



Firm's innovative performance and growth

Evidence and research questions

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**First IRIMA Workshop
Brussels, 04 December 2012**



Outline

1. The context: EU's business R&D gap
2. Recent evidence based on top R&D investors (EU Industrial R&D Scoreboard sample).
3. Some facts on the role of innovation in companies' growth and the role of public support
4. Pending questions for discussion



1. The context: EU's business R&D gap (1/2)

- A gap rooted more in the structure and dynamics of **EU industry**, than in the **internal efficiency** of EU companies' R&D.
- EU lacks R&D in **crucial innovative sectors**: EU has less and smaller young leading companies than US in **high-tech sectors, like ICT and health**.
- This translates into a **more general gap**, as these sectors are: ...
 - important sources of growth, employment and good economic performances;
 - important sources of spillovers to the rest of the economy.



1. The context: EU's business R&D gap (2/2)

- Which are the **(market and system) failures** responsible for this gap?
- Which **policy** (S&T, innovation, industrial, internationalisation, ...) can better address these failures?
- Is there a policy-leverage to **increase the number and size of companies** in these key-innovative sectors?
- How can the policy target the **growth of innovative companies in general**?

2. Evidence from the IRI Scoreboard (1/5)

The EU Industrial R&D Scoreboard

Understanding the dynamics of industrial R&D at the firm level

Since 2002



Top R&D investors

- 1000 EU and 1000 non-EU; €455.9 bn (~85% of world BERD).
- Most companies based in the EU, US, Japan (~85%).
- R&D and financial indicators from latest available companies' accounts (4 years)

Scoreboard vs BERD

- Different/complementary perspective: Company vs territorial

Original source of company micro-data.

- Incorporated by EUROSTAT as part of EU official statistics on Science, Technology and Innovation.

Main limitation

- Undisclosed location of the R&D investment and technological profile

2. Evidence from Scoreboard (2/5)

| Sub-sector (4-digit ICB) | R&D intensity (%) | | R&D Investment (€m) | |
|---|-------------------|------|---------------------|---------|
| | EU | US | EU | US |
| <i>Most R&D intensive (>10%)</i> | | | | |
| Biotechnology | 17.1 | 23.9 | 877.6 | 7642.7 |
| Semiconductors | 21.8 | 19.1 | 3344.4 | 15457.5 |
| Pharmaceuticals | 14.5 | 14.7 | 19717.5 | 25097.4 |
| Software | 14.6 | 14.8 | 3454.3 | 14320.6 |
| Telecommunications equip. | 13.3 | 14.9 | 10559.3 | 10494.9 |
| Internet | | 12.2 | 0.0 | 3167.6 |
| <i>Other, largest R&D investing sectors</i> | | | | |
| Automobiles & parts | 5.6 | 4.1 | 27257.7 | 9963.5 |
| Chemicals | 3.5 | 2.9 | 7189.6 | 3389.6 |
| Electronic equipment | 6.4 | 7.8 | 958.2 | 1663.8 |
| Electrical comp. & equip. | 4.9 | 2.6 | 5623.9 | 726.7 |
| Computer hardware | 12.5 | 3.8 | 86.7 | 6617.1 |
| Aerospace & defence | 5.8 | 3 | 7834.7 | 6405.8 |

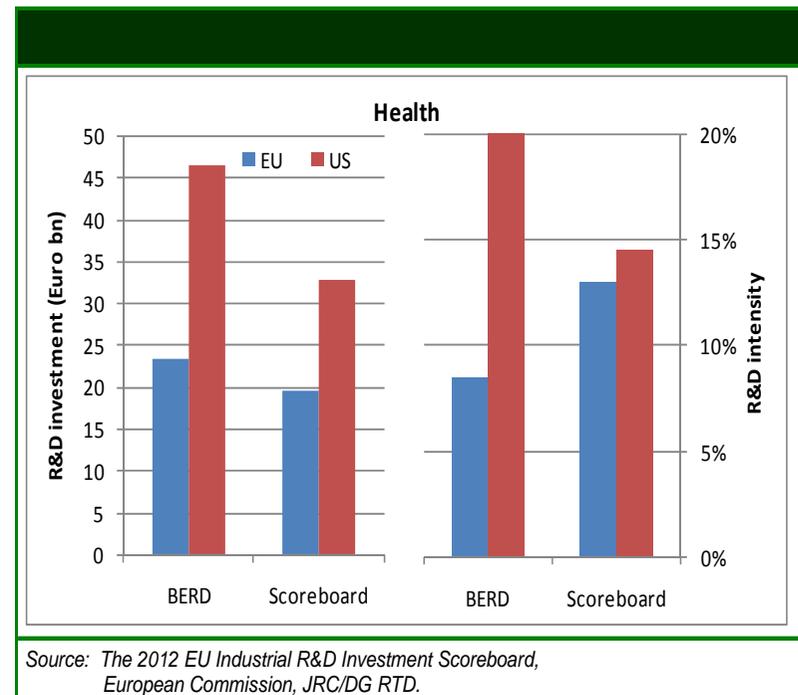
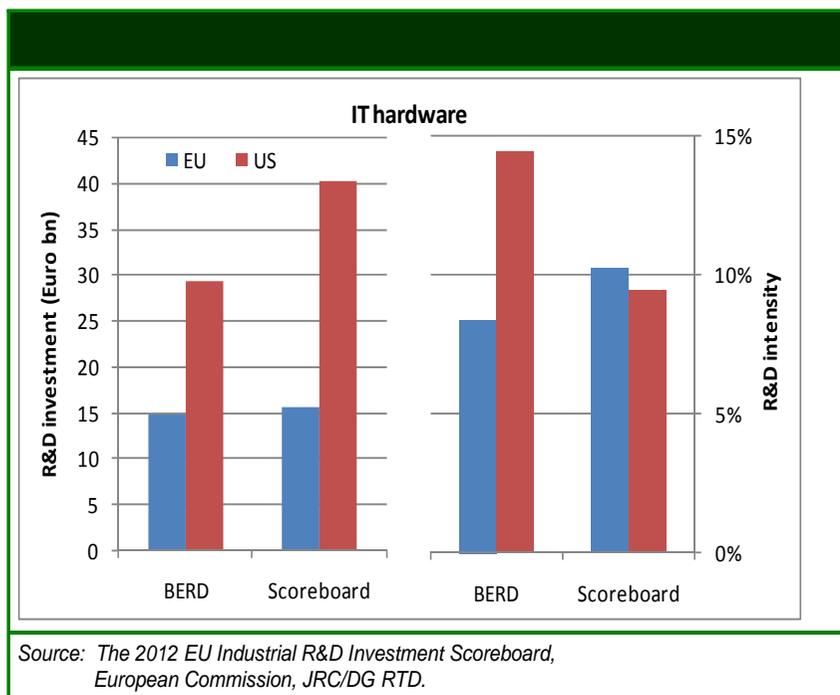
Source : The 2010 EU Industrial R&D Investment Scoreboard
European Commission, JRC/DG RTD.

Company data from top R&D investors

- R&D intensities of EU companies are close to their US counterparts.
- Big differences are in the sector mix of the EU and US Scoreboard samples.
- Strong structural origin of the R&D gap. Concentrated in a small number of high-tech sectors.

2. Evidence from Scoreboard (3/5)

EU lags behind US in ICT and Health

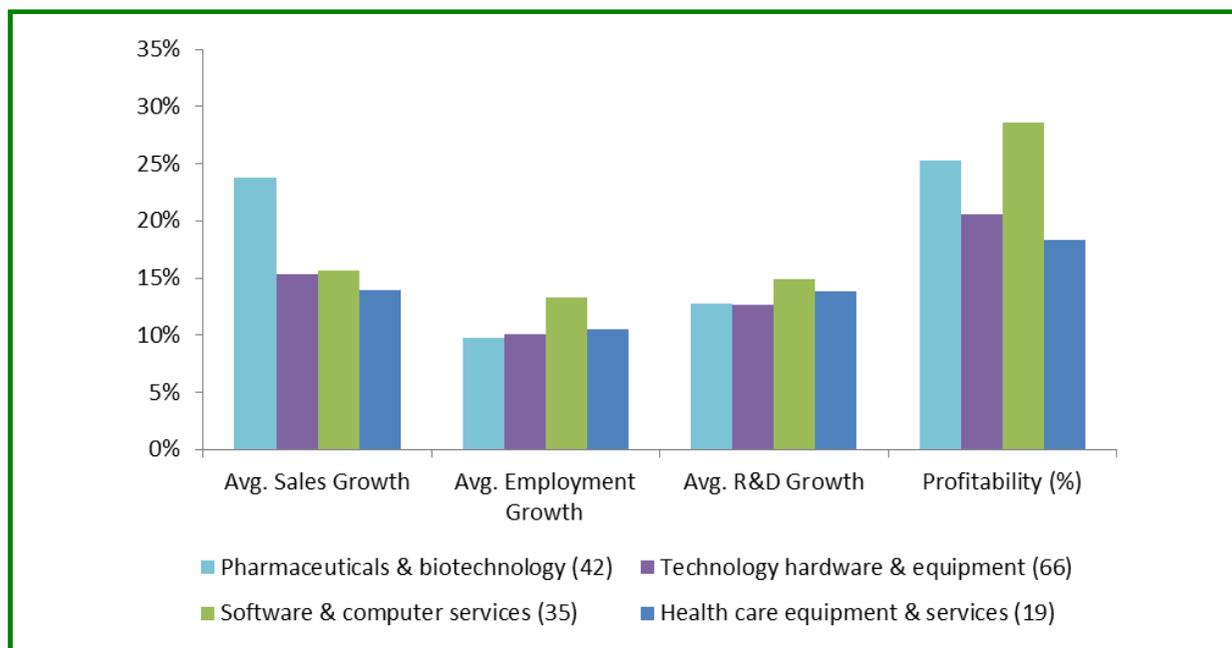




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2. Evidence from Scoreboard (4/5)

Performance of high-tech companies



Source: *The 2012 EU Industrial R&D Investment Scoreboard*, European Commission, JRC/DG RTD (forthcoming 6 December 2012).

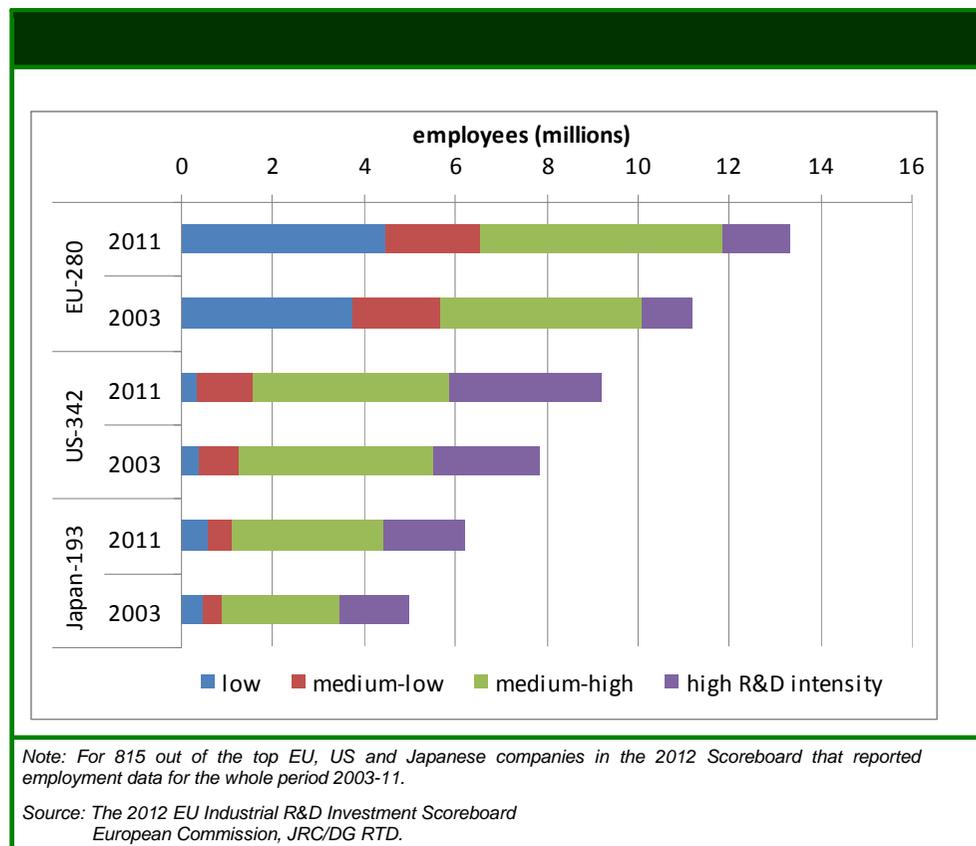
Note: The figure reports averages of firms' annual growth rates in the respective sectors. Numbers in brackets refer to the number of firms in the respective sectors. Based on a sample of 242 Scoreboard companies that doubled sales over 2002-2011



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2. Evidence from Scoreboard (5/5)

Employment creation of top R&D investors





3. Some facts (1/3): Innovation and growth

- R&D and innovation have positive impact on firm's growth and employment. Large differences across types of companies and across sectors.
- Age is a strong explanatory factor, more than size.
- Need to define "innovation" in broad terms, not just restricted to technological/R&D driven innovation.
- Importance to look not just at the pace of growth but also at its sustainability over time.
- The business model and the context (sector-location) influences the optimal size of companies (not reason for all to become "large").



3. Some facts (2/3): The role of public intervention

- Supply side: Easing access to finance for young innovators, tax incentives, clusters.
- Demand side: IP, standardisation, public procurement.
- Removal of regulatory barriers to entry, growth and exit of firms.
- Foster entrepreneurial culture, education, training/coaching of management skills for young and small enterprises.



3. Some facts (3/3): Target specific innovative firms?

- Europe needs more and bigger firms in high R&D intensive sectors: ICT, medical equipment and biotech.
- Evidence shows higher impact of R&D on firm's productivity for high R&D intensive firms and such impact increases with the size of the R&D stock.
- Positive impact of R&D on employment is higher for high R&D intensive firms.
- Public support to R&D investments of young and small R&D driven innovators particularly important: allow to keep in-house R&D, provide margin for market introduction expenditures, promote collaboration.

4. Pending questions (1/4): high-growth and ex-ante identification of companies

- Causal relationship between innovation and high-growth?
Persistence?
- Differences between types of firms?
- Role of framework conditions and location?

- How to identify ex ante innovative companies with high-growth potential?
- Is it appropriate to target particular sectors, technologies?

4. Pending questions (2/4): Other intangibles beyond R&D

-Role of policy in stimulating investments on non-tech innovation drivers such as marketing, design, training, organisational capital etc.?

-Framework conditions (e.g. accounting rules) versus direct financial support.



4. Pending questions (3/4): The need to support high-tech entrepreneurship and corporate venturing initiatives

- How to support new high-tech ventures?
- Corporate venturing initiatives versus science (universities-research centres) spin-offs.



4. Pending questions (4/4): The need of more sophisticated policy tools

- How to integrate experimentation and regular fine tuning in public support instruments?
- Firm's identification index to identify ex-ante innovative firms with high-growth potential?
- Multi-level governance of public support instruments to innovative firms.