

OECD SCIENCE, TECHNOLOGY AND INDUSTRY SCOREBOARD 2005

BRIEFING NOTE FOR FRANCE

Science, technology and innovation hold the key to stronger growth

Science, technology and innovation are key factors contributing to economic growth in both advanced and developing economies. A growing number of OECD countries are emphasising innovation and knowledge in their quest for stronger economic growth. This process is reinforced by rapid globalisation and the emergence of new international players outside the OECD area, notably China.

The 2005 *OECD Science, Technology and Industry Scoreboard* points to large cross-country differences in the extent to which OECD countries are able to apply science, technology and innovation to foster stronger growth performance. It also points to large differences in the extent to which countries are able to attract and benefit from global knowledge flows. OECD data show that France lags some of its key competitors in the knowledge-based economy.

France's spending on R&D has grown only little

OECD data show that **France** was the fifth-largest global spender on research and development (R&D) in 2003, spending over 37 billion USD, or about 5.5% of the OECD total. This is behind the United States (285 billion USD, or 42% of the OECD total), Japan (114 billion USD, or 17% of the OECD total), China (85 billion USD) and Germany (57 billion USD). **France's** R&D intensity, of 2.2% of GDP in 2003, is below that of its key competitors, such as Japan's (3.2%), Germany and the United States (2.6%), although it is ahead of the EU average (2.0%) or China (1.3%). **France** has had very little change in its R&D intensity over recent years, although its current level is somewhat below the levels in the mid-1990s, when **France** spent about 2.4% of GDP on R&D.

France is the fourth-largest spender on private R&D in the OECD area, spending 23 billion USD in 2003, or just over 5% of the OECD total. Relative to business sector value added the intensity of business R&D in **France** has remained relatively stable, at about 2%. This is below Japan, at 3.2%, and behind Germany and the United States, at 2.6%, but ahead of the European Union average, at 1.7%.

France ranks 3th in the OECD area in terms of its government R&D budget as a percentage of GDP (over 1%), about 22% of which is devoted to defence. This is behind the United States, but this country devote a substantially larger share of its budget to defence R&D. **France's** civil government R&D budget amounts to 0.8% of GDP, which is the 3d highest in the OECD area, behind Finland and Iceland, substantially ahead of the United States and the United Kingdom, that spend only about 0.5% of GDP of civil R&D, and also ahead of Germany and Japan, at 0.7% of GDP.

The **French** contribution to global patenting is roughly similar than its contribution to global R&D efforts; accounting for about 5% of all triadic patent families in 2001. **France** is not specialised in the two most rapidly growing areas of patenting, however, i.e. information and communications technology and biotechnology. This contrasts with the United States, which is heavily specialised in both fields.

France plays a less important role than Germany and the United Kingdom in international co-operation in patenting. In terms of foreign ownership of domestic innovations, France is the most important EU partner for Italy and Germany, but not for any other EU country.

France continues to be strong in science and engineering

Science and engineering (S&E) degrees represent 23% of total new degrees awarded in OECD countries, 29% in **France**, 31% in Germany, 27% in the European Union, 26% in Japan, but only 16% in the United States. **France**, as Germany, is among the OECD countries with the highest share of S&E degrees, with only Korea and Sweden having higher shares.

The vast majority of OECD countries are net beneficiaries of highly skilled migration. **France** has an above-average share of migrants; compared to its native highly-skilled, about 4.8% are from OECD countries and over 9% from non-OECD countries. This is considerably higher than Germany and Japan, relatively similar to the United States, but below the United Kingdom.

France still lags the global leaders in the uptake of ICT

France, together with Germany, is among the OECD countries that has invested relatively little in ICT. In 2003, the share of ICT investment in GDP was about 2% of GDP, compared with over 4% in Australia, Korea and the United States. **France** also received only a small boost to GDP growth from ICT capital over 1995-2003, of less than 0.4 percentage points, compared to 0.8% or more in Australia, Sweden and the United States.

In terms of access to broadband, **France** is somewhat above the OECD average. In December 2004, more 10 out of 100 inhabitants subscribed to broadband. This is higher than Germany, and Italy, but considerably lower than Denmark, the Netherlands or Switzerland.

The access of **French** households to computers has grown considerably in recent years, although France lags most other G7 countries. In 2004, just under 50% of all households in **France** had access to a home computer. This is considerably behind Japan (78%), Germany (69%) and the United Kingdom (65%).

Foreign-controlled affiliates make an important contribution to the French economy

In 2002, the share of the turnover of foreign-controlled affiliates in total manufacturing turnover ranged from 75 % in Ireland to less than 3 % in Japan. In **France**, almost 36% of manufacturing turnover was due to foreign-controlled affiliates, as was over 31% of manufacturing employment. Both turnover and employment of foreign affiliates have grown considerably since 1997. The share of foreign affiliates in manufacturing employment in France is larger than in the United Kingdom (20.4%), Germany (16.6%), the United States (12.8%) or Italy (10.9%).

In 2002, the share of the turnover of foreign affiliates in services ranged from almost 40% of total services turnover in Ireland to less than 1 % in Japan. In **France**, almost 10% of services turnover was due to foreign-controlled affiliates, as was almost 6 % of employment. The share of foreign affiliates in services employment is below that of the United Kingdom (almost 10%), but higher than in Germany (2.9%), the United States (almost 4%) and Italy (5.1%).

Foreign affiliates account for over 22% of manufacturing R&D in **France**, which is substantially above Japan (only 3.8%) and the United States (18%), but behind Germany (25.6%), the United Kingdom (31.5%) and Canada (37.9%).

France has lost market share in manufacturing

Productivity growth in **France's** services sector was poor from 1995-2003. This contrasts with a number of other OECD countries, including Australia and the United States, where services accounted for the bulk of labour productivity growth over 1995-2003. Knowledge-intensive services, such as telecommunications, finance, insurance and business services, now account for over 20% of **France's** value added, which is above the EU average and Germany, but behind the United States and the United Kingdom.

Medium-high-technology industries, such as electrical machinery, motor vehicles, chemicals and machinery and metal products account for over 42% of **France's** manufacturing exports, making one of the OECD country that has a strong position in these industries **France** has lost market share in the OECD area in high- and medium-high technology industries over the past decade, mainly at the expense of Germany and several small EU countries, as well as Mexico and Korea.

France accounted for over 4% of worldwide value added in manufacturing in 2002, making it the fifth-largest manufacturing nation in the world. China accounted for about 8%, making it the third-largest manufacturing economy in the world, behind Japan and the United States, but ahead of Germany.