European Commission

JRC POLICY BRIEF

# Boosting the EU's Attractiveness to International R&D Investments: What Matters? What Works?

Fernando Hervás, Iulia Siedschlag and Alexander Tübke*

December 2014

## 1. Introduction and Policy Challenge

It is widely acknowledged that investment in Research and Development (R&D) and innovation is key to economic growth. To adjust to rapid technological change and intensified competition, enterprises increasingly integrate their R&D and innovation activities in global production and innovation networks. Multinational enterprises (MNEs) are the main drivers of this growing internationalisation of R&D activities and the emergence of global innovation networks. While the advanced economies account for the highest share of international investment in R&D, emerging economies have attracted an increasing amount of R&D investment in recent years (OECD, 2008; Shimizutani and Todo 2008; Sachwald 2008).

Given the important role of multinational enterprises for skilled job creation, the strengthening of R&D and innovation capacity, and the transfer of new technologies, attracting foreign R&D investment is a policy priority for many governments (OECD 2011). Increasing the attractiveness of the European Union (EU) as location for international investment in R&D is part of the Europe 2020 strategy for smart, sustainable and inclusive growth. While there has been a growing interest on understanding what determines the location choice of R&D and innovation by multinational enterprises (see for example OECD, 2008; Moncada-Paternò-Castello et. al., 2011; European Commission, 2012), systematic evidence to inform European Research and Innovation (R&I) policies is still limited.

This Policy Brief is issued in the context of ***the Industrial Research and Innovation Monitoring and Analysis (IRIMA)*** project, carried out by the European Commission's Joint Research Centre (JRC) in collaboration with the Directorate General for Research and Innovation. IRIMA produces empirical evidence and analysis on the contribution of industrial R&D to the growth and employment of the European economy. The IRIMA Policy Brief series aims at presenting the results in a way that promotes policy discussion and debate, focusing on the main empirical evidence gathered and on its relevant implications for policy-makers, at EU and Member States level. More information, including activities and publications are available at: http://iri.jrc.ec.europa.eu/home

** The views expressed in this Policy Brief are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission*

Firm level evidence on the location of R&D investments of MNEs is therefore important for policymakers. The increasing internationalisation of their activities (which can affect not just manufacturing but also any part of the firms' value-chain) presents challenges and opportunities, particularly in terms of the impact on the employment and the added-value of the home- and host-countries.

This Policy Brief discusses recent evidence on patterns and trends in the internationalisation of EU corporate R&D activities and the factors which drive location choices. On the basis of this evidence, it draws implications for research and innovation policies at the EU and Member States levels aimed at increasing the attractiveness for international investment in R&D.

## 2. Evidence on Increasing Internationalisation of R&D Activities

Evidence from a recent study on R&D internationalisation [1] shows that foreign-owned firms already account for around a quarter of total business R&D in France, Germany and Spain; between 30% and 50% in Hungary, Portugal, the Slovak Republic, Sweden and the United Kingdom; and more than 50% in Austria, Belgium, the Czech Republic, Malta, and Ireland. The internationalisation of business R&D has strengthened intra-EU integration and the circulation of knowledge between EU countries. Around half of all R&D expenditure of foreign-owned firms in the EU can be assigned to firms from other EU Member States.

The above study shows evidence that the EU is an attractive R&D location for firms from outside the EU. Non-EU firms, in particular from the US, have continuously increased their R&D expenditure in the EU, especially since 2000. Despite the rising attractiveness of China and India as locations for R&D, US firms increased their R&D expenditures in the EU from 12 bn USD in 2000 to 23 bn USD in 2008. Bilateral EU-US R&D internationalisation plays a prominent role in this respect, accounting for about two thirds of all R&D expenditure of foreign-owned firms in both regions. In absolute terms, overseas R&D expenditure of US firms in the EU more than doubled between 1994 and 2008. At the same time, an increasing amount of outward R&D investment in recent years from EU-based top R&D investors has gone to emerging economies, in particular to China and India.

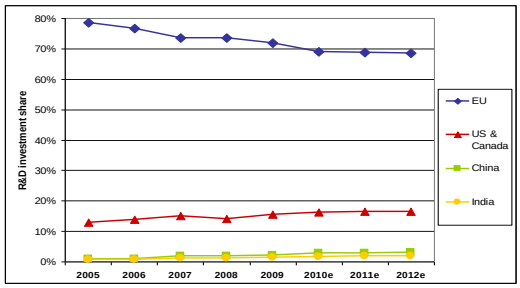
While the share of foreign firms in total business R&D decreased in the majority of countries during the crisis and the relative level of internationalisation did not recover in the period 2009-2011, the global distribution of Business Expenditures on R&D (BERD) did not change much. Both the trends in inward BERD as well as the outward investments of e.g. US companies showed a remarkable stability in the country mix. The relationship between the US and the EU with respect to investment in R&D is still strong after the crisis, while other OECD and non-OECD are gaining share. The rise of Asian countries as host and home countries of investment in R&D is slow, and did not accelerate during the crisis[2].

A survey of longer time-series trends of large EU R&D investors in 2009 has shown that these longer term trends indicate companies' participation in growth opportunities outside the EU, but not a significant erosion of their home R&D base (see Figure 1 below).

[1] "Internationalisation of business investments in R&D and analysis of their economic impact", European Commission, 2012: http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=other-studies

[2] Bernhard Dachs, Georg Zahradnik (AIT Austrian Institute of Technology, Vienna), "The internationalisation of R&D before, during and after the crisis". Presentation made at the third IRIMA Workshop on the "Internationalisation of Corporate R&D and Innovation": http://iri.jrc.ec.europa.eu/seminars.html

**Figure 1: R&D investment shares of EU-based companies between 2005 and 2012**




*Note*: Based on a 2009 survey among the 1000 EU companies of the 2008 EU Industrial R&D Investment Scoreboard, for which 63 firms provided time series. Data after 2009 were estimated (marked with "e" in the figure). Data are weighted by R&D investment and after elimination of outliers.

*Source*: European Commission (2009).

Recent evidence on foreign direct investment (FDI) projects from top R&D investors[3] also reveals that the EU plays a major role in the international economy both as the main source and destination of knowledge-intensive FDIs. Compared to other economies and regions, the EU attracts more technology-intensive projects (R&D) than resource-saving investments (manufacturing).

Table 1 shows the share of main source and destination regions in FDI projects in R&D by top investors over the period 2003-2012. The main locations for FDI projects in R&D were the BRICS countries[4] (41% of the total number of FDI projects in R&D) and the EU[5] (22% of the total number of FDI projects in R&D). The US received only 8 % of R&D projects.

With respect to the source regions of FDI projects in R&D, the US was the origin of 52% of the projects, while 26% of the projects originated from Europe, and 11% from Japan.

Further evidence shows that FDI projects in R&D are concentrated mainly in three sectors: Technology Hardware and Equipment, Automobiles & Parts, and Pharmaceuticals & Biotechnology.

**Table 1: Flows of FDIs in R&D, 2003-2012 (% of number of projects)**

| | Destination Region | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Source Region** | **Asian Tigers** | **BRICS** | **EU** | **Latin Am** | **RoW** | **South Asia** | **USA** | **Total** |
| **Asian Tigers** | 0.09 | 1.65 | 0.57 | - | 0.18 | 0.12 | 0.72 | 3.32 |
| **EU** | 2.60 | 12.39 | - | 0.84 | 3.05 | 2.12 | 4.61 | 25.61 |
| **Japan** | 1.38 | 3.92 | 2.63 | 0.03 | 0.33 | 1.14 | 2.03 | 11.46 |
| **RoW** | 0.03 | 0.39 | 0.51 | 0.03 | 0.15 | - | 0.15 | 1.26 |
| **Switzerland** | 0.42 | 1.32 | 1.20 | 0.09 | 0.45 | 0.03 | 0.51 | 4.01 |
| **USA** | 4.61 | 20.89 | 15.83 | 1.94 | 4.67 | 3.83 | - | 51.77 |
| **BRICS** | 0.09 | 0.48 | 1.11 | 0.18 | 0.33 | 0.18 | 0.21 | 2.57 |
| **Total** | 9.22 | 41.02 | 21.84 | 3.11 | 9.16 | 7.42 | 8.23 | **3,342** |

[3] The 2013 EU Industrial R&D Investment Scoreboard, European Commission 2014.

[4] Brazil, Russia, India, China, and South Africa.

[5] To ensure comparability with other world regions, intra-EU FDI flows were excluded.

All this evidence suggests that European MNEs are important players in this globalised scene of increasing international R&D flows and that Europe has remained an attractive location for these investments. At the same time, evidence shows that Europe continues to lag behind its main competitors in terms of the overall amounts invested in R&D by the business sector, mainly because it has less and smaller companies in high-tech sectors such as ICT and health. Bridging this gap is important, as these sectors are important sources of productivity and employment growth, as well as important sources of positive spillovers to the rest of the economy. Getting a better understanding of what matters for companies' location choice for their R&D investments, particularly high R&D intensive ones, is therefore relevant for policymakers that strive to find measures to promote a shift of industrial structures towards more knowledge-intensive sectors.

## 3. Boosting International Investment in R&D: What Matters?

From a company point of view, R&D location decisions are complex and subject to a large number of underlying factors. Existing evidence from survey and econometric studies uncovers those factors that matter most for the attractiveness of regions and countries to inward investment in R&D.

*Evidence from Surveys*

Thursby and Thursby (2006) report evidence from a survey on determinants of the location choice of R&D activities by multinational companies. This evidence highlights four factors that matter most: (i) market potential; (ii) quality of R&D personnel; (iii) university collaboration; and (iv) intellectual property protection. For companies locating in emerging economies, the growth potential in the market and the quality of R&D personnel were the most important factors. For companies locating in developed countries, the quality of R&D personnel and intellectual property protection were the most important factors. In addition, for more than 75 percent of the respondents, the R&D location decision was part of an expansion and, in less than 30 percent, a relocation.

As regards the motivation for the internationalisation of MNEs R&D activities, a well established literature (Dunning and Narula, 1995; Kuemmerle, 1997, 1999) has led to the distinction between two sets of factors:

- *Demand-pull factors* or home-based exploiting (HBE) activities: foreign R&D laboratories adapt technologies and products developed at home to local market conditions (regulations, standards, consumer tastes), eventually providing technological support to local subsidiaries.
- *Technology-push factors* or home-based augmenting (HBA) activities: foreign R&D laboratories are needed in order to tap into knowledge and technology sources in centres of scientific excellence located worldwide.

Furthermore, reasons to choose a particular location vary depending on the type of activity or unit. Locating an activity with stronger "Research" focus is usually based on other reasons than locating one with a stronger "Development" component (see Table 2).

**Table 2: Reasons to locate 'Research' and 'Development' in a particular location**

| Reasons to locate 'Research' | Reasons to locate 'Development' |
|---|---|
| Proximity to local universities and research parks | Local market requirements |
| Tapping informal networks | Global customers request local support |
| Proximity to centres-of-innovation | Customer proximity and lead users |
| Limited domestic science base | Cooperation with local partners |
| Access to local specialists/recruiting | Market access |

*Source: von Zedtwitz and Gassmann (2002).*

In a similar vein, the function or typology of R&D units to be located abroad is subject to a different set of determinants (see Table 3).

**Table 3: Determinants for the location of R&D by type of R&D unit**

| | **Scientific and technological supply** | **Demand** |
|---|---|---|
| **Production support unit** | Quality of formation<br><br>(engineers, technicians) | Important local market<br><br>(size, purchasing power) |
| **Global unit** | Centres of excellence<br>Quality of science-industry relations | Lead market |
| **Rationalisation unit** | Cost/efficiency of R&D activities | |

*Source: Sachwald (2004).*

In a wider context, the company considers the decision to go away from the home-base or even abroad as an alternative to staying at home, thus weighing an even larger number of factors (see Table 4).

**Table 4: Reasons for investing in R&D at home and abroad and for selecting a particular R&D location**

| | **Factors from the S&T supply perspective** | **Factors from the goods & services demand perspective** |
|---|---|---|
| **Reasons for R&D investment at home** | • Historical capabilities of the home country<br>• Economies of scale<br>• Firm is an insider in the innovation system<br>• Fewer problems of internal knowledge transfer due to geographical proximity<br>• Lesser co-ordination costs<br>• Greater control of knowledge leaks to competitors | • Leading home market |
| **Reasons for internationalising R&D** | • Centres of excellence abroad<br>• Spillovers from other firms operating in the area<br>• Access to high-quality science and engineering talent<br>• Better cost-efficiency for some activities<br>• R&D as a determinant of competitive advantage<br>• R&D asset exploiting and/or augmenting | • Adaptation to local markets<br>• Existence of leading markets abroad |
| **Reasons for selecting a particular R&D location** | • Availability of high-quality personnel<br>• Quality of education<br>• Centres of excellence<br>• Technological strengths<br>• Quality of research-industry relations<br>• Cost efficiency of qualified R&D activities<br>• Presence of other foreign firms<br>• High business R&D intensity/R&D stocks<br>• Favourable framework conditions | • Large local market (size, purchasing power)<br>• Leading market<br>• Market where innovations can be introduced with ease and support<br>• Strong intellectual property legislation |

*Source: Moncada-Paternò-Castello et. al. (2011).*

Evidence from company surveys confirms many of these location factors for R&D activities. A recent survey[6] of EU-based companies allows for a pairwise comparison of their biggest R&D sites. It shows that the biggest EU countries (Germany, France, and the United Kingdom) and the US are those with the biggest R&D sites. For sites located in the EU, attractiveness is linked to knowledge-sharing and collaboration opportunities with universities and public research organisations; the quality and quantity of R&D personnel in the labour market; proximity to other company sites; and innovation demand in terms of market size. Factors such as labour costs of R&D personnel; innovation demand via product market regulation and public procurement, were less relevant for the location of R&D in these countries.

In pairwise comparisons of the main R&D sites between the EU and the US for 37 actual cases, the quality of R&D personnel in the labour market stood out for the former whereas market size and growth were highlighted for the latter. Attractiveness for R&D sites in the US was somewhat higher than for the EU with respect to proximity to other company sites, technology poles and suppliers, and knowledge sharing opportunities with other firms. Among the 20 factors addressed, public R&D support, especially fiscal incentives, financing other (non-R&D) investments and loans and guarantees, were the lowest rated factors of attractiveness for both the EU and US as locations.

Comparing the attractiveness of the EU to that of China and India for 11 actual cases, for the EU, geographic proximity to other company sites and technology poles & incubators is an important attractiveness factor for investment in R&D. For China and India, proximity to suppliers is making these countries attractive to R&D. For EU countries, the quality of R&D personnel, knowledge sharing opportunities, Intellectual Property Rights (IPR) issues and public R&D support stand out as factors for attractiveness. For China and India, the quantity and cost of R&D personnel, and market size and growth potential are determinant for attractiveness.

It should be noted that the above findings correspond to actual cases of considerable R&D activity by very large MNEs in these countries. This is important because, while there are data and studies available for EU and the US, the data for China or India are sparse and heterogeneous despite them being considerable players in R&D internationalisation. According to official Chinese data, R&D of foreign-owned firms in China was 6.1 bn Euros in 2007, corresponding to the size of inward BERD in the UK or Japan. However, this amount does not match with the available R&D expenditure data reported by US and European firms, which are considerably lower. The data issues here are that since full reporting of Joint Ventures as R&D expenditure of foreign-owned firms is not available, there may be over-/underestimations in reported figures and the distinction between R&D and other (design or innovation activities) is not clear from the officially reported figures.

The European Commission's R&D 2013 Survey also provides interesting insights for the compared attractiveness among eight EU countries. For 152 actual cases of R&D sites located in the EU, the quality of R&D personnel and knowledge-sharing opportunities with universities and public organisations are most frequently stated. Proximity to technology poles & incubators play a role for sites in Sweden, Austria and Denmark, and quantity of R&D personnel for France, Italy and Poland. Geographic proximity to other company sites plays an important role for the location choice of foreign investment in R&D in Germany and the UK, while public R&D support via fiscal incentives appears to be important for locations in France and Spain. Less important factors for the location of R&D include: innovation demand via product market regulation (Finland, UK and Italy), and via public procurement (Belgium and Poland); market size (Austria and Denmark); market growth (France); and public R&D support via fiscal incentives (Germany and

[6] The 2013 EU Survey on Industrial R&D Investments Trends, European Commission, 2014a.

Sweden), and via financing other non-R&D investments (Spain and Italy).

***Evidence from Econometric Studies***

Econometric evidence on the determinants of the location choice of international investment in R&D identifies both demand (market access and market potential) and supply-side (factor prices) motivations. While the traditional role of foreign R&D investment has been demand-driven, linked to adapting products and services to local market conditions, knowledge-sourcing has become an important supply-driven motivation for investing in R&D internationally (Ambos 2005; Belderbos et al., 2008; Siedschlag et al., 2013). The importance of various determinants of the location choice and type of R&D investment differ in advanced and emerging economies. While both Research and Development activities are performed in advanced economies, in emerging economies, the predominant R&D activities are development and design (Shimizutani and Todo 2008).

Most existing econometric studies identify determinants of the location choice of foreign direct investment in R&D in a single country set up (for example, Frost 2001; Iwasa and Odagiri 2004; Ambos 2005; Ito and Wakasugi 2007). This empirical approach leads to biased estimates due to omitted location choices. To overcome this modelling limitation, Siedschlag et al. (2013) construct a multi-country, multi-region modelling set up to identify factors that matter for the attractiveness of foreign direct investment in R&D in the European Union. Analysing regions instead of whole countries as location alternatives is more appropriate since companies consider locations within countries. Finally, correlations among location alternatives due to unobserved location-specific characteristics are accounted for. These methodological improvements lead to more accurate estimates.

The research results indicate that, on average, the probability of an EU region to be chosen as location of R&D activities by multinational firms increased with proximity to other foreign R&D activities, and the region's knowledge base measured by human capital, proximity to centres of research excellence in the region and the region's patents intensity.

The same study finds that the determinants of the location choice of R&D activities by multinationals vary depending on the country of origin of the foreign investor. While government R&D expenditure intensity increased the probability of location of foreign R&D activities by European-based multinationals, it had no significant effect on the location of R&D activities by North American multinational firms. In comparison to European-based multinationals, the effects of patents intensity and proximity to centres of research excellence were stronger in the case of North American multinational firms.

## 4. Summary and Policy Implications

The evidence discussed above suggests that boosting international investment in R&D activities requires a combination of policy measures aimed at enhancing the knowledge base of locations, and investment promotion policies tailored to investors from different countries. While many governments still focus mainly on fiscal incentives to attract investment in R&D, the evidence discussed above indicates that these measures are perceived in most cases as the least important for the attractiveness of both the EU and US as locations for R&D investment. A more comprehensive systemic policy approach to boost inward investment in R&D would be more appropriate. This policy mix should include measures aiming at improving the efficiency of national and regional innovation systems, particularly with respect to:

- Increase the quality of education systems and skills, to enable the emergence of centres of research excellence, and to foster the innovation capacity of regions. Education systems should also promote entrepreneurship and an R&D-friendly culture.

- Facilitate the clustering of R&D activities, given the importance of proximity for knowledge spillovers. This should be complemented by measures to promote and support knowledge-exchange, mobility and collaboration between public and private actors.

Furthermore, policy-makers should also take into account the important fact that top R&D investors continue to have the majority of their R&D in their home-country, making these companies key actors of the local innovation system. Designing and implementing the right policies and measures to improve the framework conditions for conducting business and R&D (e.g. reducing red tape, adequate IPR conditions) and improve the functioning of the internal market, remain key factors to increase the level of business R&D investments in Europe.

Finally, evidence shows that innovative enterprises integrated in global production and innovation networks are likely to drive the European innovation-based growth in the next decade (Sachwald 2013; Veugelers 2013). Understanding the drivers and the effects of enterprises' integration in global value chains is key to informed policies aimed at competitiveness at firm, country and European levels.

To this purpose, further analysis to be undertaken by the European Commission (in the context of the IRIMA research project) will address the following policy relevant questions:

- What are the emerging sectoral and geographical patterns and trends of inward foreign investment in R&D in Europe and outward investment in R&D by European firms?
- What determines the decision of European firms to invest in R&D abroad and which types of enterprises are more likely to offshore R&D?
- What determines foreign acquisition by top R&D investors and what impact do they have on their R&D investment and innovation?
- What is the impact of inward foreign investment in R&D on innovation, productivity and employment in the host country?
- What effects does outward investment in R&D have on parent innovation, productivity and employment?

## References


Ambos, B., (2005), Foreign Direct Investment in Industrial Research and Development: A Study of German MNCs, Research Policy, 34: 395-410.

Belderbos, R., E. Lykogianni, R. Veugelers (2008), "Strategic R&D Location in European Manufacturing Industries", Review of World Economics, 144(2): 183-206.

Dunning, J. and R. Narula (1995), The R&D Activities of Foreign Firms in the United States, International Studies of Management & Organization, 25(1–2): 39–73.

European Commission (2009), The 2009 EU Survey on R&D Investment Business Trends, JRC-IPTS

European Commission (2012), Internationalisation of Business Investment in R&D, European Commission, Directorate General for Research and Innovation.

European Commission (2014), The 2013 EU Industrial R&D Investment Scoreboard, JRC- ITPS

Frost, T. S. (2001), "The Geographic Sources of Foreign Subsidiaries' Innovations", Strategic Management Journal, 22: 101-123.

Ito, B., and R. Wakasugi (2007), "What Factors Determine the Mode of Overseas R&D by Multinationals? Empirical evidence", Research Policy 36: 1275-1287.

Iwasa, T., and H. Odagiri (2004), "Overseas R&D, Knowledge Sourcing, and Patenting: An Empirical Study of Japanese R&D Investment in the US", Research Policy 33: 807-828.

Kuemmerle, W. (1997), Building Effective R&D Capabilities Abroad, Harvard Business Review, March-April: 61–70.

Kuemmerle, W. (1999), "Foreign Direct Investment in Industrial Research in the Pharmaceutical and Electronic Industries – Results from a Survey of Multinational Firms", Research Policy, 28, 179-193.

Kumar, N. (2001), "Determinants of Location of Overseas R&D Activity of Multinational Enterprises: The Case of US and Japanese Corporations", Research Policy, 30, 159-174.

Moncada-Paternò-Castello, P., Vivarelli, M., Voigt, P. (2011): "Drivers and Impacts of the Gobalization of Corporate R&D: An Introduction Based on the European Experience", Industrial and Corporate Change, Vol. 20 (1), pp. 585-603.

OECD (2008) The Internationalisation of Business R&D: Evidence, Impacts and Implications, Paris: OECD.

OECD (2011) Attractiveness for Innovation: Location Factors for International Investment, Directorate for Science, Technology and Industry, Paris: OECD.

Sachwald, F. (2004), "Globalization of Innovation Networks - The Case of French Firms", Proceedings to the 32nd Annual EIBA Conference Copenhagen.

Sachwald, F. (2008), "Location Choice within Global Innovation Networks: The Case of Europe", Journal of Technology Transfer, 33: 364-378.

Sachwald, F. (2013) "The Development of Global Innovation Networks", in Global Innovation Networks, High Level Economic Expert Group Innovation for Growth i4g, European Commission, DG Research and Innovation, Luxembourg: Publications Office of the European Union, pp. 143, 168.

Shimizutani, S., and Y. Todo (2008), "What Determines Overseas R&D Activities? The Case of Japanese Multinational Firms", Research Policy, 37: 530-544.

Siedschlag, I., D. Smith, C. Turcu, X. Zhang (2013), "What Determines the Location Choice of R&D Activities by Multinational Firms?", Research Policy, 42: 1420-1430.

Thursby, J. and M. Thursby (2006), Here or There: A Survey of Factors in Multinational R&D Location, Report to the Government-University-Industry Research Roundtable, The National Academies Press, Washington.

von Zedtwitz, M. and O. Gassmann (2002), Market versus technology drive in R&D internationalization: Four different patterns of managing research and development, Research Policy, 31: 569–88.

Veugelers, R. (2013) "Innovative Firms in the Global Value Chain", in Global Innovation Networks, High Level Economic Expert Group Innovation for Growth i4g, European Commission, DG Research and Innovation, Luxembourg: Publications Office of the European Union, pp. 39-52.

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

**Contact information**
Fernando Hervás
Address: Edificio Expo. c/ Inca Garcilaso, 3. E-41092 Seville (Spain)
E-mail: jrc-ipts-secretariat@ec.europa.eu
Tel.: +34 9544 88 463
Fax: +34 9544 88 326

https://ec.europa.eu/jrc
https://ec.europa.eu/jrc/en/institutes/ipts

This publication is a Technical Report by the Joint Research Centre of the European Commission.



JRC92084

EUR 26877 EN
ISBN 978-92-79-43547-8 (PDF)
ISSN 1831-9424 (online)
doi:10.2791/13382

Luxembourg: Publications Office of the European Union, 2014



2014 – 10 pp. – 21.0 x 29.7 cm

**Abstract**
This Policy Brief discusses recent evidence on patterns and trends in the internationalisation of EU corporate R&D activities and the factors which drive location choices. This evidence suggests that boosting international investment in R&D activities requires a combination of policy measures aimed at enhancing the knowledge base of locations, and investment promotion policies tailored to investors from different countries. The policy mix should include measures aiming at improving the efficiency of national and regional innovation systems, particularly through: a) Increasing the quality of education systems and skills, to enable the emergence of centres of research excellence, b) Facilitating the clustering of R&D activities, given the importance of proximity for knowledge spillovers.

LF-NA-26877-EN-N

## JRC Mission

As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new methods, tools and standards, and sharing its know-how with the Member States, the scientific community and international partners.

*Serving society*
*Stimulating innovation*
*Supporting legislation*

Publications Office

Doi:10.2791/13382
ISBN 978-92-79-43547-8