Conseil Stratégique des Technologies de l'Information

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RESEARCH AND DEVELOPMENT IN INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE MAJOR INDUSTRIAL COUNTRIES: STATISTICAL ANALYSIS OF INVESTMENT, REGULATORY AND TAX ASPECTS AND COMPETITIVENESS INDICATORS

INTRODUCTORY NOTE

1. PURPOSE OF THE STUDY

This study follows on from the one with the same objectives and scope carried out for the CSTI in 2003. The aim remains to consolidate the statistical foundations on which our recommendations are based by providing as accurate as possible an estimate of investment volumes and trends, in both the public and the private sector, in R&D in ICT in the major industrial countries.

For lack of any other possible method, these figures are constructed from an existing statistical base created by the OECD, which defines the ICT sector according to 5 activity codes.[i] These codes do not perfectly encompass ICT as a whole. Some sectors are excluded from the scope of the OECD definition, especially everything relating to embedded digital control applications. Software R&D is also excluded if it is not carried out by specialist software houses, as is R&D by vendors of software products (except in the US). The statistics, increasingly at odds with the real economy, do not include data (to be constructed) for China and India, which are outside the OECD's scope.

2. FINDINGS

The following conclusions may be drawn from consolidating the 2002 and 2003 figures and extending the series using more reliable estimates for 2004 and 2005.

2.1. Confirmation of existing trends

- → In absolute terms, the total amount invested in **ICT R&D in the USA** ($63bn in 1999, **$71bn in 2005**) is systematically **more than double that of EU15** ($29bn PPP[ii] in 1999, **$32bn in 2005**).
- → **The intensity of ICT R&D in Europe is half the level in Japan and the United States** as a proportion of GDP: 0.62% in the USA and 0.27% in EU15, with 0.42% in France.
- → **ICT R&D is the only field in which there is such a gap between Europe and the United States**, even though ICTs are "empowering technologies" that determine performance in all sectors of activity.

2.2. New trends in relation to the previous study

→ **South Korea, Finland and Sweden are steadily pursuing highly proactive policies. The UK**, thanks to a policy of public-sector orders, has moved from the "lagging" group **into the "proactive" group**. **France, Germany and Japan** appear to have reacted, over the period of the study, by ensuring that they stick with the average trend. But this trend is primarily the result of public spending: the low intensity of private-sector ICT R&D remains constant.

→ Key aspects of the period under consideration:

- **a very clear trend reversal in American firms' funding of ICT R&D carried out in-house: funding has been declining by 2% a year for three years**. In contrast, public spending on ICT R&D in the US, where defence budget credit represent 85% of the total, is continuing to rise strongly;

- **a new uncoupling of trend rates for public and private funding**, resulting in a significant shift in the structure of total domestic spending on ICT R&D in the US, with the share of public spending rising from 12.9% to 19.1%. The US is the only country in the study where such a development has taken place;

- the sudden drop in the indicator of the intensity of internal ICT R&D (measured as a proportion of GDP), which fell from 0.69% to 0.60% over the period, a phenomenon not found in R&D intensity across the economy as a whole. **In the US, ICT R&D is no longer the main driver of internal R&D in the economy as a whole.**

→ This **erosion of the relative share of private-sector funding of ICT R&D**, although particularly clear in the United States, where the indicator fell by 6 points between 1999 and 2005, **is found in all the developed countries**. The decline in the relative share of private-sector funding in the US and Europe would doubtless be even greater if the scope of the study were more precisely adjusted to the real features of the global economy and included countries like India and China,.

→ **The relocation of some ICT R&D to emerging countries, especially by American ICT firms, certainly explains the rapid erosion of ICT R&D financed by firms and carried out in-house**, which is the only parameter measurable by the current indicators.

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[i] The industries which make up the ICT sector as defined by the OECD are: Division 30 – Manufacture of office, accounting and computing machinery; Division 32 – Manufacture of radio, television and communication equipment and apparatus; Division 33 – Manufacture of medical, precision and optical instruments, watches and clocks; Division 72 – Computer and related activities; Division 64 – Post and telecommunications, group 642 – Telecommunications. The first three classes are manufacturing industries, the last two are service industries.

[ii] PPP: Purchasing power parity