



## J R C T E C H N I C A L R E P O R T S

# Second IRIMA workshop Industrial Research and Innovation Monitoring and Analysis: Counting (and accounting) R&D and non-R&D intangibles, drivers of firm's innovation and growth – SUMMARY REPORT

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The objective of the IRIMA Workshops is to obtain feed-back from policy-makers, industry representatives and experts about how the analytical activities of this project are best serving their needs (and could best serve them in future work), in particular in terms of providing empirical evidence to support policy-making in the area of research and innovation. The IRIMA project aims at supporting the implementation of the 3% R&D investment intensity target enshrined in the Europe 2020 strategy. Previous evidence from JRC analysis in this area has shown that the EU business R&D gap is rooted more in the structure and dynamics of the EU industry than in the internal efficiency of EU companies' R&D. The EU has less world leading innovators in high R&D intensive sectors, such as ICT and health and this translates into a potential broader weakness as these sectors are important sources of economic growth and employment as well as important sources of spillovers to the rest of the economy. The aim of the IRIMA project in this context is to collect data and provide analysis on companies' R&D and innovation investments to better understand their main determinants and barriers and ultimately identify policy measures which could address existing market failures.

In this second IRIMA Workshop the aim was to discuss the policy implications of new evidence obtained by the project on the role that R&D and non-R&D intangible assets (e.g. training, design,

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<sup>1</sup> *The views expressed are purely those of the author and may not in any circumstances be regarded as stating an official position of the European Commission.*

branding and reputation) have for companies' innovation and growth in Europe. In particular, it focused on what accounting data at company level can actually reveal on the role of intangibles assets - both at the micro and at the macro level - and on what they miss-reveal or simply are not able to disclose. The informative and policy role of other kinds of (non-accounting) statistical sources - like dedicated surveys on firms' intangible investments - was also central to the workshop.

The workshop, titled "Counting (and accounting) R&D and non-R&D intangibles, drivers of firm's innovation and growth", was organised in two sessions: the first one was dedicated to the discussion of recent evidence on companies' R&D investments and the second one to the analysis of companies' investments on the broader set of intangibles assets which drive firm's innovative activities.

## FEED-BACK FROM THE WORKSHOP SESSIONS AND DISCUSSIONS

### SESSION 1 - RECENT EVIDENCE ON R&D IN EUROPE

In this session, recent empirical evidence from the [2013 EU Industrial R&D Investment Scoreboard](#) was presented. Main methodological aspects and nature of the data were also recalled, as well as on-going and planned activities related to data extension and combination with other sources ([link](#)). In a second presentation, main trends and prospects from official statistics (BERD and CIS notably) were presented ([link](#)). In both presentations the issue of complementarity between company data sources and territorial based official statistics on R&D was discussed.

During this session, the following main issues were discussed:

#### **- On the use, interpretation and comparability of different sources of business R&D data and statistics.**

The (non)-comparability between Scoreboard data (R&D investments taken from companies' consolidated -i.e. group / ultimate owner level- annual accounts) and the Business Enterprise R&D (BERD) official statistics (established at territorial level) has been a recurrent issue analysed and discussed<sup>2</sup>. While a direct comparison of both sources is inappropriate, past analyses have demonstrated the usefulness of using them in a complementary way. For large countries and for world regions (e.g. US, EU, Japan) Scoreboard and BERD broadly correspond. Moreover, differences between the two indicators can help to infer the role that companies' cross-border R&D and production activities play in the origin and different interpretation of the EU-US R&D gap across different industrial sectors<sup>3</sup>.

As shown by G. Perani in his presentation, the differences between Scoreboard and BERD data remain consistent over time (2004 - 2010) for most European countries, a sign of the reliability of both indicators. At the same time, and as illustrated by F. Galindo (OECD) in his presentation, SB data and R&D data from OECD Main Science and Technology Indicators ([www.oecd.org/sti/msti.htm](http://www.oecd.org/sti/msti.htm)) show, for the main world regions, a rather different picture concerning the exit from the crisis (2010-11): R&D investment growth rates in the SB, particularly for the US and Asian countries samples, are substantially higher than in official statistics. The origin of these differences would be worth studied, taking into account new evidence from countries that collect or match accounting data to business survey responses. He explained that the OECD Working Party of National Experts on S&T Indicators (NESTI) is paying particular attention to the use of and references to accounting

<sup>2</sup> See for example Azagra and Grablovitz (2008), "Data on Business R&D: Comparing BERD and the Scoreboard", EC, JRC/IPTS.

<sup>3</sup> See Chapter 7 "EU-US R&D Intensity Gap" in the 2012 Scoreboard report.

information in the context of R&D surveys as part of the ongoing revision of the Frascati Manual. (<http://www.oecd.org/sti/inno/frascati-manual-revision.htm>)

F. Galindo argued that SB data should be used and interpreted with extreme care and cautioned about the potential to mislead users when comparing totals and growth rates for regions, countries and sectors. He encouraged the SB team to attempt to shed some further light on the activity and spatial distribution of R&D activities of large and complex firm groups using additional accounting data sources. He also insisted that, despite the limitations, the SB has been and should continue to be a very valuable open resource for the study of firm dynamics and agreed with other discussants on this being its major source of value to users.

Finally, B. Aschhoff (ZEW) pointed to the fact that the country company samples of the SB differ from the ones captured by the official statistics, and that therefore direct comparison of aggregated figures from these two sources is inappropriate. She gave the example of Germany: 168 firms in the SB vs 250 firms in CIS, for similar R&D investment thresholds and comparable aggregate figures<sup>4</sup>. There is therefore a need to tailor the use and interpretation of each statistical set in accordance to its analytical strengths: SB is appropriate for example to capture globalisation and firms' dynamics.

### **- On the limitations of existing R&D sources and on the trends and prospects of R&D official statistics**

Building on G. Perani's presentation on the on-going revision of the European legal framework for business statistics ([link](#)), a number of limitations of current statistical sources and of needs to be covered in the future were commented:

- There is a need to further harmonise definitions and methodologies for data collection, across countries (where levels of reporting obligations for example differ) and across surveys. In the absence of such harmonisation, comparability and the possibility to merge different sources are very limited. Some participants questioned the worthiness of investing resources in matching datasets, given the complexity of the exercise. In any case, there is a strong need of more panel data and the merging option seems to be the only way, at least in the near future.
- Data collection for business R&D and innovation should put more emphasis on outputs (now there is too much focus on inputs) and find ways of measuring them in a broader context of firm's knowledge management strategies. The aim will be to facilitate the analysis of the conceptual link knowledge-innovation-growth.
- Another emerging need is to better capture the R&D globalisation. A better targeting of MNE's research activities (as the SB does) will help in this respect.
- Current sources do not capture appropriately the R&D and innovation activities of very small firms. This is an issue for many Member States where the average size of firms is around five employees. Besides, small firms in particular, do not properly declare R&D expenses and very often do not capitalise them. In addition, small firms in innovation surveys (such as CIS) are randomly sampled and this restricts the possibility of analysing them over time.

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<sup>4</sup> This comes from the differences in methodology (SB data for consolidated accounts, at group level, and for companies having it headquarters in Germany).

### **- On further exploitation of Scoreboard data.**

- SB data is well suited to analyse firm dynamics (e.g. entries and exits to the ranking) as well as firms' heterogeneity. This potential should be further exploited.
- As many SB companies are multinational groups embracing different activities, it would be interesting to try to reassign these different activities to the corresponding ICB sectors (to see for example to what extent aggregate figures per region/sector change).
- One strong point of the SB is that it provides a global perspective, which can be very useful to further analyse R&D flows between countries and regions. In this context, the analysis of spillovers through technology trade is an interesting possibility to be pursued.
- It would be interesting to further analyse mergers and acquisitions (M&A) as a source of growth for many companies.
- As illustrated by on-going analysis done by M. Cincera, the exploitation of patent data at subsidiary level could be useful to improve information about the location of SB companies' R&D and innovation activities (looking for example at the location of the inventor declared in the patent application).
- It is recommended to reproduce some of the analysis done in the past using the most recent editions of the SB, for example on the productivity impact of R&D and on the age of companies. This in order to see if previous findings persist or if new patterns have emerged.

## **SESSION 2 - RECENT EVIDENCE ON NON-R&D INTANGIBLE ASSETS IN EUROPE**

During this session, work on the strategic value of the firm's intangible investments and on their innovative performance, carried-out in the context of the IRIMA project, was presented. Recent collaboration with DG ENTR for the elaboration and exploitation of results of the 2012 Innobarometer survey, dedicated to intangible assets, was also presented ([link](#)). In her keynote intervention, C. Corrado (from the Conference Board, [link](#)) presented the analytical framework for investments in intangible assets developed together with Hulten and Sichel (2005) and some recent results about the impact of such investments on productivity growth (at macro level, using the standard growth accounting framework<sup>5</sup>).

During this session, the following main issues were discussed:

- Capturing data on investments and on value of capital stocks derived from intangible assets remain a challenge. At the same time, and given the compelling evidence of growing intangible capital factor shares (both at micro and macro levels), efforts to better capture and value these activities should continue. Policy makers in particular need more timely data and analysis to design proper policies that stimulate investment and diffusion of innovative activity, as sources of growth. The crucial role of intangibles as business functions in a global value chain (from R&D and design to marketing and services) has been illustrated by the "smiling curve", showing that production tangible activities represent just a small portion of the added economic value created along such chain.

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<sup>5</sup> See in particular the COINVEST and INNODRIVE projects financed by the EU 7th Research Framework Program.

- The 2012 Innobarometer questionnaire on intangibles was designed to test a new approach of collecting micro data, taking benefit of previous experiences, in particular of the UK NESTA-sponsored survey. Its wide country coverage gave a unique opportunity for such a test and first analyses provide already interesting results which nonetheless require further research. It would be very useful to consider replicating such a survey, using similar or adapted questionnaires, and to move towards the analysis of quantitative aspects on its basis. When trying to collect information on investment levels or values, T. Clayton called for caution as the UK experience showed that companies tend to undervalue in their responses things that are not reflected in companies' accounts. Nonetheless, the information provided at micro level by the Innobarometer, in particular on the expected life-lengths of intangible assets, play a crucial role to better derive intangible capital stocks and their relative rental prices.
- The need for further research on the complementarity between different types of intangible assets, between intangible and tangible assets and their combined impact on productivity has been claimed. Evidence already shows close links between ICT and organizational and training investments. In addition, the data presented by Corrado shows that non-R&D intangible factor shares are more evenly distributed across sectors, suggesting stronger complementarities than the ones of R&D intangibles assets which concentrate mostly in the industrial sector.
- As suggested by A. Pesole (JRC-IPTS), the presence of such complementarities seems to indicate the emergence of new business models in which non-R&D intangibles "bundles" are constitutive features. It is therefore essential to better understand the role of these "bundles" of intangible assets in creating knowledge, what spillover effects they create and how do they impact global value chains as well as companies' innovation processes, their capital value and their performance. This requires improved measures of intangible assets, information on companies' innovation strategic behaviour as well as new research on how companies appropriate spillovers and open knowledge.
- Distinguishing between different types of intangible assets and how they separately impact on firms value and performance is however a very difficult task. The example of brands, which value can be affected by everything the firms does, is just an example.
- Some concrete comments on the draft report prepared on the Innobarometer 2013 on intangibles, in the context of the IRIMA project (S. Montresor et al.) are:
  - It is difficult to distinguish between R&D and design, as well as between R&D and other non-R&D intangibles, as there are some risks of double-counting.
  - It is difficult to distinguish between manufacturing and services, given that outsourcing and vertical integration have made their boundaries more blurred.
  - It would be useful to comment on how micro evidence can help to improve macro estimates, in particular in order to remedy the simplifying hypotheses that the latter are forced to make in building up the stocks of human and organizational capital. (i.e. see above on life-lengths)
  - It would be worth to present policy implications in a separate document (policy brief).
  - In view of future research, it would be useful to have more disaggregated industry level data.

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#### Abstract

In this second IRIMA Workshop the aim was to discuss the policy implications of new evidence obtained by the project on the role that R&D and non-R&D intangible assets (e.g. training, design, branding and reputation) have for companies' innovation and growth in Europe. In particular, it focused on what accounting data at company level can actually reveal on the role of intangibles assets - both at the micro and at the macro level - and on what they miss-reveal or simply are not able to disclose. The informative and policy role of other kinds of (non-accounting) statistical sources - like dedicated surveys on firms' intangible investments - was also central to the workshop. The workshop, titled "Counting (and accounting) R&D and non-R&D intangibles, drivers of firm's innovation and growth", was organised in two sessions: the first one was dedicated to the discussion of recent evidence on companies' R&D investments and the second one to the analysis of companies' investments on the broader set of intangibles assets which drive firm's innovative activities.

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