# OECD Internet Economy Outlook 2012

# Highlights

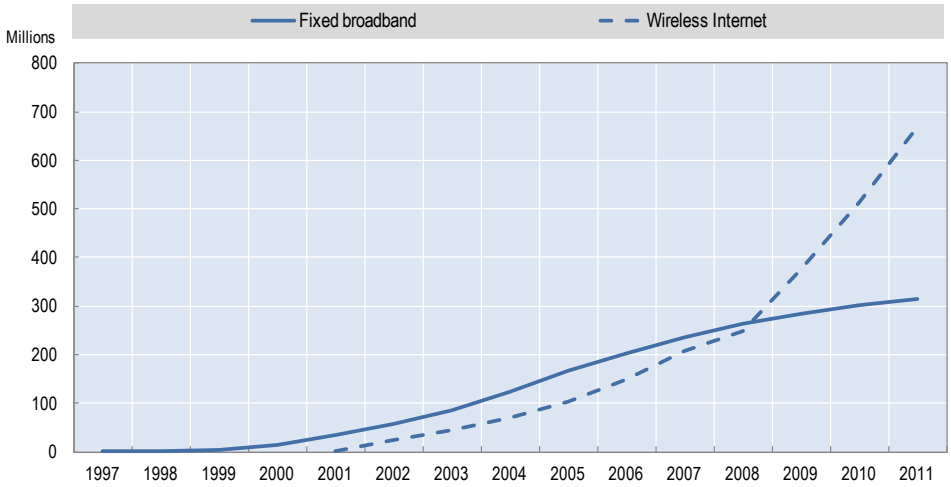
The Internet began as a way of linking different computers over the phone network, but it now connects billions of users worldwide from wherever they happen to be via portable or fixed devices. People with no access to water, electricity or other services may have access to the Internet from their mobile phone. The Internet is a multi-billion dollar industry in its own right, but it is also a vital infrastructure for much of the world's economy. The *OECD Internet Economy Outlook* provides data on the evolving Internet economy, emphasises trends across the OECD area, and highlights emerging policy issues.

## Rapidly expanding broadband

The combination of widespread network coverage, sufficient data transfer capacity, affordable devices and connectivity options in most OECD markets has encouraged growth in services and ways in which people use the Internet.

Wireless connections are the key source of recent Internet expansion, overtaking fixed broadband subscriptions in 2009. As of December 2011, the estimated number of wireless broadband connections in the OECD (667 million) was more than double that of fixed broadband subscriptions (315 million) and the growth rate for wireless subscriptions continues to increase. Broadband speed has improved while prices have fallen. Advertised speeds of DSL and cable broadband increased annually by 32% and 31% respectively in OECD countries over 2008-11, while prices declined by 3% and 4% respectively.

**Wireless Internet access overtaking fixed broadband subscriptions**

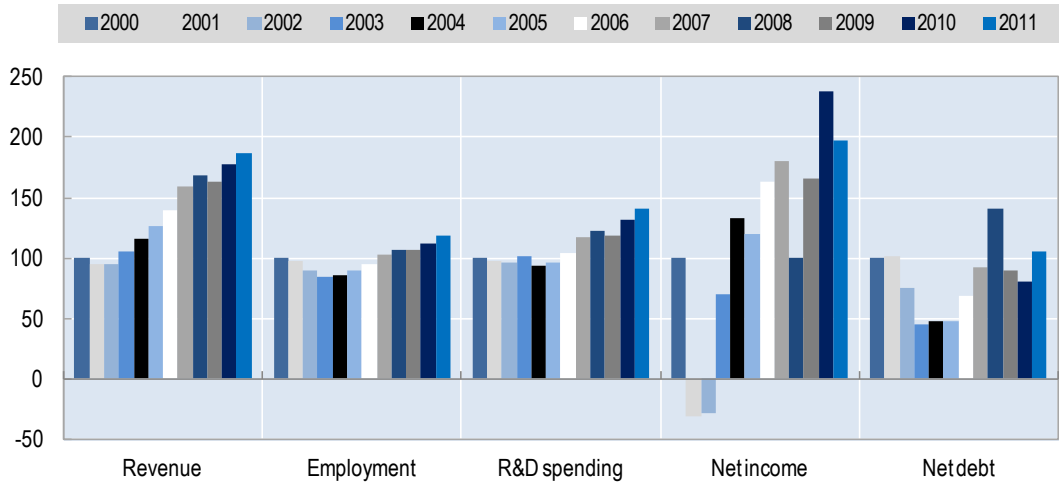


The number of mobile phone subscriptions worldwide has more than doubled since 2005 and tripled in non-OECD countries. Tablet PCs and smartphones are making computers ubiquitous while cloud services and mobile Internet are enabling "everything/everywhere" data access, thus paving the way for new services and applications. The two technologies that will shape the near future of connectivity are *very-high-speed fibre connections* being deployed closer to population areas and new *high-speed wireless connections*.

## The ICT sector and the crisis

The expansion of mobile Internet connectivity has helped buoy the ICT sector during the crisis, with 6% growth a year in revenue between 2000 and 2011 for the top firms. ICT services is doing better than ICT manufacturing, reaching output growth of 5%-10% in 2012. Employment in the sector has benefited too, with the top firms hiring more than 14 million people worldwide in 2011, a 6% increase from 2010. Among the top ICT firms, Internet firms performed the best in terms of revenue and employment growth.

**Performance trends of Top 250 ICT firms, 2000-11**




E-commerce represents an increasing share of total business revenue. Although this share is still small in many countries, it is growing generally, as is the share of businesses selling and purchasing over the Internet.

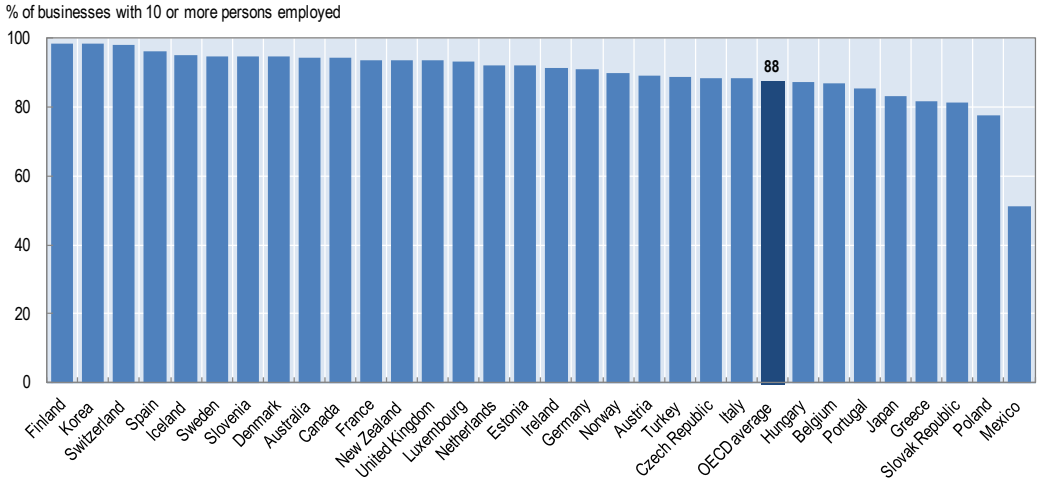
The ICT sector continues to attract venture capitalists, accounting for more than 50% of all venture capital in the United States, the world's largest market, in 2011. Venture capital investment is at its highest level ever, with the exception of an anomalous peak in 2000 during the dot-com bubble. ICT business R&D also continues with both Korea and Finland reaching over 1.5% of GDP.

## Business adoption and use

The Internet is affecting nearly all sectors of the economy, from making hard-to-find data available online to transforming entire markets, as is occurring with music, video, software, books and news.

Businesses were among the earliest adopters of the Internet and helped lead the upgrade to higher speeds. In 2003, less than four out of ten companies had broadband access in the EU15; by 2009, this proportion had increased to nine firms out of ten. At the end of 2011, nearly all companies in OECD countries were connected to the Internet. In two-thirds of OECD countries, more than 95% of the companies use the Internet, with only a small proportion of the smallest businesses not yet connected; in 2010, only 5.7% of small firms (10-49 employees) in the EU25 were not accessing the Internet.

**Businesses with a broadband connection, 2011 or latest available year**

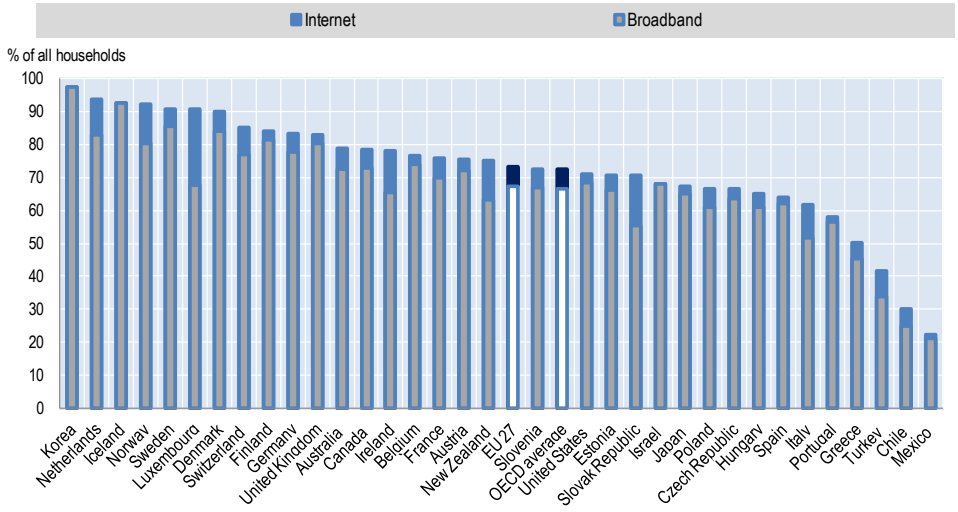



At the company level, the restructuring of business models in association with Internet use has led to improved efficiency and the rapid growth of new online businesses. There is scope for improvement, however, as significantly fewer firms sell goods online compared to those ordering online. In 2010, on average, 35% of all businesses with ten or more persons employed used the Internet for purchasing, and only 18% for selling goods and services.

## Household adoption and use

The Internet is reshaping the way individuals live, bringing a larger variety of digital goods and services, lower prices, improved information gathering, more distribution channels and so forth. Approximately 70% of OECD households have access to broadband Internet, at increasingly higher speeds and lower costs. The shift to mobile Internet connectivity is also changing the way in which people interact and consume content, via social networking.

**Internet access and broadband connections in OECD households, 2011 or latest available year**




The Internet has also become a vital tool to help match available workers with jobs: in 2010, an average of 17% of Internet users reported using the Internet in a job search.

Despite recent advances in connectivity, however, certain segments of the population are much more likely to use the Internet (16-24 years old) than others (people over 65). Additional demographic characteristics, such as lower income or educational levels, are also correlated with lower levels of Internet access.

## Digital content

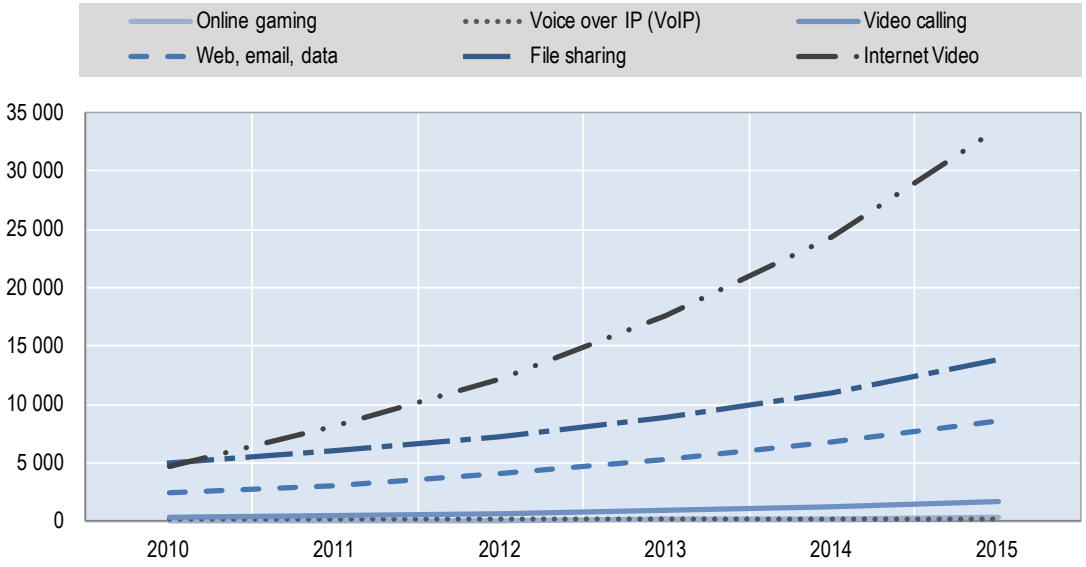
Digital content is arguably the most important driver of consumer Internet adoption, with related revenues growing rapidly across all sectors. Advertising represents the biggest online market in absolute terms, followed by computer and video games, online music and film and video. In 2010, games led global consumer demand, accounting for an estimated 39% of digital revenues. According to the International Federation of the Phonographic Industry (IFPI), digital music worldwide accounted for 29% of recording companies' revenues – more than four times that of the combined online revenues from the book, film and newspaper industries, despite these other industries being much larger overall.

The last two years have seen significant growth in devices capable of accessing online digital content. Sources of content are also expanding, with social networking and new video and audio services helping to drive ICT industry growth and create new business models. Indeed, the switch to digital technologies has forced businesses in a growing list of sectors to rethink their business models and adapt to survive.

Bandwidth usage continues to increase each year, with video and entertainment services demanding an increasing share on both fixed and mobile platforms. Sandvine reports that real-time entertainment applications have overtaken peer-to-peer (P2P) as primary drivers of network capacity in North America, accounting for 58% of peak traffic and almost 65% of peak downstream traffic in 2012. The streaming video service Netflix alone reached a peak of 32.9% of all US downstream traffic in the same year.

Devices such as set-top boxes and gaming consoles are also helping to drive this shift to online entertainment. Cisco predicts that IP traffic will grow fourfold between 2010 and 2015 at an annual growth rate of 32%. Sandvine also reports that the majority of real-time entertainment traffic (54.3%) is going to streaming video and audio and that 15.6% of this traffic is viewed on mobile devices and tablets being used from home via Wi-Fi.

**Global consumer Internet traffic, 2010-15**

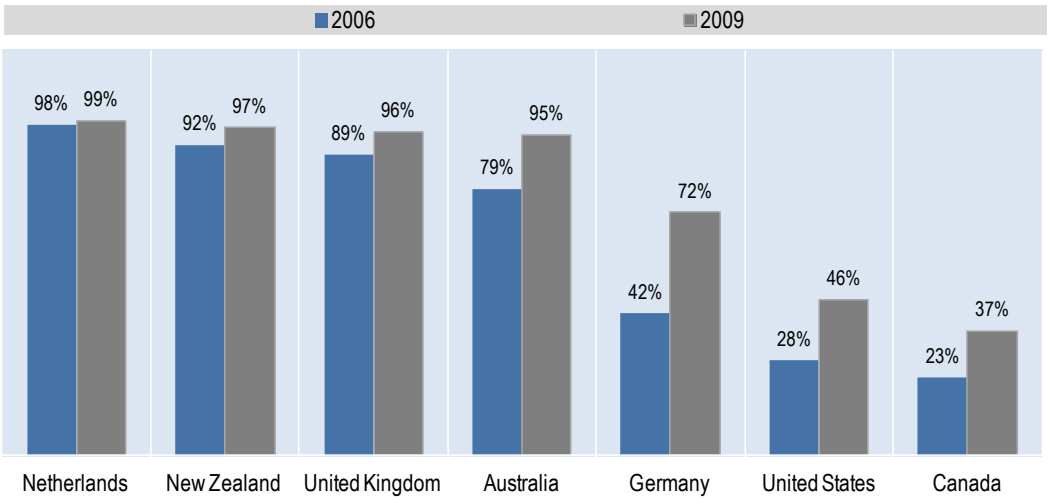



## ICT for health

The Internet is affecting all sectors of the economy but ICTs in health offer particular promise. The use of ICTs in the health sector can provide increased quality of care and efficiency, reduced operating costs and entirely new modes of care. OECD governments have recognised this potential and are taking on an increasingly larger share of implementation costs to ensure that the potential benefits are realized.

One example is electronic health records (EHRs) which enable timely access and better transmission of medical information across the healthcare continuum, thereby making patient care more responsive and efficient. Telehealth is also increasingly seen as an important tool for enhancing healthcare delivery, particularly in rural and remote areas where healthcare resources and expertise are often scarce or even non-existent.

**Use of electronic medical records by physicians in seven OECD countries, 2006 and 2009**




However, many health ICT systems still cannot communicate with other systems and health information exchange remains a serious problem, even in countries where EHRs have proven particularly successful. Continued commitments to broadband, open standards and interoperability will be essential for successful change.

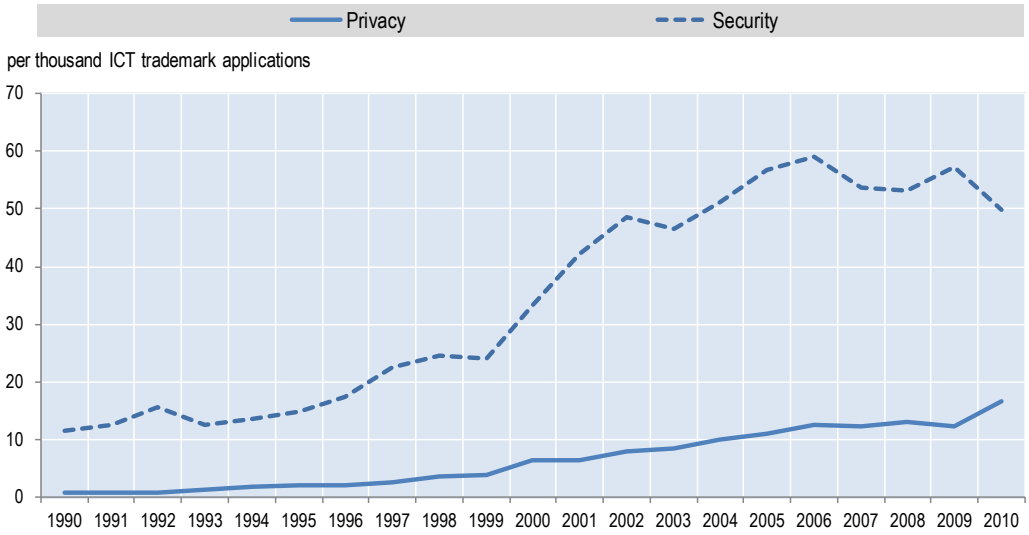
## Security and privacy

The future of the Internet economy depends on whether users, businesses and governments feel safe using the network and trust it for critical applications and services. Malware, denial of service (DoS) attacks and other incidents compromising the confidentiality, integrity or availability of information systems and networks are increasing. Where personal data are collected, stored or processed, these incidents also heavily affect privacy. As a result, governments are paying increasing attention to cybersecurity and data privacy threats.

Data on the role of innovation in privacy are incomplete, either because R&D figures are hard to find or because privacy-enhancing technologies are less frequently patented. Statistics on trademarks seem to capture innovation in privacy much better; however, the number of trademark applications related to privacy is six times lower than those related to information security. This may indicate a lower level of ongoing technological and product innovation in the field of privacy compared to information security.

The increasing relevance of information security and privacy at the organisational, national and international level suggests that demand for security and privacy professionals will increase, making skills a potential bottleneck for enhancing innovation in information security and privacy.

**Relative number of trademark applications in information security and privacy at USPTO, 1990-2010**




## The Internet of things

Internet development is on the cusp of a potentially large expansion to objects typically not associated with communication capabilities. Electricity plugs, automobiles and even light bulbs for instance are increasingly connected to the Internet as a way to introduce new functionality. This forthcoming third wave of Internet connectivity is expected to connect anywhere from ten to a hundred devices per family, and thousands or potentially millions of devices per company.

Two enabling factors are driving this Internet of things: the ubiquity of networks and ever lower prices for the communications modules used to connect devices. Ericsson estimates that there will be 50 billion mobile wireless devices connected to the Internet by 2020, and this could eventually reach 500 billion. For example, incorporating a communication device into each automobile, and assuming a lifespan of ten years, would result in around 700 million "machine-to-machine enabled" cars by 2020. Connecting every power socket in North America to a network as part of a smart grid rollout would easily result in 10 billion connections.

As economies and societies become increasingly intermeshed with devices that continuously communicate with each other and provide information to users, data will be processed and delivered as a myriad of signals across multiple devices and networks. It will increasingly inform people about their surroundings, but also provide information about people to third parties. The privacy considerations are therefore significant.

## Measuring the Internet economy

Governments increasingly fund broadband rollouts, either through direct public investment or via the modification of universal service programmes, yet there is still no widely accepted methodology or single measure to capture the whole Internet economy. But the existing OECD research presented in the *Internet Economy Outlook* illustrates the importance of establishing an international definition and the need to develop related policies. The data shows that *at least 3% and up to 13% of business sector value added in the United States in 2010 could be attributed to Internet-related activities* depending on the scope of the definition.

Two important requirements for further analysis are high-quality data as inputs and a robust model to interpret them. In addition, cross-country comparisons require harmonisation of data collections across countries, which will likely take years. As such, the full impact of the Internet on our economies remains far from clear, even as the available means of communicating and connecting to information continue to expand rapidly. What is clear is that the Internet is becoming a key economic infrastructure, revolutionising businesses and serving as a platform for innovation.

## Government priorities

Policy makers across governments are increasingly focused on policies related to the Internet and ICTs as our reliance on them grows. In 2011, OECD governments indicated their policy priority areas and the results are provided in the table below. Overall, broadband remains a key priority but there is a new emphasis on ICT skills and employment as many countries continue to face economic challenges. Governments are also looking for ways to move more government services online.

**Overall ICT policy priority areas**

| | |
|---|---|
| 1 | Broadband |
| 2 | ICT skills and employment |
| 3 | Government online |
| 4 | Security of information systems and networks |
| 5 | Research and development (R&D) programmes |
| 6 | Technology diffusion to business |
| 7 | Electronic settlement/payment |
| 8 | Digital content |

The data and research in this *OECD Internet Economy Outlook* highlight the spread of the Internet's influence throughout the economy and help support empirically-based policy making. In the coming years, the Internet will continue to expand while businesses, individuals, and governments will find new, innovative ways to leverage the potential of networks.