

Index

Note to the infographics.....	1
Glossary of definitions.....	2
Methodological notes.....	3

Notes to the infographics

Top R&D Investing Companies by country | Part 1 of 7

World map

- The R&D growth is computed on 2491 out of 2500 companies for which data are available for both 2013 and 2014.
- The net sales growth is computed on 2435 out of 2500 companies for which data are available for both 2013 and 2014.

European Union map

- The R&D growth is computed on 605 out of 608 companies for which data are available for both 2013 and 2014.
- The net sales growth is computed on 592 out of 608 companies for which data are available for both 2013 and 2014.

Key figures by country (2013-2014) | Part 2 of 7

Key trends worldwide

- R&D growth computed on 2491 out of 2500 companies for which data are available for both 2013 and 2014.
- Net sales growth computed on 2435 out of 2500 companies for which data are available for both 2013 and 2014.
- Employment growth computed on 2138 out of 2500 companies for which data are available for both 2013 and 2014.

Key trends EU

- R&D growth computed on 605 out of 608 companies for which data are available for both 2013 and 2014.
- Net sales growth computed on 592 out of 608 companies for which data are available for both 2013 and 2014.
- Employment growth computed on 577 out of 608 companies for which data are available for both 2013 and 2014.

R&D Investments and net sales trends | Part 5 of 7

- R&D and net sales growth computed on 1832 out of 2500 companies for which data are available for the all period.

R&D Investments by sector (2006 vs 2014) | Part 6 of 7

- R&D and net sales growth computed on 1832 out of 2500 companies for which data are available for the all period.

Glossary of definitions

- 1. Research and Development (R&D) investment** in the *Scoreboard* is the cash investment funded by the companies themselves. It excludes R&D undertaken under contract for customers such as governments or other companies. It also excludes the companies' share of any associated company or joint venture R&D investment. Data is based on what is disclosed in the annual report and accounts, and is therefore subject to the accounting definitions of R&D. For example, a definition is set out in International Accounting Standard (IAS) 38 "Intangible assets" and is based on the OECD "Frascati" manual. **Research** is defined as original and planned investigation undertaken with the prospect of gaining new scientific or technical knowledge and understanding. Expenditure on research is recognised as an expense when it is incurred. **Development** is the application of research findings or other knowledge to a plan or design for the production of new or substantially improved materials, devices, products, processes, systems or services before the start of commercial production or use. Development costs are capitalised when they meet certain criteria and when it can be demonstrated that the asset will generate probable future economic benefits. Where part or all of R&D costs have been capitalised, the additions to the appropriate intangible assets are included to calculate the cash investment and any amortisation eliminated.
- 2. Net sales** follow the usual accounting definition of sales, excluding sales taxes and shares of sales of joint ventures & associates. For banks, sales are defined as the "Total (operating) income" plus any insurance income. For insurance companies, sales are defined as "Gross premiums written" plus any banking income.
- 3. R&D intensity** is the ratio between R&D investment and net sales of a given company or group of companies. At the aggregate level, R&D intensity is calculated only by those companies for which data exist for both R&D and net sales in the specified year. The calculation of R&D intensity in the *Scoreboard* is different from than in official statistics, e.g. BERD, where R&D intensity is based on value added instead of net sales.
- 4. Operating profit** is calculated as profit (or loss) before taxation, plus net interest cost (or minus net interest income) minus government grants, less gains (or plus losses) arising from the sale/disposal of businesses or fixed assets.
- 5. One-year growth** is simple growth over the previous year, expressed as a percentage: $1 \text{ yr growth} = 100 \cdot ((C/B) - 1)$; where C = current year amount, and B = previous year amount. 1yr growth is calculated only if data exist for both the current and previous year. At the aggregate level, 1yr growth is calculated only by aggregating those companies for which data exist for both the current and previous year.
- 6. Three-year growth** is the compound annual growth over the previous three years, expressed as a percentage: $3 \text{ yr growth} = 100 \cdot (((C/B)^{(1/t)} - 1))$; where C = current year amount, B = base year amount (where base year = current year - 3), and t = number of time periods (= 3). 3yr growth is calculated only if data exist for the current and base years. At the aggregate level, 3yr growth is calculated only by aggregating those companies for which data exist for the current and base years.
- 7. Capital expenditure (Capex)** is expenditure used by a company to acquire or upgrade physical assets such as equipment, property, industrial buildings. In accounts capital expenditure is added to an asset account (i.e. capitalised), thus increasing the asset's base. It is disclosed in accounts as additions to tangible fixed assets.
- 8. Number of employees** is the total consolidated average employees or year-end employees if the average is not stated.

Methodological notes

The data for the 2015 EU Industrial R&D Scoreboard (the *Scoreboard*) have been collected from companies' annual reports and accounts by [Bureau van Dijk Electronic Publishing GmbH](#) (BvD). The source documents, annual reports & accounts, are public domain documents and so the *Scoreboard* is capable of independent replication. In order to ensure consistency with our previous *Scoreboards*, BvD data for the years prior to 2012 have been checked with the corresponding data of the previous *Scoreboards* adjusted for the corresponding exchange rates of the annual reports.

Main characteristics of the data

The data correspond to companies' latest published accounts, intended to be their 2014 fiscal year accounts, although due to different accounting practices throughout the world, they also include accounts ending on a range of dates between late 2013 and mid-2015. Furthermore, the accounts of some companies are publicly available more promptly than others. Therefore, the current set represents a heterogeneous set of timed data.

In order to maximise completeness and avoid double counting, the consolidated group accounts of the ultimate parent company are used. Companies which are subsidiaries of any other company are not listed separately. Where consolidated group accounts of the ultimate parent company are not available, subsidiaries are included.

In case of a demerger, the full history of the continuing entity is included. The history of the demerged company can only go back as far as the date of the demerger to avoid double counting of figures.

In case of an acquisition or merger, pro forma figures for the year of acquisition are used along with pro-forma comparative figures if available.

The R&D investment included in the *Scoreboard* is the cash investment which is funded by the companies themselves. It excludes R&D undertaken under contract for customers such as governments or other companies. It also excludes the companies' share of any associated company or joint venture R&D investment when disclosed. Where part or all of R&D costs have been capitalised, the additions to the appropriate intangible assets are included to calculate the cash investment and any amortisation eliminated.

Companies are allocated to the country of their registered office. In some cases this is different from the operational or R&D headquarters. This means that the results are independent of the actual location of the R&D activity.

Companies are in industry sectors according to the NACE Rev. 2¹ and the ICB (Industry Classification Benchmark).

Limitations

The *Scoreboard* relies on disclosure of R&D investment in published annual reports and accounts. Therefore, companies which do not disclose figures for R&D investment or which disclose only figures which are not material enough are not included in the *Scoreboard*. Due to different national accounting standards and disclosure practice, companies of some countries are less likely than others to disclose R&D investment consistently.

In some countries, R&D costs are very often integrated with other operational costs and can therefore not be identified separately. For example, companies from many southern European countries or the

¹ NACE is the acronym for "Nomenclature statistique des activités économiques dans la Communauté européenne".

new EU Member States are under-represented in the *Scoreboard*. On the other side, UK companies are over-represented in the *Scoreboard* since the UK requires all companies above a certain minimum size to report R&D investment.

For listed companies, country representation will improve with IFRS adoption.

The R&D investment disclosed in some companies' accounts follows the US practice of including engineering costs relating to product improvement. Where these engineering costs have been disclosed separately, they have been excluded from the *Scoreboard*. However, the incidence of non-disclosure is uncertain and the impact of this practice is a possible overstatement of some overseas R&D investment figures in comparison with the EU.

Where R&D income can be clearly identified as a result of customer contracts it is deducted from the R&D expense stated in the annual report, so that the R&D investment included in the *Scoreboard* excludes R&D undertaken under contract for customers such as governments or other companies. However, disclosure practice differs and R&D income from customer contracts cannot always be clearly identified. This means a possible overstatement of some R&D investment figures in the *Scoreboard* for companies with directly R&D related income where this is not disclosed in the annual report.

In implementing the definition of R&D, companies exhibit variability arising from a number of sources: i) different interpretations of the R&D definition. Some companies view a process as an R&D process while other companies may view the same process as an engineering or other process; ii) different companies' information systems for measuring the costs associated with R&D processes; iii) different countries' fiscal treatment of costs.

Interpretation

There are some fundamental aspects of the *Scoreboard* which affect their interpretation.

The focus of the *Scoreboard* on R&D investment as reported in group accounts means that the results can be independent of the location of the R&D activity. The *Scoreboard* indicates the level of R&D funded by companies, not all of which is carried out in the country in which the company is registered. This enables inputs such as R&D and Capex investment to be related to outputs such as Sales, Profits, productivity ratios and market capitalisation.

The data used for the *Scoreboard* are different from data provided by statistical offices, e.g. BERD data. The *Scoreboard* refers to all R&D financed by a particular company from its own funds, regardless of where that R&D activity is performed. BERD refers to all R&D activities performed by businesses within a particular sector and territory, which are often just a part of a company, regardless of the location of the business's headquarters, and regardless of the sources of finance.

Further, the *Scoreboard* collects all data from audited financial accounts and reports. BERD typically takes a stratified sample, covering all large companies and a representative sample of smaller companies. Additional differences concern the definition of R&D intensity (BERD uses the percentage of value added, while the *Scoreboard* measures it as the R&D/Sales ratio) and the sectoral classification they use (BERD follows NACE, the European statistical classification of economic sectors, while the *Scoreboard* classifies companies' economic activities according to the ICB classification).

Sudden changes in R&D figures may arise because of a change in company accounting standards. For example, the first time adoption of IFRS², may lead to information discontinuities due to the different treatment of R&D, i.e. R&D capitalisation criteria are stricter and, where the criteria are met, the amounts must be capitalised.

For many highly diversified companies, the R&D investment disclosed in their accounts relates only to part of their activities, whereas sales and profits are in respect of all their activities. Unless such groups disclose their R&D investment additional to the other information in segmental analyses, it is not possible to relate the R&D more closely to the results of the individual activities which give rise to it. The impact of this is that some statistics for these groups, e.g. R&D as a percentage of sales, are possibly underestimated and so comparisons with non-diversified groups are limited.

At the aggregate level, the growth statistics reflect the growth of the set of companies in the current year set. Companies which may have existed in the base year but which are not represented in the current year set are not part of the *Scoreboard* (a company may continue to be represented in the current year set if it has been acquired by or merged with another).

For companies outside the Euro area, all currency amounts have been translated at the Euro exchange rates ruling at 31 December 2014 as shown in table here below.

Country	Exchange Rate as of 31/12/2013	Exchange Rate as of 31/12/2014
Australia	\$ 1.56	\$ 1.48
Brazil	3.25 Brazilian real	3.22 Brazilian real
Canada	\$ 1.47	\$ 1.41
China	8.42 Renminbi	7.43 Renminbi
Czech Republic	27.43 Koruna	27.72 Koruna
Denmark	7.46 Danish Kronor	7.43 Danish Kronor
Hungary	297.62 Forint	314.46 Forint
India	85.40 Indian Rupee	76.86 Indian Rupee
Israel	4.79 Shekel	4.72 Shekel
Japan	145.14 Yen	146.41 Yen
Mexico	18.03 Mexican Peso	17.87 Mexican Peso
Norway	8.38 Norwegian Kronor	9.02 Norwegian Kronor
Poland	4.15 Zloty	4.26 Zloty
Russia	45.15 Rouble	68.31 Rouble
South Korea	1449.28 Won	1333.33 Won
Sweden	8.86 Swedish Kronor	9.39 Swedish Kronor
Switzerland	1.23 Swiss Franc	1.20 Swiss Franc
Turkey	2.95 Turkish lira	2.82 Turkish lira
UK	£ 0.84	£ 0.78
USA	\$ 1.38	\$ 1.21
Taiwan	\$ 41.42	\$ 40.02

Table 1: Euro exchange rates applied to the 2015 *Scoreboard* data for companies based in different currency areas (as of 31 Dec 2014).

² Since 2005, the European Union requires all listed companies in the EU to prepare their consolidated financial statements according to IFRS (International Financial Reporting Standards, see: <http://www.iasb.org/>).

The exchange rate conversion also applies to the historical data. The result is that over time the Scoreboard reflects the domestic currency results of the companies rather than economic estimates of current purchasing parity results. The original domestic currency data can be derived simply by reversing the translations at the rates above. Users can then apply their own preferred current purchasing parity transformation models.