

# Latest figures on ICT sector worldwide and its R&D investment

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The latest edition of the Prospective Insights in ICT R&D (PREDICT) report, by the European Commission's Joint Research Centre (JRC), is now available. It provides the most complete and extensive analysis available of the Information and Communication Technology (ICT) industries including their expenditure on research and development (R&D) in Europe and beyond, spanning from 1995 to the most recent year for which official statistics are available. The 20-years perspective over 40 countries offered by the report shows how the ICT sector has tripled in value added in the last 20 years, and the leading role of ICT services which represent 73.1% of the total value added of the ICT sector globally.

The PREDICT report, shedding light on R&D in the sector, contributes to the recently published Europe's Digital Progress Report. It focuses on 40 advanced and emerging countries - the EU28 plus Norway, Russia and Switzerland, as well as Australia, Brazil, Canada, China, India, Japan, South Korea, Taiwan and the United States of America.

## **The ICT sector in EU was employing 5.7 million people in 2014**

A comparatively high R&D intensity and productivity level were distinctive features of the ICT sector common to almost all the analysed countries, which qualify the sector as strategic for productivity growth. The EU ranked third in terms of value added in 2014, challenged by the

spectacular progression of China which reached the second position behind US after overtaking the EU, Japan and South Korea. ICT services were playing the most important role. The ICT sector in EU was employing 5.7 million people in 2014 (considering the "operational" definition of the ICT sector, a definition allowing comparability with non-EU countries). Public funding of ICT R&D was keeping a slow but positive pace.

The ICT sector received a high share of the total R&D business expenditure at global level in 2014

In 2014 almost a quarter of total business expenditure in R&D (BERD) originated in the ICT sector at global level (16 % in the EU). R&D intensity, i.e. the ratio of BERD to total value added in the EU was at 5.3 %, similar to China's (5.2 %), but much behind South Korea (21.1 %), the US (12.3 %) and Japan (11.0 %).

In absolute terms, when converting national currencies into Purchasing Power Standards (PPS) euro to net for the effect of differences in price levels across countries and of movements in exchange rates, the United States was the leader in business expenditure in research and development, spending € 84 bn in 2014, followed by China (€ 33 bn) and the EU (more than € 29 bn). Together with South Korea (€ 23 bn) and Japan (€ 21 bn), these five geographical areas represented 89% of ICT BERD in the 40 countries in the study.

## **The ICT sector globally tripled in size between 1995-2014**

The ICT sector of the 40 economies has tripled in value added in the last two decades (1995-2014). Since 1995, when neither Google, Facebook nor Wikipedia existed, and MP3s, DVDs and USBs were new, the US

ICT sector doubled, the EU's multiplied by 2.3. Asian countries led by China, India and Taiwan, however, experienced an even bigger growth. In 2014 the US had the largest ICT sector closely followed by China, while the EU ranked third with a size of € 546.2 bn. The weight of the ICT sector in the total EU economy reaches 3.9%, behind China and India (4.7%), the US (5.3%) and Japan (5.4%) while in Taiwan it reached 15.9 % in 2014.

ICT services are driving the ICT sector

The ICT services subsector, which includes computer and related activities and telecoms, is the leading subsector representing 73.1 % of the total value added of the ICT sector globally, while the manufacturing sub-sector constitutes the remaining 26.9 %. Manufacturing is significant in terms of value added for Taiwan, South Korea, China and Japan. In the EU, ICT services represent more than 90 % of total ICT value added in 2014 while ICT manufacturing industries amount to about 9 % of total ICT value added.

The weight of the ICT manufacturing sub-sector is higher in BERD than in value added. Hence, the BERD intensity of the ICT manufacturing is relatively high (at 21.8 %), with that of the 'manufacture of communication equipment' being the highest (30.1 %), versus 3.6 % for the ICT services sub-sector. However, over the medium-term period, in the EU we witnessed a structural decline in BERD in the ICT manufacturing sector (falling by 17 % from 2006 to 2014), whereas the ICT services sector saw a structural increase (BERD rising by 49 % over the same period), and in particular in the ICT services sector comprising computers and related activities, whose BERD grew by 80 % between 2006 and 2014.

**ICT Employment growing in all countries and ICT**

## productivity in EU ahead of China

Employment in the ICT sector grew in all 40 countries, except Russia, between 1995 and 2014. Employment in the EU ICT sector was 5.7 million in 2014, 1.4 times higher than in 1995. The overall growth in ICT sector employment was interrupted by slight declines during two short periods, between 2001-2003 and 2008-2010.

Within the sector, employment in ICT services grew for all countries except Russia, but employment in ICT manufacturing decreased in the majority of countries, and most markedly in Norway and Canada (by around 45 %), Japan, Australia and the EU (around 30 %). Only India, China, Brazil and Taiwan experienced a growth in ICT manufacturing employment.

In Europe, the intense growth rates of productivity in the ICT sectors throughout the period from 1995 to 2014 led it to exceed by far the levels of the total economy, even if the productivity of the EU ICT sector (defined as the ratio between value added and employment) remains markedly behind that of the US. The productivity of EU ICT sector is anyway ahead of that of Japan, and China, the latter resembling in this respect the patterns of emerging economies.

Provided by European Commission Joint Research Centre

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