

Trademark patterns of the top R&D-driven innovators

The trademark patterns of R&D-driven innovators confirm the role of trademarks as a key intangible asset in the corporate strategies of innovative firms

Leading innovation extends well beyond a commitment to R&D. A recent report published by the European Commission's Joint Research Centre (JRC) and the Organisation for Economic Cooperation and Development (OECD) demonstrates that the top R&D-driven innovators around the world tend to complement their investments in R&D with key IP rights and other intangibles, in order to protect, signal and value their innovation investments (see H Dernis, M Dosso, F Hervás, V Millot, M Squicciarini and A Vezzani (2015), *World Corporate Top R&D Investors: Innovation and IP Bundles*, a JRC and OECD common report. Luxembourg: Publications Office of the European Union at <http://iri.jrc.ec.europa.eu/other-reports.html>). This article draws on the report to give a brief overview of trademark application patterns among R&D-driven innovator companies.

Trademarks are distinctive signs – including words, pictures, logos, shapes, colours, sounds and any combination of these – through which companies distinguish their goods and services from those of competitors. Their legal status can be supported by actual use or intent to use in commerce, depending on the jurisdiction. The importance of trademarks lies in their dual role, as they allow consumers and competitors to identify the origin of a product (informational role) and to differentiate that product from the goods or services of other organisations (differentiation role). From an economic perspective, trademarks address the market failure of the *ex ante* asymmetry of information between buyers and sellers with regard to a product's quality (this informational asymmetry and its implications was described by G Akerlof in "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism", *Quarterly Journal of Economics*, vol 84, no 3, 1970, pp 488-500). In other words, trademarks reduce search costs by clearly identifying a product's origin.

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They may also incentivise the production of higher-quality goods in order to maintain the reputation of the associated brand.

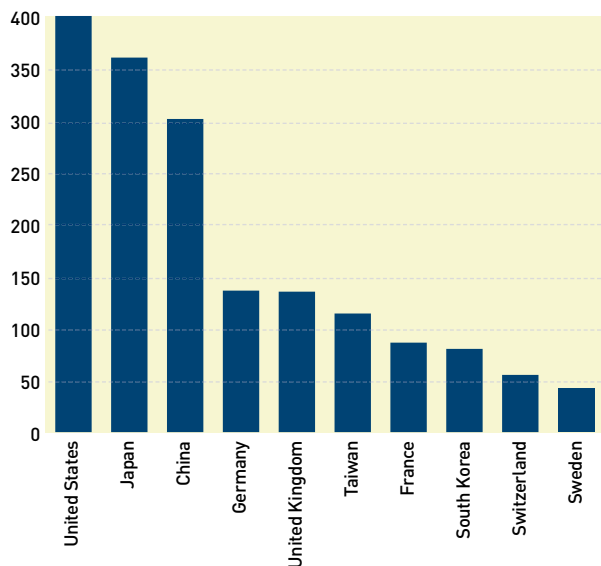
In recent years a growing number of studies in the field of economics of innovation have paid more attention to trademark-based indicators as a proxy for companies' innovative activities. There are many reasons for this, including trademarks' importance in the commercialisation phase of innovations, their wide use across different sizes of firms and types of industry, their direct links with products and the fact that they can be used to protect innovations that are not always patentable (see European Patent Office (EPO) and Office for Harmonisation in the Internal Market (OHIM) (2013), *Intellectual property rights intensive industries: contribution to economic performance and employment in the European Union*, September 2013, joint project between EPO and OHIM).

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Pharma-biotech companies are among the most active in terms of trademarks in the group of top 20 R&D-driven innovators

Recent evidence of the link between trademarks and innovation suggests that trademarks play a significant role in the actual reference to innovation, particularly in knowledge-intensive business services and in reference to non-technological forms of innovation, such as marketing and organisational innovations (see MJ Flikkema, AP de Man and C Castaldi (2014), *Are Trademark Counts a Valid Indicator of Innovation? Results of an In-depth Study of New Benelux Trademarks Filed by SMEs. Industry and*

FIGURE 1: Top 10 headquarters locations of R&D-driven innovators*



* Number of companies by country location of headquarters – United States: 829 companies
 Source: 2015 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD

Innovation, 21(4), pp 310-331; S Mendonça, TS Pereira and MM Godinho (2004), *Trademarks as an Indicator of Innovation and Industrial Change. Research Policy*, 33, pp 1385-1404; V Millot (2012), *Trademarks Strategies and Innovative Activities*, PhD dissertation, University of Strasbourg, France; U Schmoch and S Gauch (2009), “Service marks as indicators for innovation in knowledge-based services”, *Research Evaluation*, 18(4), pp 323-335).

Dataset

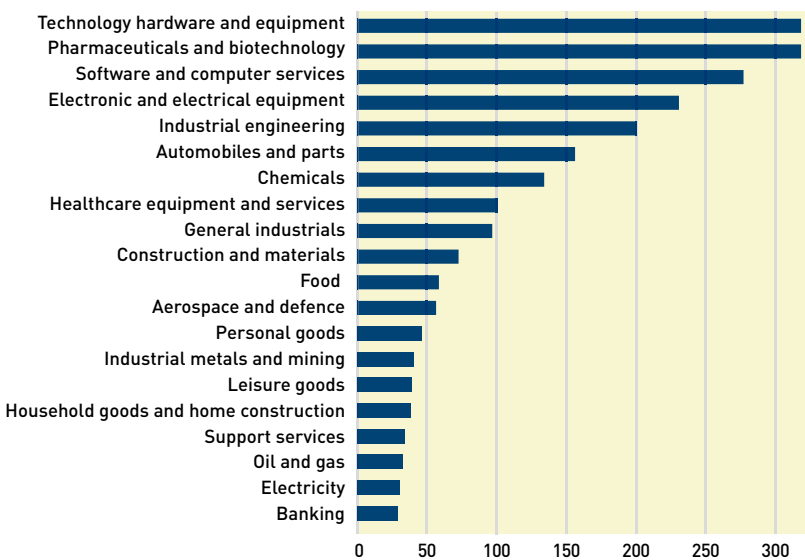
The data used in this article was collected from the EU Industrial R&D Investment Scoreboards (<http://iri.jrc.ec.europa.eu/scoreboard.html>) and the recently released EC-JRC/OECD COR&DIP Database (<http://survey.oecd.org/Survey.aspx?s=7d7469b2122144fa811c5f3b13d1cb79>)

For the 2015 scoreboard, the world’s top 2,500 R&D investors investing more than €17.9 million in 2014/15 were ranked by their R&D investments. Together, they account for €607.2 billion – equivalent to about 90% of the R&D expenditure financed by the business sector worldwide.

The COR&DIP Database provides information on the R&D activity and inventive output (ie, patents and trademarks) of the top 2,000 corporate R&D performers worldwide. Information about the R&D investors is taken from the 2013 EU Industrial R&D Investment Scoreboard, while the trademark-related information is taken from selected IP offices. The indicators are based on new trademark applications at OHIM and the US Patent and Trademark Office (USPTO) for the period 2010 to 2012.

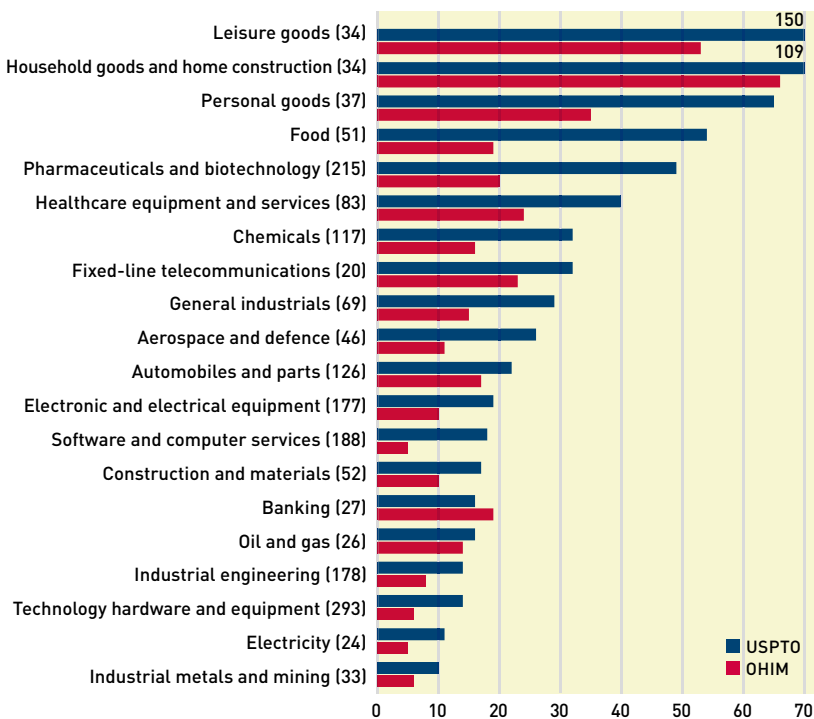
Figures 1 and 2 show the upper distributions of the top R&D-driven innovators by the country location of headquarters (HQ) and by the main industry affiliation of companies. The industries are defined according to the industry classification benchmark (ICB).

FIGURE 2: Top 20 industries of R&D-driven innovators (main affiliation)

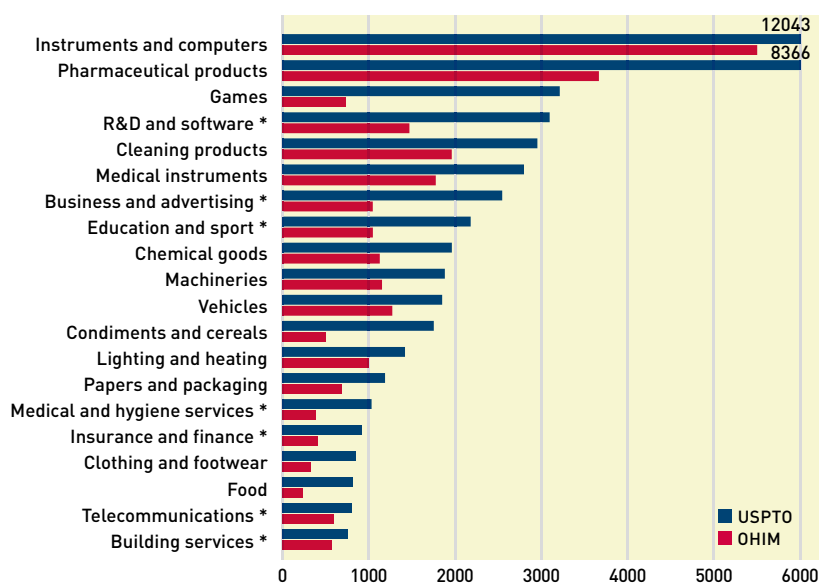


Note: sectors are classified according to the industry classification benchmark (three-digit level of aggregation)
 Source: 2015 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD

FIGURE 3: Average number of trademark applications per company, main affiliation at ICB 3 digit, 2010-2012



Note: Industries are defined following the ICB and ranked according to USPTO data. Only industries with more than 20 companies in the top 2,000 corporate R&D investors (Scoreboard 2013) are shown. Trademarks are based on fractional counts
 European Commission JRC-IPTS calculations.
 Source: EC-JRC/OECD, IP bundle of top corporate R&D investors, COR&DIP database v0, 2015

FIGURE 4: Top 20 product classes, Nice classes, 2010-2012 (number of trademark applications)

Note: Nice classes are ranked according to USPTO data* Services classes - Short labels for Nice classes are taken from Dernis *et al* (2015)
 European Commission JRC-IPTS calculations
 Source: EC-JRC/OECD, IP bundle of top corporate R&D investors, COR&DIP database v0, 2015

Top R&D-driven innovators mainly come from three world regions represented in the top 10 HQ countries: North America, Western Europe and East Asia. As for the number of firms, R&D investment is also highly concentrated across the most representative countries. The top countries in terms of R&D investment are the United States (38.2%), Japan (14.3%), Germany (10.3%), China (5.9%), France (4.6%), the United Kingdom (4.2%), Switzerland (4.1%), South Korea (3.9%), the Netherlands (2.8%), Taiwan (2%) and Sweden (1.5%). The first 100 firms (respectively of the top 500 firms) account for more than half (respectively 80%) of the total €607.2 billion (EU Industrial R&D Investment Scoreboard 2015).

The sectoral concentration is also high. The top four sectors account for more than 200 companies each, altogether equivalent to more than one-third of the world's top 2,500 companies. In terms of R&D investment, the divide is even more striking, as three industries – pharmaceuticals and biotechnology (about 18%), technology hardware and equipment, and automobiles and parts (about 16% each) – account for about half of the total investment made by the scoreboard companies (EU Industrial R&D Investment Scoreboard 2015).

Trademarks of top R&D-driven innovators: an industry perspective

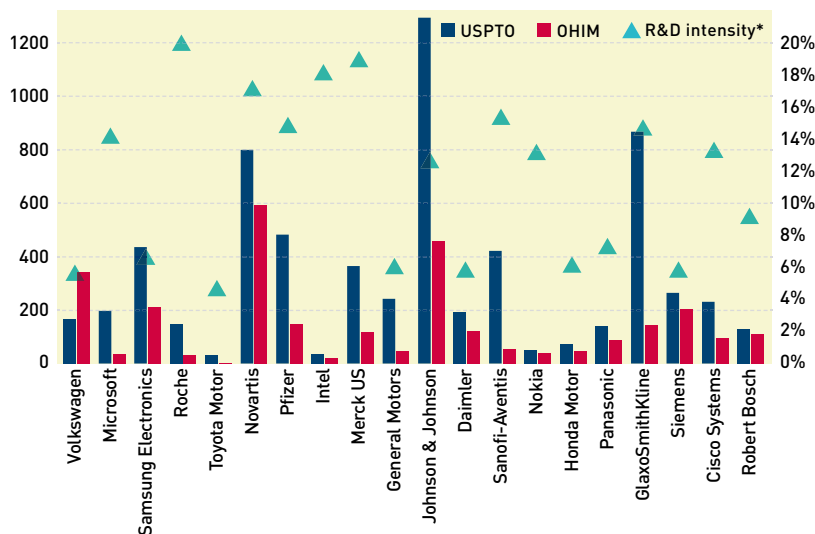
Figures 3 and 4 present the level of trademark activities at the industry level considering the industries defined

TABLE 1: Number of trademark applications and R&D investment of top 20 R&D-driven innovators, 2010-2012

Top 20 R&D investors *	Headquarters location	Main industry affiliation (ICB 3 digit)	Trademark applications - USPTO	Trademark applications - OHIM	R&D investment average 2010-12 (€ millions)	R&D intensity *
Volkswagen	Germany	Automobiles and parts	163	338	7659	5%
Microsoft	United States	Software and computer services	195	35	7394	13%
Samsung Electronics	South Korea	Electronic and electrical equipment	430	208	7341	6%
Roche	Switzerland	Pharmaceuticals and biotechnology	146	33	7056	19%
Toyota Motor	Japan	Automobiles and parts	30	1	6765	4%
Novartis	Switzerland	Pharmaceuticals and biotechnology	789	587	6737	16%
Pfizer	United States	Pharmaceuticals and biotechnology	476	146	6632	14%
Intel	United States	Technology hardware and equipment	35	20	6415	17%
Merck US	United States	Pharmaceuticals and biotechnology	360	115	6265	18%
General Motors	United States	Automobiles and parts	239	46	5758	5%
Johnson & Johnson	United States	Pharmaceuticals and biotechnology	1277	452	5657	12%
Daimler	Germany	Automobiles and parts	191	121	5373	5%
Sanofi-Aventis	France	Pharmaceuticals and biotechnology	416	54	4698	14%
Nokia	Finland	Technology hardware and equipment	51	39	4672	13%
Honda Motor	Japan	Automobiles and parts	72	46	4576	6%
Panasonic	Japan	Leisure goods	138	88	4525	7%
GlaxoSmithKline	United Kingdom	Pharmaceuticals and biotechnology	856	141	4439	14%
Siemens	Germany	Electronic and electrical equipment	261	200	4364	6%
Cisco Systems	United States	Technology hardware and equipment	228	95	4359	13%
Robert Bosch	Germany	Automobiles and parts	129	109	4330	9%

Notes: companies are ranked according to their R&D investments in 2012 (Scoreboard 2013)
 European Commission JRC-IPTS calculations
 Source: EC-JRC/OECD, IP bundle of top corporate R&D investors, COR&DIP database v0, 2015

FIGURE 5: Number of trademark applications and R&D intensity of top 20 R&D-driven innovators, 2010-2012



Notes: companies are ranked according to their R&D investment in 2012 (Scoreboard 2013)

by the ICB (Figure 3) and the products or Nice classes (Figure 4).

The average number of trademarks per company in each industry reveals no systematic relationship between the size of the industrial groups and the relative level of trademark applications. Both smaller and larger groups of top R&D investors appear all the way along the distribution. However, the highest ratios can be found in business-to-consumer industries such as leisure, household, personal goods, food and healthcare. This supports the rationale suggesting that trademarks constitute a key corporate asset, particularly in consumer-oriented end markets.

The high concentration of trademark applications can also be found at the product class level. The top 20 classes represent more than 80% of all trademark applications of top R&D investors. The most targeted classes in both offices include instruments and computers (about 20% of applications) and pharmaceutical products (more than 12% of applications). Among the service classes, R&D and software (Class 42) appears as a primary target in the trademark portfolios of the top 2,000 R&D investors worldwide. It mainly relates to scientific, technological

and research services, and industrial analysis, as well as to the design and development of computer hardware and software.

Trademarks and R&D investments of top 20 R&D-driven innovators

Table 1 and Figure 5 break down the statistics at the company level and compare the trademarks and R&D activity of the top 20 R&D investors. As expected from the previous aggregated figures, most companies record much higher trademark activity at the USPTO than at OHIM for the period 2010 to 2012. With the exception of German automobile firm Volkswagen, this is the case for large EU-based R&D innovators such as French pharmaceutical company Sanofi-Aventis and the United Kingdom’s GlaxoSmithKline.

Pharma-biotech companies are among the most active in terms of trademarks in the group of top 20 R&D-driven innovators. These companies are also among the most R&D intensive, with ratios of R&D to net sales above 10%. Among these top companies and in terms of trademark activity, Johnson & Johnson is ranked second at the USPTO and fifth at OHIM, while Novartis is respectively ranked sixth and second (Dernis *et al*, 2015). Other highly R&D-intensive companies, such as Intel and Nokia, show relatively low trademark activity; while lower R&D intensity values can also be associated with quite high trademark activity (eg, Samsung Electronics, Siemens and Volkswagen).

The trademark patterns of R&D-driven innovators confirm the role of trademarks as a key intangible asset in the corporate strategies of innovative firms. Although trademarks entered into the scope of innovation studies only recently, their link with innovation is already widely recognised: “It is the mark through which a business can attract and retain customer loyalty, and create value and growth. The mark works as an engine for innovation and has a favourable impact on employment” (Council of the European Union, Press Release ST 12130/14, Presse 425, Brussels, July 23 2014).

Further research on trademarks and their links with innovative activities would benefit from systematic data collection and from the establishment of international database(s) at the company level. In this regard, the EC-JRC/OECD’s recent initiative to match the patents and trademarks of the top 2,000 R&D investors constitutes a relevant basis on which to foster our knowledge of the (combined) use of trademarks, patents and other IP rights by innovative companies. Similar exercises should be conducted on a more regular basis for a wider set of firms, industries and economies in order to better characterise the links between innovative properties, innovation and economic performance. **WTR**

80%

Percentage of applications from top 20 product classes

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