



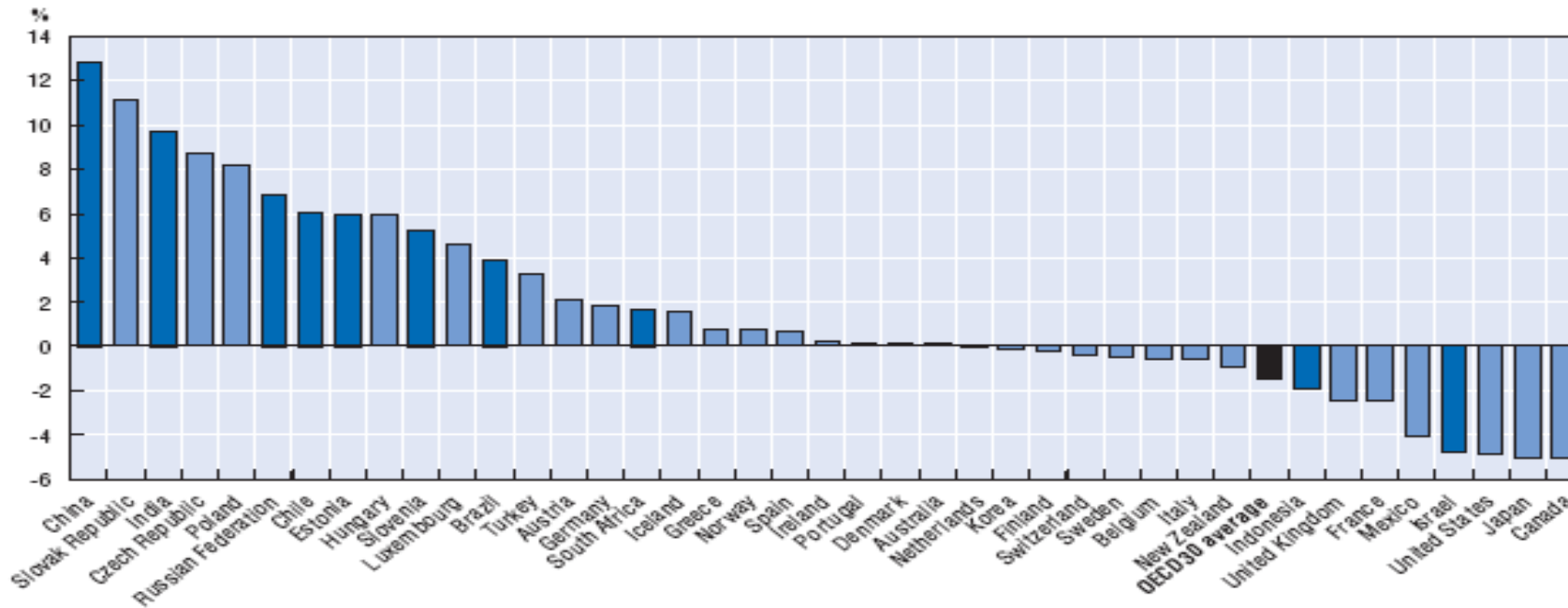
Globalisation and R&D localisation: what can IRIMA offer?

**Joint Research Centre – IPTS
Knowledge for Growth Unit**

Brussels, 4 December 2012

- **A new flavour to global markets from emerging countries:**

Figure C.6.1. **World export market shares in goods and services**
Average annual growth rate 2000-07, current prices, in percentage



Source: OECD 2010 Economic Globalisation Indicators

- **What does this mean for R&D?**
- **Are the dynamics of globalisation a source of concern for the EU (de-localisation)?**

Theoretical background

- R&D as a determinant of competitive advantage (Griliches, 1998; Mansfield, 1965; Scherer, 1965)
- Asset exploiting vs. asset augmenting R&D strategies (Dunning and Narula, 1995; Kuemmerle, 1997)
- Technological strengths of the countries with respect to those of the company (Patel and Vega, 1999; Le Bas and Sierra, 2002)
- Lowering costs of qualified research, especially in emerging countries (UNCTAD, 2005)
- Institutional factors: public support to R&D, IPR system; quality of technological infrastructures; macroeconomic and political stability

Reasons for investing in R&D at home and abroad and for selecting a particular R&D location

	Factors from the S&T <u>supply</u> perspective	Factors from the goods & services demand perspective
Reasons for R&D investment at home	<ul style="list-style-type: none"> ♦ Historical capabilities of the home country ♦ Economies of scale ♦ Firm is an insider in the innovation system ♦ Fewer problems of internal knowledge transfer due to geographical proximity ♦ Lesser co-ordination costs ♦ Greater control of knowledge leaks to competitors 	<ul style="list-style-type: none"> ♦ Leading home market
Reasons for internationalising R&D	<ul style="list-style-type: none"> ♦ Centres of excellence abroad ♦ Spillovers from other firms operating in the area ♦ Access to high-quality science and engineering talent ♦ Better cost-efficiency for some activities ♦ R&D as a determinant of competitive advantage ♦ R&D asset exploiting and/or augmenting 	<ul style="list-style-type: none"> ♦ Adaptation to local markets ♦ Existence of leading markets abroad
Reasons for selecting a particular R&D location	<ul style="list-style-type: none"> ♦ Availability of high-quality personnel ♦ Quality of education ♦ Centres of excellence ♦ Technological strengths ♦ Quality of research-industry relations ♦ Cost efficiency of qualified R&D activities ♦ Presence of other foreign firms ♦ High business R&D intensity/R&D stocks ♦ Favourable framework conditions 	<ul style="list-style-type: none"> ♦ Large local market (size, purchasing power) ♦ Leading market ♦ Market where innovations can be introduced with ease and support ♦ Strong intellectual property legislation

Impact of R&D globalisation

Impact	On host country	On home country
Positive	<ul style="list-style-type: none"> ▪ Increased local technical capability ▪ Knowledge & economic spillover ▪ Better tailored products ▪ Productivity increases ▪ Employment and sales growth 	<ul style="list-style-type: none"> ▪ Access to other sources of expertise and innovation ▪ Enhance access to foreign markets (sales growth) ▪ Results of R&D abroad may be exploited at home, producing economic benefits ▪ Prolong the life cycle of existing goods/services
Negative	<ul style="list-style-type: none"> ▪ Foreign control over domestic R&D resources ▪ Results may be exploited elsewhere; loss of economic benefit ▪ Decrease in R&D impact if the link with production gets weaker 	<ul style="list-style-type: none"> ▪ Loss of technical capability ▪ Hollowing out of industries ▪ Loss of economic benefits if results are exploited only locally ▪ Negative impact on industrial diversification ▪ Loss of jobs in the short-term

Source: IPTS WP 02/2011 prepared from different sources

Data and background

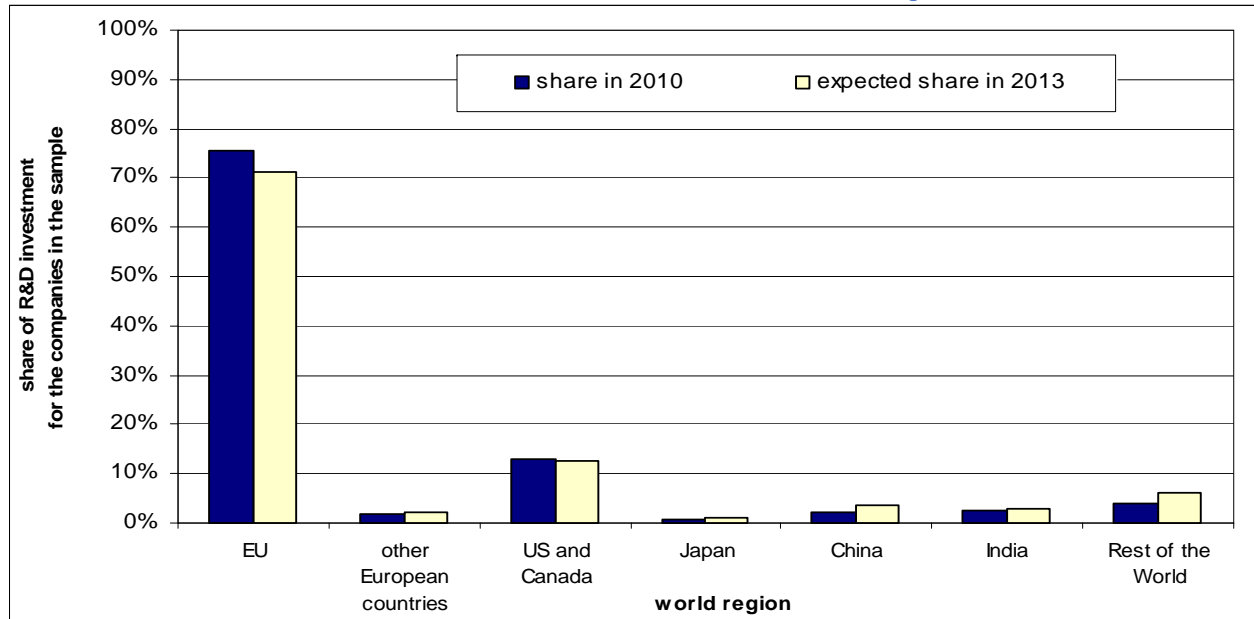
- Official data (BERD) and EU Industrial R&D Investment Scoreboard : **two main sources for assessing R&D activities in the private sector**
 - **But they are limited with respect to trends in R&D internationalisation:**
 - **EU R&D Scoreboard:** geographical location where companies execute their R&D investment is unknown
 - **BERD:** all R&D carried out in a given territory irrespective of the nationality of the R&D performer, difficulty to measure flows (especially outward data)
- ⇒ EU Survey on R&D Investment Business Trends



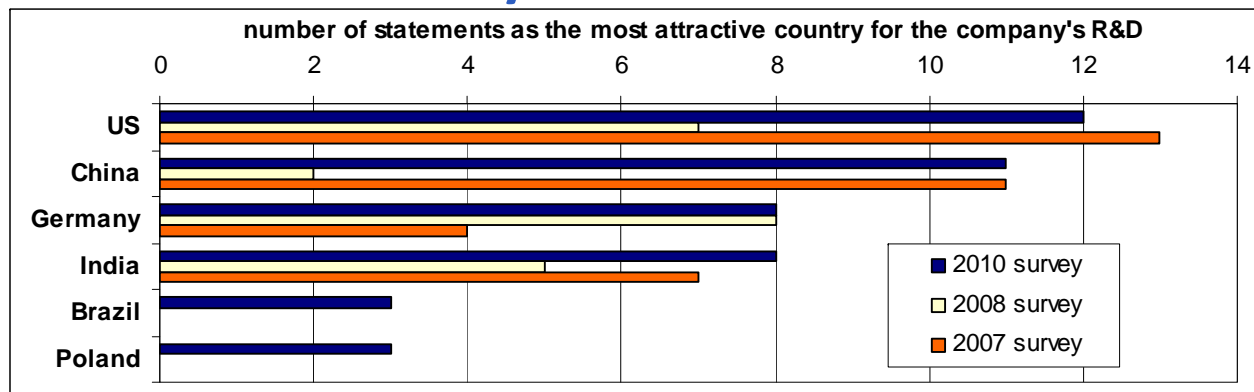
IRIMA Surveys on Industrial R&D Investment Trends

- **Since 2005, the annual Survey questionnaires collect ex-ante expectations and qualitative statements of the 1000 EU Scoreboard companies.**
- **2012 main results:**
 - the 187 responding companies invested €56 billion, around **40% of the total R&D investments** by the 1000 EU Scoreboard companies
 - R&D investments are expected to **increase by an average of 4% annually over 2012-2014**, similar to the trend observed before the 2008 crisis
 - among other questions on collaboration and innovation, the companies signal **strong positive effects of national and EU public support** valuing in particular: fiscal incentives, grants and public private partnerships

- R&D investment shares in 2010 and expected in 2013:

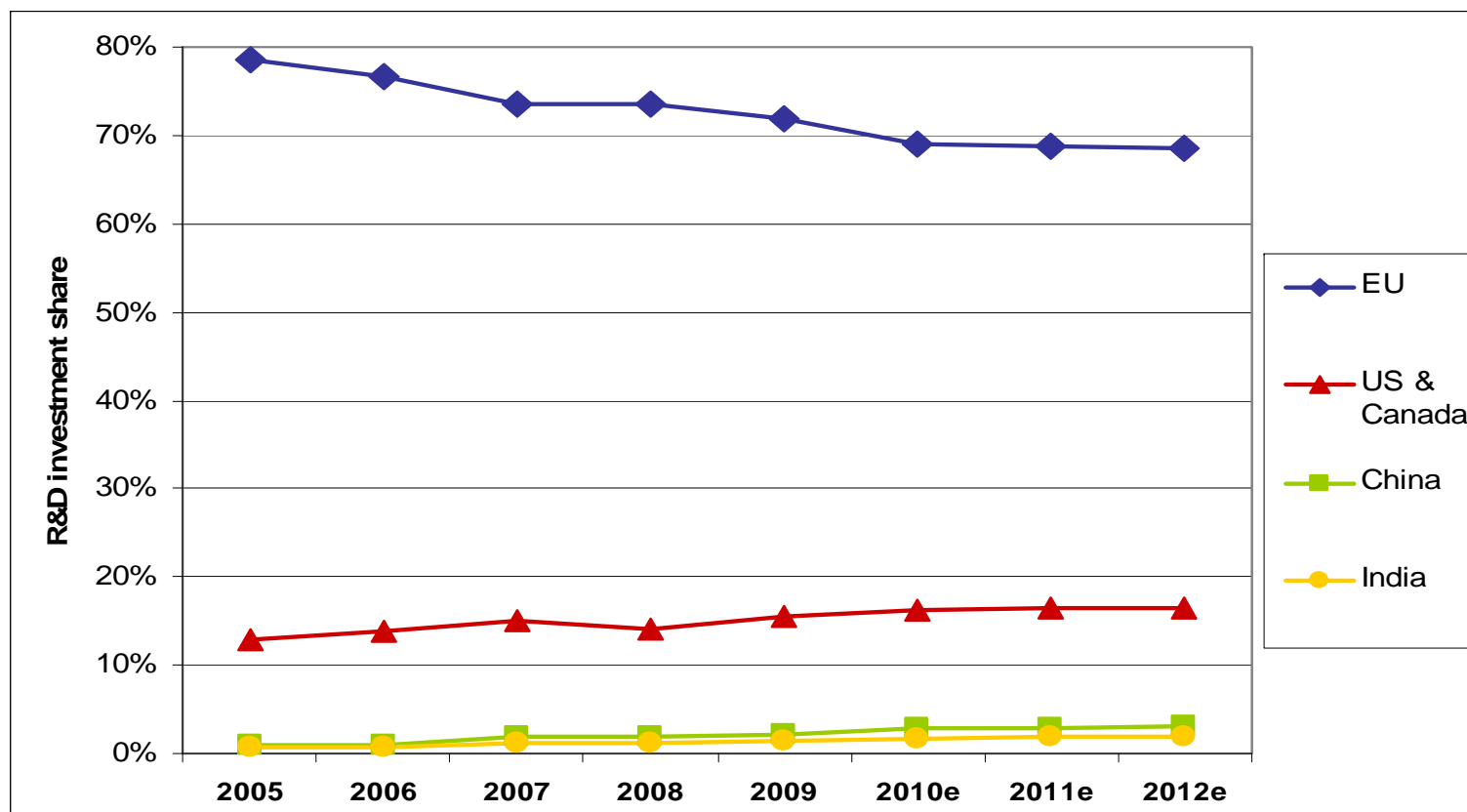


- Most attractive country for R&D outside the home country:



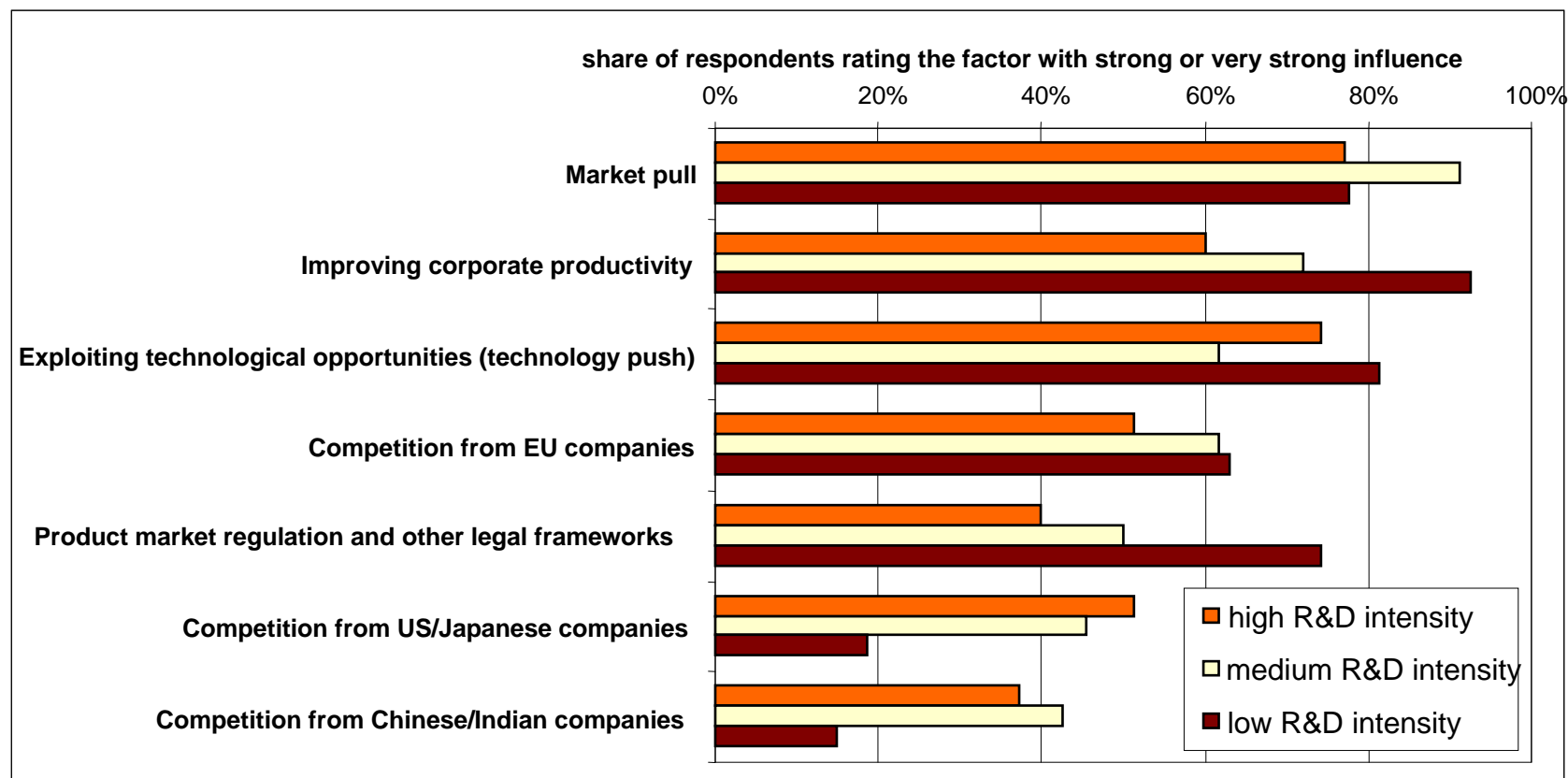
R&D globalisation in the Surveys: a concern?

- Longer term trends show companies' participation in growth opportunities outside the EU, but not erosion of the R&D base



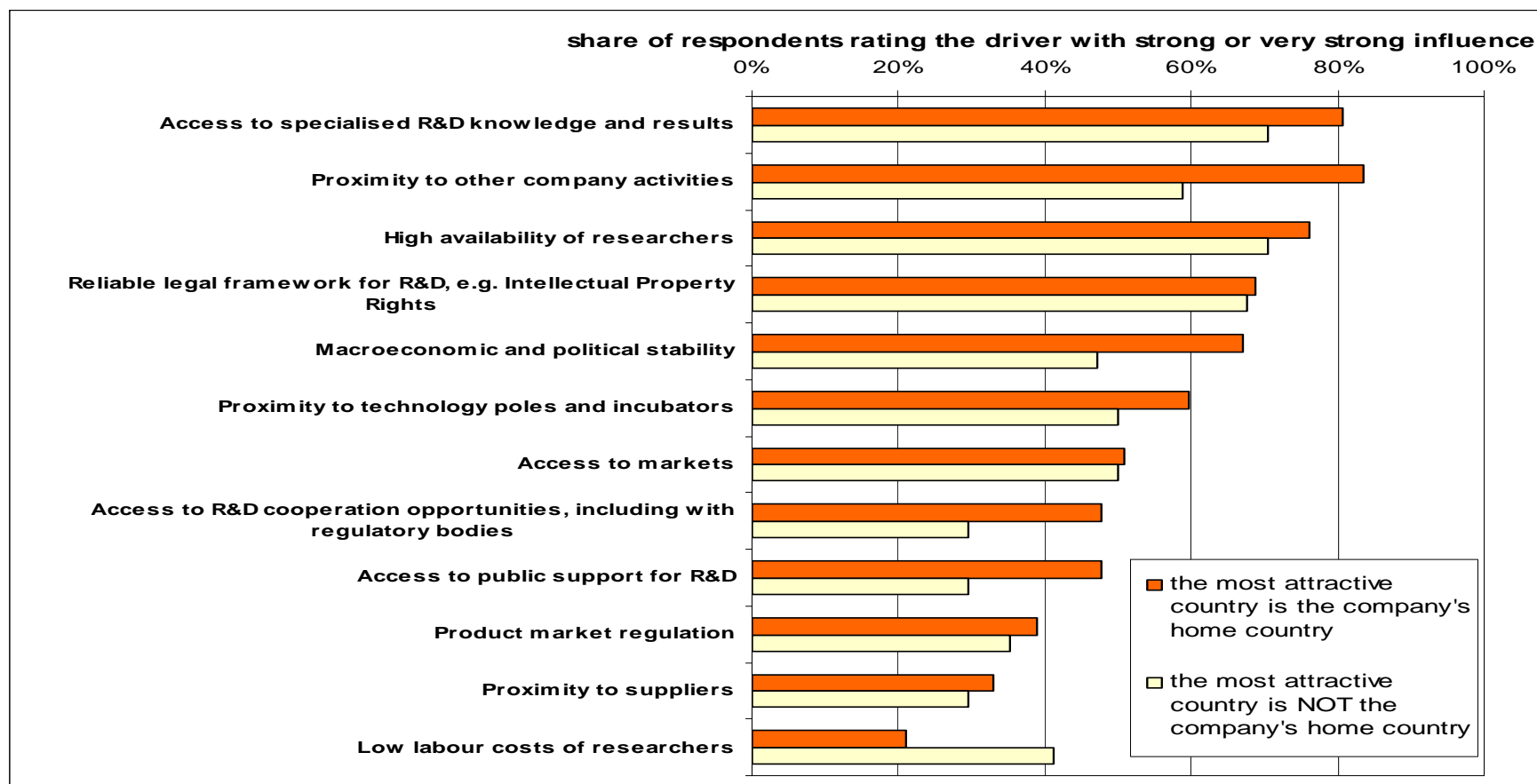
Source: 2009 Survey

Drivers for increasing R&D investment



Source: 2009 Survey

Country factors for R&D investment

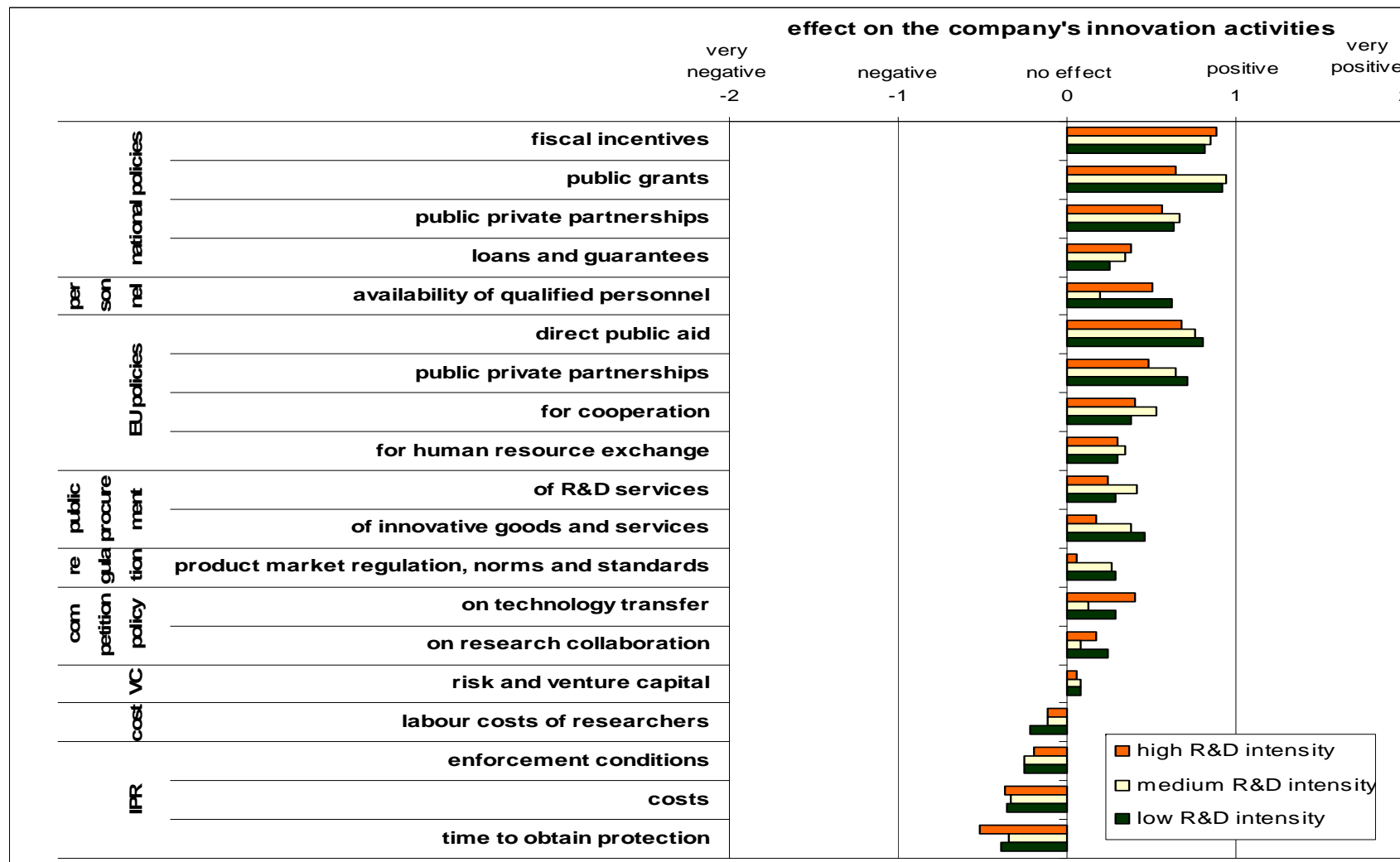


Source: 2009 Survey



European Commission

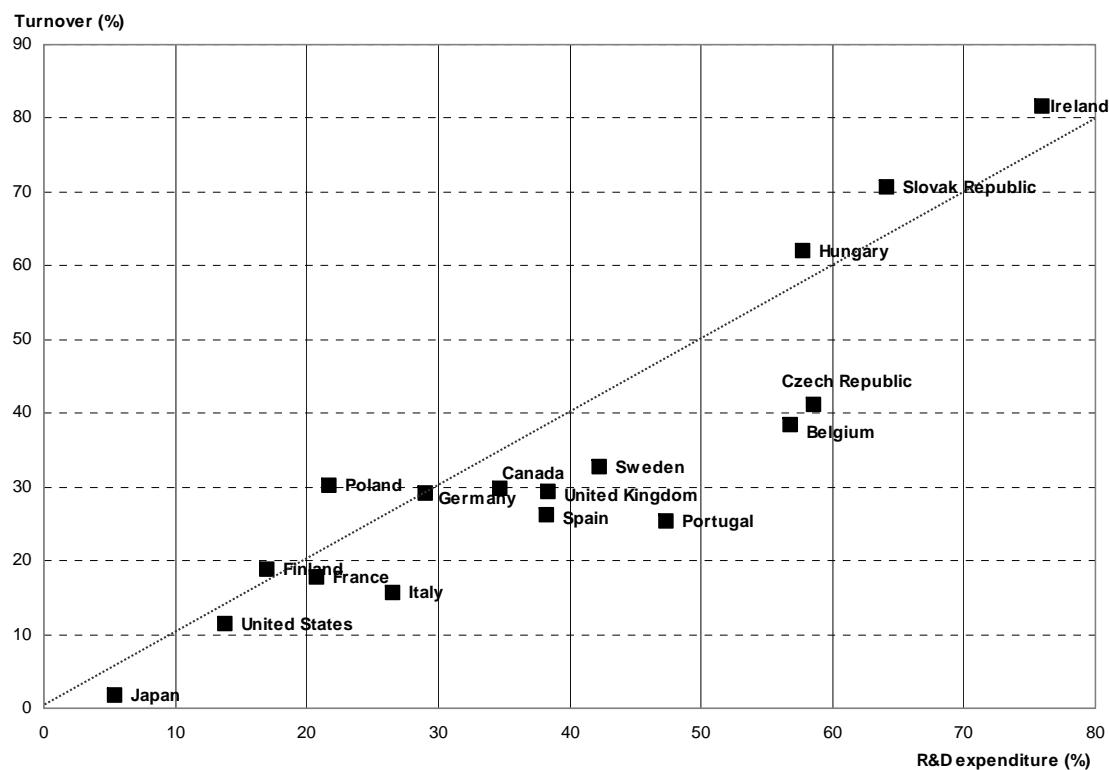
Factors and policies for the company's innovation





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- **In most countries the share of foreign affiliates in total R&D manufacturing expenditure is higher than their share in total manufacturing turnover**



which suggests that research is nowadays more internationalised than production

Source: IPTS WP 02/2011 and OCED 2009

Policy implications

- Companies tend to keep a strong focus on their homebase, R&D globalisation should be seen as opportunity rather than treat
- While affiliates of foreign firms tend to do more R&D, innovate more and get higher returns from doing so than purely domestic firms, this is not necessarily due to foreign ownership but to the larger and more internationalised nature of these companies and their embeddedness in the innovation system.
- Two complementary policy strategies:
 - ***a) favour internationalisation of businesses, especially SMEs including R&D, and***
 - ***b) attract private R&D investment in a given territory***

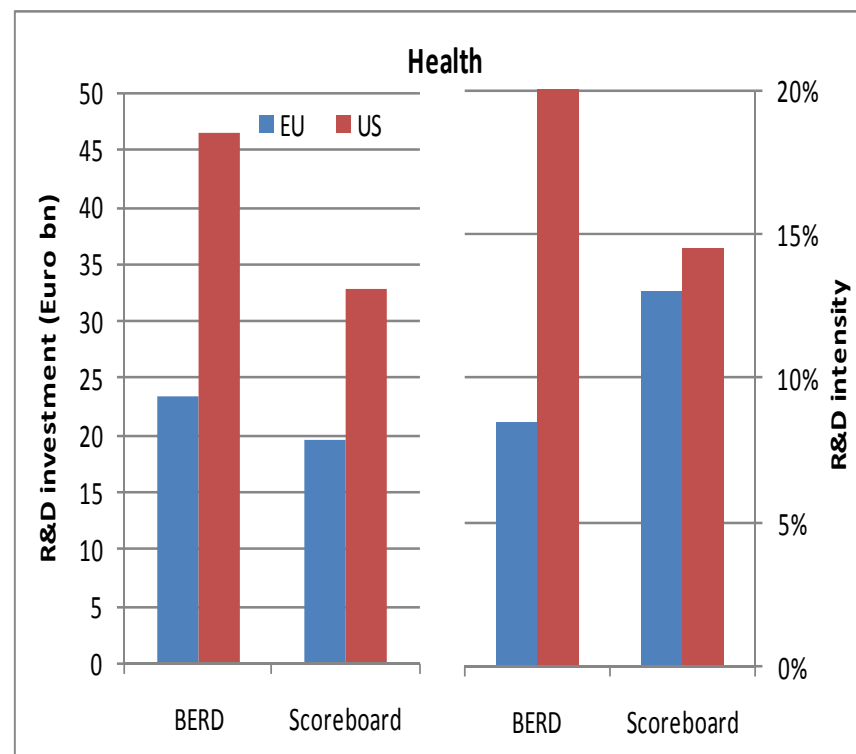
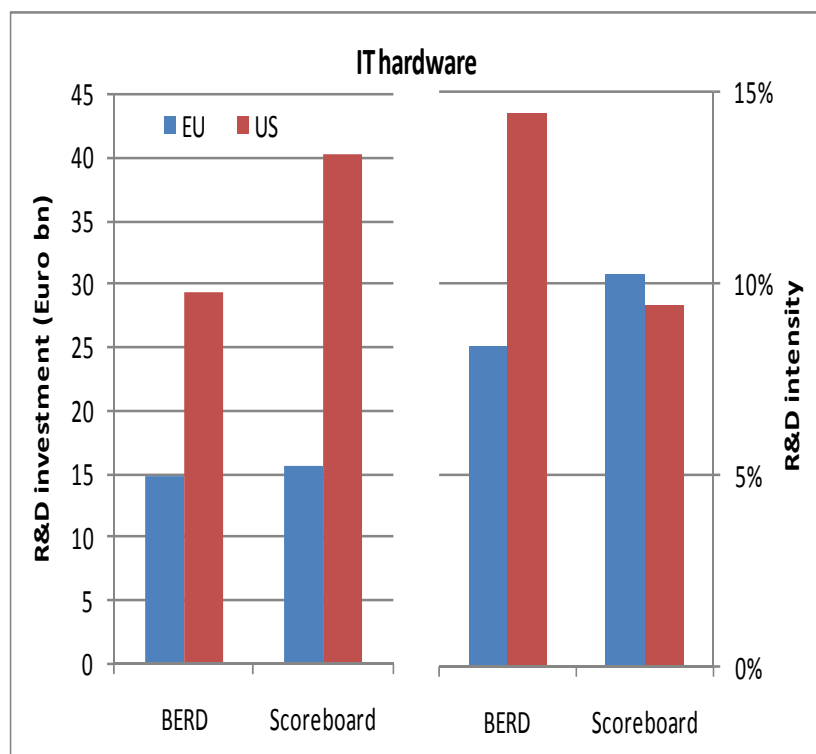
Measurement issues

- For official statistics (BERD, FATS) there is considerable less outward than inward data.
- Even with Scoreboard and Survey data, it is virtually impossible to exactly measure flows.
- Since new Scoreboard data are available since 2012, it was possible to improve the Scoreboard data time series in length (9 years) and take into account changes in:
 - ***Corporate structure,***
 - ***Reporting currencies, and***
 - ***Reporting dates.***
- These allow a better comparison with official statistics and global trends.



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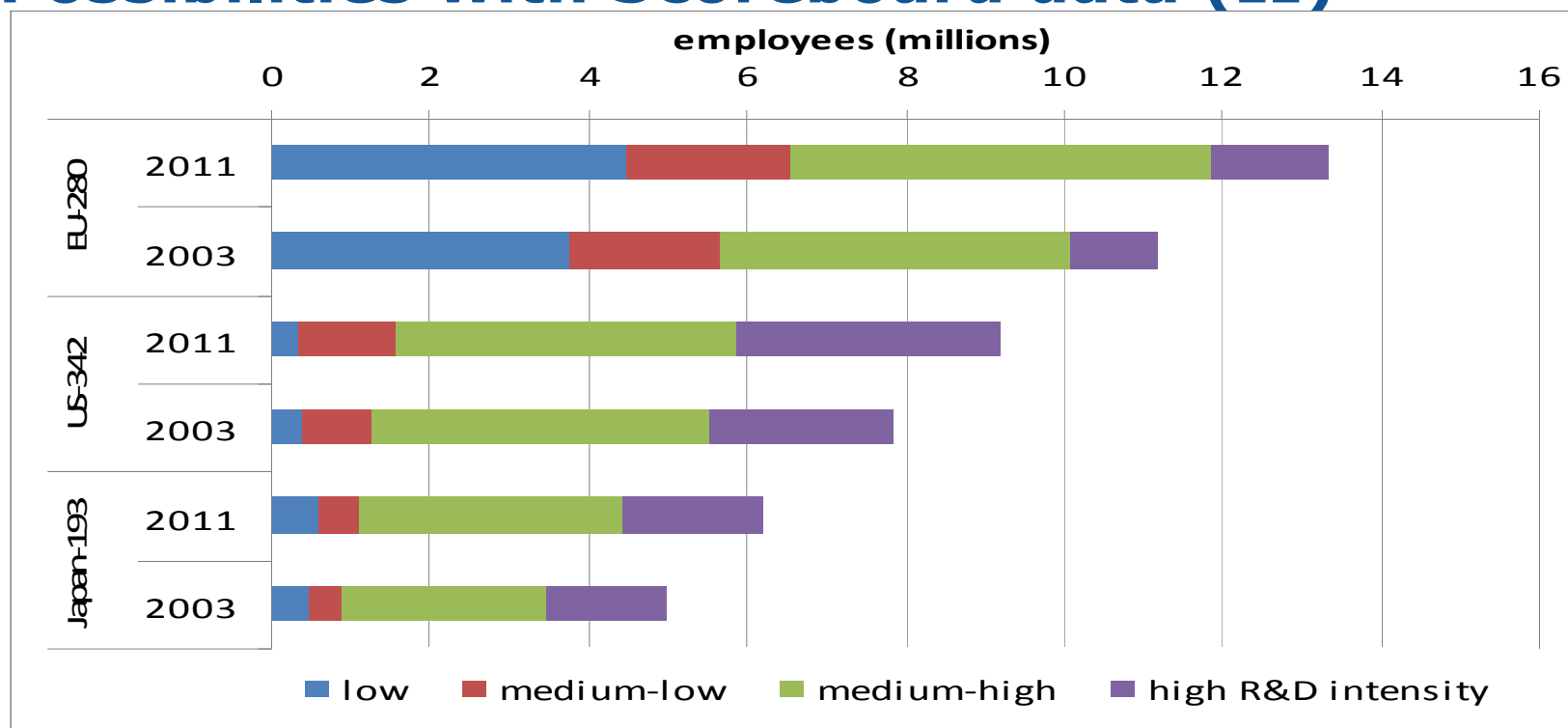
Potential with Scoreboard data (I)



The US attracts considerable R&D from foreign companies in health (pharma) and keeps substantial amounts from their ICT companies, the EU needs to further increase its attractiveness as location for FDI on R&D in both sectors

Source: IPTS 2012 Scoreboard

Possibilities with Scoreboard data (II)



Source: IPTS 2012 Scoreboard

Among the Scoreboard companies, the high R&D intensity sectors were leading employment generation between 2003-2011



Thank you very much!

<http://iri.jrc.es/index.htm>

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C. R&D location strategy

- Please estimate the distribution of your company's in-house R&D activity among the following world regions at present and in three years?

Present distribution	R&D carried out:	Expected distribution in three years
%	in the European Union	%
%	in other European countries	%
%	in the US and Canada	%
%	in Japan	%
%	in China	%
%	in India	%
%	in the Rest of the World	%

- Which country do you consider the *most attractive* location for the company's R&D?

⇒ _____

Source: 2010 and 2009 Surveys

1. What was your company's R&D investment in the past? *Please estimate the amounts which should not be directly available.*

	2005	2006	2007	2008
R&D investment (€ million)				

2. Please estimate your company's R&D investment in the future?

Rationale: Periodicity based upon current context and expected trends.

	2009	2010	2011	2012
R&D investment (€ million)				

3. Please estimate the geographic distribution of your company's R&D investment for the following years?

Rationale: company based in country X is doing R&D in country Y.

R&D carried out:	in 2005	in 2006	in 2007	in 2008	in 2009	in 2010	in 2011	In 2012
in the European Union	%	%	%	%	%	%	%	%
in Switzerland	%	%	%	%	%	%	%	%
in other European countries	%	%	%	%	%	%	%	%
in the United States & Canada	%	%	%	%	%	%	%	%
in Japan	%	%	%	%	%	%	%	%
in China	%	%	%	%	%	%	%	%
in India	%	%	%	%	%	%	%	%
in South Korea	%	%	%	%	%	%	%	%