THE EU ICT SECTOR AND ITS R&D PERFORMANCE

METHODOLOGICAL NOTE

Definition of the ICT sector

In the following section, the ICT sector is defined according to the definition provided by the OECD on the basis of the NACE (Statistical Classification of Economic Activities in the European Community) Rev.2 (2008) nomenclature. The ICT sector consists of 12 subsectors:

- ***ICT Manufacturing***

C261 Manufacture of electronic components and boards
C262 Manufacture of computers and peripheral equipment
C263 Manufacture of communication equipment
C264 Manufacture of consumer electronics
C268 Manufacture of magnetic and optical media

- ***ICT Services***

G4651 Wholesale of computers, computer peripheral equipment and software
G4652 Wholesale of electronic and telecommunications equipment and parts
J5820 Software publishing
J61 Telecommunications
J62 Computer programming, consultancy and related activities
J631 Data processing, hosting and related activities; web portals
S951 Repair of computers and communication equipment

Comprehensive vs. Operational definition

The “comprehensive” definition of the ICT sector corresponds to the 2007 OECD definition

The “operational” definition of the ICT sector allows international comparisons but does not include the following sectors: Manufacture of magnetic and optical media (268) and ICT trade industries (465).

Segment analysis

In the following section, a segment analysis is made for each indicator. The 12 subsectors are aggregated into 4 segments:, ICT Manufacturing (excluding Communication equipment), Communication equipment, ICT Services (excluding Telecommunications) and Telecommunications

Source

JRC-IPTS calculations and estimates, based on EUROSTAT data, PREDICT project

VALUE ADDED IN THE ICT SECTOR
At EU and World level

The ICT sector Value Added (VA) amounts to €496bn in 2010. After a slowdown in 2009, the ICT sector has experienced a partial recovery in 2010.

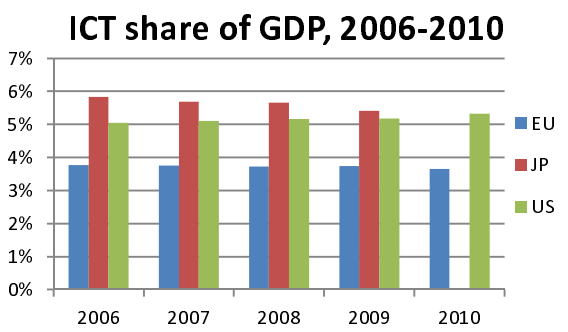
The breakdown by subsectors shows the predominance of ICT services (€450bn and 91% of total ICT VA in 2010) over ICT manufacturing industries (€46bn and 9% of total ICT VA in 2010).

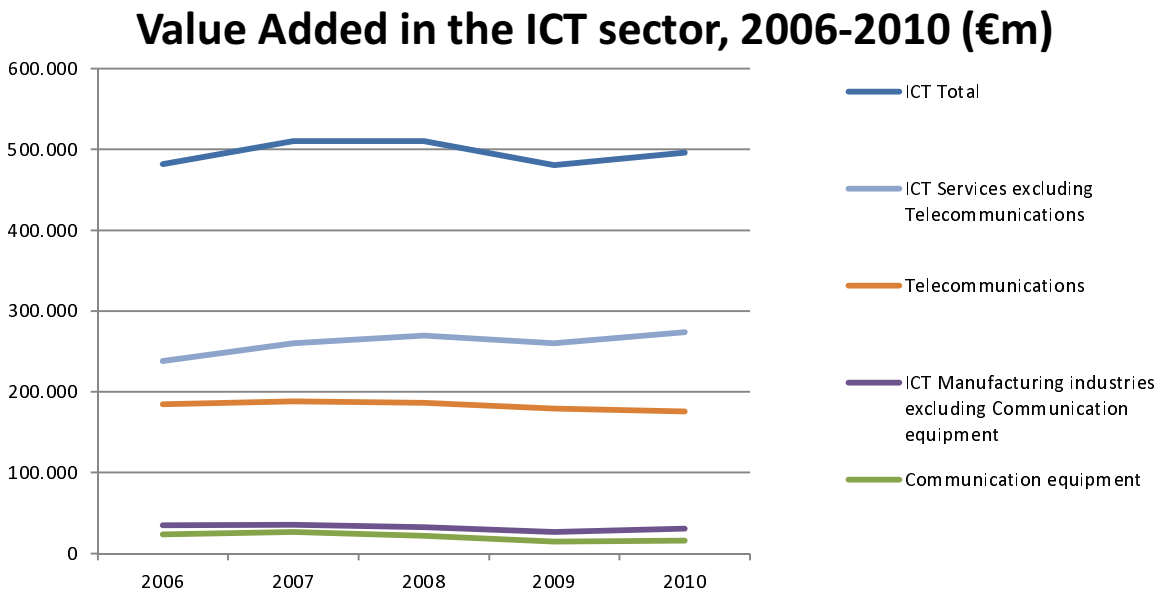
The ICT services (excluding Telecoms) segment is the only one that has recorded an increase in VA in the medium term up to €274bn in 2010.

The Communication equipment segment has experienced the sharpest decline in the medium term. From its apex of €26bn in 2007, it has dropped to €16bn in 2010, showing evidence of a structural decline.

In 2010, ICT VA represents 4.0% of EU GDP (based on the comprehensive definition – see methodological note).

However (based on the comparable operational definition), ICT VA in EU (3.7% in 2010) lags behind Japan (5.4% in 2009) and US (5.3% in 2010).



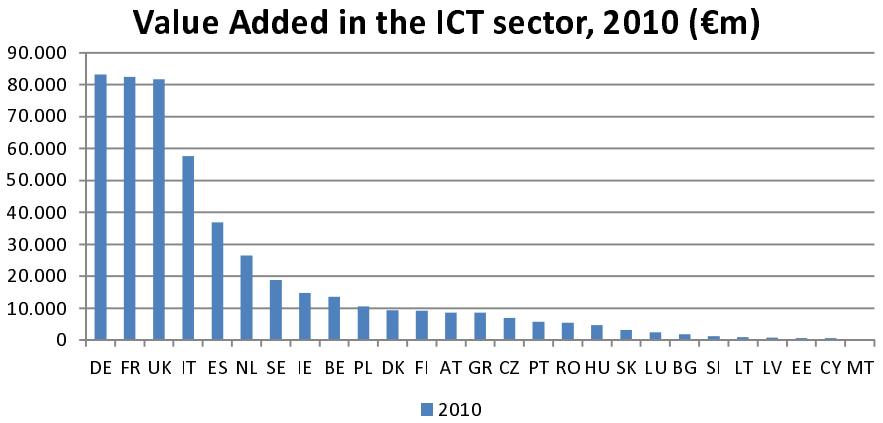


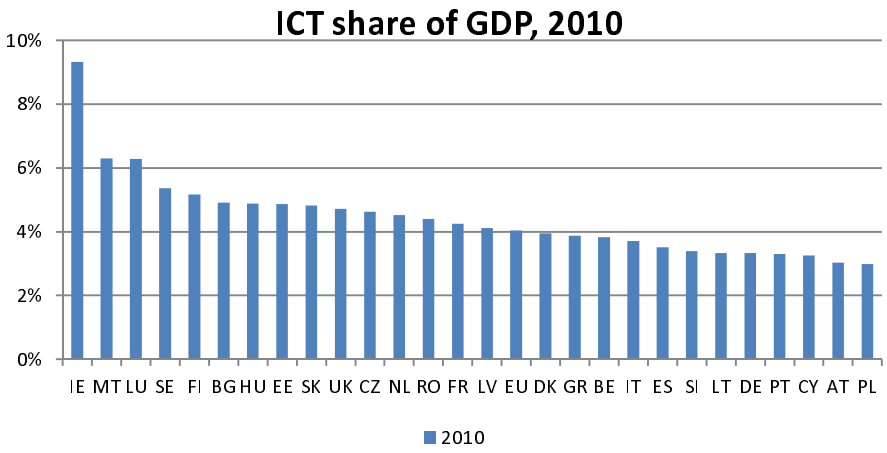
Source: JRC-IPTS calculations and estimates, based on EUROSTAT data, PREDICT project

VALUE ADDED IN THE ICT SECTOR
By Member States

Unsurprisingly, the five largest economies are also the five biggest contributors to ICT VA in 2010: Germany, France and the United Kingdom (€82-83bn and 16-17%), Italy (€58bn and 11.6%) and Spain (€37bn and 7.4%).

Together, those five countries represent 69% of total EU ICT VA in 2010.





Ireland has – by far – the highest ICT share of GDP with a ratio of 9.3% in 2010, whereas Poland lags behind with less than 3.0%.

Other countries: Malta and Luxembourg (both 6.3%), followed by Sweden (5.4%) and Finland (5.2%). Important shares characterise also some eastern Member States (BG, HU, EE, SK, CZ).

In most of the Member States, ICT shares of GDP remain globally stable during the crisis (2008-09) with the exception of Finland (2009/08: - 1.63pp)

Source: JRC-IPTS calculations and estimates, based on EUROSTAT data, PREDICT project

EMPLOYMENT IN THE ICT SECTOR
At EU and World level

The ICT sector employs a little less than 6.0m (million) people in 2010, down from 6.1m in 2008.

The ICT services (excluding Telecoms) segment employs more than 4.0m people and 69% of total ICT employment in 2010. It has stabilized since the crisis and is the only segment that has recorded a structural increase.

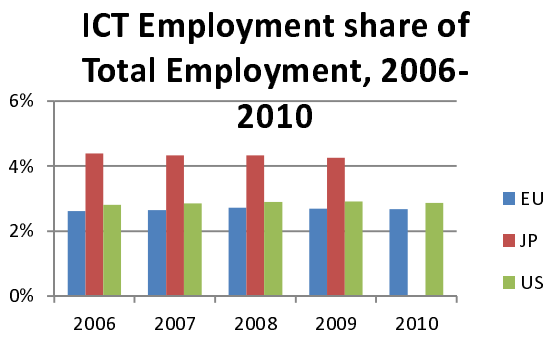
The Telecommunications segment employs more than 1.0m people in 2010, a number which has been decreasing in the medium term.

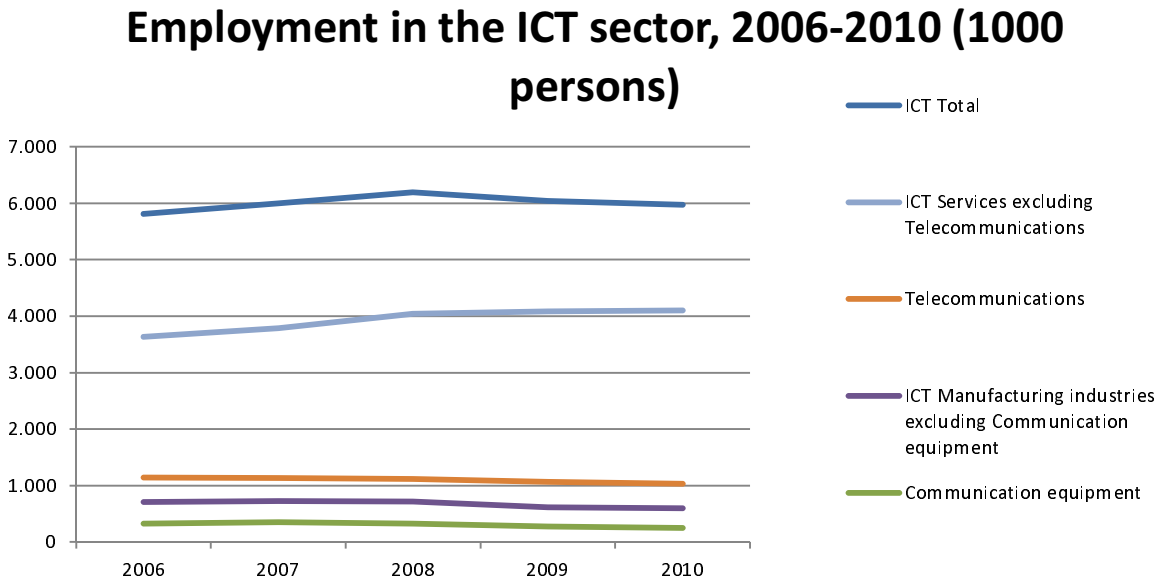
The ICT manufacturing industries (excl. Communication equipment) segment employs 596,000 people in 2010 and the number has been decreasing.

The Communication equipment segment has recorded the sharpest structural decline down to 248,000 people in 2010.

Employment in the ICT sector represents 2.7% of EU total employment in 2010, remaining remarkably stable in the mid-term.

The EU share compares to that of the US (2.9% and stable), but both lag markedly behind Japan (4.3% and stable).



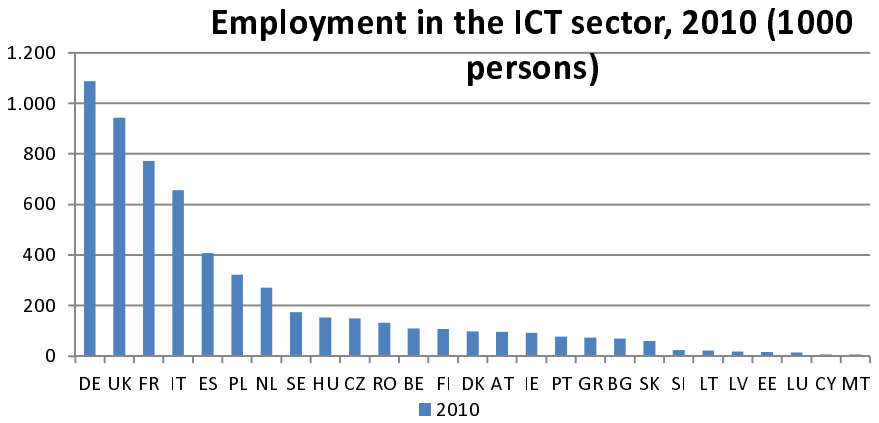


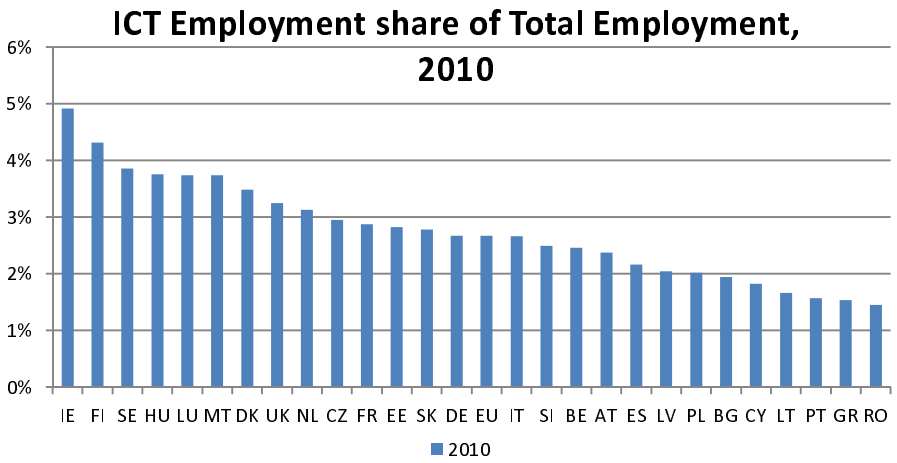
Source: JRC-IPTS calculations and estimates, based on EUROSTAT data, PREDICT project

EMPLOYMENT IN THE ICT SECTOR
By Member States

As in the case of Value Added, the five largest economies are also the five biggest employers of the ICT sector in 2010: Germany (more than 1m people and 18.2%), the United Kingdom (0.94m people and 15.8%), France (0.77m and 12.9%), Italy (0.65m and 11%) and Spain (0.4m and 6.8%)

Together, those five biggest employers represent 65% of total ICT employment in 2010.





Ireland holds again the lead with 4.9% of ICT employment in total employment in 2010, and Romania brings up the rear with only 1.5% of ICT employment.

Other countries: Finland (4.3% in 2010); Sweden, Hungary, Luxembourg and Malta follow with ratios between 3.5% and 4%.

During the crisis, the share of ICT employment in total employment remains stable in almost all countries.

Source: JRC-IPTS calculations and estimates, based on EUROSTAT data, PREDICT project

BUSINESS ENTERPRISE R&D (BERD) EXPENDITURE IN THE ICT SECTOR
At EU and World level

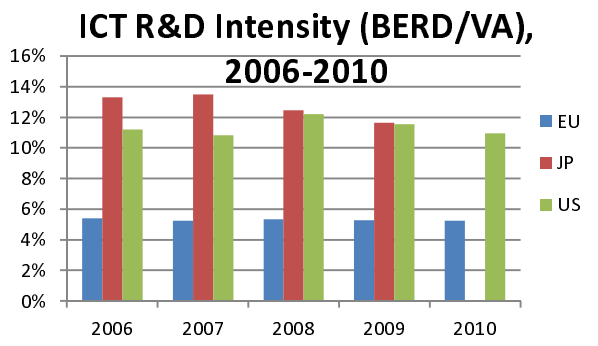
The ICT sector BERD expenditure amounts to €26bn in 2010, down from its high point of €27bn in 2008, with signs of recovery since the low point of €25bn in 2009

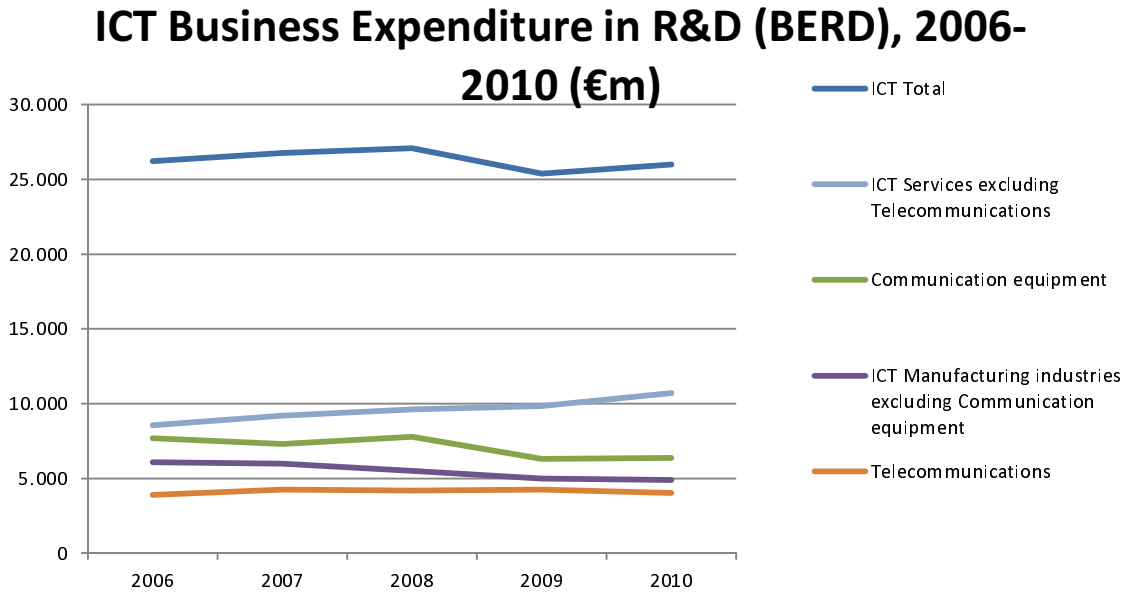
The breakdown by subsectors shows a more balanced situation for BERD than for VA: despite driving only 9% of ICT VA, the ICT manufacturing segment spends 43% of total ICT BERD (€11bn) while the ICT services segment spends 57% (€15bn) in 2010.

In the medium term, the situation is contrasted. The ICT Manufacturing segment records a structural decline (-18% in 4 years). On the contrary, the ICT services segment shows a structural increase (+18% over 2006-10), especially the ICT Services (excluding Telecoms) segment (+25% over 2006-10).

R&D intensity in the ICT sector (comprehensive definition) amounts to 5.2% (in 2010).

EU (5.2% in 2010) has kept lagging behind US (10.9% in 2010) and Japan (11.7% in 2009) (comparable operational definition).



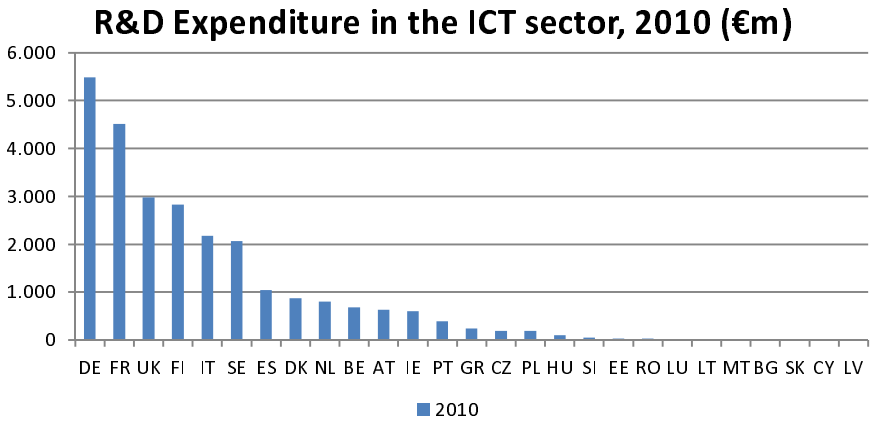


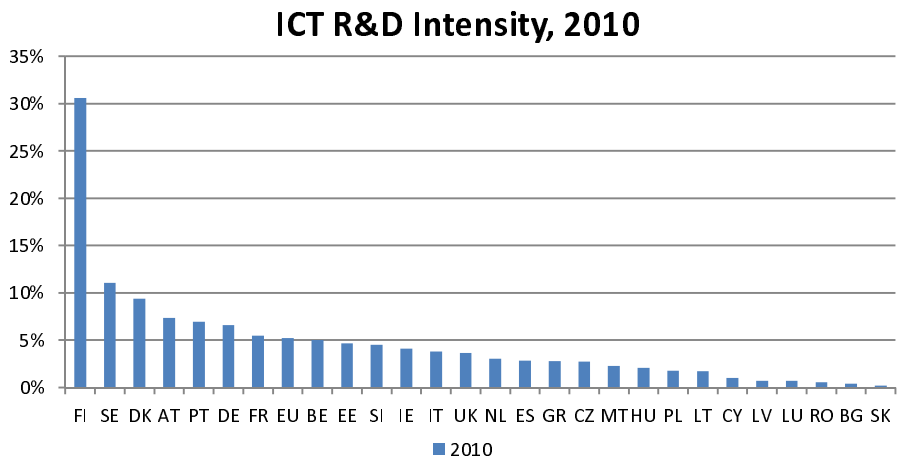
Source: JRC-IPTS calculations and estimates, based on EUROSTAT data, PREDICT project

R&D EXPENDITURE IN THE ICT SECTOR By Member States

The five main contributors in terms of R&D expenditure in the ICT sector in 2010 are four of the five main countries of the EU plus Finland: Germany (€5.5bn and 21%), France (€4.5bn and 17%), the United Kingdom (€3bn and 11.4%), Finland (€2.8bn and 11%) and Italy (€2.2bn and 8.4%). They are followed by Sweden (€2.1bn and 8%), confirming the importance of Nordic countries for ICT R&D.

Together, the five biggest contributors represent 69% of ICT R&D expenditure in 2010.





Finland leads Europe with more than 30% of ICT R&D Intensity in 2010, and Slovakia bottoms out with a tiny 0.2%.

Other countries: Sweden (11%) and Denmark (9.4%). Other important countries are Austria (7.4%), Portugal (7%), Germany (6.6%) and France (5.5%).

During the crisis, ICT R&D intensity remains globally stable with the notable exception of Finland which experiences a surge of more than 8 percentage points (2009/08) due to a sharp drop of its value added (denominator of the ratio).

Source: JRC-IPTS calculations and estimates, based on EUROSTAT data, PREDICT project

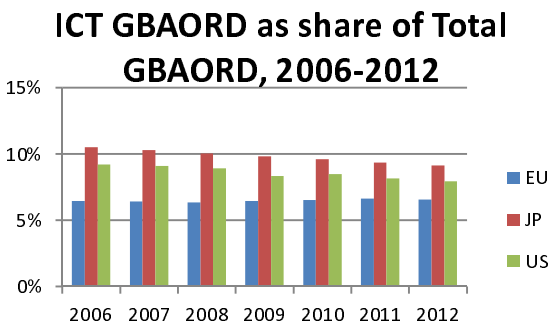
PUBLIC FUNDING
ICT R&D EXPENDITURE
At EU and World level

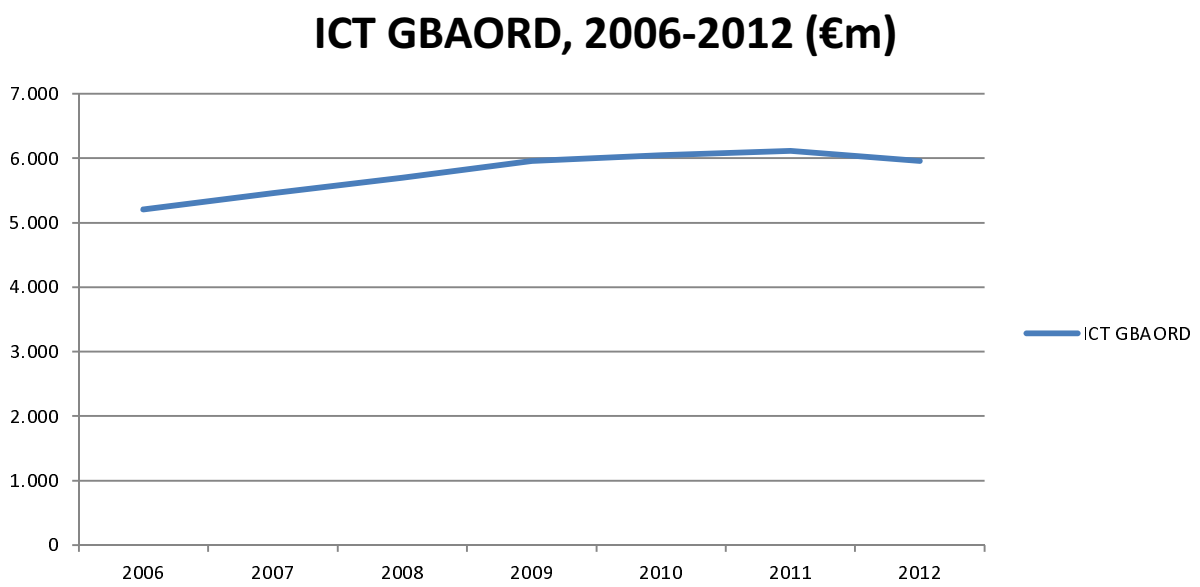
After increasing for several years, in 2011 the estimated ICT R&D publicly funded expenditure increases despite a fall in total public R&D expenditure. In 2012, ICT R&D public expenditure has followed the overall decrease and went down by 2.6%, a bit faster than the overall decline.

The Digital Agenda target of doubling publicly funded R&D in ICT by 2020 requires an annual growth rate of 5.5% (assuming constant annual growth rate). Already in 2011, the estimated public ICT R&D is below the necessary trend line; in 2012 the gap is about 20%

In 2012, ICT GBAORD represents 6.6% of EU Total GBAORD, broadly stable in the medium term

The EU lags behind Japan (9.1%) and the US (7.9%), even if both have experienced some decline in their ratios.



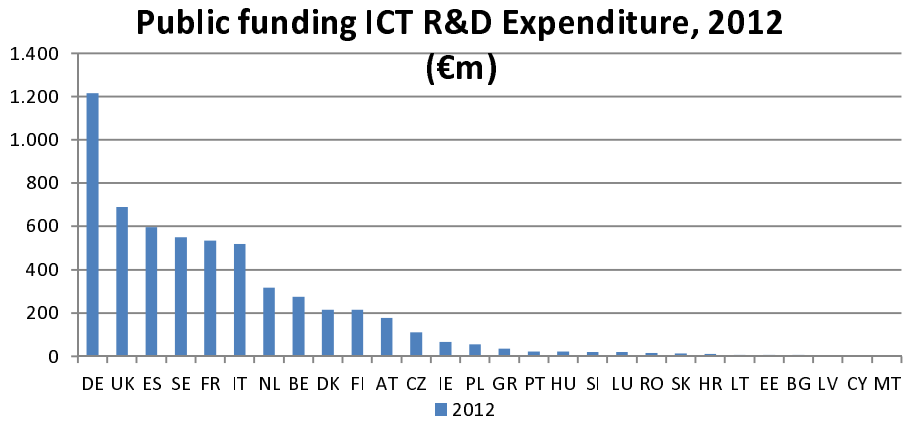


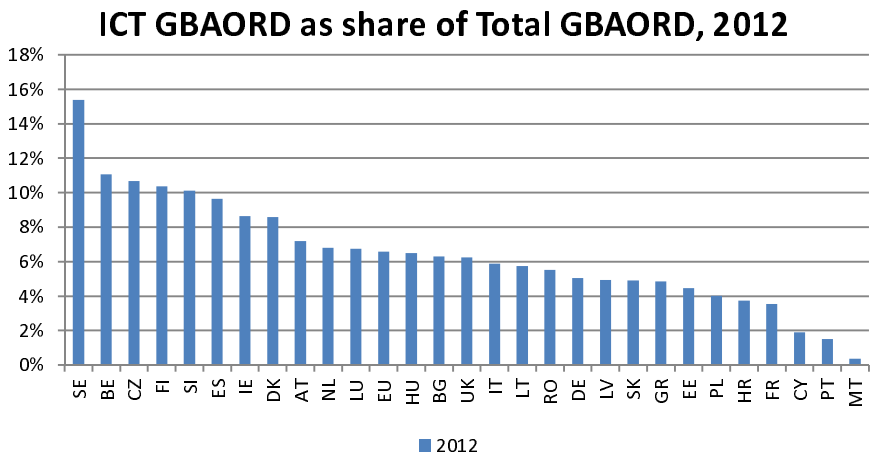
Source: JRC-IPTS calculations and estimates, based on EUROSTAT data, PREDICT project

PUBLIC FUNDING
ICT R&D EXPENDITURE
By Member States

The five biggest public funders of R&D in ICT in 2012: Germany takes – by far – the lead (€1.2bn and 20%), followed by the United Kingdom (€0.69bn and 12%), Spain (€0.60bn and 10%) and on equal footing Sweden (€0.55bn and 9%) and France (€0.54bn and 9%).

Together, those five countries represent 60% of total public funding of R&D in ICT.





The ranking of ICT GBAORD as share of Total GBAORD in 2012 highlights again the performance of Nordic countries: Sweden (1st with 15%) and Finland (4th with 10%).

However, other countries do seem to attribute special importance to ICT in their R&D public spending: Belgium (2nd with 11%), Czech Republic (3rd with 11%), and Slovenia (5th with 10%).

Source: JRC-IPTS calculations and estimates, based on EUROSTAT data, PREDICT project

R&D PERSONNEL IN THE ICT SECTOR At EU and World level

R&D personnel in the ICT sector includes 256,000 Full Time Equivalent (FTE) in 2010, with an increasing trend in the medium term, and a recovery in 2010.

The ICT services (excluding Telecoms) segment employs 138,000 FTE in 2010 (54% of R&D personnel in the ICT sector, first place), with an increasing trend.

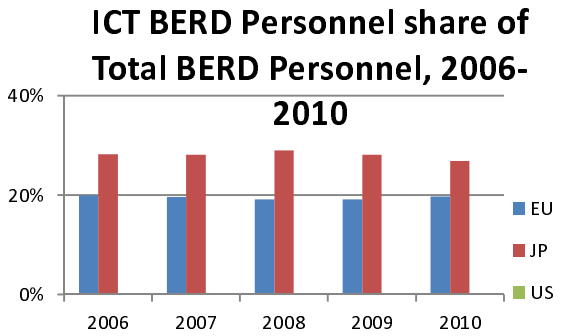
The ICT Manufacturing (excluding Communication equipment) segment employs 40,000 FTE in 2010, in constant decline.

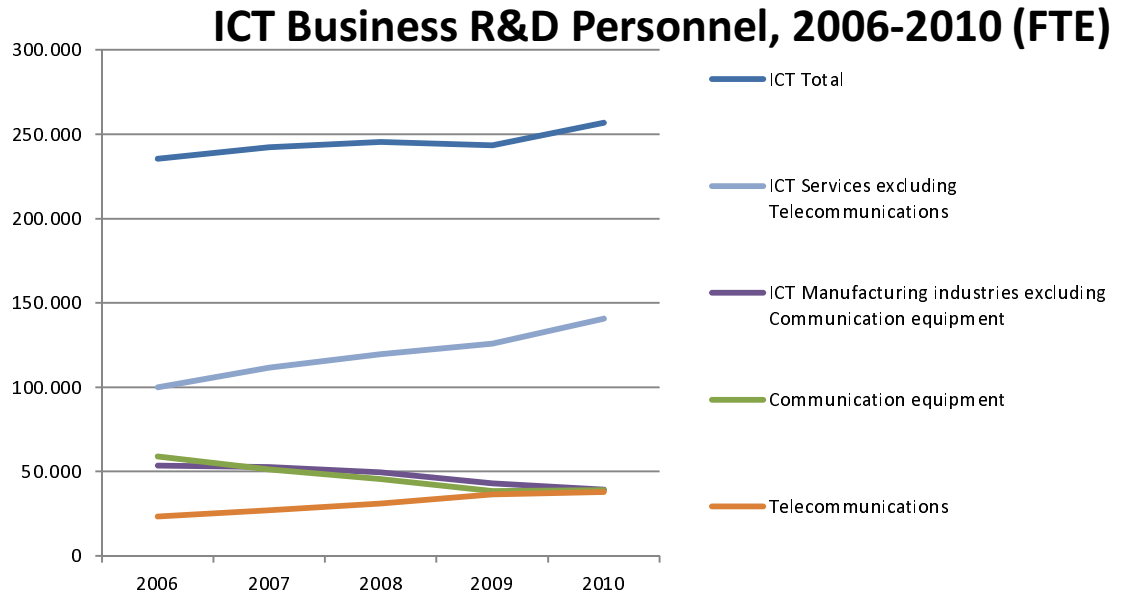
The Communication equipment segment follows the same path as the ICT Manufacturing segment.

The Telecommunications segment employs 39,000 FTE in 2010 (15% of R&D personnel in the ICT sector), with a strong positive trend (+62% over 2006-2010).

R&D personnel in the ICT sector makes up 20% of total R&D personnel in 2010, stable in the medium term.

However, it has remained below Japan (27%-29% on the medium term). No data is available for US.



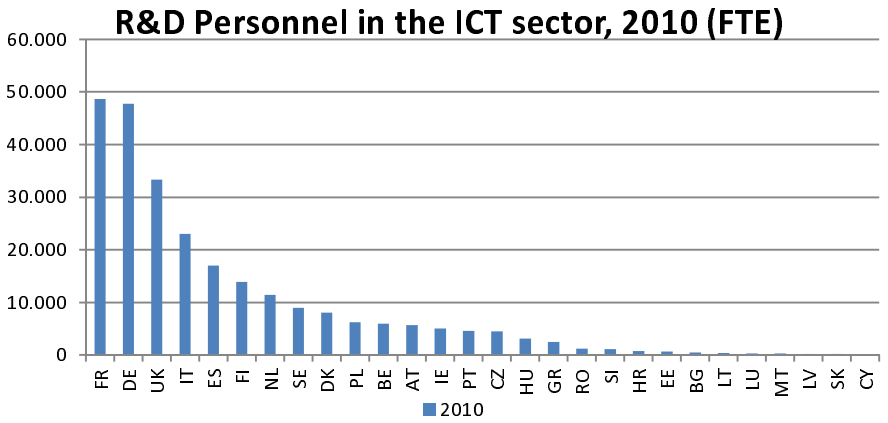


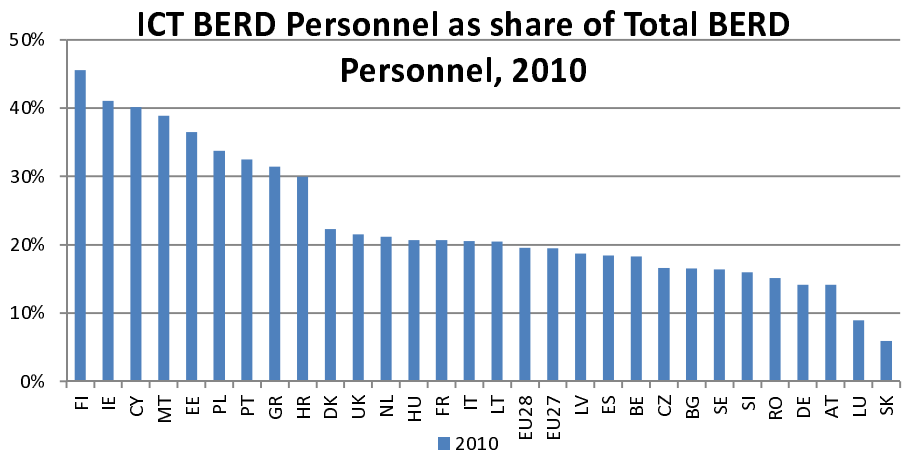
Source: JRC-IPTS calculations and estimates, based on EUROSTAT data, PREDICT project

R&D PERSONNEL
IN THE ICT SECTOR
By Member States

The five largest economies are also the five biggest employers of R&D personnel in the ICT sector in 2010: France (49k and 19%), Germany (48k and 19%), the United Kingdom (33k and 13%), Italy (23k and 9%) and Spain (17k and 6.6%). Finland follows suit (14k and 5.4%).

Together, the five biggest employers represent 66% of total R&D personnel in the ICT sector in 2010.





Finland is a country where R&D personnel is highly concentrated in the ICT sector (46% in 2010). Slovakia is the weakest (less than 6%), as for R&D expenditure.

Other performing countries (between 35-40% of R&D personnel for the ICT sector in 2010) are: Ireland (41%), Cyprus (40%), Malta (39%) and Estonia (36%).

Source: JRC-IPTS calculations and estimates, based on EUROSTAT data, PREDICT project