"Technological profile and innovation patterns of European top R&D investors"

IRI prospected research activities

Sandro Montresor
JRC-IPTS, European Commission
Sandro.Montresor@ec.europa.eu

Agenda

1. General objective of Topic 3
2. Policy rationale
3. Prospected research lines and research background
4. Data sources and methodology

1. General objective

Investigate the ***technological profile*** and ***innovation patterns*** of ***European companies***

- ***European companies***: top R&D investors and from innovation/R&D-data trackable companies [sub 4]
- ***Technological profile***: technological fields (and geographical areas) companies invest and/or reveal advantages [sub 3]
- ***Innovation patterns***: regular behaviours/relationships companies adopt in innovation [sub 3]

2. Policy rationale

- Boosting EU ***SSI growth*** and closing the EU ***productivity gap*** in a global, post-crisis scenario

- Help companies in shaping more competitive and socially oriented ***technological profiles***
- Support ***internationalisation*** strategies for firms to tap in the competencies of emerging economies
- Promote ***open innovation*** modes for firms to complement internal and external R&D/knowledge
- Exploit the innovation opportunities of the increasing ***integration of KIBS*** into manufacturing sectors

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Europe 2020 Flagship Initiative
Innovation Union

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3. Prospected research lines/background

- 3.i) Technological profile of the top European R&D investors (IRI Scoreboard)

- 3.ii) Open innovation capabilities of European companies (Community Innovation Survey)

- 3.iii) Innovation patterns across European KIBS and manufacturing industries

3. Prospected research lines/background

☞ 3.i) Technological profile of the top European R&D investors (IRI Scoreboard)

- Identification and analysis of their ***patent portfolio*** (IRI-IS pilot on the ICT sector): technological diversity, geography, competencies, … temporal aspects (if possible)

- Which is the ***impact*** of these issues on their innovation input/output? Which are the ***determinants*** of their technological profile?

3. Prospected research lines/background

3.i) Previous in-house work on top-R&D investors:

Monitoring industrial research: The 2011 EU Industrial R&D Investment Scoreboard

5.2 Ranking of the top 1000 non-EU companies by level of R&D investment

				R&D Investment		Net Sales	R&D/Net Sales ratio	Operating Profit
				2010	change 10/09	2010	2010	2010
Rank	Company	ICB Sector	Country	€m	%	€m	%	% of Net Sales
			Top 1000 Companies	323,928.73	3.2	8,675,068	3.7	10.7
		number of companies for calculation		*1000*	*996*	*1000*	*1000*	*998*
1	Roche	Pharmaceuticals (4577)	Switzerland	7.181,11	-4,5	37.967	18,9	28,4

IPTS Working Papers on Corporate R&D and Innovation

The IPTS Working Papers on Corporate R&D and Innovation shed light on economic and policy questions related to industrial research and innovation and their contribution to the European competitiveness.

2011

Wp 5/2011: Access to Finance for Innovation: The Role of Venture Capital and the Stock Market (Bogliacino – Lucchese)

Wp 2/2011: Evolution of Globalised Business R&D - Features, drivers (Moncada-Paternò-Castello, Voigt and Vivarelli)

Wp 1/2011: Globalisation, industrial diversification and productivity growth in large European R&D companies (Cincera and Ravet)

…

3. Prospected research lines/background

3.i) Research background for future work

- **Technological diversification** of big companies (**MNC**):
  - *Seminal works*: Patel & Pavitt, 1995 IIASA, 1997 RP; Zander, 1997 RP; Cantwell & Piscitello, 2002 JIM, …
  - *Recent contributions*: Breschi, Lissoni & Malerba, 2003 RP; Garcia-Vega, 2006 RP; Quintana-Garcia and Benavides-Velasco, 2008 RP; ...

- **R&D internationalisation** (mainly MNC):
  - *In-house work*: Moncada-Paterno-Castello, Vivarelli & Voigt, 2011, ICC; …
  - *Recent work*: Cantwell, 2009 JIBS; Filippaios et al., 2009 RP, Karabag et al., 2011 RP

3. Prospected research lines/background

☞ 3.ii) Open innovation capabilities of European companies (Community Innovation Survey)

- Analysis of their ***innovation cooperation*** (business partners and research organizations) and ***absorptive capacity*** (potential and actual)

- Which factors enable/hamper these ***open-innovation drivers***? What can ***innovation policy add*** to these innovation behaviours?

3. Prospected research lines/background

3.ii) Previous in-house work on absorptive capacity and innovation cooperation:


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Knowledge for Growth – Industrial Research & Innovation (IRI)

The "potential" face of absorptive capacity. An empirical investigation for an area of 3 European countries

Authors Chiara Franco[1], Alberto Marzucchi[2], Sandro Montresor[3]

Fosfuri, A. and Tribó, J. (2008). Exploring the antecedents of potential absorptive capacity and its impact on innovation performance. *Omega*, 36(2):173–187.

$$PAC = EXTKNOW - [\hat{a} + \hat{b}COUNTRIES + \hat{c}SECTORS + \hat{d}MNC] \quad (2)$$

Innovation cooperation within and across regional boundaries.
Does innovation policy add something? *

Alberto Marzucchi† Davide Antonioli‡ Sandro Montresor§

February, 2012

Georghiou, L. (2003). Evaluation of behavioral additionality. *Concept paper for OECD Directorate for Science, Technology and Industry, Committee for Scientific and Technological Policy, Working Party on Innovation and Technology Policy, Paris.*

$$ATT_{PSM} = E_{P(X)|D=1}\{E[Y_1|D=1, P(X)] - E[Y_0|D=0, P(X)]\} \quad (2)$$

$$R = r(T, X) \quad (3)$$

3. Prospected research lines/background

3.ii) Research background for future work:

- **Open innovation, innovation cooperation and absorptive capacity**:
  - *Seminal work*: Chesbrough et al., 2006, …; Cassiman & Veugelers, 2002 AER, …; Zahra & George, 2002 AMR, …;
  - *Related contributions*: Laursen and Salter, 2006 SMJ, …; Lhuillery & Pfister, 2009 RP, …; Lim, 2009 ICC, …

- Innovative cooperation behaviours and **policy behavioral-additionality**:
  - *Seminal work*: Georghiou, 2003 OECD; OECD, 2006; …
  - *In-house work*: Marzucchi, Antonioli & Montresor, 2012 IRI-WP.

3. Prospected research lines/background

☞ 3.iii) Innovation patterns across European KIBS and manufacturing industries

- Sub-system analysis of **R&D** (rent) **spillovers from** Knowledge Intensive Business Services (**KIBS**) **to manufacturing**: vertically integrated sectors and R&D embodied intersectoral flows

- To which extent are KIBS **vertically integrated** (directly and indirectly) into manufactruing industries? Does this impact on **innovation in manufacturing**?

3. Prospected research lines/background

3.iii) Previous in-house work on KIBS:

To what extent are knowledge-intensive business services contributing to manufacturing? A sub-system analysis

Daria Ciriaci and Daniela Palma[1]

Preliminary draft - Do not quote without authors' permission

Momigliano, F. and Siniscalco, D. 1982A. The growth of service employment: a reappraisal, BNL Quarterly Review, vol. 142, 269–306.

$$B = \hat{q}^{-1}(I - A)^{-1}\hat{y} \qquad (1)$$

$$C = \hat{l}\,B\left(\hat{l'}B\right)^{-1} \qquad (2)$$

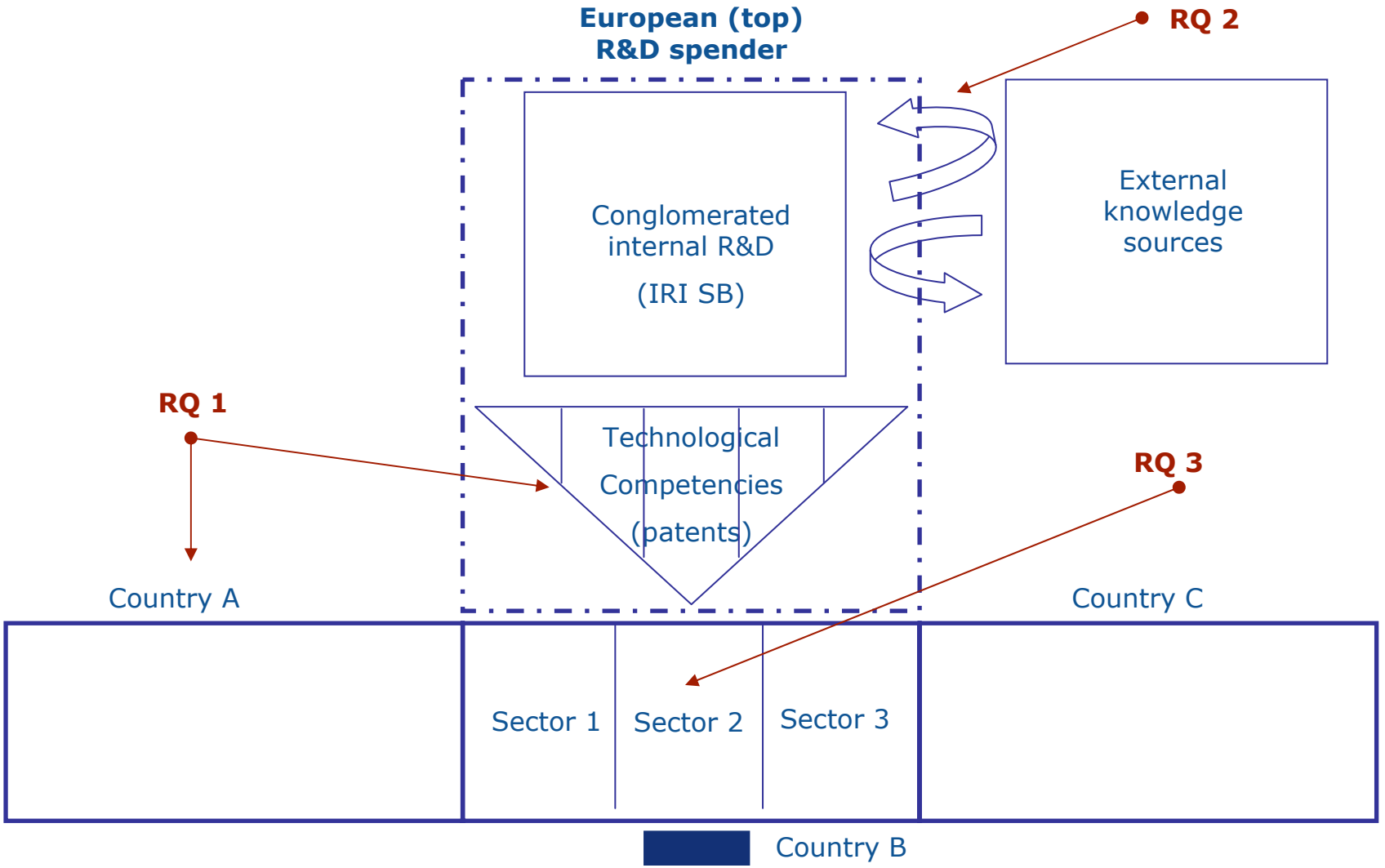
3. Prospected research lines/background

3.iii) Research backround for future research:

- **Innovation in services** and **KIBS**
  - *Methodological works*: Gallouj & Weinstein, 1997 RP, …; Miles, 2005 OHI, …; Gallouj & Savona, 2009 JEE, …
  - *Empirical works*: Muller and Zenker, 2001 RP; Evangelista and Savona, 2003 SCED; Mansury & Love, 2008 TN; …

- **R&D spillovers** and **intersectoral innovation flows**
  - *Seminal works*: Jaffe, 1986 NBER, Griliches, 1992 SJE, …; Cohen & Helpman, 1995 EER, … Momigliano & Siniscalco, 1982 BNL
  - *Recent works*: Corrocher et al., 2009 JEE; Love et al., 2011 RP; Evangelista et al., 2012 SCED
  - *In-house works*: Ciriaci & Palma, 2012 IRI-WP; Franco, Montresor & Vittucci, 2011 SCED.

3. Prospected research lines/background



4. Data sources

- **IRI Scoreboard of top R&D investors (2000 EU and extra EU)**: 2-step **integration** to overcome its limitations (*indistinguishable* technological competences and innovative locations)

  - **Orbis database (Bureau van Dijk)**: ownership structure of the SB companies (e.g. capital shares, address, sector, …);
  - **Worldwide Patent Statistical Database (PATSTAT EPO)**: terminological harmonization and identification of patent applications for SB companies.

- **Pilot** Study on the SB companies in the **ICT sector:** partnership with IS (JRC-IPTS).

4. Data sources

- **Eurostat "Community Innovation Survey"** (CIS 2008 and previous waves): microdata accessable through the Eurostat SAFE Centre in Luxembourg;

- **OECD Input-Output Tables (mid-2000s and previous waves)**: accessable via OECD data dissemination service OECD.STAT;

- **OECD ANBERD database on industrial R&D expenditure** (2009 and previous years): accessable via OECD's data dissemination service OECD.STAT.

4. Data sources

- **OECD-ORBIS (alias ORBIS plus) micro database**
- **SSD/European BusinessRegister (EBR)**
- **FATS**

4. Methodology

- **Kind of analysis**: mainly **quantitative**
  - data gathering, cleaning and organization;
  - descriptive statistics of the investigated phenomenon;
  - research hypotheses (policy relevance and scientific background)
  - econometric tests and analysis;
  - policy recommendations.

- **Unit of analysis**: mainly firm-**company** level
  - in EU, with limited country representativeness;
  - also sectoral and intersectoral analysis at country level.

- **Dissemination of the results**:
  - thematic workshops with expert groups and policy makers.