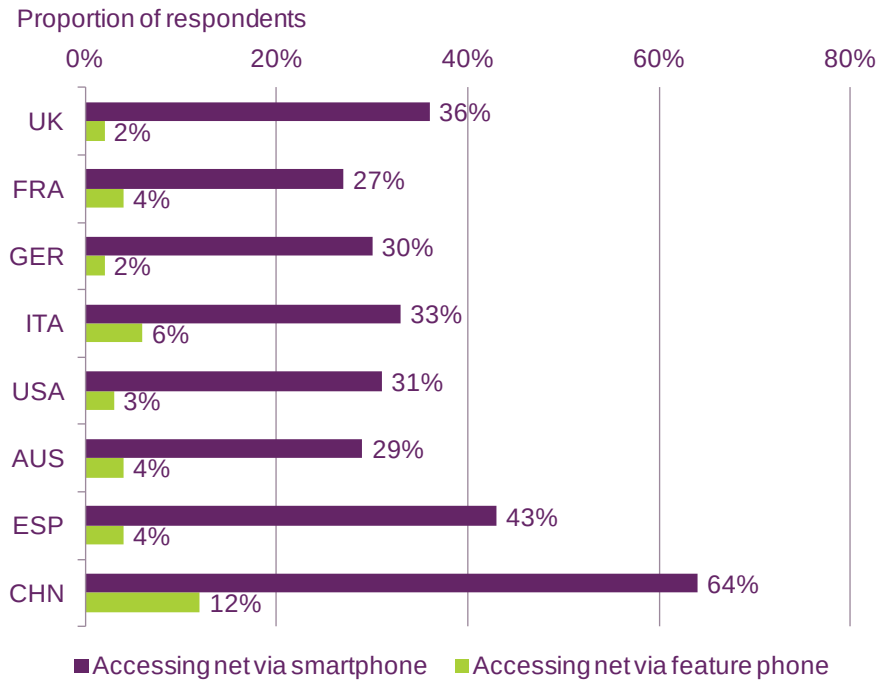
Source: IDATE / industry data / Ofcom
Note: All figures rounded to nearest one per cent. UK figures show the percentage of premises that are covered by at least one mobile network. Figures for other comparator countries show population coverage by the operator in each country that covers the largest proportion of the population.

In the UK, 36% of respondents used smartphones to go online in 2012, in Europe second only to Spain

A higher proportion of respondents in China reported using mobiles to access the internet in 2012 than in any other comparator country for which we have data (Figure 6.51). Of these, 64% used a smartphone and 12% used a feature phone. However, as our respondents have internet access, these figures may best reflect behaviour in areas of China where internet penetration is higher, and are not directly comparable with those from other comparator countries. Among the remainder of our comparator countries, the second largest proportion of respondents who used smartphones to go online was in Spain (43%), followed by the UK (36%).

Respondents were least likely to use internet-enabled mobiles to go online in France (where 27% did so) and in Germany (30%). China contained the largest proportion of respondents who used feature phones rather than smartphones to go online (12%).

Figure 6.51 Proportion of respondents who access the internet via a mobile device: 2012



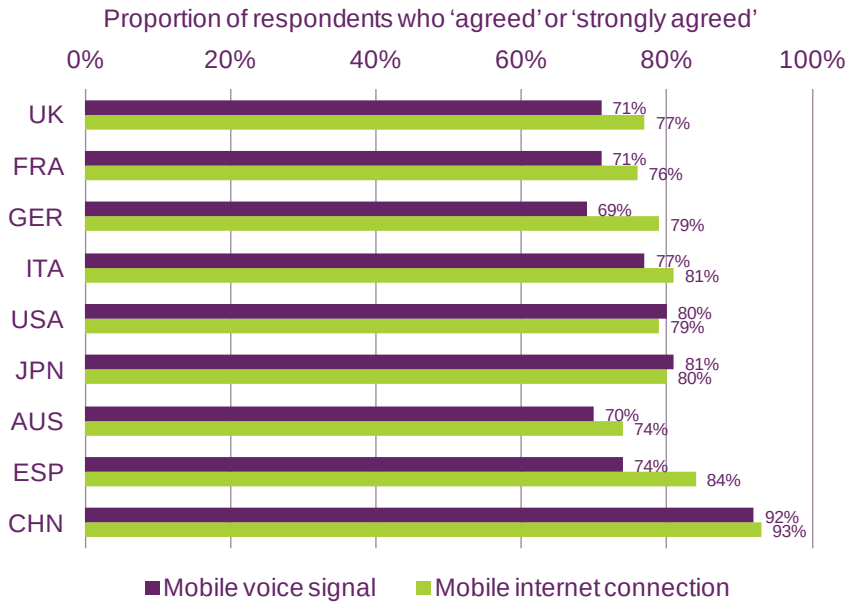
Source: Ofcom consumer research, September 2012
Q.7 Which of the following devices do you use to access the internet generally (e.g. visiting web sites, emailing, online gaming, downloading files)?
Base: All respondents who own and use any devices capable of connecting to the internet (n = 9069)

Satisfaction with voice signal was lowest in Germany and satisfaction with mobile internet connectivity was lowest in Australia

In 2012, among nine countries surveyed, a higher proportion of respondents in China reported satisfaction with the reliability of the mobile voice signal than in any other comparator country: 92% agreed or strongly agreed that they could make a call when they wanted to. However, as our respondents were internet users, in China this is likely to reflect a skew towards respondents in urban areas, to a greater extent than in other comparator countries. Outside China, satisfaction with voice coverage was highest in Japan: 81% of respondents agreed or strongly agreed that they could make calls when they wanted to (Figure 6.52). A comparable number did so in the US (80%). Respondents in Australia (where 70% agreed or strongly agreed), Germany (69%) the UK (71%) and France (71%) were the least satisfied with voice coverage among the countries for which we have data.

A large proportion of respondents in Spain agreed or strongly agreed that they had mobile internet signal when they needed it (84%), second only to China (93%, a figure that may also reflect urban areas more accurately). Australia recorded the lowest satisfaction with mobile internet connectivity (74%), though this was higher than satisfaction with voice reception. Japan and the US were the only countries where satisfaction with voice coverage was higher than that with mobile internet connectivity. In Spain and Germany there was a 10 percentage point gap between satisfaction with voice and mobile internet.

Figure 6.52 Consumer perceptions of the reliability of mobile voice signal and mobile internet connectivity: 2012



Source: Ofcom consumer research, September 2012
Q.4b Thinking about when you use your mobile phone / smartphone, please select an answer to each of the following: I always have a mobile signal when I want to make a call
Q.4b Thinking about when you use your smartphone, please select an answer to each of the following: I can always connect to the internet when I want to
Base: All respondents who own a smartphone and / or feature phone (n = 8242)