



RTA of EU regions and top R&D investors

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*EC - Joint Research Centre
Knowledge for Growth (J.2)*

Serving society
Stimulating innovation
Supporting legislation



Two research topics of IRIMA:

- 1) Technological and innovation profiles of world top R&D investors -> Scoreboard companies
- 2) The location of R&D and innovation activities of Scoreboard companies -> outward investments of EU firm's and inward investments in Europe



Role of countries/regions' technological endowment in attracting high value investments

World Corporate Top R&D Investors:
Innovation and IP bundles

ANALYSIS TRADE APPROVAL
VALU DEVELOP
CORP
TECH MARK INTEL
NOLOGY PATENT LEGTUAL
INNOVATION
INVESTMENT
CUSTOMER

A **JRC-OECD report** by Derris H., Dosso M., Hervás F., Millot V., Squicciarini M. & Vezzani A.

Published in March 2015, online at

<http://iri.jrc.ec.europa.eu/other-reports.html>

Original & unique **company-level dataset & statistics** on the innovative output (**Patents & Trademarks**) of the world top R&D investors (~ 90% of BERD)

Three main features:

I) Corporate structure (**subsidiaries**) in 2012 is used for the matching exercise.

II) **Patent applications filed at the five top IP offices (IP5) in the world** →
Patent families (reflecting groups of inventions).

III) **Trademarks & IP Bundle**

Top R&D investors and international knowledge seeking: the role of emerging technologies and technological proximity

M. Dosso and A. Vezzani

Soon available at: <http://iri.jrc.ec.europa.eu/papers15.html>

Motivation: shed new light on the internationalization of technological activities of the world's top R&D investors.

Objective: introduce 'technology indicators' (emerging technologies and technological proximity) into the firms' location framework.

Data: Scoreboard data and patent data from the IPTS-OECD joint project

Main variables of interest

$$RTA \text{ in emerging tech}_c = \frac{share_emerging_{c,05/09}}{share_emerging_{05/09}}$$

Emerging technologies -> the 4-digit IPC classes on that experienced a patent "burst" - sudden and persistent increase in the number of patents filed in the 2000s (OECD, 2013)

$$Tech. \text{ proximity} = 1 / \sqrt{\sum_{i=1}^{35} (n_{i,10/12} - c_{i,05/09})^2}$$

Technological proximity -> the inverse of the Euclidian distance (and its square) between the company and host country technological profiles (resident inventors)

Main Results



Dependent:
inventors located
in a given
country (yes/no)

	European Commission	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Log number of patents (country)		0.861*** (0.017)	0.865*** (0.017)	0.988*** (0.021)	0.996*** (0.021)	0.996*** (0.021)
RTA in emerging technologies (country)		0.632*** (0.055)	0.654*** (0.055)	0.580*** (0.073)	0.636*** (0.073)	0.508*** (0.106)
Technological proximity		0.195*** (0.018)	0.648*** (0.045)	0.171*** (0.018)	0.631*** (0.049)	0.583*** (0.057)
Technological proximity (square)			-0.033*** (0.003)		-0.033*** (0.003)	-0.033*** (0.003)
Tech. prox. # RTA in Emerging Tech.						0.052* (0.031)
Other controls				Yes	Yes	Yes
<i>Random effects</i>						
Industrial		0.168*** (0.033)	0.242*** (0.047)	0.185*** (0.043)	0.154*** (0.035)	0.152*** (0.035)
Company		2.386*** (0.103)	2.421*** (0.100)	2.479*** (0.104)	2.556*** (0.118)	2.553*** (0.118)
Observations		39,807	39,807	35,068	35,068	35,068
Number of groups		31	31	31	31	31
Chi-square		3093	3184	3034	3086	3088
Log-likelihood		-11613	-11554	-10499	-10445	-10443
LR test vs logistic (p-values)		0.000	0.000	0.000	0.000	0.000

- Top world R&D investors tend to seek international knowledge in technological areas closely related to those they master.

- Curvilinear relationship between technological proximity and the company's location decision.

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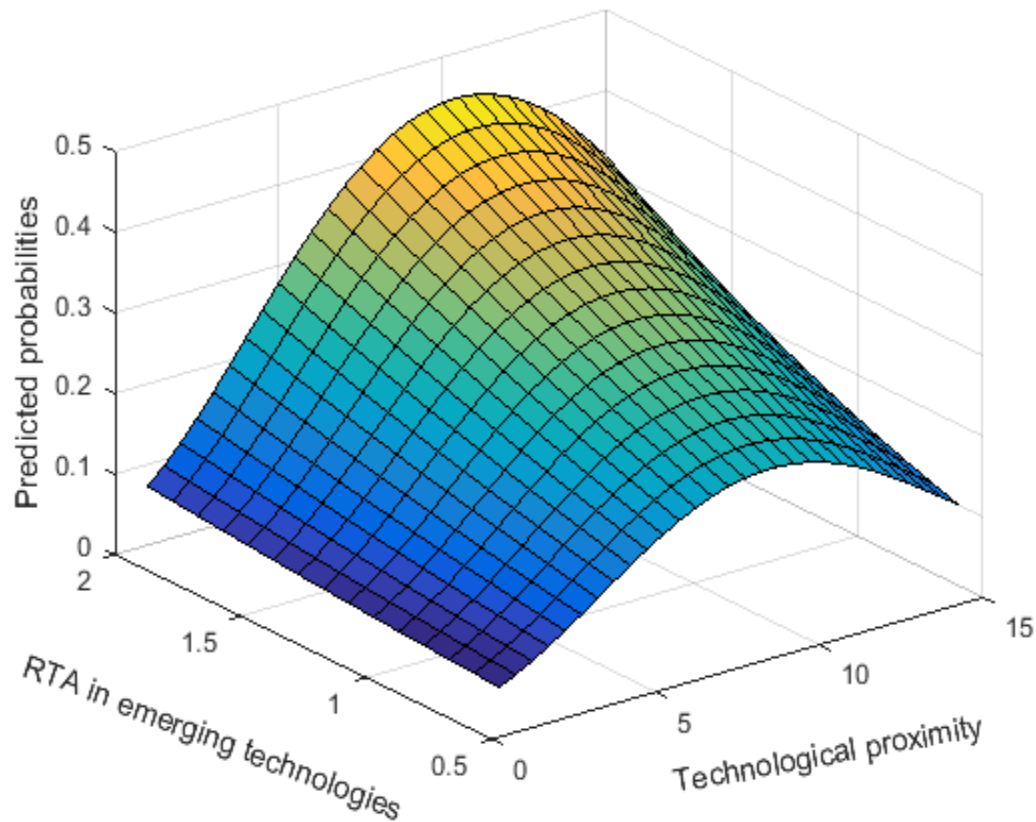
- Superior performances in emerging technologies are a key country attribute in attracting MNCs knowledge creation activities.

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- Moreover, the specialization in emerging technologies reinforces the effect of technological proximity in driving firms' location decisions.

Predicted location probabilities for different values of technological proximity (right axis) and countries revealed technological advantages in emerging technologies (left axis).



What about Smart Specialization and Regional Technological Capabilities?

"Revealed Technological Comparative Advantages and SMART Specialisations"

- (1) The technological advantages and the knowledge and innovation networks of the EU regions
- (2) The role of technological advantages for the attractiveness and economic performances of regions
- (3) Implications of the Revealed Technological Advantages of regions for the R&I strategies for smart specialisations (RIS3)



Thank you for your attention

<http://iri.jrc.ec.europa.eu/home>