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COMMISSION

Monitoring industrial  
research:

**The 2010 EU Survey  
on R&D Investment  
Business Trends**

Joint Research Centre

Directorate-General for Research and Innovation

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IRMA activities aim to improve the understanding of industrial R&D and Innovation in the EU and to identify medium and long-term policy implications.

The project was coordinated under the leadership of Xabier Goenaga Beldarrain (Head of JRC-IPTS Knowledge for Growth - KfG Unit) and Pierre Vigier (Head of DG RTD.C6 Economic Analysis and Indicators). This document was produced by Alexander Tübke and Héctor Hernández (KfG Unit) as the main authors. Fernando Hérvas and Pietro Moncada-Paternò-Castello from the KfG Unit and Patrick McCutcheon, Agnieszka Skonieczna and María Herminia Andrade from DG RTD.C made contributions to the design and review of the survey.

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Any comments can be sent by email to: [JRC-IPTS-IRI@ec.europa.eu](mailto:JRC-IPTS-IRI@ec.europa.eu)

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### European Commission Joint Research Centre Institute for Prospective Technological Studies

Edificio Expo  
C/ Inca Garcilaso 3  
E-41092 Seville (Spain)  
Tel.: +34 95 448 83 18, Fax: +34 95 448 83 00

IPTS e-mail: [jrc-ipts-secretariat@ec.europa.eu](mailto:jrc-ipts-secretariat@ec.europa.eu)

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# Key Findings

This report presents the findings of the sixth survey on trends in business R&D investment. These are based on 205 responses of mainly larger companies from the 1000 EU-based companies in the 2010 EU Industrial R&D Investment Scoreboard. These 205 companies are responsible for R&D investment worth almost €40 billion, constituting around 30% of the total R&D investment of the 1000 EU Scoreboard companies. The main findings of the survey are as follows:

## Expectations of future R&D investment and its location

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**Companies' R&D investment is expected to grow by 5%, more than double the expectations of last year's survey.**

On average, the companies surveyed expect their R&D investment to grow by 5% per year over the period 2010-13. This is more than double the rate of last year (2%) and reflects a generally improved economic climate. The expectations have however not yet reached the levels prior to the crisis (7% in the 2007 survey).

**The responding companies carry out one-quarter of their R&D outside the EU.**

The EU-based companies in the sample carry out one-quarter of their R&D outside the EU. The largest share of foreign R&D investment is in the US and Canada (13%), followed by India (2.6%), China (2.2%), other European countries (1.9%), Japan (1%) and the rest of the world. The shares of R&D investment carried out in China and India are around 5%, which is a similar value to previous surveys and a relatively low share in the light of globalisation.

**Their expectations for R&D investment growth within the EU have increased to 3%, but are the lowest compared to the other world regions.**

Growth expectations have increased in all world regions compared to the past survey. For the EU, 3% p.a. R&D investment increases are expected (triple the rate of last year's survey), leading to a considerable nominal increase of R&D in the EU in the coming years. However, growth rate expectations are much higher in China (25%), Japan (17%), the rest of the world (20%), India (8%), other European countries (8%) and the US and Canada (5%). This reflects the increasing participation of European companies in the global economy, in particular emerging economies, while maintaining their R&D focus in the EU.

**Most companies chose their home country as the most attractive location for R&D, and identified the US, China, Germany and India as the most attractive locations outside their home country.**

As in earlier surveys, two-thirds of companies considered their home country as the most attractive location for R&D. Of all locations outside the company's home country, the US is the most preferred, followed by China, Germany and India. These four countries were also the most preferred in the last two surveys.

## Innovation

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**R&D is the most important component of innovation for companies which invest most in R&D. In low R&D intensity sectors, greater increases in innovation investments are expected.**

As might be expected, R&D is critical for innovation for 95% of the top R&D investing companies. Market research, training, design, acquisition of new machinery, purchase/licensing of knowledge and R&D outsourcing are also important. The importance of these activities inside the EU is generally higher than outside. Purchase or licensing of knowledge is relatively more important for the high R&D intensity sectors, and design for the medium R&D intensity ones. Outsourcing R&D is overall the least relevant activity for innovation.

**The responding companies report that an average 27% of annual sales came from innovative products and services introduced in the past three years.**

The share of annual sales from innovative products introduced in the past three years broadly correlates with the R&D intensity of the company. Companies from high R&D intensity sectors derive almost 40% of annual sales from these products, compared to 26% for the medium and 9% for the low R&D intensity companies.

**Availability of qualified personnel and public support had a clearly positive effect on the company's innovation activities.**

Among fifteen factors considered, availability of qualified personnel, public grants and fiscal incentives had the strongest effect, and even more for firms in the high R&D intensity sectors. Other factors also considered for promoting innovation were loans and guarantees, public procurement of innovative goods and R&D services, competition policy requirements on technology transfer agreements and research collaboration and product market regulation. Different aspects related to Intellectual Property Rights (IPRs), namely the conditions for putting them into force, the costs, and the time to obtain protection, are perceived as negative for all sectors.

**Recruitment of qualified employees, collaboration with universities and companies and participation in conferences were important for company innovation.**

As in previous surveys, the importance of access to qualified employees was underlined. Other factors which had some importance for R&D and innovation activities include collaboration, participation in conferences and monitoring scientific literature. Companies in the high R&D intensity sectors however state a considerably higher importance for all forms of licensing activity than their counterparts from other sectors, and especially with respect to licensing with other companies.

## Sources of knowledge for R&D and innovation

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**The patterns and trends of knowledge sharing activities are similar to those observed for R&D investment, i.e. a focus within the EU, but with stronger growth expected outside.**

Companies' knowledge sharing activities with public and private partners among the main world regions was focused on the EU (more than two-thirds), followed by the US and Canada (14%), the rest of the world (6%), other European countries (4%) and Japan, China and India (around 2% each). Although not directly comparable with R&D investment, the distribution and growth expectations of the companies' knowledge sharing activities are similar. In both cases, the high R&D intensity sectors are the most globalised ones compared to the medium and low R&D intensity sectors. The respondents expect the percentage of knowledge sharing activities in the EU to decline slightly in the future, which is a sign of these companies benefiting from the exploitation of sources of knowledge outside the EU.

# 1 Introduction

Investment in research and innovation is at the heart of the Europe 2020 strategy,<sup>1</sup> which has set a goal for Europe's market economy in the 21st century to emerge from the crisis stronger and turn the EU into a smart, sustainable and inclusive economy, delivering high levels of employment, productivity and social cohesion. Private sector R&D investment plays a particularly important role in this strategy, as well as its flagship initiatives: "Innovation Union"<sup>2</sup>, which includes a 3% EU headline target for R&D investment intensity,<sup>3</sup> and "Industrial Policy for the Globalisation Era"<sup>4</sup>.

The survey is part of the Industrial Research Monitoring and Analysis (IRMA) initiative,<sup>5</sup> which supports policymakers in these initiatives and monitors progress towards the associated 3% headline target. The survey complements IRMA's core activity, the *EU Industrial R&D Investment Scoreboard*,<sup>6</sup> which analyses private R&D based on the audited annual accounts of companies and shows ex-post trends. The present survey is an additional instrument addressing the Scoreboard companies which collects ex-ante expectations and qualitative statements.

The five surveys<sup>7</sup> undertaken since 2005 gathered information from EU companies on the factors and issues influencing R&D investment by companies. The 2010 survey presented here includes a special focus on the relationship between R&D and innovation and the role of different knowledge transfer vectors. R&D investment in the surveys refers to the total amount of R&D financed by the company, regardless of where or by whom it was performed. This excludes R&D financed by governments or other companies as well as the companies' share of any associated company or joint venture R&D investment. It includes research contracted out to other companies or public research organisations. The survey reports what each responding company states as its particular financial commitment to R&D. This is different from the official statistical concept, Business Expenditure on R&D (BERD), which provides a geographical perspective.<sup>8</sup>

The questionnaire was sent to the 1000 European companies which appear in the *2010 EU Industrial R&D Investment Scoreboard*. The 205 responses received from these companies was equivalent to a response rate of 20.5%.<sup>9</sup> The 205 respondents are responsible for a total global R&D investment of around €40 billion, which corresponds to 30% of the total R&D investment by the European Scoreboard companies, and thus a similar share of the R&D financed and carried out by the business sector in the EU<sup>10</sup>.

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- 1 See: European Commission: Europe 2020: A strategy for smart, sustainable and inclusive growth: [http://ec.europa.eu/eu2020/index\\_en.htm](http://ec.europa.eu/eu2020/index_en.htm).
  - 2 The Innovation Union flagship aims at strengthening knowledge and innovation as drivers of future growth by re-focusing R&D and innovation policies for the main challenges society faces, such as climate change, energy and resource efficiency, health and demographic change.
  - 3 This target refers to the EU's overall (public and private) R&D investment approaching 3% of GDP (see: [http://ec.europa.eu/research/era/areas/investing/investing\\_research\\_en.htm](http://ec.europa.eu/research/era/areas/investing/investing_research_en.htm)).
  - 4 The Industrial Policy for the Globalisation Era flagship aims at improving the business environment, notably for SMEs, and supporting the development of a strong and sustainable industrial foundation for global competition.
  - 5 See: <http://iri.jrc.ec.europa.eu/>. The activity is undertaken jointly by the Directorate General for Research (DG RTD C, see: <http://ec.europa.eu/invest-in-research/>) and the Joint Research Centre, Institute of Prospective Technological Studies (JRC-IPTS, see: <http://ipts.jrc.ec.europa.eu/activities/research-and-innovation/iri.cfm>).
  - 6 The Scoreboard is published annually and provides data and analysis on companies from the EU and abroad investing the largest sums in R&D (see: <http://iri.jrc.ec.europa.eu/research/scoreboard.htm>).
  - 7 See: <http://iri.jrc.ec.europa.eu/research/survey.htm>
  - 8 BERD includes R&D financed by the company itself as well as R&D performed by a company but funded from other sources. Official BERD figures comprise R&D carried out by the companies physically located in a given country or region (including foreign-owned subsidiaries), regardless of the source of funding.
  - 9 See: Annex A: The Methodology of the 2010 Survey.
  - 10 Scoreboard and BERD data address industrial R&D in the EU using different concepts and are therefore not directly comparable, but their latest figures were of similar magnitude (according to the latest available data for 2008: Scoreboard €130 bn and BERD (Eurostat) €124 bn).

The responses by R&D intensity and sector group are shown in Table 1<sup>11</sup>.

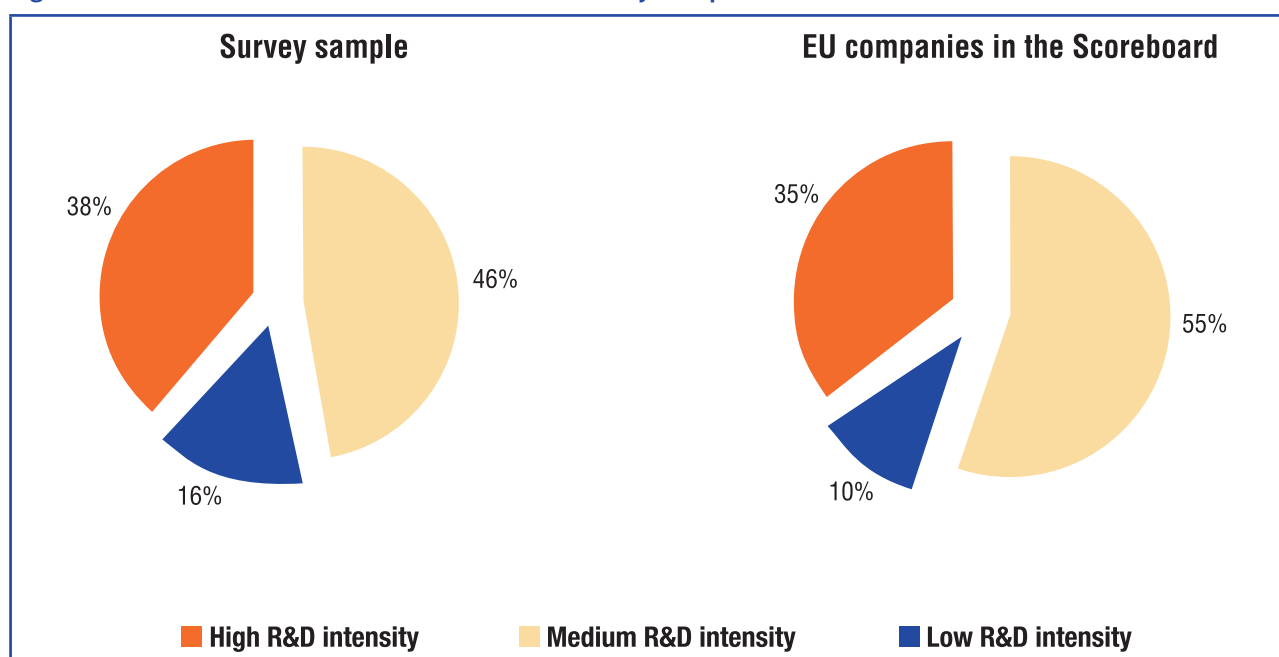
**Table 1: Number of responses, by sector group**

Sector group	ICB Sector	Number of responses
High R&D intensity	Pharmaceuticals & biotechnology, technology hardware & equipment, software & computer services, health care equipment & services, and leisure goods.	58
Medium R&D intensity	Industrial engineering, chemicals, aerospace & defence, electronic & electrical equipment, automobiles & parts, general industrials, fixed line telecommunications, food producers, alternative energy, household goods & home construction, support services, travel & leisure, oil equipment, services & distribution, other financials, personal goods, and tobacco.	95
Low R&D intensity	Industrial metals & mining, construction & materials, banks, electricity, oil & gas producers, gas, water & multiutilities, industrial transportation, forestry & paper, food & drug retailers, life insurance, mining and mobile telecommunications.	52
<b>total</b>		<b>205</b>

Source: European Commission JRC-IPTS (2011)

The table shows that most responses are from the medium R&D intensity sector group. Also, in terms of R&D investment, the medium R&D intensity sectors have the highest share of R&D in the survey sample. The share of the medium R&D intensity sectors is however not as high as in the Scoreboard (Figure 1), leading to a somewhat better representation of the high and low R&D intensity sectors in the survey sample compared to the Scoreboard.

**Figure 1: Distribution of R&D investment in the survey compared to the Scoreboard**



Note: The figure refers to all 205 companies in the sample.

Source: European Commission JRC-IPTS (2011)

<sup>11</sup> R&D intensity is the ratio between R&D investment and net sales. An individual company may invest a large overall amount in R&D but have a low R&D intensity if net sales are high (as is the case of many oil & gas producers, for example). For the groupings see: Annex A: The Methodology of the 2010 Survey.



The size of the responding companies is very large, with an average turnover of €8.3 billion, 25,800 employees, and 1,250 employees in R&D. This is similar to our previous surveys. Among the respondents, there are 12 medium-sized companies: 9 in the high and 3 in the medium R&D intensity sectors. Consequently, this survey differs from the Community Innovation Survey (CIS), which uses a different sampling technique and also addresses small and medium-sized firms.<sup>12</sup>

Compared to last year, a higher share of R&D from companies in the low R&D intensity sectors has been observed. Out of the 205 responding companies, 88 had participated in the previous two, 47 in the previous three, 48 in the previous four, and 31 in the previous five and six surveys.

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12 The CIS uses stratified sampling for at least 3 size classes (small, medium and large enterprises) across all EU Member States.

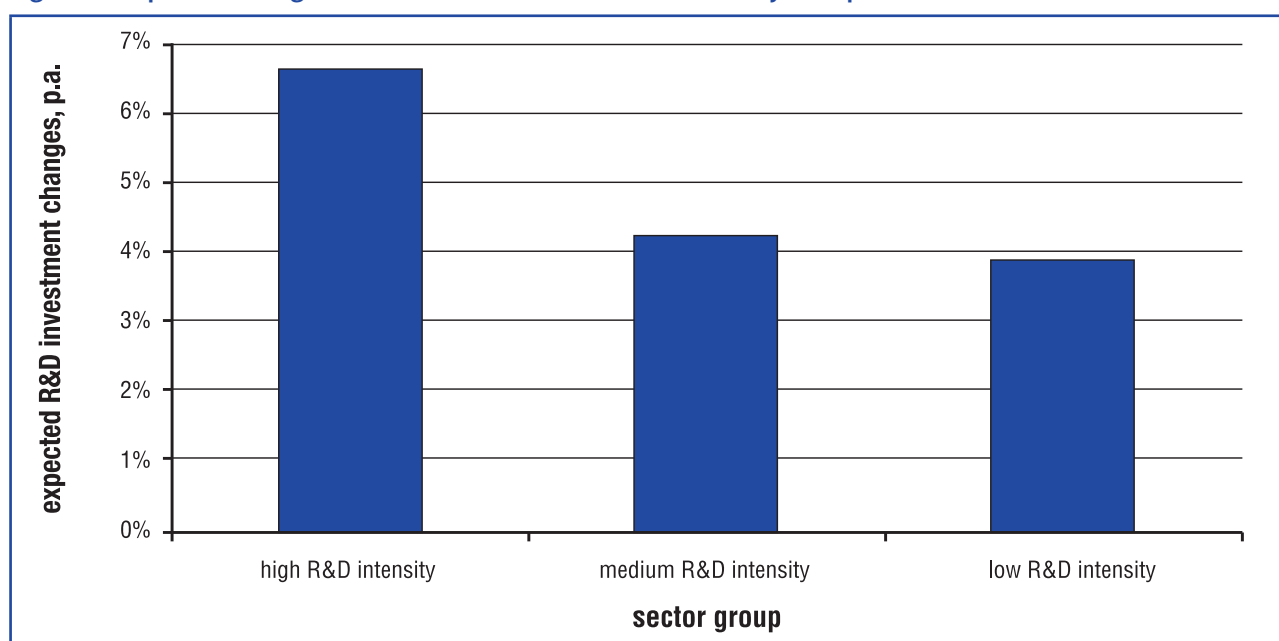


## 2 R&D Investment Expectations

The responding companies expect their global R&D investment to grow annually by an average of 5% over the period 2011-13.<sup>13</sup> This is more than double the expectation in last year's survey and of a similar level to that of the 2008 Survey, which corresponded with the period immediately following the onset of the economic and financial crises. The data reflected here suggest that companies have begun to recover from the crisis, but have not yet reached the levels expected prior to the crisis (7% in the 2007 survey). The 5% expected growth rate is higher than the nominal EU GDP growth estimates for 2011 and 2012.<sup>14</sup>

As shown in Figure 2 below, expectations are highest for the high R&D intensity companies (6.6%), followed by the medium (4.3%) and low (3.9%) R&D intensity ones. This contrasts with last year's survey where the lowest expectations were in the medium R&D intensity sectors.

Figure 2: Expected changes in R&D investment in the next three years, per annum, in real terms



Note: The figure refers to 174 out of the 205 companies in the sample, weighted by R&D investment.

Source: European Commission JRC-IPTS (2011)

Expectations for R&D investment increases are higher for all sectors compared to the previous survey, with the exception of the aerospace & defence and household goods sectors, which are both medium R&D intensity. Within each sector group, there were some industrial sectors where expectations were considerably different from the averages presented above (only for sectors with at least five observations each):

- **At least a fourth higher expected growth than the average for the sector group:** software & computer services (high R&D intensity) and banks (low R&D intensity).
- **At least a fourth lower expected growth than the average for the sector group:** technology hardware & equipment (high R&D intensity) and industrial metals and oil & gas producers (low R&D intensity).

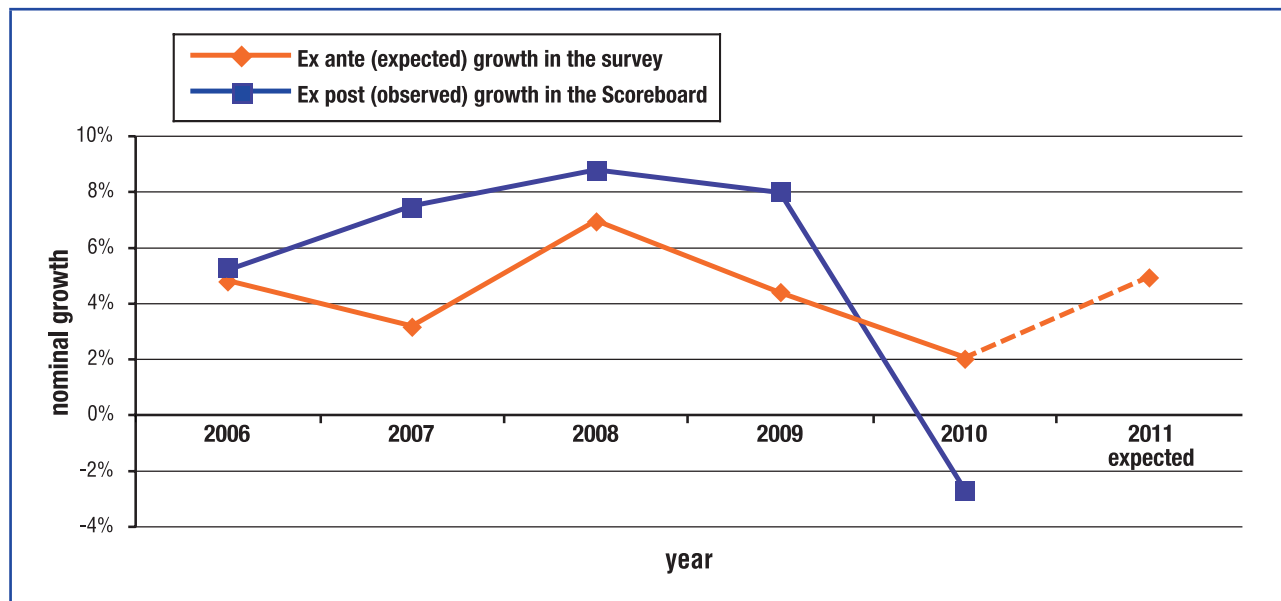
<sup>13</sup> The expectations are per annum over the next three years, weighted by R&D investment.

<sup>14</sup> Nominal GDP growth estimates of Eurostat per July 2011 were at 3.4% for 2011 and 3.8% for 2012 (for GDP in Euros at market prices).

Company surveys in the US have also found improved prospects for R&D in 2011 with similar expectations for US companies to those reported above for EU companies, in the area of 3% growth<sup>15</sup> and above.<sup>16</sup> It should however be noted that these surveys were undertaken six to eight months earlier than ours and may therefore not reflect the generally improving economic climate.

The comparison of R&D investment growth expectations collected in our past surveys with the development of R&D investment is shown in Figure 3.

**Figure 3: Expected (survey) vs. observed (Scoreboard) R&D growth**



Note: Survey annual growth expectations are for the next three years following the exercise, while the Scoreboards refer to the latest audited accounts.

Source: European Commission JRC-IPTS (2011)

For most years, trend expectations from past surveys have been consistent with the actual trends observed later in the Scoreboard, and the trends anticipated in the survey since 2007 have been statistically significant.<sup>17</sup> The improved R&D investment trend in the present survey is likely to be reflected in the upcoming 2011 Scoreboard, which is scheduled for October 2011.<sup>18</sup>

15 See: "The Batelle 2011 Global R&D Funding Forecast", R&D Magazine December, 2010

16 See: "The Industrial Research Institute's R&D Trends Forecast for 2011", Research Technology Management, January-February 2011

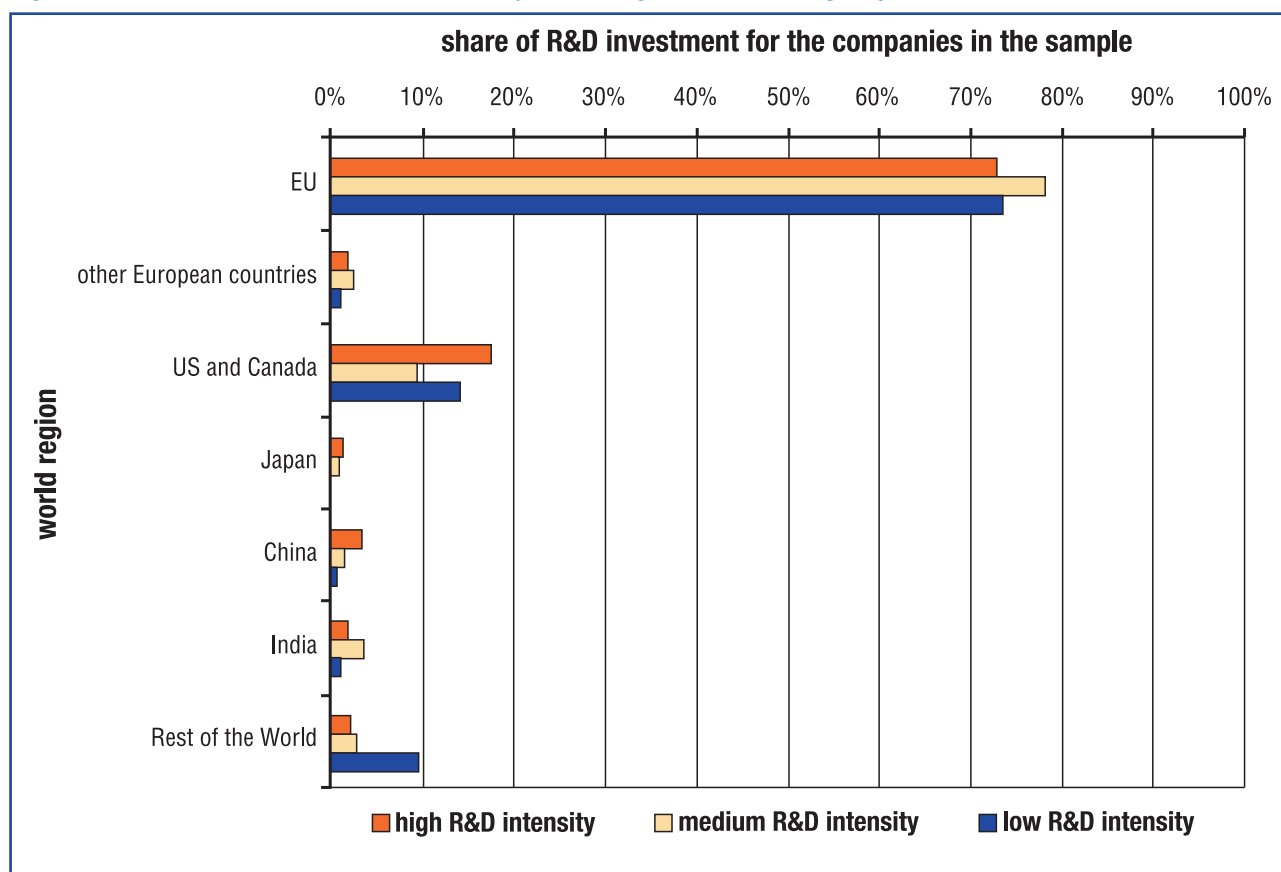
17 Using two-sample t-tests with unequal variances between the trends for each of the four data points, the trends were statistically significant at least at 98.6%.

18 For the latest EU Industrial R&D Investment Scoreboard see: <http://iri.jrc.ec.europa.eu/reports.htm>.

### 3 R&D Investment Location

The survey examines R&D location both as the actual distribution (stock) of R&D investment and the distribution of the expected changes in R&D investment (dynamics). The actual distribution is shown by the shares of total R&D investment in each of seven world regions in Figure 4 below.

Figure 4: Distribution of R&D investment by world region and sector group



Note: The figure refers to 163 out of the 205 EU companies in the sample, weighted by R&D investment. Other EU countries include Switzerland, Norway and others, while the rest of the world includes a heterogeneous set of countries such as South Korea, Taiwan, Brazil.

Source: European Commission JRC-IPTS (2011)

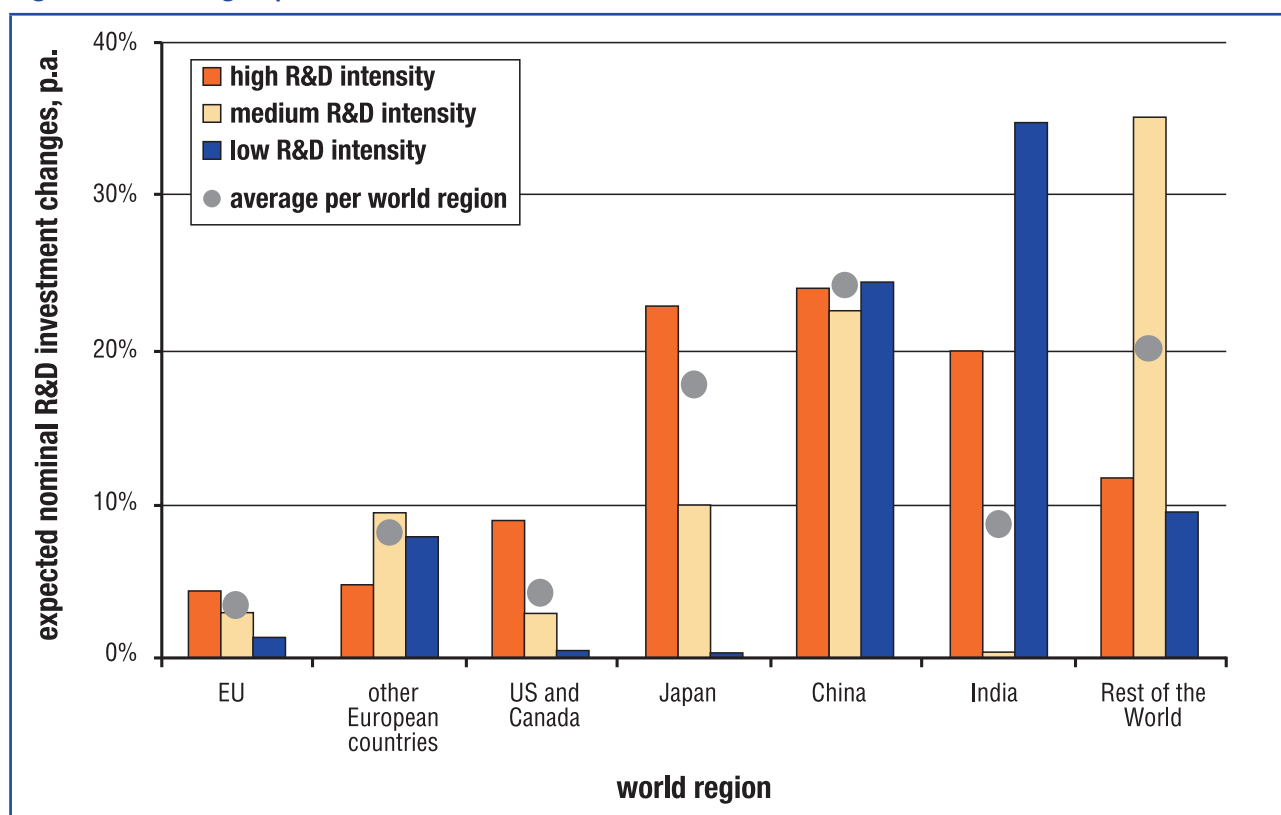
Similarly to last year's survey, EU-based companies in the sample carry out one-quarter of their R&D outside the EU. The largest share of foreign R&D investment is in the US and Canada (13%), followed by India (2.6%), China (2.2%), other European countries (1.9%), Japan (1%) and the rest of the world. The shares of R&D investment carried out in China and India are around 5%, a similar value to previous surveys and, considering their rising share of global production and GDP, a relatively low share in the light of globalisation.

Also, the distribution of R&D investment per sector groups is also similar to that seen in previous surveys. The medium R&D intensity sector accounts for the largest share of R&D investment within the EU and companies in the high R&D intensity sectors, where Europe is already under-represented in relation to the US,<sup>19</sup> are the most internationalised ones. Seventeen percent of their R&D investment is in the US and Canada. This is mainly attributed to companies in the pharmaceuticals & biotechnology sector, as in most previous years of the survey, but also to companies in software & computer services.

R&D investment for the low R&D intensity sectors in the rest of the world can be attributed to companies from the banking, industrial metals & mining and oil & gas producing sectors.

The expectations for R&D investment growth in the different world regions are shown in Figure 5.

**Figure 5: Expected changes in R&D investment in the next three years, per annum, in real terms, by world region and sector group**



Note: The figure refers to 163 out of the 205 EU companies in the sample, weighted by R&D investment and after elimination of outliers. Other EU countries include Switzerland, Norway and others, while the rest of the world includes a heterogeneous set of countries such as South Korea, Taiwan, Brazil.

Source: European Commission JRC-IPTS (2011)

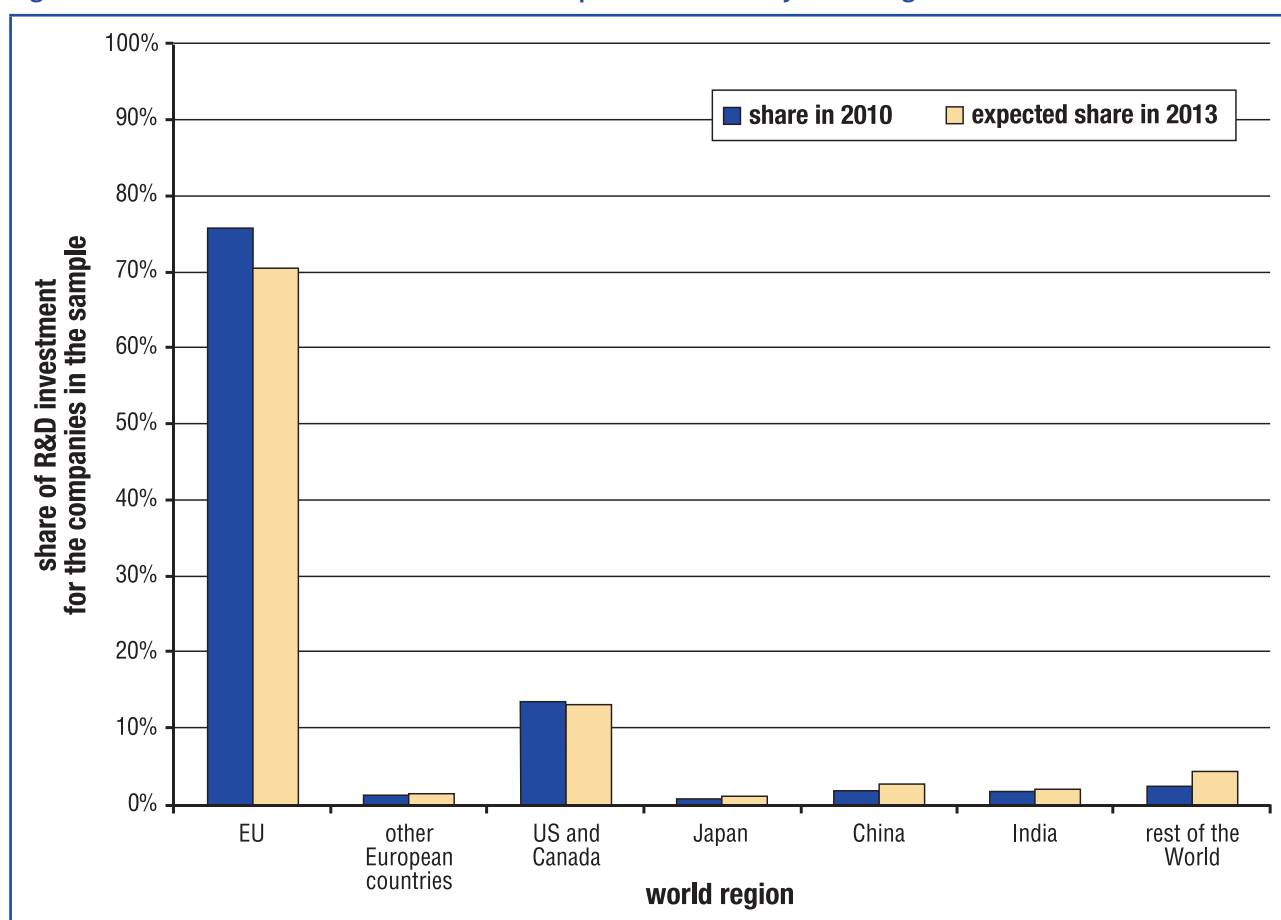
Growth expectations have increased in all the different world regions compared to the previous survey. The lowest growth is again expected in the EU (3% p.a. over the next three years, triple the rate of last year's survey). Much higher R&D investment increases are expected in China (25%), Japan (17%), the rest of the world (20%), India (8%), other European countries (8%), and the US and Canada (5%).

<sup>19</sup> In the Scoreboards, the R&D investment share of high R&D intensity sectors is almost twice that of the EU for US companies, mainly due to pharmaceuticals & biotechnology and ICT-related sectors (see: The 2009 EU R&D Investment Scoreboard).

In the high R&D intensity sectors, pharmaceuticals are the driver of expectations in the EU, the US, Canada and Japan. Among the medium R&D intensity sectors in India, the positive expectations from the automobiles & parts, industrial machinery and general industrial sectors are offset by negative ones from fixed-line telecommunications companies. For the medium R&D intensity sectors in the rest of the world, expectations in the aerospace & defence, automobiles & parts, chemicals and fixed-line telecommunications sectors are notable. For the low R&D intensity sectors, banks and oil & gas producers reported especially high expectations for R&D investment in India.

If realised, the expected higher R&D investment growth outside the EU would lead to a future reduction of R&D investment shares in the EU (Figure 6).

**Figure 6: R&D investment shares in 2010 and expected in 2013, by world region**



*Note: The figure refers to 146 out of the 205 EU companies in the sample, weighted by R&D investment and after elimination of outliers. Other EU countries include Switzerland, Norway and others, while the rest of the world includes a heterogeneous set of countries such as South Korea, Taiwan, Brazil.*

*Source: European Commission JRC-IPTS (2011)*

Higher percentages of R&D investment growth outside the EU have been observed in three of our four previous surveys within a similar range<sup>20</sup> and can be considered a trend. In these past surveys, the highest growth was repeatedly expected for China and India, while the US, Canada and Japan remained relatively stable.

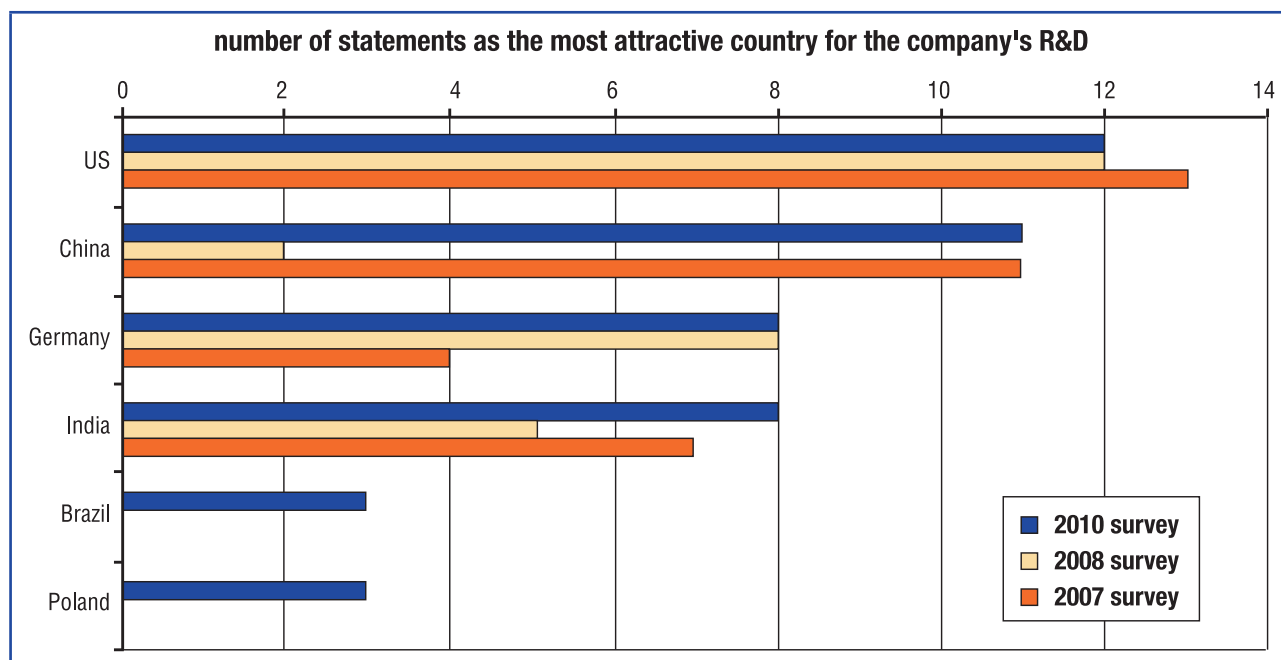
<sup>20</sup> The only exception was the 2008 survey, where R&D investment was expected to stagnate due to the impact of the economic and financial crisis in autumn 2008.

The decreasing share of R&D invested in the EU might be a source of concern, but takes place within an overall increase in R&D investment in all world regions over the coming years. For the EU, the respondents expect nominal R&D investment to increase by €2.2bn over three years (from €23.2bn to €25.4bn). The corresponding expected investment outside the EU is in a similar range (€2.7bn over three years). This reflects the increasing participation of European companies in the global economy, in particular the emerging economies, while maintaining their R&D focus in the EU.

The above considerations on the geographic distribution of R&D investment are further evidenced by identification of the most attractive country for the company's R&D. As observed in the 2008 survey, two-thirds of the 151 respondents from companies considered their home country as the most attractive location.

Of all locations outside the company's home country, the US is the most preferred, followed by China, Germany and India (Figure 7). These four countries were also the top four in our previous surveys with however varying preferences amongst them.

**Figure 7: Most attractive countries for the company's R&D outside the home country**



Note: Data for 56 cases from the present survey, 35 cases for the 2008 survey and 45 cases for the 2007 survey. Only countries mentioned at least twice in the 2010 survey are shown.

Source: European Commission JRC-IPTS (2011)

Brazil and Poland follow the top four.<sup>21</sup> Several respondents mentioned that the home country (and the EU) remains the main location, and that expansion to countries like China or India is an additional response to the changing role of these economies in the world. Other respondents also added that their companies operate on a global-local basis, which means that the regional businesses, manufacturing or R&D activities are located on a case-by-case basis, thus making it difficult to point out a single country as a preferred location.

21 In the 2008 survey, these were France and Ireland.

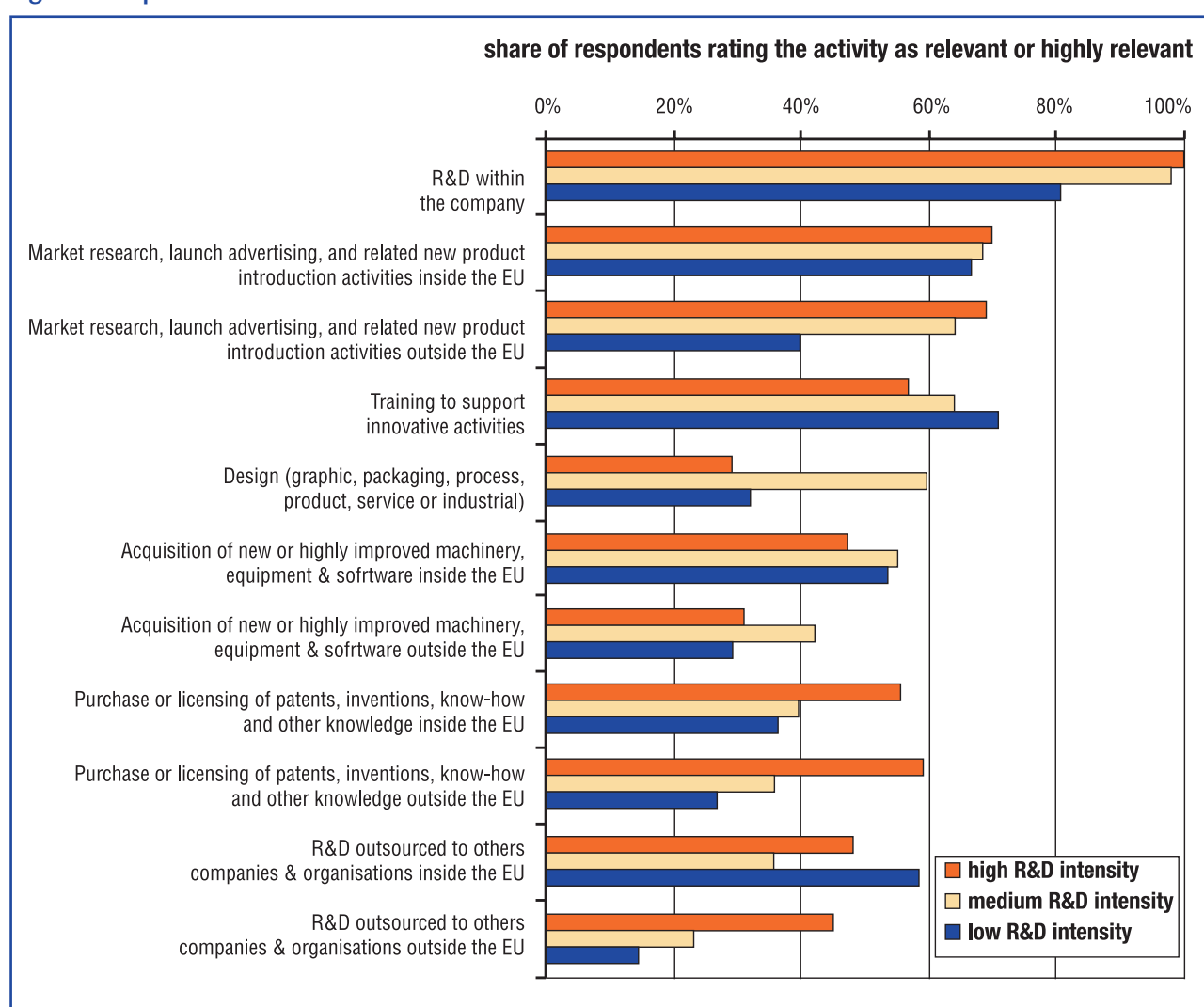


## 4 Innovation

Given the linkage of R&D and innovation in the Europe 2020 strategy, the survey was extended to address three main topics: the importance of activities for innovation, factors and policies for innovation, and the role of knowledge sources for innovation.

The respondents were asked to rate a number of activities for their relevance to innovation.<sup>22</sup> Not surprisingly, given the sample of companies surveyed and the positions of the respondents, R&D is regarded as the most relevant factor for innovation, being considered relevant or highly relevant by more than 95% of the respondents (Figure 8).

**Figure 8: Importance of R&D for innovation activities**



Note: The activities are listed by average relevance of the major items in the survey.

The figure refers to 204 out of the 205 companies in the sample.

Source: European Commission JRC-IPTS (2011)

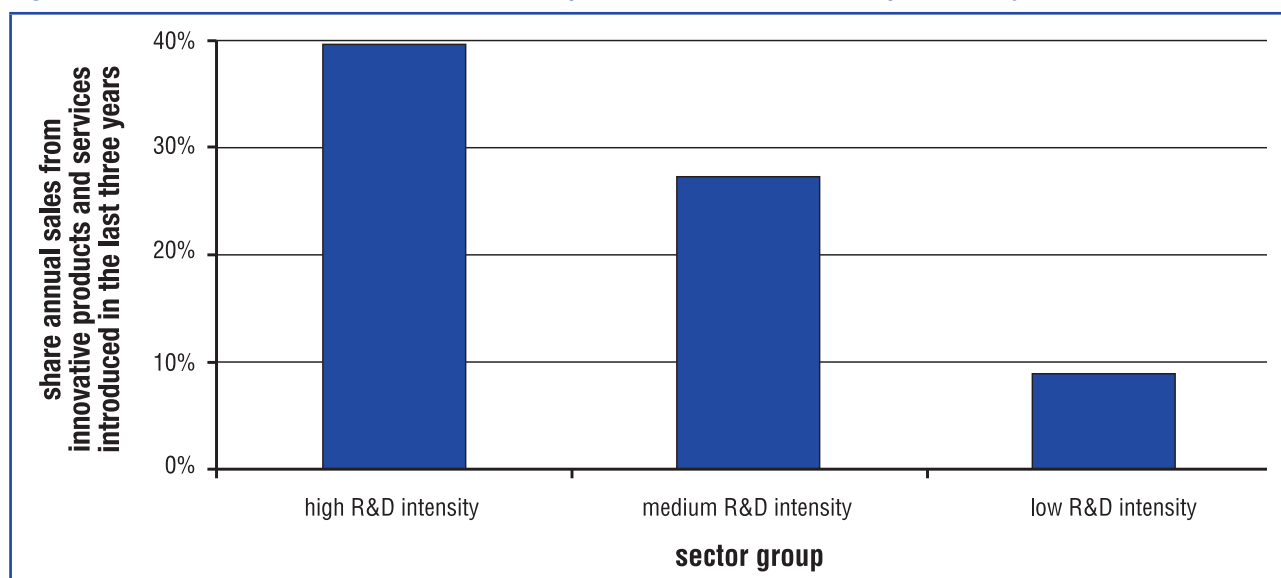
<sup>22</sup> Innovation is the introduction of new or significantly improved products, services or processes.

Other factors have some relevance for innovation.<sup>23</sup> On average, market research comes before training, design, acquisition of improved machinery & equipment, purchase or licensing of knowledge and R&D outsourcing. The importance of these activities inside the EU is generally higher than outside.

There are differences between sector groups.<sup>24</sup> Purchase and licensing of knowledge in general is relatively more important for the high R&D intensity sector (especially pharmaceuticals & biotechnology) and design for the medium R&D intensity ones (mainly industrial engineering, electronic & electrical equipment and automobiles & parts). Two activities outside the EU are worth mentioning: market research and related new product introduction activities for high and medium R&D intensity sectors<sup>25</sup> and outsourcing R&D for high R&D intensity sectors (particularly pharmaceuticals & biotechnology). Among the eleven activities mentioned, outsourcing R&D is overall the least relevant one for innovation.

Regarding the share of annual sales coming from innovative products and services introduced in the past three years,<sup>26</sup> the average was 27%. Although the survey addresses different samples of companies, this figure matches the proportion of turnover from new products observed in the Community Innovation Survey.<sup>27</sup>

**Figure 9: Share of annual sales from innovative products introduced in the past three years.**



Note: The figure refers to 144 out of the 205 companies in the sample.

Source: European Commission JRC-IPTS (2011)

The share of annual sales from innovative products launched in the past three years correlates with the R&D intensity of the company as shown in Figure 9. The companies from the high R&D intensity sectors derive almost 40% of annual sales from these products, compared to 26% for the medium and 9% for the low R&D intensity companies. Within these broad sector groups, above average shares were found for ICT producers (50%) in the high R&D intensity sector group, automobiles & parts and electronic & electrical equipment (above 30%) in the medium R&D intensity sector group and industrial metals (20%) in the low R&D intensity sector group.

23 "Some relevance" means that the factor is relevant or highly relevant for more than one-third but less than two-thirds of the respondents.

24 Only differences of at least 10% between the two values were considered as an indication of a difference.

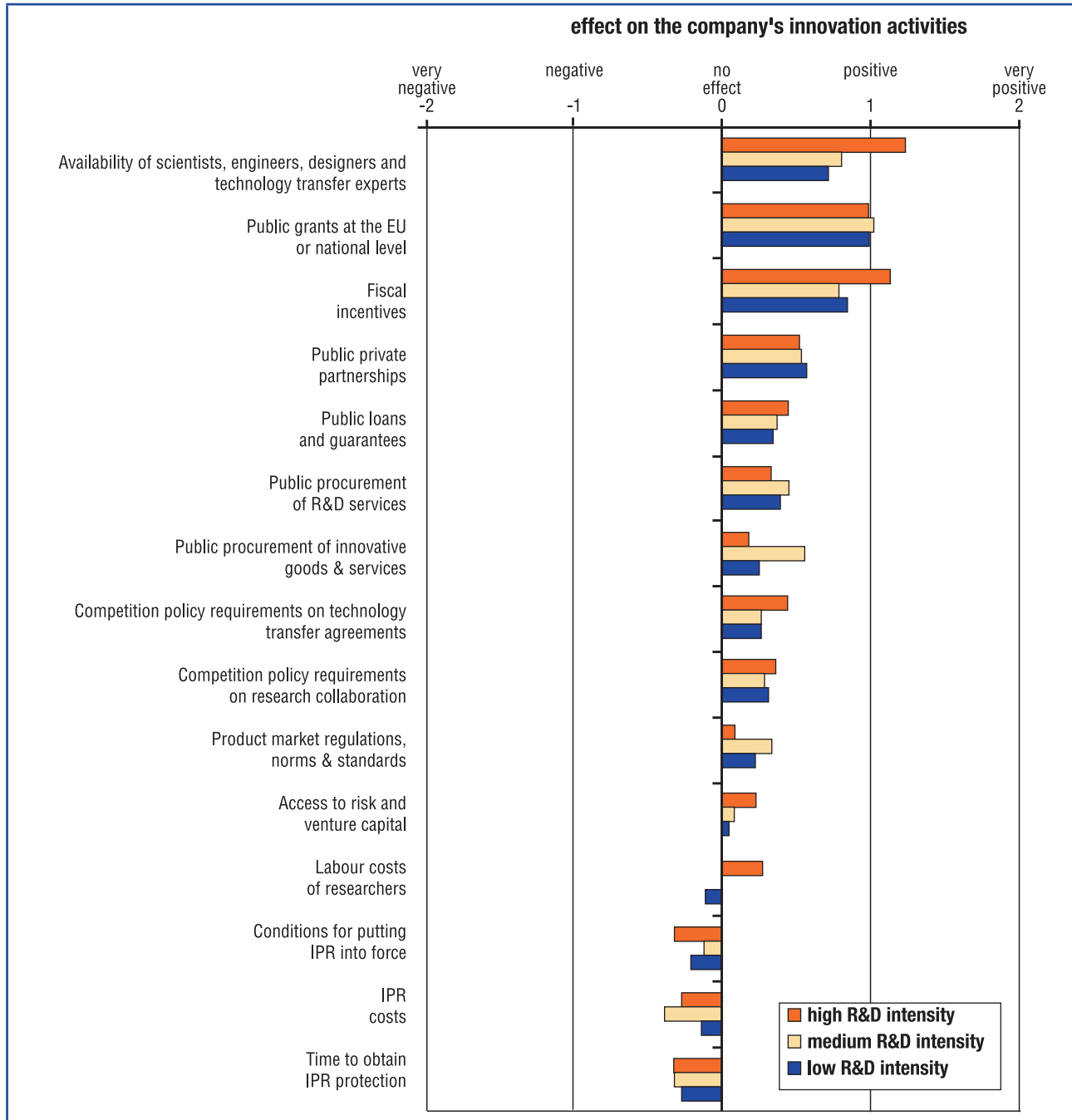
25 Particularly pharmaceuticals & biotechnology, software & computer services, technology hardware & equipment in the high R&D intensity sectors, and chemicals, electronic & electrical equipment and automobiles & parts in the medium R&D intensity sectors.

26 Innovation is defined as the introduction of new or significantly improved products, services or processes.

27 The proportion of turnover from new products in CIS 3 was 28% (see: Eurostat, Community Innovation Survey 3 results).

Regarding factors and policies which impact positively or negatively on their company's current innovation activities, availability of qualified personnel (scientists, engineers, designers and technology transfer experts) and public support (grants, fiscal incentives, public private partnerships and loans & guarantees) had a clearly positive effect,<sup>28</sup> as shown in Figure 10. Availability of qualified personnel and fiscal incentives were of particular importance for firms in the high R&D intensity sector (mainly health care equipment & services, pharmaceuticals & biotechnology and software & computer services).

**Figure 10: Factors and policies affecting the company's current innovation activities.**



Note: Effects on the company's innovation activities listed by average relevance of the major items in the survey. The figure refers to 195 out of the 205 companies in the sample.

Source: European Commission JRC-IPTS (2011)

28 A positive effect means that the average rating on the scale was between 0.5 and 1.5.

Of the other factors shown, public procurement of R&D services and innovative goods & services, competition policy requirements on technology transfer agreements and research collaboration and product market regulation were also considered to promote innovation.<sup>29</sup> Access to risk and venture capital and labour costs of researchers had some effect for some high R&D intensity sectors only (mainly pharmaceuticals & biotechnology).

Different aspects related to Intellectual Property Rights (IPRs), namely the conditions for putting them into force, the costs, and the time to obtain protection, are perceived as negative<sup>30</sup> for all sectors. The Commission is addressing this in its implementation of the Innovation Union flagship through i.a. the proposal for a Unitary EU patent.

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<sup>29</sup> Factors promoting innovation were those with a somewhat positive effect, which means that the average rating on the scale was between 0.2 and 0.5.

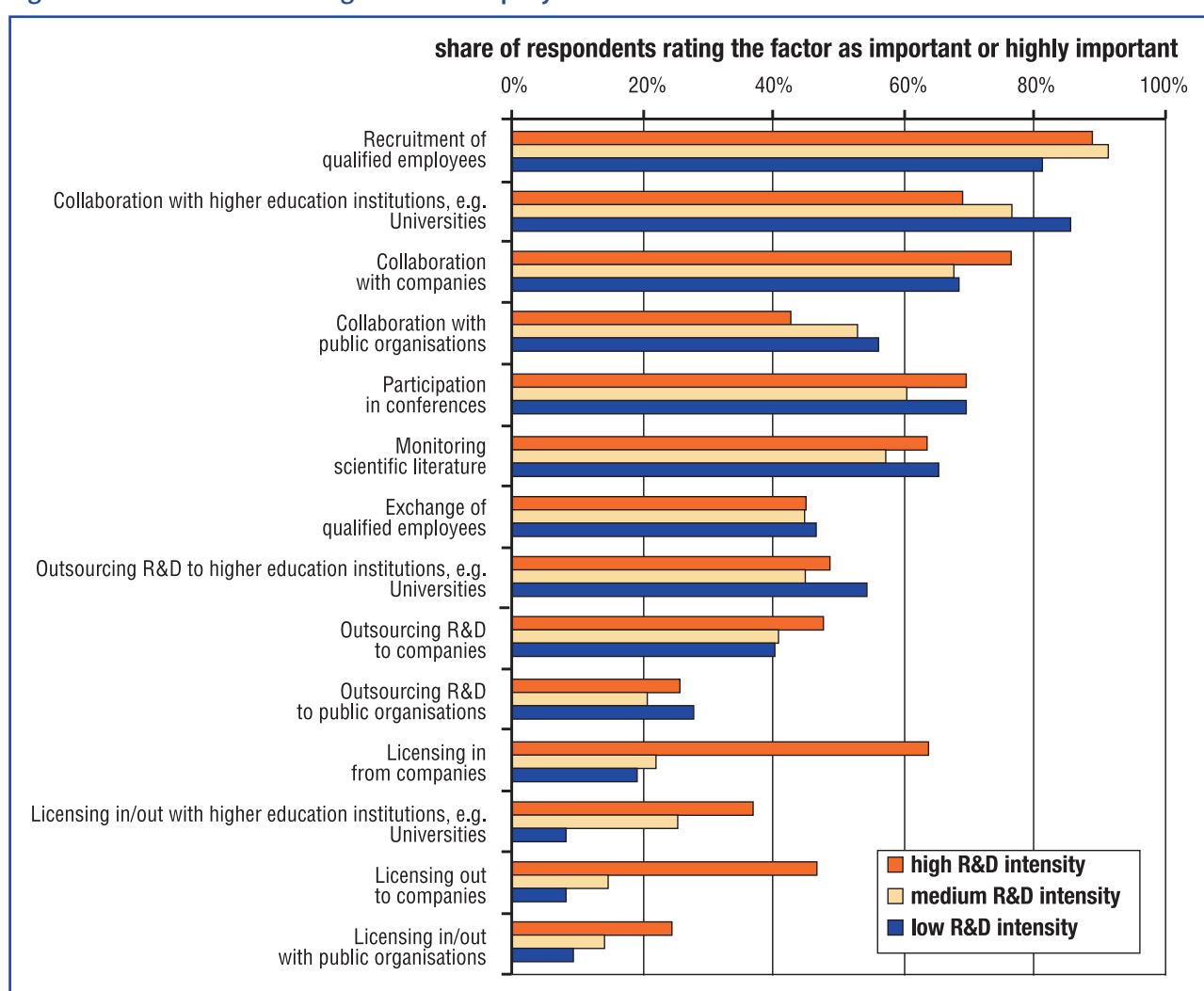
<sup>30</sup> A negative effect means that the average rating on the scale was between -0.2 and -0.5.

## 5 Sources of Knowledge for R&D and Innovation

For the first time, the survey addressed how knowledge is shared for R&D and innovation, i.e. the relative importance of sources of knowledge for R&D and innovation activities and the distribution of the company's knowledge sharing activities with public and private partners in and outside the EU.

Recruitment of qualified employees was the most important source of knowledge (Figure 11), and this was also repeatedly observed in our previous surveys.<sup>31</sup> This is followed by collaboration as a source of knowledge, where collaboration with higher education institutions (e.g. universities) and companies were highly important.<sup>32</sup> Participation in conferences and monitoring scientific literature were also highly important as a source of knowledge for the company's R&D and innovation activities.

**Figure 11: Sources of knowledge for the company's R&D and innovation activities.**



Note: The sources of knowledge are listed in importance for the major items in the survey.

The figure refers to all 205 companies in the sample.

Source: European Commission JRC-IPTS (2011)

31 See also the 2007 EU Survey on R&D Investment Business Trends, where the access to qualified employees was considered the most relevant location factor for R&D investment ([http://iri.jrc.ec.europa.eu/research/survey\\_2007.htm](http://iri.jrc.ec.europa.eu/research/survey_2007.htm)).

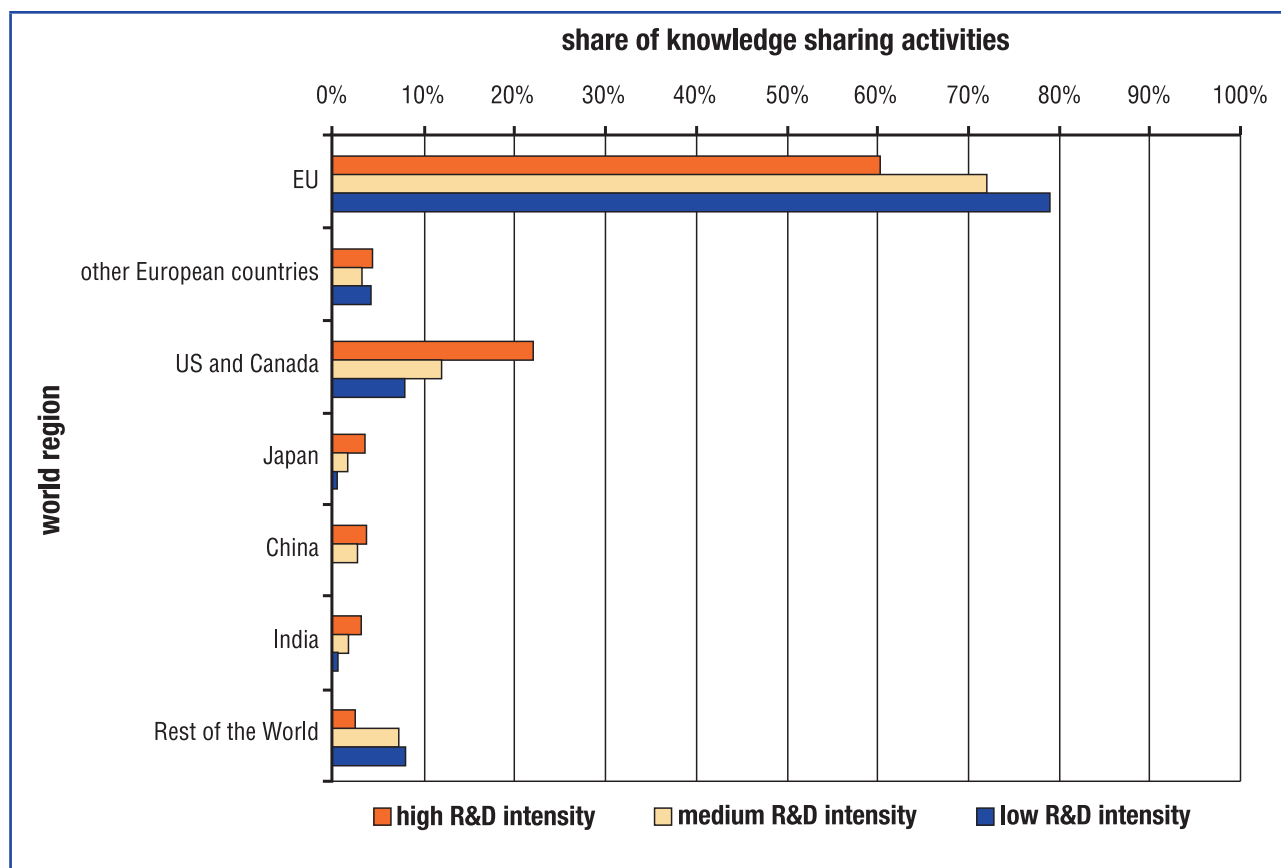
32 "High importance" means that the factor is relevant or highly relevant for more than two-thirds of the respondents.

Other important sources of knowledge<sup>33</sup> include exchange of qualified employees and outsourcing. Licensing as a knowledge source was less important.<sup>34</sup> Licensing with companies and public organisations were more important for the high R&D intensity sectors (especially pharmaceuticals & biotechnology, software & computer services and technology hardware & equipment) than the others. Licensing with higher education institutions (e.g. universities) was especially important for the high R&D intensity sectors (particularly pharmaceuticals & biotechnology) and medium R&D intensity sectors (mainly chemicals, electronic & electrical equipment and industrial engineering).

Regarding the distribution of the company's knowledge sharing activities (collaboration, outsourcing and licensing activities) with public and private partners among the main world regions, more than two-thirds of the company's knowledge sharing activities were located in the EU. The other third involved the US and Canada (14%), the rest of the world (6%), other European countries (4%) and Japan, China and India (around 2% each), see Figure 12. These figures cover all types of knowledge sharing activities as a whole and cannot be attributed to a single one.

Although not directly comparable in terms of numbers,<sup>35</sup> the distribution of the company's knowledge sharing activities in Figure 12 is similar to that of R&D investment in Figure 4. In both cases, the high R&D intensity sectors are the most globalised ones, compared to the medium and low R&D intensity sectors. The percentage of knowledge sharing activities in the US and Canada is notable for the high R&D intensity sectors, particularly pharmaceuticals & biotechnology.

**Figure 12: Distribution of the company's knowledge sharing activities with public and private partners.**



Note: The figure refers to 113 out of the 205 companies in the sample. Other EU countries include Switzerland, Norway and others, while the rest of the world includes a heterogeneous set of countries such as South Korea, Taiwan, Brazil.

Source: European Commission JRC-IPTS (2011)

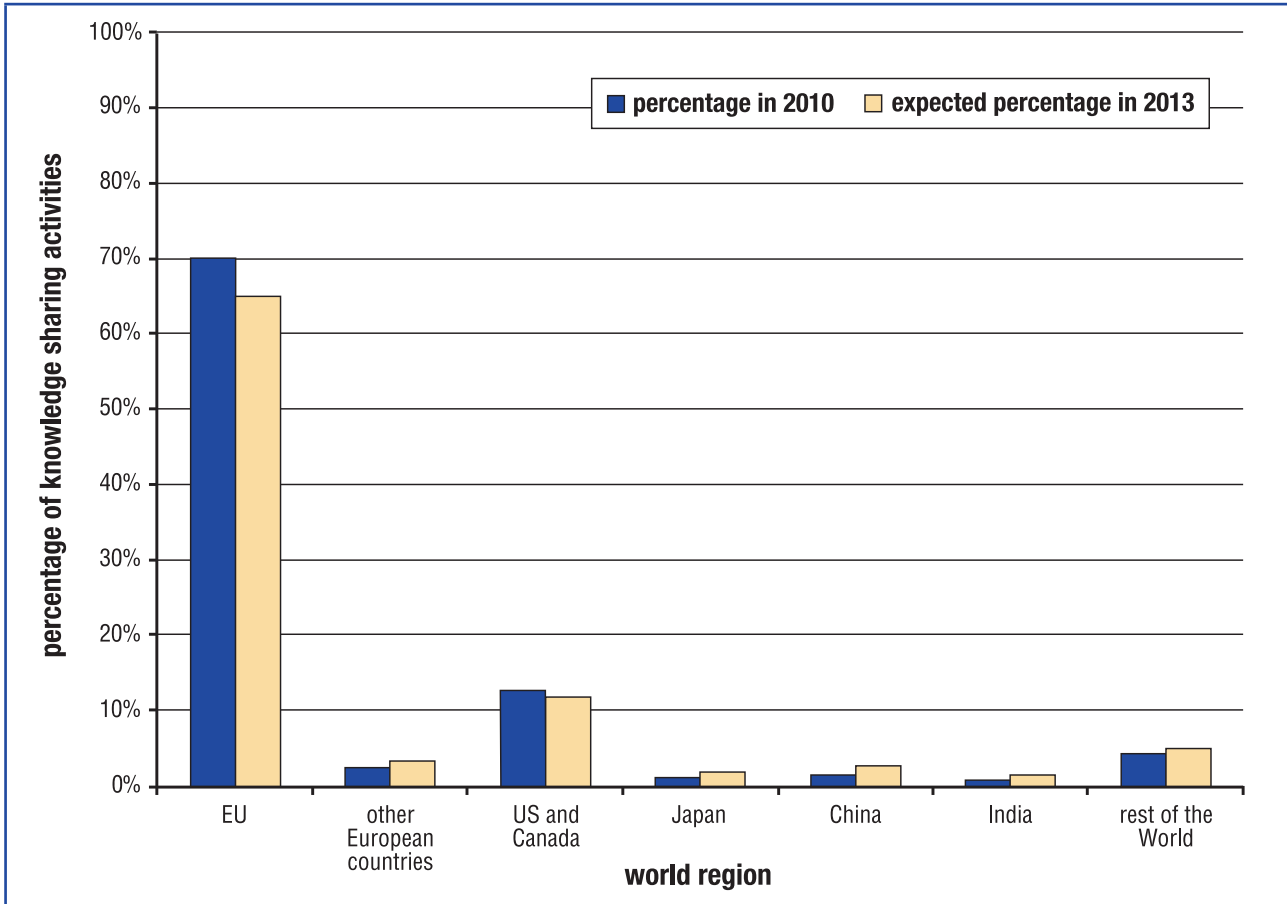
33 "Some importance" means that the factor is important or highly important for more than one-third but less than two-thirds of the respondents.

34 "Less importance" means that the factor is important or highly important for less than a third of the respondents.

35 R&D investment figures are much easier to quantify than knowledge sharing activities, as they can be derived from corporate accounting. Also, the R&D investment shares are weighted, while those for knowledge sharing are standard averages.

Parallel to the observations on the expected changes in the R&D investment distribution, and subject to the same caveats of comparability, the responding companies expect the percentage of knowledge sharing activities in the EU to decline slightly in the future (Figure 13).

**Figure 13: Percentage of knowledge sharing activities in 2010 and that expected in 2013, by world region**



Note: The figure refers to 113 out of the 205 companies in the sample. Other EU countries include Switzerland, Norway and others, while the rest of the world includes a heterogeneous set of countries such as South Korea, Taiwan, Brazil.

Source: European Commission JRC-IPTS (2011)

Over the coming three years, the EU share will drop from 70% to 65% due to more activity in China (from 2% to 5%), other European countries (from 4% to 5%), India, Japan and the rest of the world (increasing their share between 0.5% and 1%). As observed for the expected distribution of R&D investment in section 3, these shifts are a sign of European companies in the sample benefiting from the exploitation of sources of knowledge outside the EU.





## 6 Annex A: The Methodology of the 2010 Survey

### Background and Approach

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The 2004 mapping of industrial R&D data showed that official statistics on R&D and innovation, and some occasional country-specific statistics, were the main sources of these data.<sup>36</sup> Private sources existed but were rarely published, and there was a shortage of qualitative and prospective information on industrial R&D. Another mapping and analysis of available trans-national data sources on industrial R&D<sup>37</sup> from the European Commission, OECD and European industry associations, showed that data on business enterprise R&D essentially drew upon retrospective surveys and were based on differing approaches. Statistical offices generally collect R&D data in the form of Business R&D Expenditure (BERD), which defines R&D from a top-down perspective. Surveys by industrial associations were undertaken sporadically, their scope was limited and the results were not often fully disclosed. The perspective taken in most of these surveys did not permit cross-sector comparisons at a European level.

To improve the understanding of industrial R&D and innovation in the EU and to identify medium and long-term policy implications, the European Commission established the Industrial Research Monitoring and Analysis (IRMA)<sup>38</sup> initiative, which are jointly carried out by the European Commission's Joint Research Centre (JRC) - Institute for Prospective Technological Studies (IPTS) and the Directorate General for Research - Directorate C, Research and Innovation.

The present survey tackles the information gap identified above through an approach at the European level by gathering qualitative information on factors and issues surrounding and influencing companies' current and prospective R&D investment strategies.

The survey complements other R&D investment related surveys and data collection exercises (e.g. Innobarometer, the results from the Knowledge Economy Indicators project,<sup>39</sup> Eurostat's data collection of structural indicators and other ongoing surveys).

### Link to the R&D Investment Scoreboards

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The survey is part of the Industrial Research Monitoring and Analysis (IRMA) initiative<sup>40</sup> and complements the *EU Industrial R&D Investment Scoreboard*.<sup>41</sup> The Scoreboard is the main product of IRMA and serves as a tool for the European Commission to monitor and analyse company R&D investment trends, and to benchmark, inform and communicate developments in R&D investment patterns.

The Scoreboard is based on the audited annual accounts of companies and therefore looks at trends ex-post. The objective of the survey is to gather (ex-ante) information from the European Scoreboard companies over time.

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36 See the results of the European Science and Technology Observatory (ESTO) study: "Mapping Surveys and other Data Sources on Industrial R&D in the EU-25 countries", Seville, June 2004.

37 See the results of the JRC-IPTS study: "Description of Information Sources on Industrial R&D data : European Commission, OECD and European Industry Associations", Seville, July 2004.

38 IRMA activities correspond to the implementation of the approach set out in "Investing in research: an action plan for Europe" (COM, 2003) and in further Communications of the Commission: "More Research and Innovation – Investing for Growth and Employment – A common approach", COM (2005) 488 final, "Implementing the Community Lisbon Programme: A policy framework to strengthen EU manufacturing – Towards a more integrated approach for industrial policy", COM (2005) 474 final.

39 See <http://kei.publicstatistics.net/index.html>

40 See: <http://iri.jrc.ec.europa.eu/>. The activity is undertaken jointly by the Directorate General for Research (DG RTD C, see: <http://ec.europa.eu/research>) and the Joint Research Centre, Institute of Prospective Technological Studies (JRC-IPTS, see: <http://ipts.jrc.ec.europa.eu/activities/research-and-innovation/iri.cfm>).

41 The Scoreboard is published annually and provides data and analysis on the largest R&D investing companies in the EU and abroad (see: <http://iri.jrc.ec.europa.eu/research/scoreboard.htm>).

A questionnaire is used for this, from which it is possible to obtain an overall response rate and identify repeated patterns over different years.

## Methodology

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**Outliers** were detected by analysing the distribution of the dataset in scatter and boxplots and defining upper and lower quartiles ranges around the median, according to the variable(s) analysed. To maintain the maximum information in the data, outliers were eliminated only in extreme cases and after assessing the impact on the result.<sup>42</sup>

**One-year growth** is simple growth over the previous year, expressed as a percentage:  $1\text{yr growth} = 100 * ((C/B) - 1)$ ; 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.

**Three-year growth** is the compound annual growth over the previous three years, expressed as a percentage:  $3\text{yr growth} = 100 * (((C/B)^{(1/t)} - 1)$ ; 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.

Unless otherwise stated, the weighted figures presented in this report are weighted by R&D investment.

To improve response rates, the following measures were taken in the course of each survey cycle:

- (1) The questionnaire was revised and streamlined with a view towards keeping it as short and concise as possible, to minimise the burden for the respondent. The size of the 2010 questionnaire however increased by around a fifth due to the inclusion of additional topics.
- (2) The questionnaire was sent together with the Scoreboard report to take advantage of this occasion as a door-opener.
- (3) As well as physically sending the questionnaire to each company, an online site was provided to facilitate data entry via the European Commission's Interactive Policy-Making (IPM) tool,<sup>43</sup> where a Word version of the questionnaire was downloadable for offline information input.
- (4) The questionnaire was emailed to the respondents of previous surveys, together with a link to the electronic copy of the latest analysis.
- (5) The contact database was continuously improved. Respondents who had already participated in previous surveys, or their substitutes in cases where they had left their position, were priority contacts. Returned questionnaires and reminder mailings were resent using the latest contact information on the internet or by contacting the company directly via email or phone.
- (6) Personal contact, mostly by phone, was made with several dozen companies when the deadlines were close, especially for those which had participated in the past.

The response rate has steadily increased over the past five years, taking full advantage of the familiarity of the EU Scoreboard companies with the exercise and their mature approach<sup>44</sup>.

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42 For the systematic detection of outliers, an adjusted methodology from the NIST/SEMATECH e-Handbook of Statistical Methods was applied, see: <http://www.itl.nist.gov/div898/handbook/prc/section1/prc16.htm>

43 See: [http://ec.europa.eu/yourvoice/ipm/index\\_en.htm](http://ec.europa.eu/yourvoice/ipm/index_en.htm)

44 The response rate of the present survey is 20.5%. Those of the last three surveys were 11.8% (2007), 13.0% (2008), and 18.5% (2009).

## R&D Investment Definition

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The objective of the survey is to address R&D investment, and not R&D expenditure, due to its direct link to the Innovation Union headline target of 3% R&D intensity for overall R&D investment of a country as a share of GDP. To make the survey as easy to complete as possible and to maximise the response rate, only a short definition of R&D investment, which is as close as possible to accounting standards, is provided in the survey.<sup>45</sup> The definition refers mainly to R&D as reported in the company's most recent accounts. The definition used in the survey is thus closely related to the International Accounting Standard (IAS) 38 "Intangible Assets",<sup>46</sup> based on the OECD "Frascati" manual,<sup>47</sup> and the definition used in the EU Industrial R&D Investment Scoreboards.

## Composition of the Responses

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The 205 responses were classified according to the ICB<sup>48</sup> described in the questionnaire. Sector classifications of individual companies were cross-checked with the Scoreboards. The sectors were combined into three groups according to their average R&D intensities in the 2010 Scoreboard:

- **High (more than 5%) R&D intensity (58 companies):** biotechnology, health care equipment & services, leisure goods, pharmaceuticals, software, support services, technology hardware & equipment.
- **Medium (between 2 and 5%) R&D intensity (95 companies):** aerospace & defence, automobiles & parts, chemicals, commercial vehicles & trucks, computer services, electrical components & equipment, electronic equipment, food producers, general industrials, industrial machinery, personal goods.
- **Low (less than 2%) R&D intensity (52 companies):** banks, construction & materials, electricity, fixed-line telecommunications, food & drug retailers, food producers, forestry & paper, gas, water & multiutilities, general retailers, industrial metals, industrial transportation, oil & gas producers, oil equipment, services & distribution.

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45 See Annex B

46 See <http://www.iasplus.com/standard/ias38.htm>

47 See "Proposed Standard Practice for Surveys on Research and Experimental Development: Frascati Manual", OECD, Paris, 2002, <http://www1.oecd.org/publications/e-book/9202081E.PDF>

48 ICB Industry Classification Benchmark (see: [http://www.icbenchmark.com/docs/ICB\\_StructureSheet\\_120104.pdf](http://www.icbenchmark.com/docs/ICB_StructureSheet_120104.pdf))

Table 2 shows the distribution of the responses among the sectors with their respective R&D investment shares.

**Table 2: Distribution of the responses by sectors**

ICB Sector	Number of responses	Number of Scoreboard companies	Response rate by sector	Total R&D investment share compared to the Scoreboard*	R&D intensity sector group**
Pharmaceuticals & Biotechnology	31	131	23,7%	between 20 and 40 %	High
Technology Hardware & Equipment	12	50	24,0%	above 40 %	High
Software & Computer Services	8	100	8,0%	below 20 %	High
Health care equipment & services	5	25	20,0%	above 40 %	High
Other high R&D intensity sectors	2	10	20,0%		High
<b>Subtotal high R&amp;D intensity sectors</b>	<b>58</b>	<b>316</b>	<b>18,4%</b>	<b>433,7%</b>	
Industrial Engineering	21	95	22,1%	below 20 %	Medium
Chemicals	13	49	26,5%	above 40 %	Medium
Aerospace & defence	9	30	30,0%	between 20 and 40 %	Medium
Electronic & Electrical Equipment	9	65	13,8%	below 20 %	Medium
Automobiles & parts	8	42	19,0%	below 20 %	Medium
General industrials	6	23	26,1%	between 20 and 40 %	Medium
Fixed line telecommunications	5	14	35,7%	above 40 %	Medium
Food producers	5	35	14,3%	below 20 %	Medium
Alternative energy	4	13	30,8%	above 40 %	Medium
Household goods & home construction	4	21	19,0%	below 20 %	Medium
Support services	4	35	11,4%	below 20 %	Medium
Travel & leisure	3	23	13,0%	above 40 %	Medium
Other medium R&D intensity sectors	4	76	5,3%		Medium
<b>Subtotal medium R&amp;D intensity sectors</b>	<b>95</b>	<b>521</b>	<b>18,2%</b>	<b>25,8%</b>	
Industrial metals & mining	9	13	69,2%	above 40 %	Low
Construction & materials	8	35	22,9%	between 20 and 40 %	Low
Banks	7	30	23,3%	between 20 and 40 %	Low
Electricity	7	18	38,9%	above 40 %	Low
Oil & gas producers	64	9	66,7%	above 40 %	Low
Gas, water & multiutilities	4	9	44,4%	above 40 %	Low
Industrial transportation	4	14	28,6%	between 20 and 40 %	Low
Forestry & paper	3	7	42,9%	above 40 %	Low
Other low R&D intensity sectors	4	28	14,3%		Low
<b>Subtotal low R&amp;D intensity sectors</b>	<b>52</b>	<b>163</b>	<b>31,9%</b>	<b>50,2%</b>	
<b>Total</b>	<b>205</b>	<b>1000</b>	<b>20,5%</b>	<b>31,0%</b>	

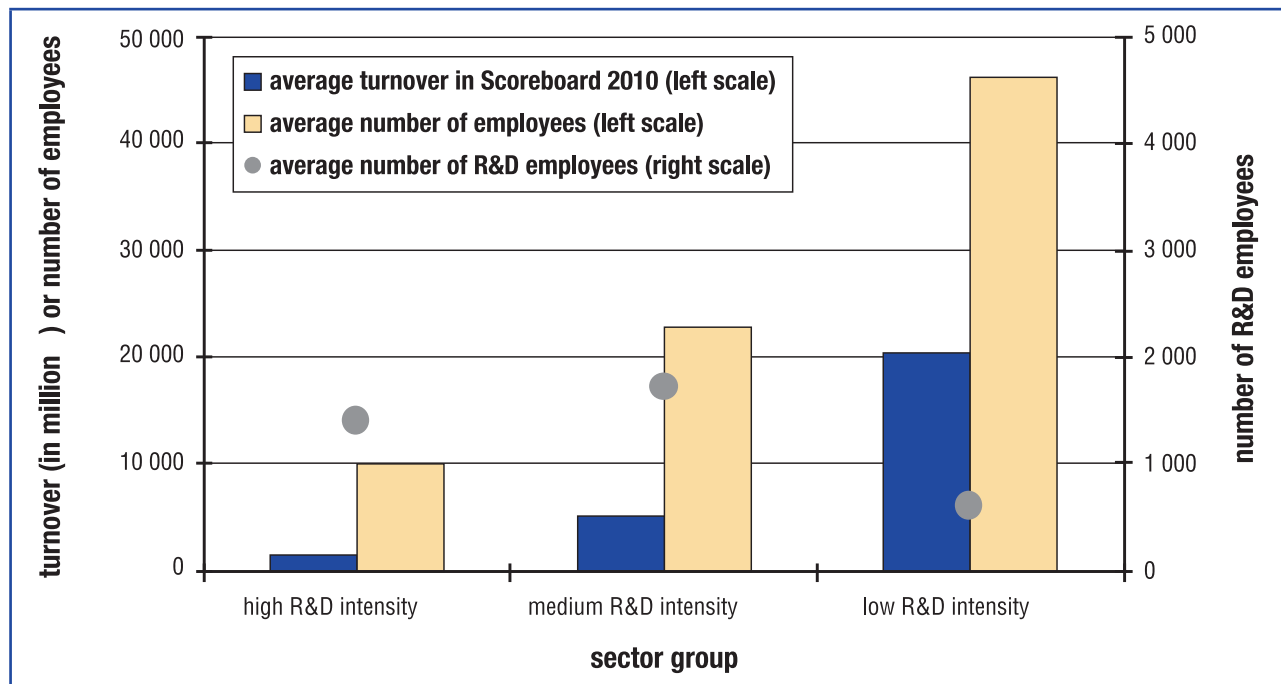
Note: \* For confidentiality reasons, R&D investment shares of individual sectors are shown in ranges.

\*\* Sector group according to the average Scoreboard R&D intensity of each sector.

Source: European Commission JRC-IPTS (2011)

Almost half of the responses were from the medium R&D intensity sectors, but the biggest share of R&D investment in the sample was from the low R&D intensity sectors (see also Figure 1 of the section on R&D Investment Expectations). As shown in Figure 14, the average survey respondent is a very large company.<sup>49</sup> However, there are differences in company size between the sector groups.

**Figure 14: Average turnover and employee numbers for the responding companies, by sector group**



Note: The figure refers to all 205 companies in the sample.

Source: European Commission JRC-IPTS (2011)

The figure above shows how average turnover and employee numbers are inversely proportional to the R&D intensity of the sector group. In addition, the average number of R&D employees is considerably larger in the high and medium R&D intensity sectors than in the low one. This is the result of the high share of R&D employees in large companies that responded from technology, hardware & equipment (high R&D intensity), aerospace & defence and electronic & electrical equipment (medium R&D intensity) sectors.

<sup>49</sup> The average turnover of the responding companies was €10 billion, 23,600 employees, and 1,100 employees in R&D. Among the 185 respondents there were 11 medium-sized companies in the high-R&D intensity sectors (according to the European Commission's SME definition, see: [http://ec.europa.eu/enterprise/enterprise\\_policy/sme\\_definition/index\\_en.htm](http://ec.europa.eu/enterprise/enterprise_policy/sme_definition/index_en.htm)).



## 7 Annex B: The 2010 Questionnaire on R&D Investment

We would appreciate your response by **deadline**, preferably by using the questionnaire on our website at: <http://iri-survey.jrc.es/2010/>. Alternatively, you may return this completed form by e-mail (Alexander.Tuebke@ec.europa.eu), fax (+34.95.448.83.26), or post<sup>50</sup>.

The information in your response will be treated as **confidential**. It will only be used within this study and in an aggregated form. The European Commission is committed to the protection and privacy of data<sup>51</sup>.

It will take about **30 minutes** to complete the questionnaire.

We will automatically inform you of the results of the survey when they are available (for that, please ensure that you have provided your e-mail address below).

Name of the company you are responding for: \_\_\_\_\_  
Its primary sectors of activity: \_\_\_\_\_  
Your name: \_\_\_\_\_  
Job title: \_\_\_\_\_  
E-mail: \_\_\_\_\_  
Phone number: \_\_\_\_\_

The European Commission may follow up this survey by short-interviews to clarify major trends revealed in the analysis. Please **tick here**  if you do not wish to be approached for this purpose.

### Definition of R&D investment

For the purposes of this questionnaire, **'R&D investment'** is the total amount of R&D financed by your **company** (as typically reported in its accounts, exclusive of R&D from public sources).

<sup>50</sup> European Commission, Institute for Prospective Technological Studies (IPTS), Attn.: Alexander Tübke, Edificio Expo, Calle Inca Garcilaso 3, E-41092 Seville, Spain, Tel : +34.95.448.83.80

<sup>51</sup> see the Privacy Statement on the last page

## A. Corporate background

1. How many employees in total work in your company?

About \_\_\_\_\_.

2. How many employees work on R&D in the company?

About \_\_\_\_\_.

## B. R&D investment levels and trends

3. What was your company's R&D investment in the last financial year?

About € \_\_\_\_\_ million.

4. At what rate do you expect the company to increase its overall R&D investment over the next three years, in real terms?

About \_\_\_\_\_ % per annum.

## C. R&D location strategy

5. Please estimate the distribution of your company's in-house R&D activity among the following world regions at present and in three years?

Present distribution	R&D carried out:	Expected distribution in three years
%	in the European Union	%
%	in other European countries	%
%	in the US and Canada	%
%	in Japan	%
%	in China	%
%	in India	%
%	in the Rest of the World	%

6. Which country do you consider the *most attractive* location for the company's R&D?

⇒ \_\_\_\_\_



## D. R&D and innovation

7. How relevant are the following activities for your company's innovations<sup>52</sup>? Please rate on a scale from 1 (irrelevant) to 5 (highly relevant).

	Irrelevant				Highly relevant
	1	2	3	4	5
(a) R&D within the company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) R&D outsourced to other companies & organisations:					
(b1) inside the European Union	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b2) outside	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) Acquisition of new or highly improved machinery, equipment and software:					
(c1) inside the European Union	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c2) outside	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) Purchase or licensing of patents, inventions, know-how and other types of knowledge:					
(d1) inside the European Union	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d2) outside	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) Training to support innovative activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f) Design (graphic, packaging, process, product, service or industrial)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) Market research, launch advertising, and related marketing activities for new product introduction:					
(g1) inside the European Union	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g2) outside	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(h) Other (please specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. How much of your annual sales come from innovative products and services introduced in the past three years?

About \_\_\_\_\_ % of total sales.

52 Innovation is the introduction of new or significantly improved products, services, or processes.

9. Which effect do the following factors and policies have on your company's current innovation activities? Please rate on a scale from -2 (very negative effect) to 2 (very positive effect).

	Very negative effect	Negative effect	No effect	Positive effect	Very positive effect
	-2	-1	0	1	2
(a) Availability of scientists, engineers, designers and technology transfer experts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) Labour costs of researchers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) Access to risk and venture capital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) Public support in the form of:					
(d1) grants at the EU or national level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d2) fiscal incentives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d3) loans and guarantees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d4) public private partnerships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) Competition policy requirements on:					
(e1) research collaboration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e2) technology transfer agreements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f) Public procurement of:					
(f1) innovative goods and services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f2) R&D services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) Product market regulation, norms and standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(h) Intellectual Property Rights in terms of:					
(h1) costs of protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(h2) time to obtain protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(h3) conditions for putting them into force	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(i) Other (please specify):					

10. How important are the following sources of knowledge for your R&D and innovation activities? Please rate on a scale from 1 (unimportant) to 5 (highly important).

	Un- important				Highly important
	1	2	3	4	5
(a) Monitoring scientific literature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) Participation in conferences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) Recruitment of qualified employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) Exchange of qualified employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) Knowledge sharing with other companies via:					
(e1) collaboration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e2) outsourcing R&D on contract	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e3) licensing in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e4) licensing out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f) Knowledge sharing with higher education institutions, e.g. Universities, via:					
(f1) collaboration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f2) outsourcing R&D on contract	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f3) licensing in/out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) Knowledge sharing with Public Organisations, e.g. public R&D bodies, via:					
(g1) collaboration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g2) outsourcing R&D on contract	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g3) licensing in/out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(i) Other (please specify):					

11. Please estimate the distribution of your company's knowledge sharing activities<sup>53</sup> with public and private partners among the following world regions at present and in three years?

Present distribution		Expected distribution in three years
%	in the European Union	%
%	in other European countries	%
%	in the US and Canada	%
%	in Japan	%
%	in China	%
%	in India	%
%	in the Rest of the World	%

53 collaboration, outsourcing and licensing activities

## E. Comments or suggestions

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**Thank you very much for your contribution!**

## Privacy Statement

The 2010 EU Survey on R&D Investment Business Trends is carried out by the Industrial Research and Innovation (IRI) action of the European Commission's Joint Research Centre (JRC), Institute for Prospective Technological Studies (IPTS). The survey is directed at the 1000 European companies in the *2010 EU Industrial R&D Investment Scoreboard*.

The European Union is committed to data protection and privacy as defined in Regulation (EC) n° 45/2001. This survey is under the responsibility of the IRI action leader, Fernando Hervás Soriano, acting as the Controller as defined in the above regulation. The Controller commits himself dealing with the data collected with the necessary confidentiality and security as defined in the regulation on data protection and processes it only for the explicit and legitimate purposes declared and will not further process it in a way incompatible with these purposes. These processing operations are subject to a Notification to the Data Protection Officer (DPO) in accordance with Regulation (EC) 45/2001.

### Purpose and data treatment

The purpose of data collection is to establish the analysis of the 2010 EU Survey of R&D Investment Business Trends. This survey has a direct mandate from the Commission's 2003 Action Plan "Investing in Research" (COM 2003 (226) final, see [http://ec.europa.eu/invest-in-research/action/2003\\_actionplan\\_en.htm](http://ec.europa.eu/invest-in-research/action/2003_actionplan_en.htm)). The personal data collected and further processed are:

- Company: name, primary sectors of activity, company size
- Contact Person: name, job title, phone number, e-mail

The collected personal data and all information related to the above mentioned survey is stored on servers of the JRC-IPTS, the operations of which underlie the Commission's security decisions and provisions established by the Directorate of Security for these kind of servers and services. **The information you provide will be treated as confidential and aggregated for analysis.**

### Data verification and modification

In case you want to verify the personal data or to have it modified respectively corrected, or deleted, please write an e-mail message to the address mentioned under "Contact information", by specifying your request. Special attention is drawn to the consequences of a delete request, in which case any trace to be able to contact you will be lost. Your personal data is stored as long as follow-up actions to the above mentioned survey are necessary with regard to the processing of personal data.

### Contact information

In case you have questions related to this survey, or concerning any information processed in this context, or on your rights, feel free to contact the IRI Team, operating under the responsibility of the Controller at the following email address: [jrc-ipts-iri@ec.europa.eu](mailto:jrc-ipts-iri@ec.europa.eu).

### Recourse

Complaints, in case of conflict, can be addressed to the European Data Protection Supervisor (EDPS) at [www.edps.europa.eu](http://www.edps.europa.eu).



**European Commission**

**EUR 24891 EN – Joint Research Centre – Institute for Prospective Technological Studies –  
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## **Abstract**

This report presents the findings of the sixth survey on trends in business R&D investment. These are based on 205 responses of mainly larger companies from the 1000 EU-based companies in the 2010 EU Industrial R&D Investment Scoreboard. These 205 companies are responsible for R&D investment worth almost €40 billion, constituting around 30% of the total R&D investment by the 1000 EU Scoreboard companies.

The main result is that top R&D investing companies in the EU expect their global R&D investments to grow by 5 % annually from 2011 to 2013. This is more than double the rate of last year's expectations, and represents a significant upturn from the 2.6 % R&D investment cuts observed for these companies in 2009. Companies surveyed expect their R&D investment inside the EU to grow 3 % a year over the next three years, although this remains the lowest rate compared to what they expect to invest in R&D in other world regions, especially in Asian countries like China (25%) or India (8%), but also in the US and Canada (5%).

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