PROFILING REGIONAL INNOVATION REALITIES: CONSIDERATIONS IN LIGHT OF GLOBAL TRENDS

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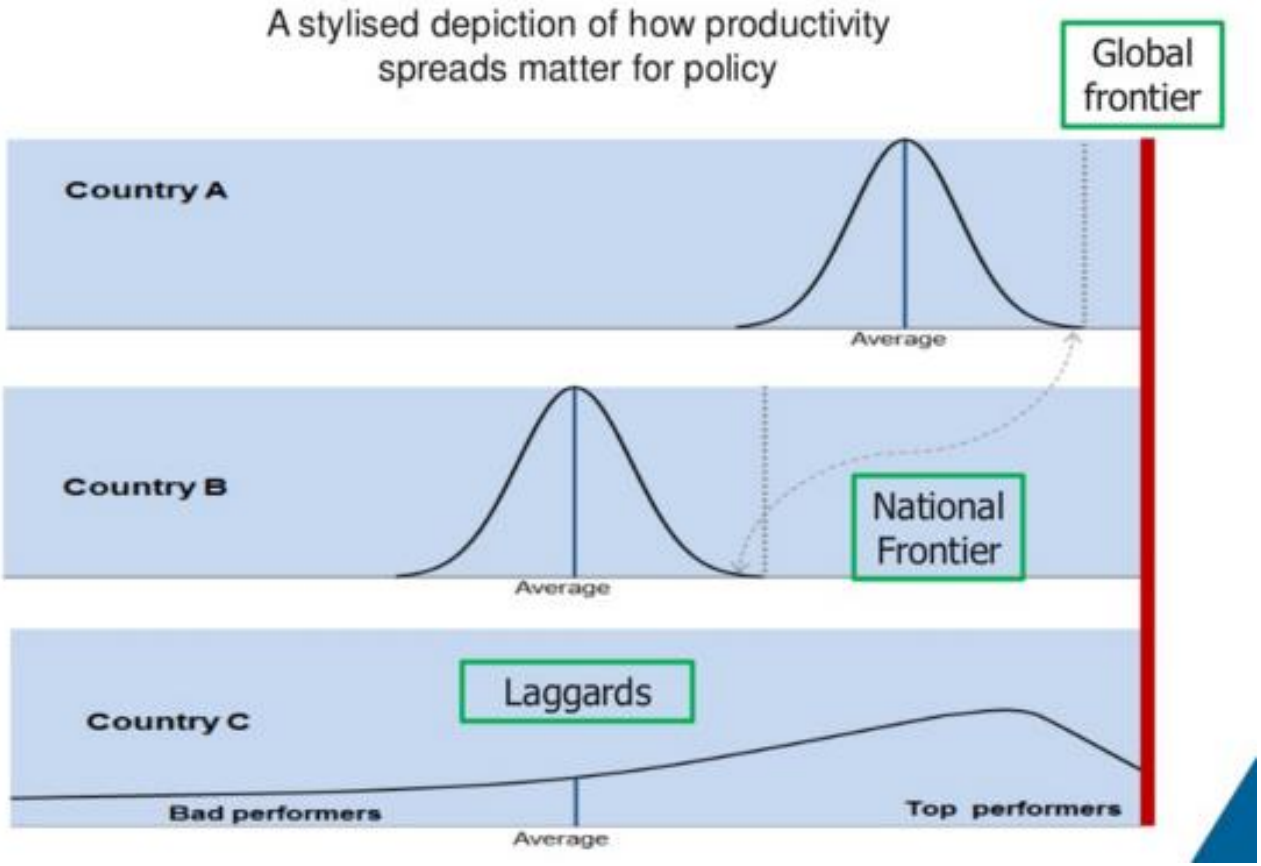
OECD
BETTER POLICIES FOR BETTER LIVES

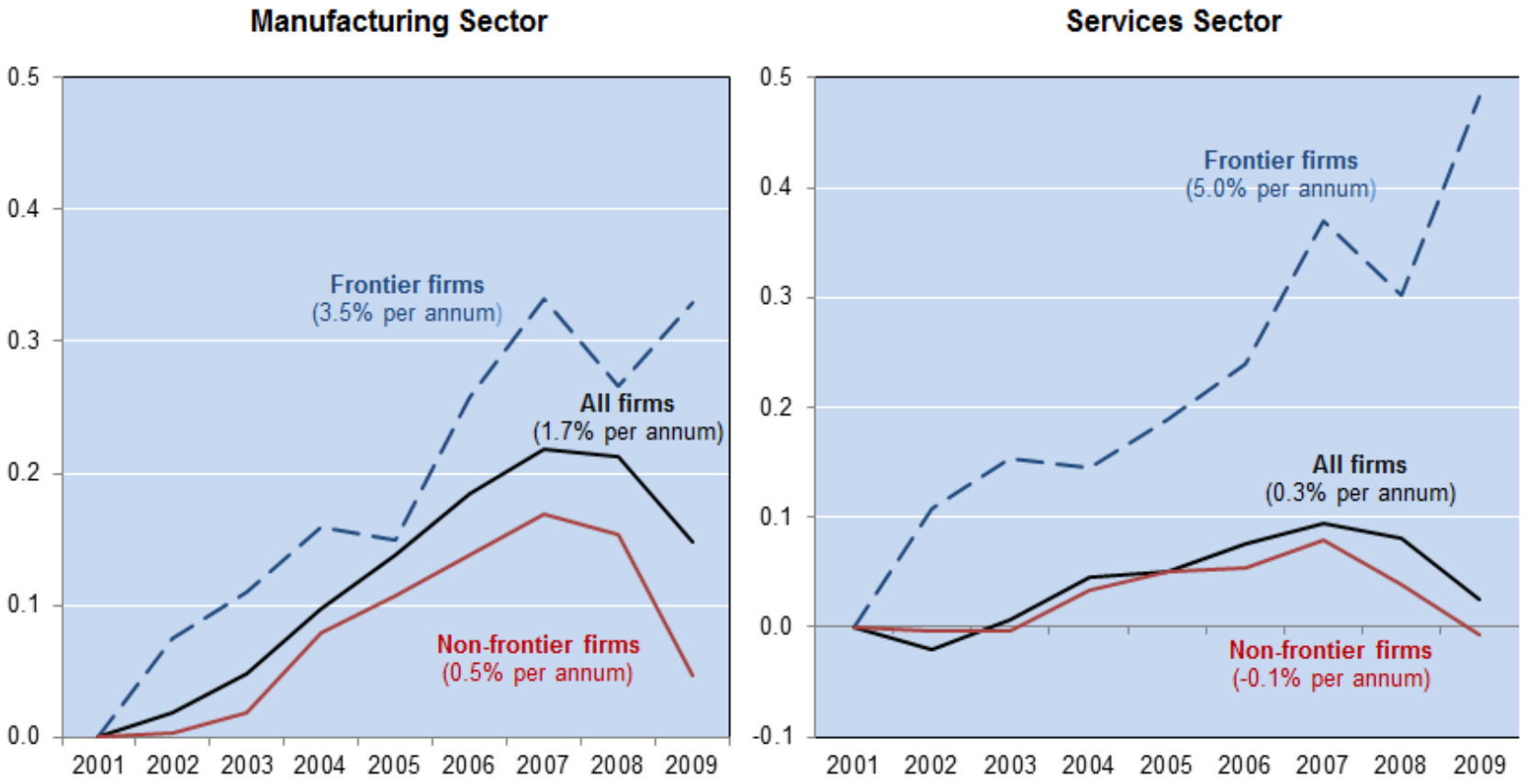
Some recent OECD work on innovation and innovation policy

Future of productivity:
The problem is not innovation, it is diffusion



An increasing gap between firms at the frontier and the others

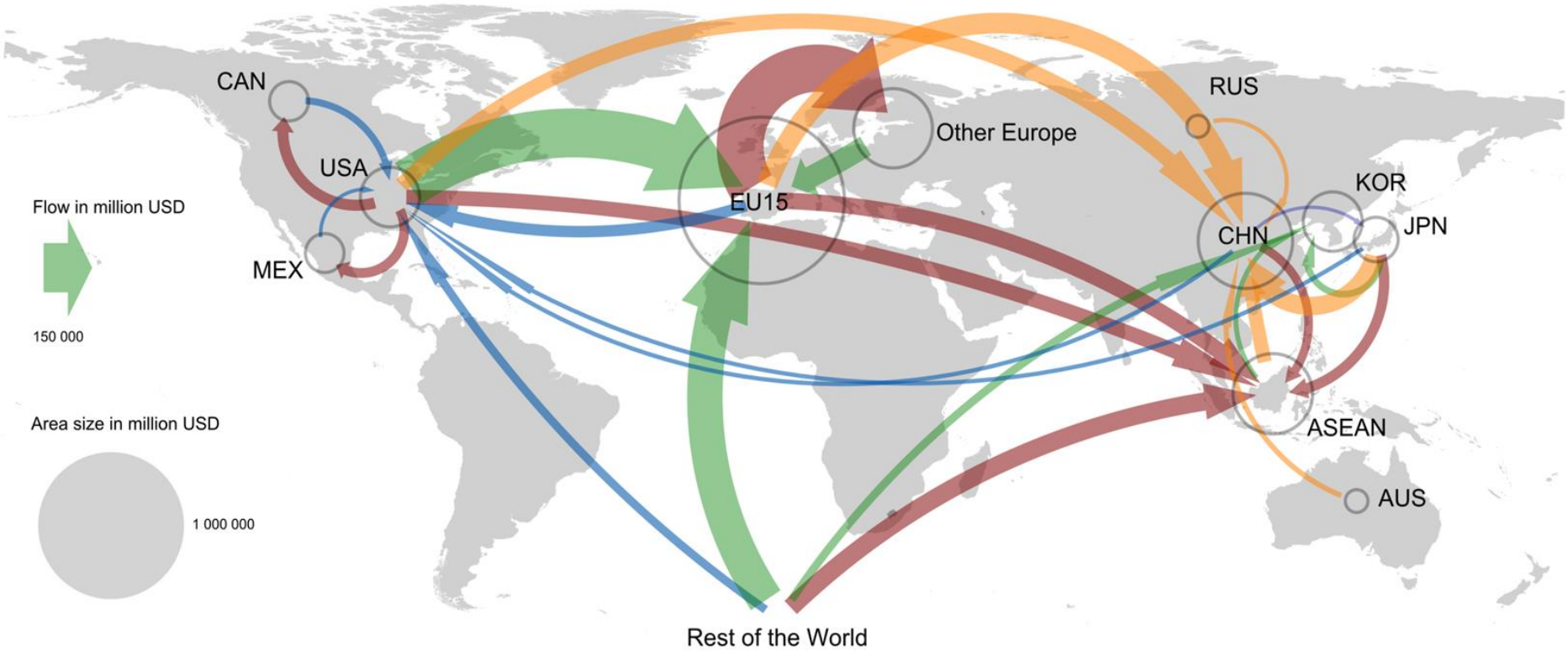
Labour productivity; index 2001=0



Source: Andrews, D. C. Criscuolo and P. Gal (2015), "Frontier firms, technology diffusion and public policy: micro evidence from OECD countries", OECD.
OECD (2015), *The Future of Productivity*, OECD.

TIVA: trade *in value added*

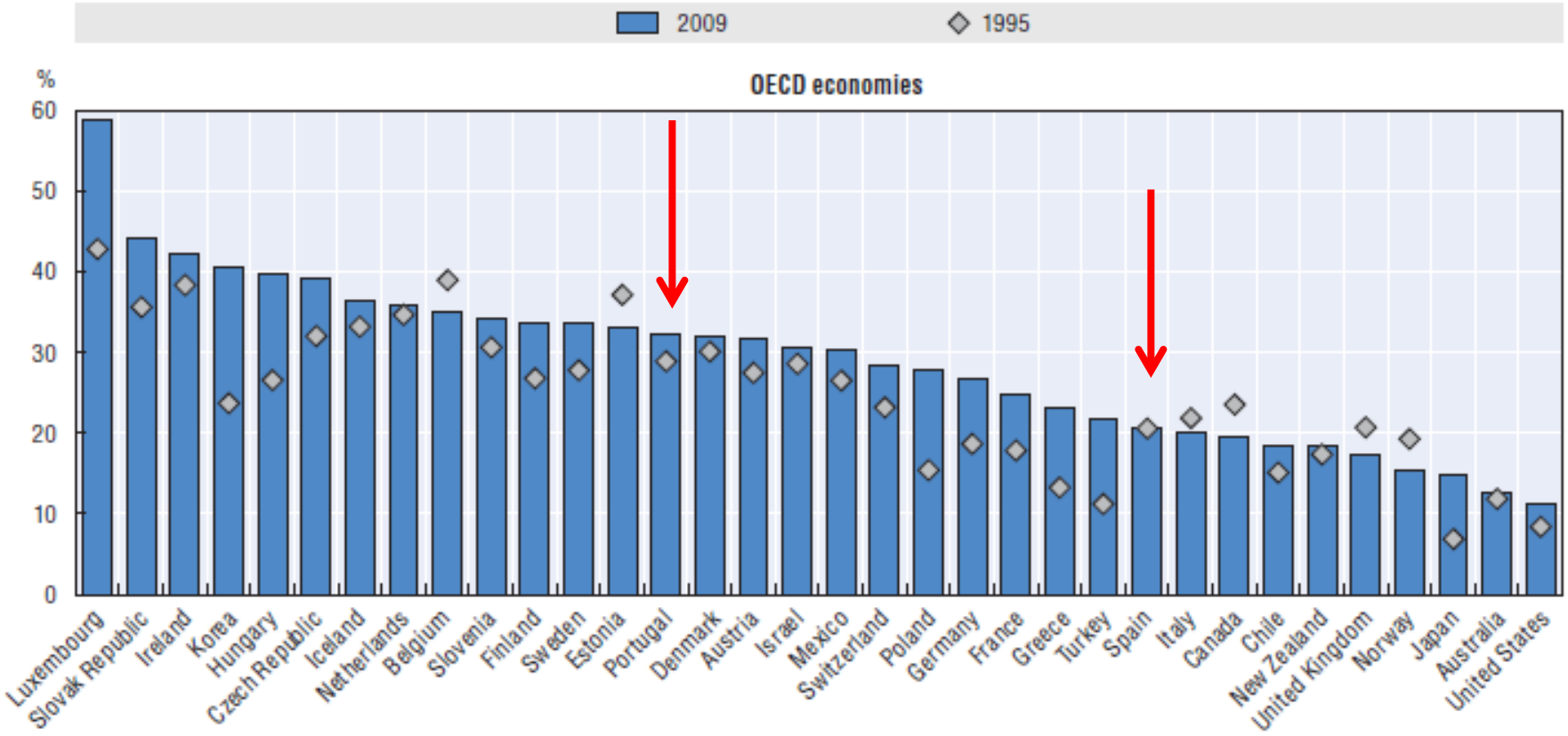
- **OECD-WTO initiative** www.oecd.org/trade/valueadded; 2015 edition
- 61 economies covering OECD, EU28, G20, most East and South-east Asian economies and a selection of South American countries. T
- 34 unique industrial sectors, including 16 manufacturing and 14 services sectors.
- The years covered are 1995, 2000, 2005 and 2008 to 2011.



How much value are you adding?

Foreign value-added content of exports by country

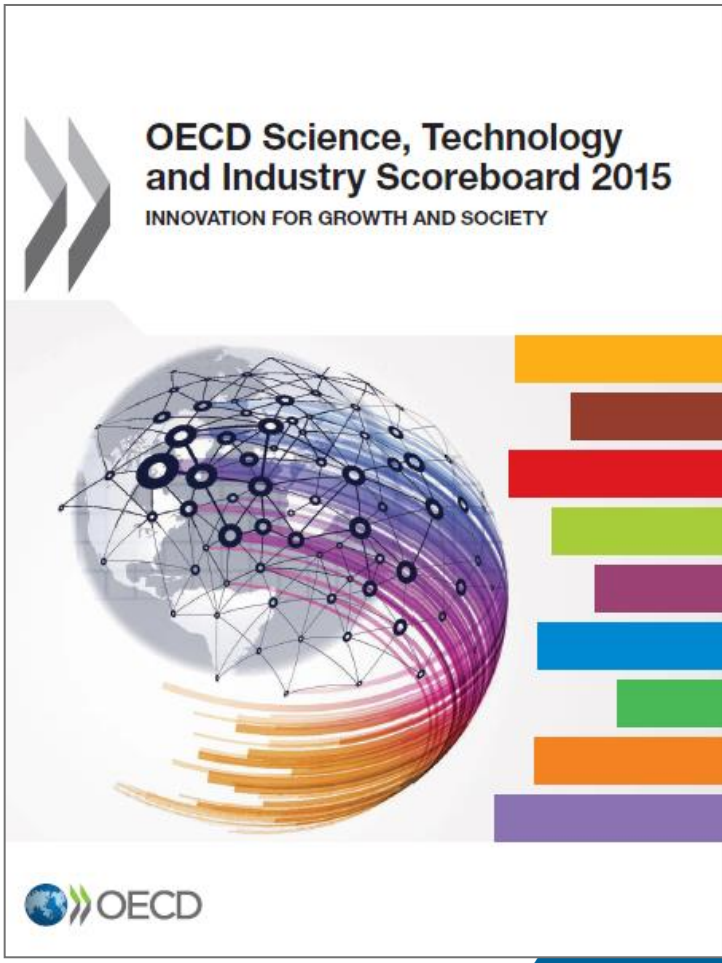
As a percent of total exports 1995 and 2009



OECD-WTO: Statistics on Trade in Value Added, (database), doi: 10.1787/data-00648-en

Latest OECD STI Scoreboard

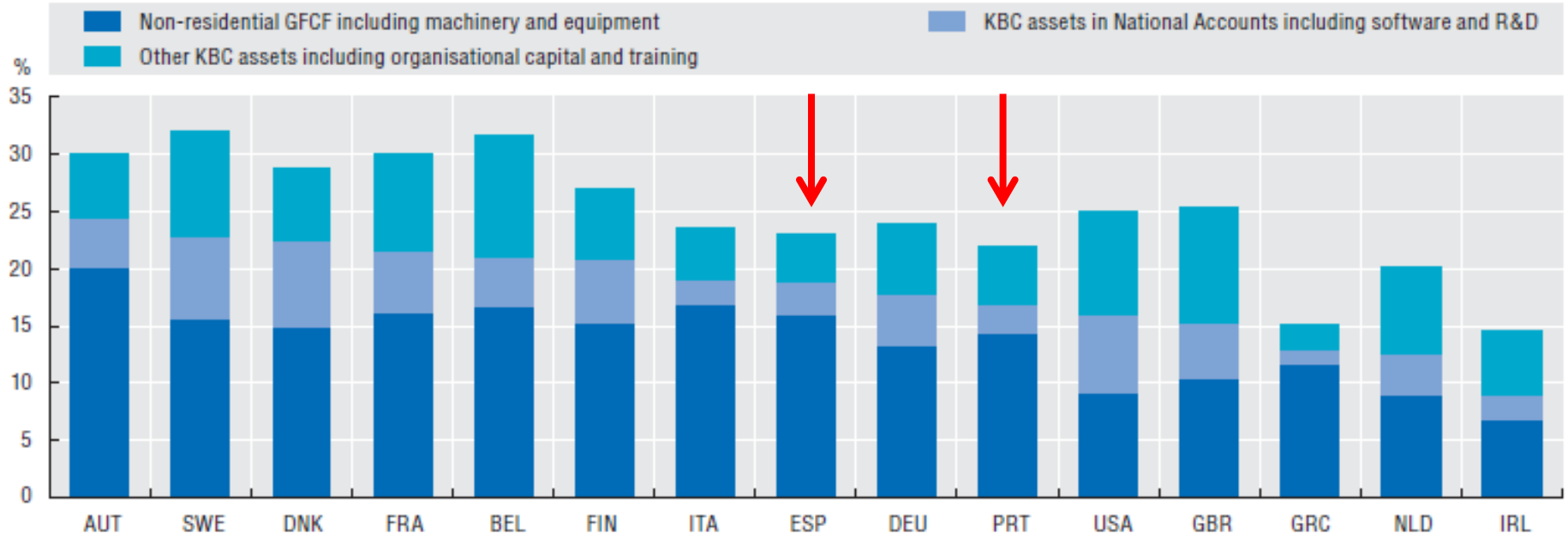
- Business R&D on the rise, government R&D was hit by budget consolidation
- 250 multinationals accounted for 70% of R&D expenditure, 70% of patents, almost 80% of ICT-related patents, and 44% of trademarks filings
- Other forms of IP



Type of business capital investment by country: KBC leading in many countries

26. Business investment in fixed and knowledge-based capital, selected economies, 2013

As a percentage of business sectors' gross value added



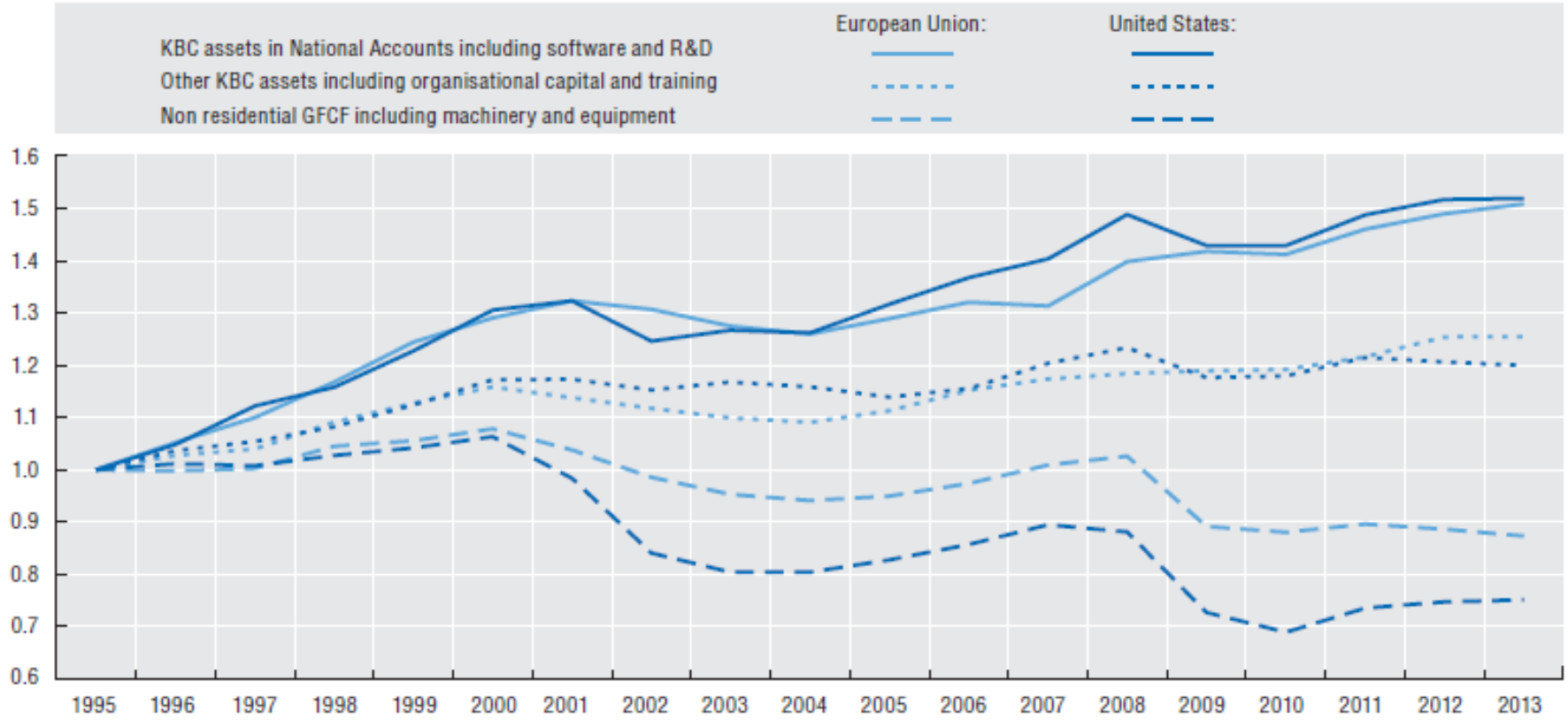
Source: OECD calculations based on INTAN-Invest data, *www.intan-invest.net* and OECD, *Structural Analysis (STAN) Database*, *http://oe.cd/stan*, June 2015.
See chapter notes.

StatLink http://dx.doi.org/10.1787/888933273011

KBC trends in Europe and the US

25. Knowledge intensity of business investment, selected EU economies and the United States, 1995-2013

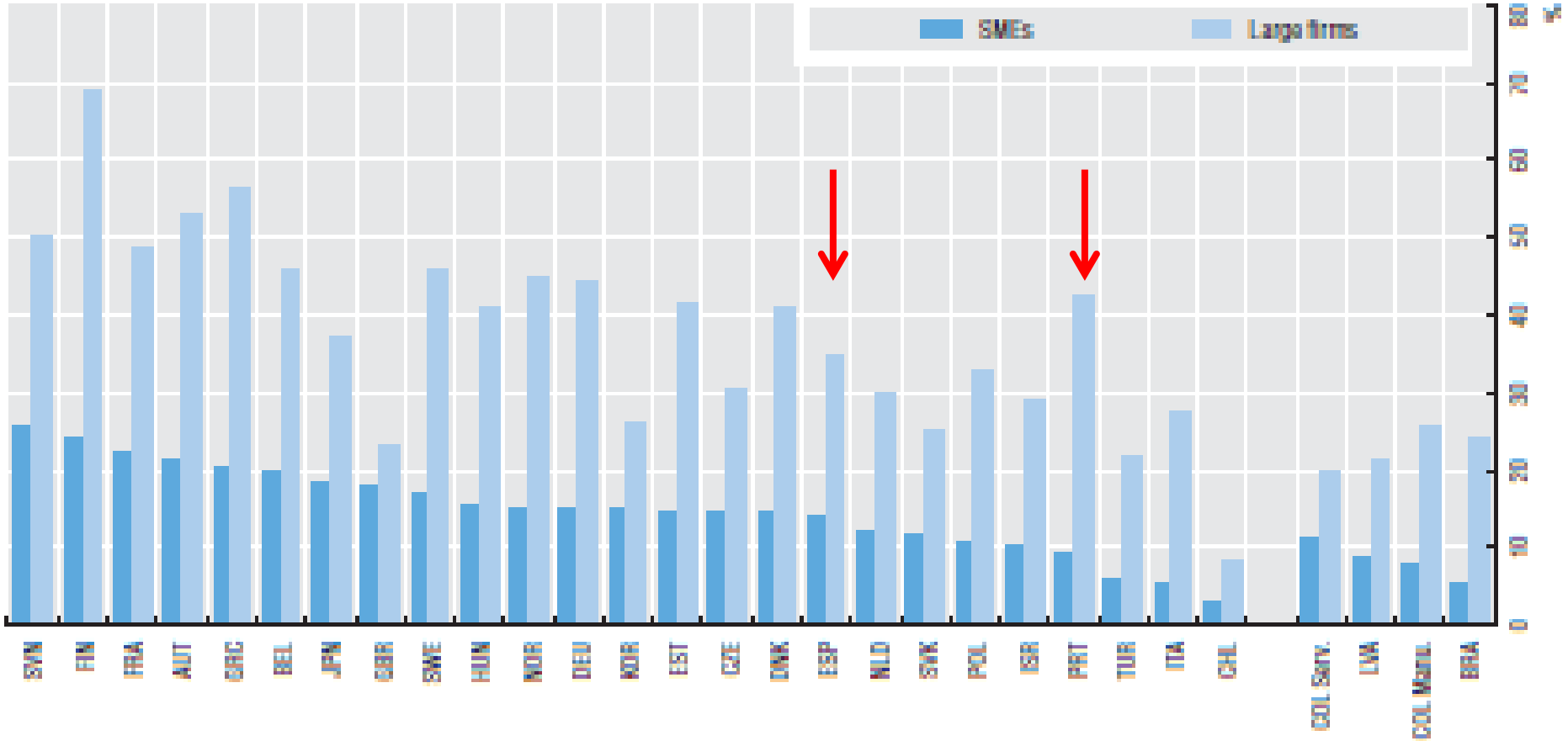
Business sector investment by type of asset, as a percentage of gross value added, index 1995 = 1



Source: OECD calculations based on INTAN-Invest data, *www.intan-invest.net* and OECD, *Structural Analysis (STAN) Database*, *http://oe.cd/stan*, June 2015.
See chapter notes.

StatLink http://dx.doi.org/10.1787/888933273008

Collaboration with public/higher education researcher *(share of product/process innovating firms)*



Note: International comparability may be limited due to differences in innovation survey methodologies and country-specific response patterns. European countries follow harmonized survey guidelines with the Community Innovation Survey. See www.oecd.org/sti/inno-stats.htm for more details.

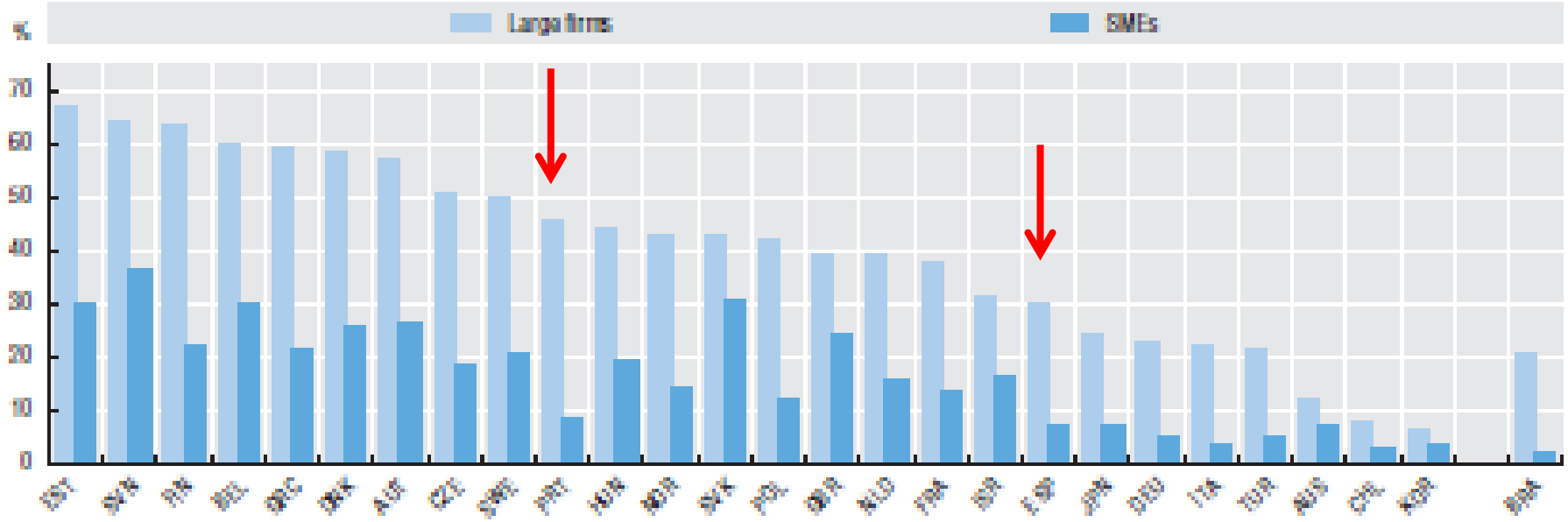
Source: OECD based on Eurostat, Community Innovation Survey (CIS-2012) and national data sources, June 2015. See chapter notes.

StatLink http://dx.doi.org/10.1787/888933274074

Challenge to boost international innovation collaboration among SMEs

Firms engaged in international collaboration for innovation, by firm size, 2010-12

As a percentage of product and/or process-innovating firms in each size category



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Source: OECD based on Eurostat, Community Innovation Survey (CIS-2012) and national data sources, June 2015. See chapter notes.

StatLink http://dx.doi.org/10.1787/888933274055

Data-driven innovation

Part of work on "knowledge-based capital"

- Boost productivity growth
  - More comprehensive studies needed to better assess impact on productivity growth
- Contribute to well-being
- Further inclusiveness and development

Updated OECD Innovation Strategy

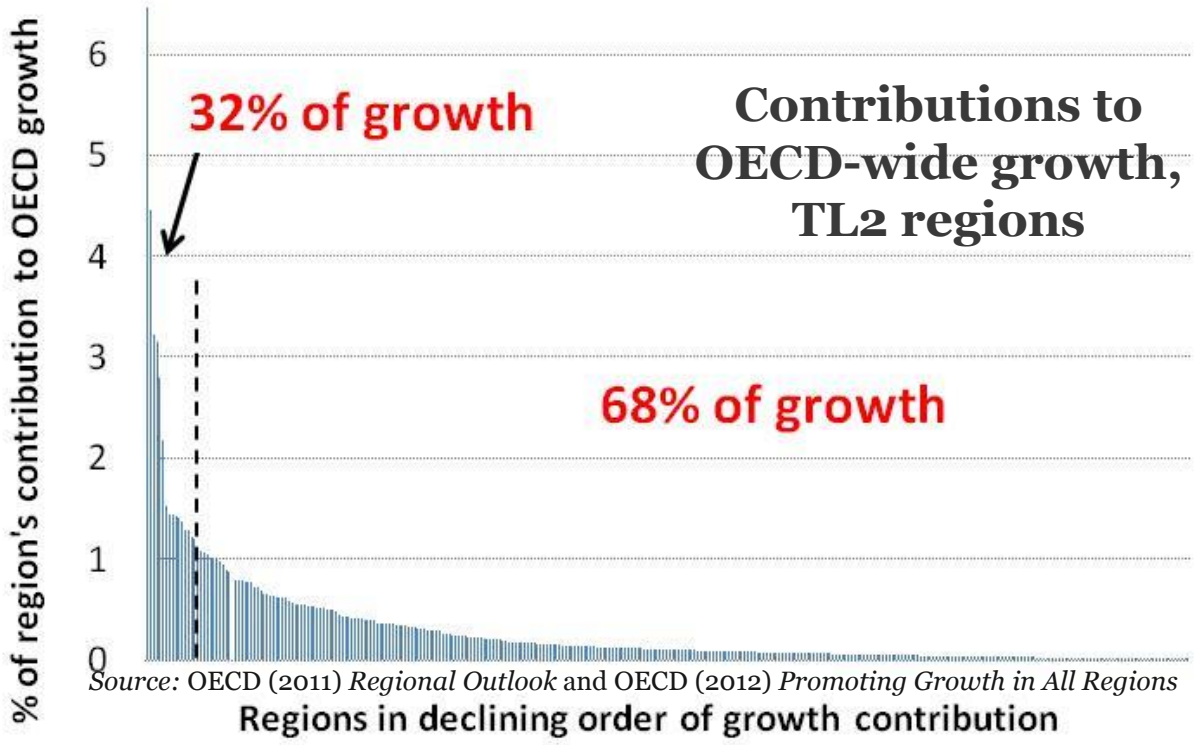
- A skilled workforce
- A sound business environment
- A strong and efficient system for knowledge creation and diffusion
- Policies that encourage innovation and entrepreneurial activity
- A strong focus on governance and implementation

Additional innovation policy considerations

- Market and *systemic failures*
- Changes in behaviour of agents (additionality)
- Benefits of some types of policy intervention have been more easy to document than others
- Innovation as a means to an end

Regional growth: some key findings

- A few big regional hubs contribute a lot to aggregate growth
- Most growth occurs outside the hubs
- Many big cities are making little or no growth contribution
- The notion of an "average region" is meaningless



Source: OECD (2011) *Regional Outlook* and OECD (2012) *Promoting Growth in All Regions*

Regional growth: innovation-related variables

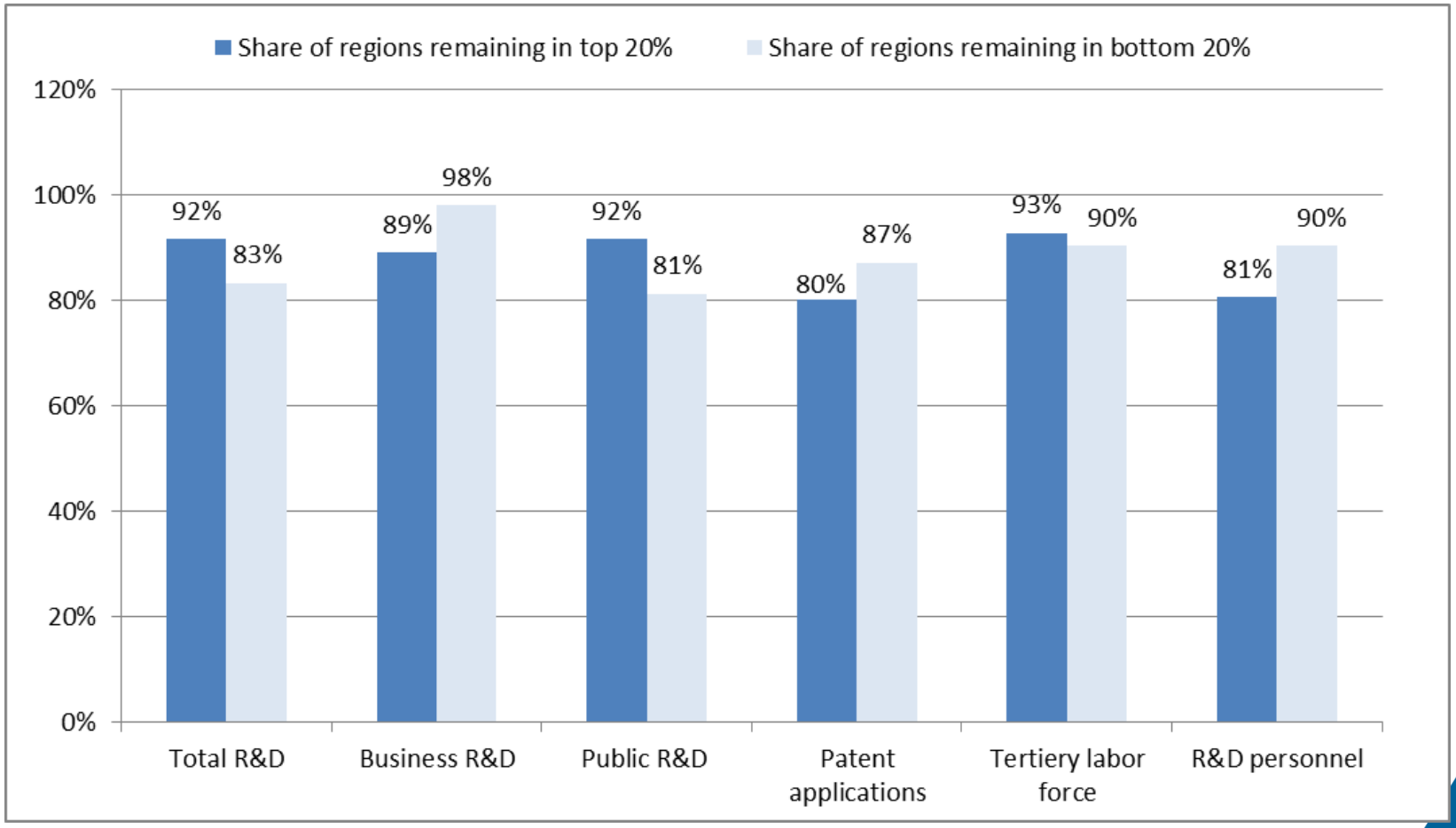
- **Innovation:** Technology-based measures of innovation become increasingly important for regional growth the closer the region is to the technology frontier
- **Skills:** The low-skilled population is a bigger drag on regional growth than the lack of high-skilled workers, in part because the low-skilled are less mobile

Growth drivers/bottlenecks	Relative level of development		
	Lagging (>75% of national average *per capita* GDP)	Intermediate (75-100% of national average *per capita* GDP)	Leading (>100% of national average *per capita* GDP)
Human capital/skills: presence of very low skilled	√√	√	√√
Human capital/skills: presence of highly skilled	√	√	√√
Labour-force mobilisation: participation/employment rates		√	√√
Innovation activity: patents, R&D spending, employment in knowledge-intensive sectors	√	√	√√√
Agglomeration effects: density of population, density of GDP			√
Quality of government	√√	√	√

Note: √ = somewhat important √√ = very important; √√√ = critical factor.
Source: Based on OECD (2012), *Promoting Growth in All Regions* and other ÒECD research.

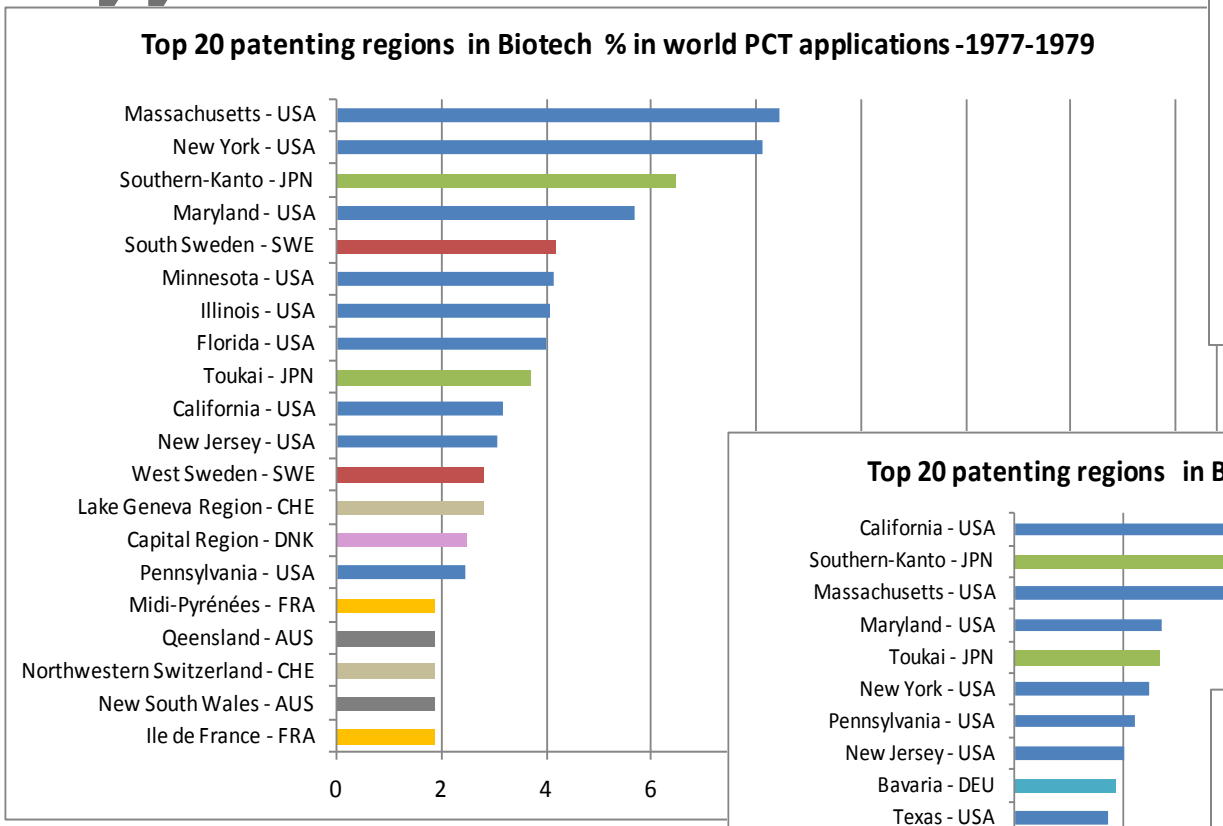
Not easy to change positioning over time in broad "result" indicators

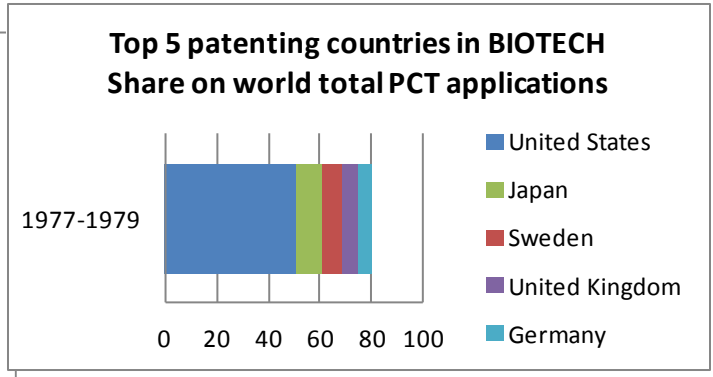
Share of same regions in top/bottom 20%, 2001-2011

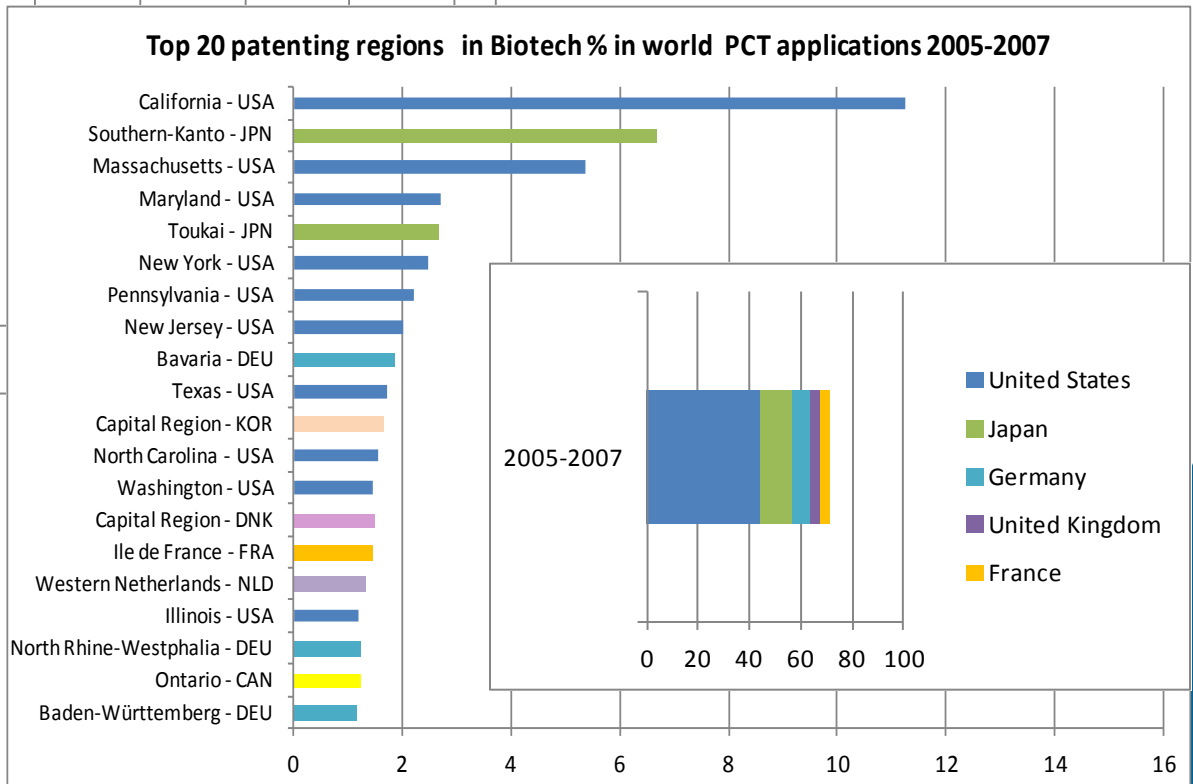


Note: Patent data is three year averages.

A bit easier to observe when you go to the level of specific sectors/technologies: example biotech patents





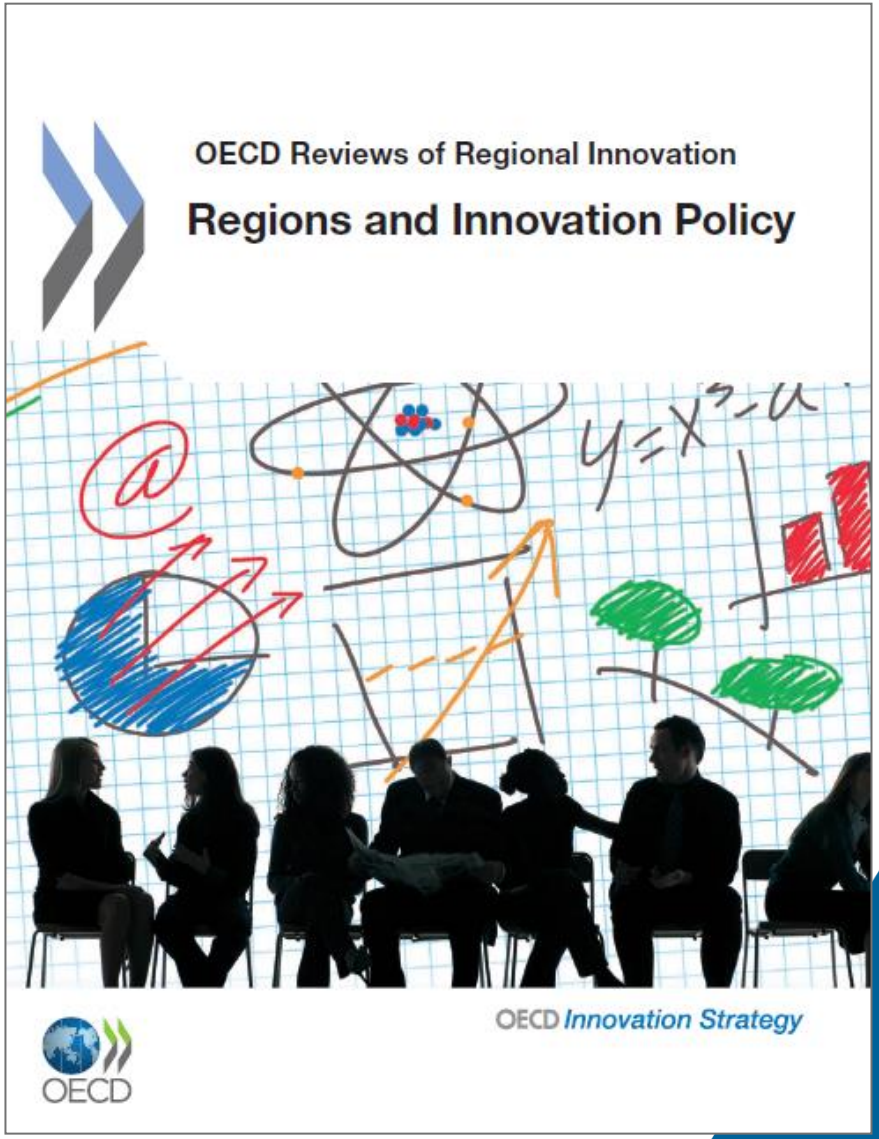


Share of top 20 patenting regions on total patent applications 76% = > 52%

Giulia Ajmone Marsan and Annalisa Primi (2012), "Tell Me Who You Patent With and I'll Tell You Who You Are - Evidence from Inter-Regional Patenting Networks in Three Emerging Technological Fields", *OECD Regional Development Working Papers* 2012/03, OECD Publishing.

Regions matter for innovation, and innovation matters for regions

- Concentration of certain forms of innovation activity; inter-regional differences
- Developing a policy mix to meet the needs of the region
- Multi-level governance of innovation policy
- Special role of regional innovation/economic development agencies



Observations on innovation in regions that are not large metro areas

- Non-metro innovation can be any sector, not just the primary sector.
- The potential is particularly great in services – and perhaps especially in logistics and services allied to manufacturing.
- Innovation in low-density environments is more likely to be driven by one person than metro-based innovation.
- Such innovations may lead to patents, but many do not.
- Many such innovations are likely to have a niche market, primarily significant in a particular place, but some have global effects.
- It may take time for such innovations to exhibit their full value, so they tend not to attract venture capital.

Universities and regional innovation ecosystems

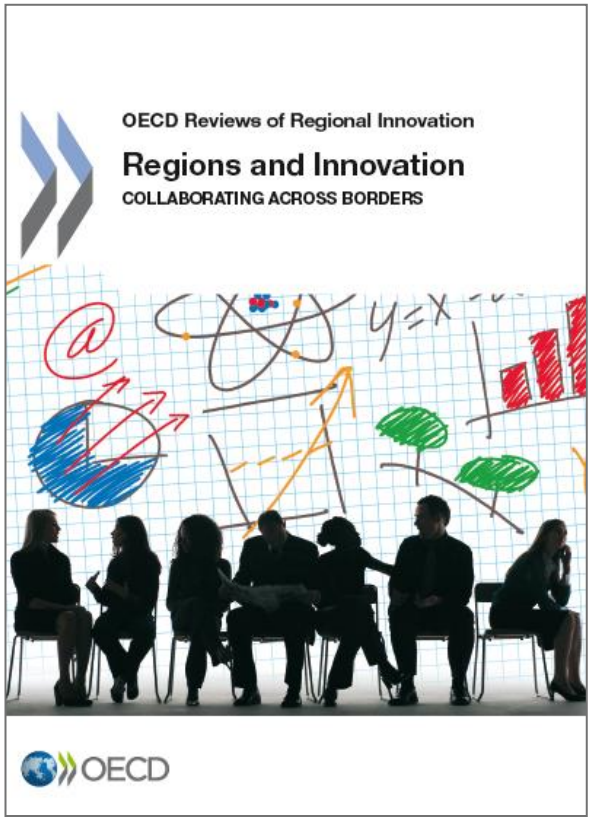
- Expectations for knowledge transfer to be matched with regional context
  - Regional growth model, regional innovation system, type of university, etc.
- Research and curricula relevant for the *existing* firm base may have greater economic impact
  - Even if there is a bias in regional approaches towards patents and start-ups as indicators of “third mission” engagement
  - And timing delays in updating curricula are a recurring complaint of firms seeking knowledge transfer in the form of educated workers
- Mapping university offer and ensuring brokers to reach SMEs is costly
  - And cost not easily borne by universities themselves

Universities and regional innovation ecosystems (cont.)

- Quality of technology transfer offices a consideration
  - So merging of offices across universities has been one way to improve quality and efficiency
- In-firm placement of university PhDs/recent graduates can be helpful
  - But in some cultural contexts, firms resistant to this form of knowledge transfer
- Universities can play a key “hub” role in the region and “gateway” role to the world to bring knowledge to the region’s firms
  - As evidenced in co-patenting data and other analyses

Geographic proximity one form of proximity for collaboration

Proximity	Favourable conditions
Geographic	Short spatial or physical distances allow for "tacit" knowledge flows
Cognitive	Shared knowledge base (need novelty but also common base). Concept of "related variety"
Organisational	Control uncertainty and opportunism (avoid lock-in)
Social	Trust and commitment for interactive learning (avoid lock-in and opportunism)
Institutional	Enabling factor providing stable conditions (need common practices but avoid lock-in and inertia)



Source: Derived from Boschma (2005).

Innovation policy to consider actors operating at different geographic scales

Geographic scales

- Cross-border co-operation *(contiguous areas)*
- Trans-national co-operation
- *(macro-regions)*
- Inter-regional co-operation *(internationally)*

Actors

- SME collaboration more localised than large firms
- Different university orientations: global, national and regional
- Co-location more important for market-oriented research impacts than for inter-regional networks for scientific research (Attila et al, 2012)

Ease of using cross-border instruments (Based on case study examples)

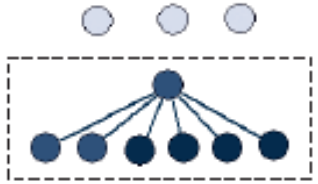
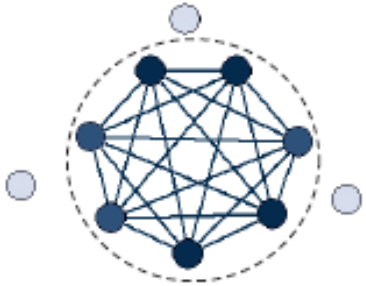
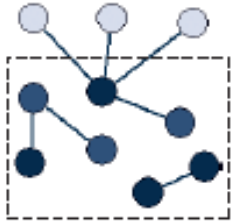
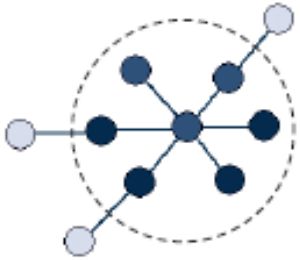
Easiest to implement	Mixed results	Most challenges observed
Cross-border linkages of firms with providers (e.g., innovation vouchers) Cluster-related support for areas of common competencies Joint prioritised research Access to shared S&T parks, scientific installations, joint centres	Broad-based university collaborations (collaboration in specific fields easier) • researchers look for excellence over proximity • students need right framework conditions (diploma recognition, financing, etc.) Firm networking and matchmaking; leading to collaboration? Cross-border cluster initiatives	Attempts to allow funds from one country go to another (rare exceptions) Certain innovation projects in highly regulated sectors (health, energy) • Albeit often those areas have greatest potential for using border as source of innovation International branding efforts often caught up in political sensibilities

More specifically on indicators

Types of systems and linkages: monitoring evolutions

Type of regional innovation system (RIS)

International linkages

	Centralised RIS	Decentralised Dense RIS	Decentralised Sparse RIS
No hinges			
Single hinge			
Diverses hinges			

OECD (2011) *Regions and Innovation Policy*, OECD Publishing, Paris based on Benneworth, P. and A. Dassen (2012), Strengthening Global-Regional Connectivity in Regional Innovation Strategies, *Regional Development Working Papers*, OECD Publishing, Paris.

Degree of matching and filling gaps of competences/specialisation in priority areas

- Scientific
- Technological
- Economic
- Skills

Cross-border considerations: performance can be monitored at different levels

- At the scale of the cross-border area
- Within constituent sub-regions
- Degree of co-operation/integration
  - To what extent is co-operation an end or a means to an end; still debated in cross-border circles

Common pitfalls observed in OECD reviews

- Indicator lists so long hard to keep track for the non-expert (dashboard or cockpit?)
- Not actually used at regular check-in points
  - And new plans didn't take stock of what happened and why it did/did not progress as hoped
- Systems for administrative data not put in place to receive the information
- Easier for regions with some statistical capacity
- Certain result indicators not easy to move given the nature/magnitude of the policy interventions