POLICIES TO BOOST INNOVATION AND KNOWLEDGE TRANSFER

OECD Directorate for Science, Technology and Innovation

Teagasc Symposium, 24 November 2015

BETTER POLICIES FOR BETTER LIVES

Outline

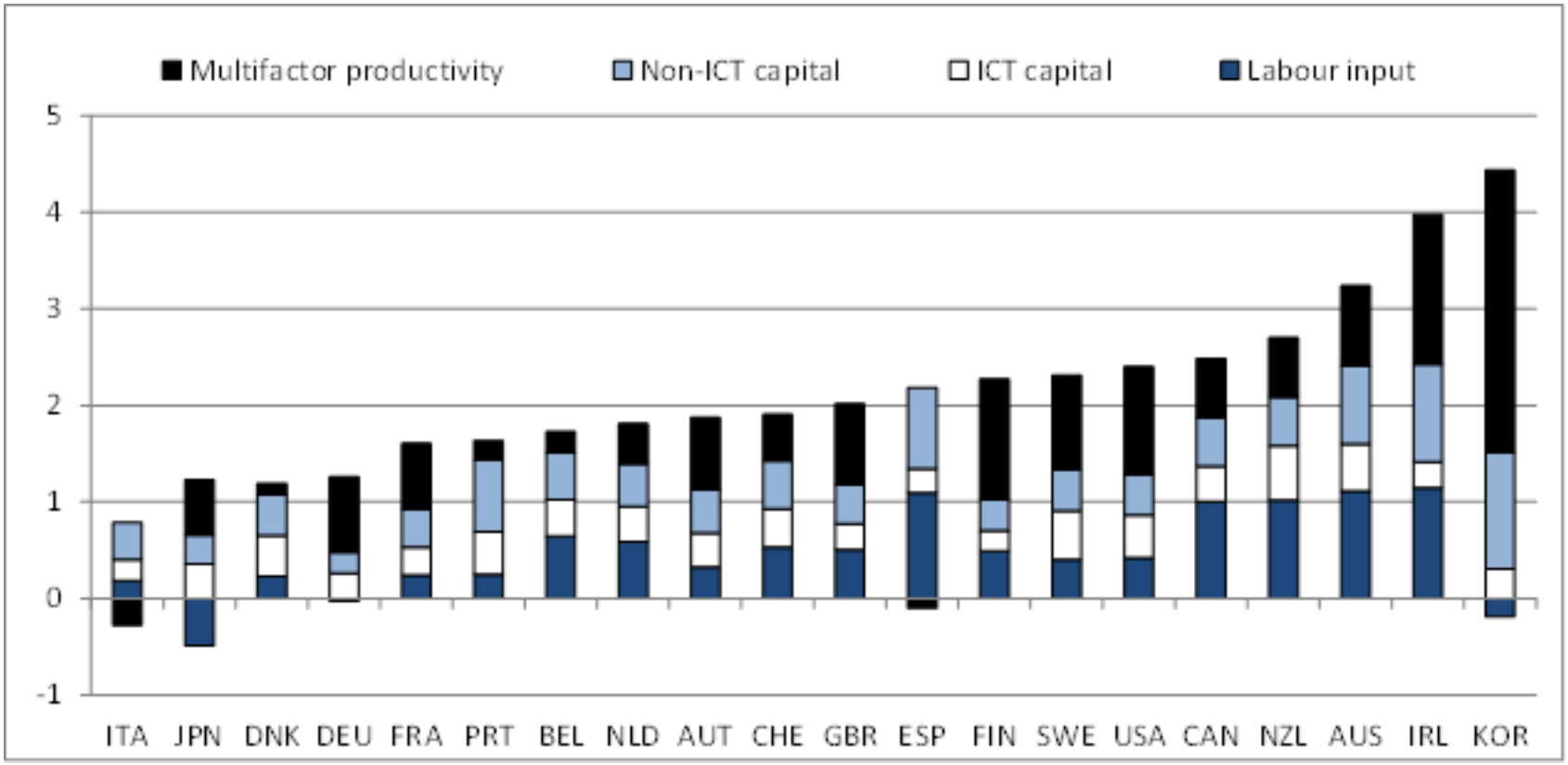
- Challenge driven innovation
- Framework conditions for 21st century innovation
- Knowledge transfer as a specific policy focus
- Conclusions

Challenge driven science & innovation

- The sustainability of the environment is humanity's greatest challenge (energy-land-water-food nexus)
- Productivity is the top economic challenge for OECD countries in the face of falling business investment and public indebtedness
- Social challenges are rife and interconnected (i.e. ageing, health but also inclusiveness, migration)
- Security challenges (cyber security, terrorism, pandemics, organised crime)

The contribution of innovation inputs to GDP growth is greater relative to other inputs

Total economy, annual percentage point contribution, 1995-2013

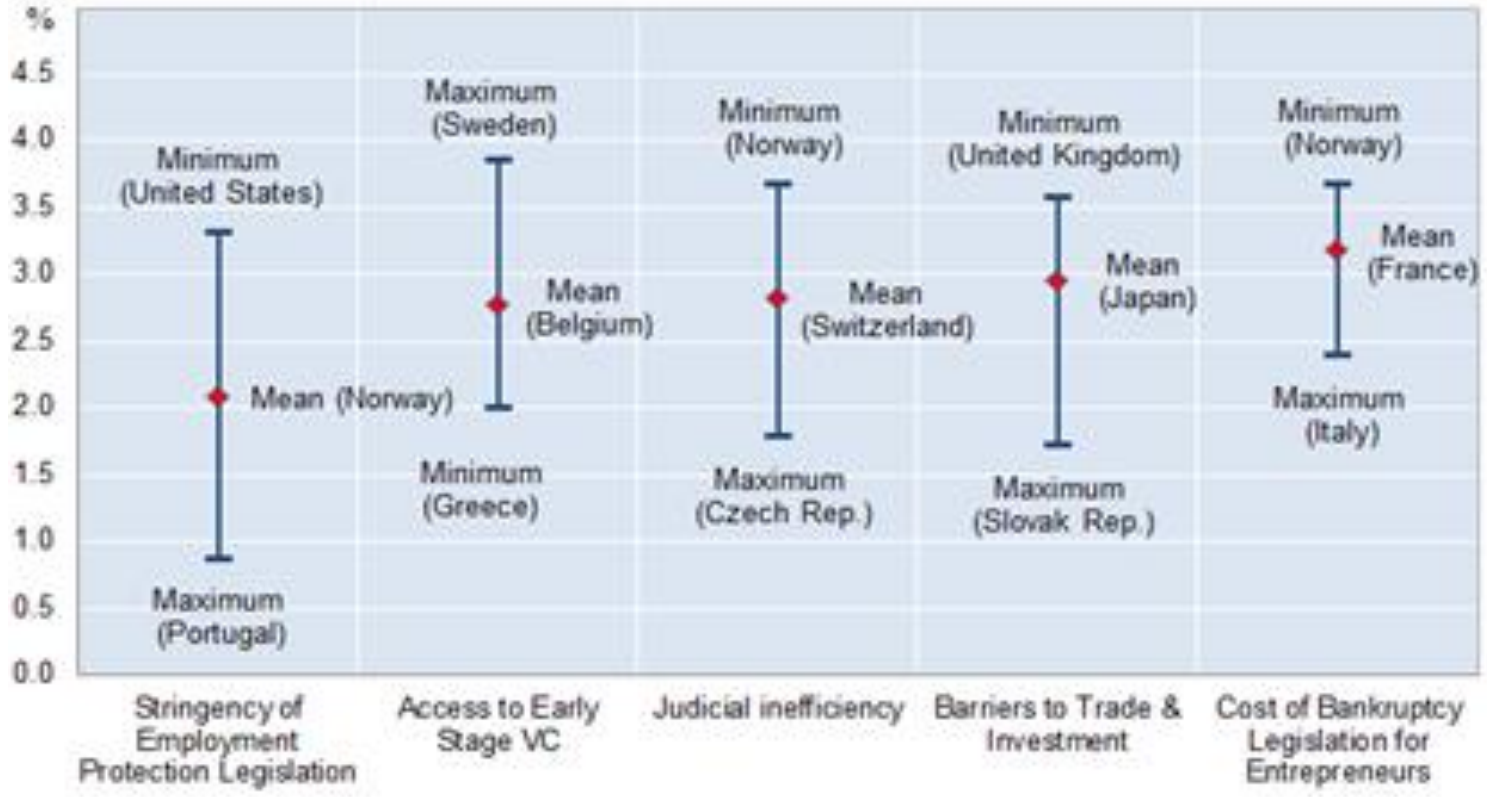


Framework conditions enable the (re) allocation of resources to the most productive activities

- Need business friendly environment for R&D and innovation
- But also in other forms of knowledge-based capital (e.g. Intellectual property)
- Need smarter investments in public research and better connecting it with industry
- Need to support entrepreneurship and new firm creation and growth

Framework policies affect the flow of capital to innovative firms

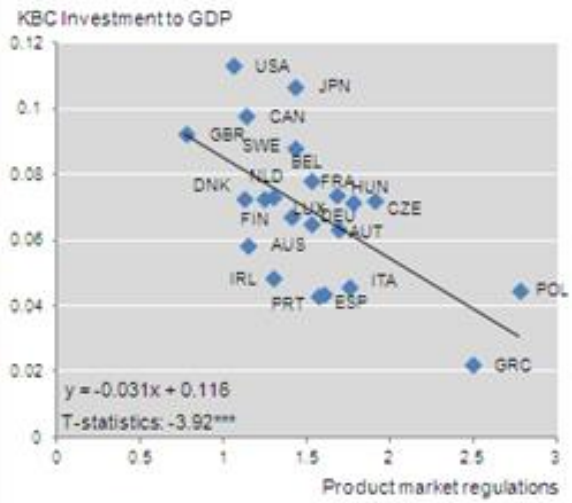
The Estimated impact of various framework condition policies on firm investment



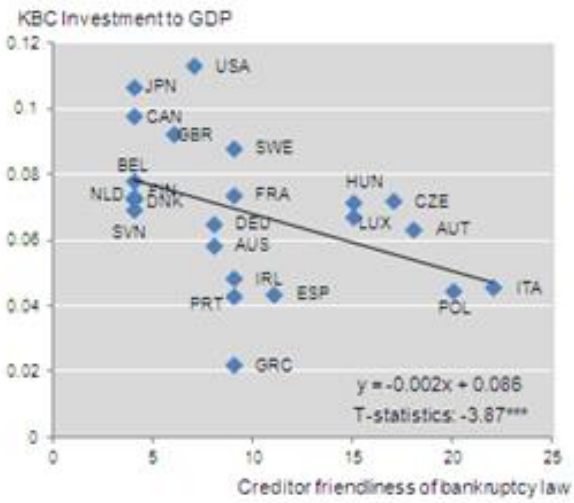
The estimated impact of various policies on the responsiveness of the firm investment to patenting

Good framework policies are associated with investment in knowledge based capital (KBC)

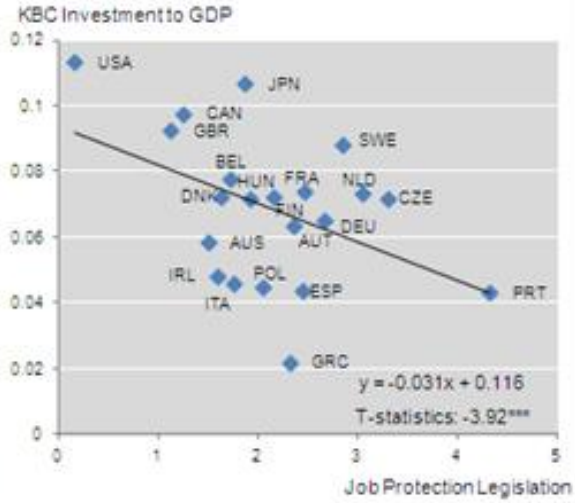
Product market regulations



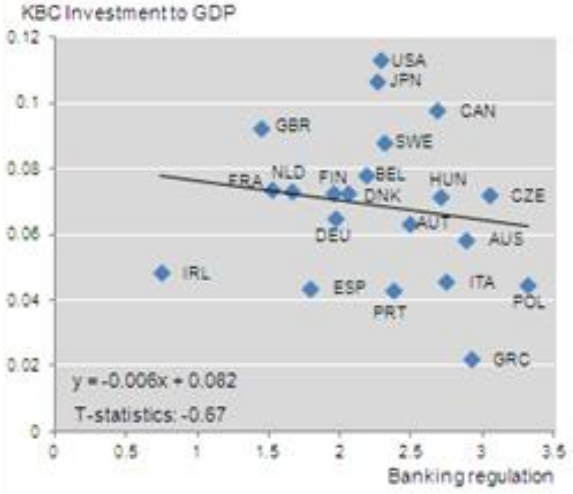
Creditor friendliness of bankruptcy law



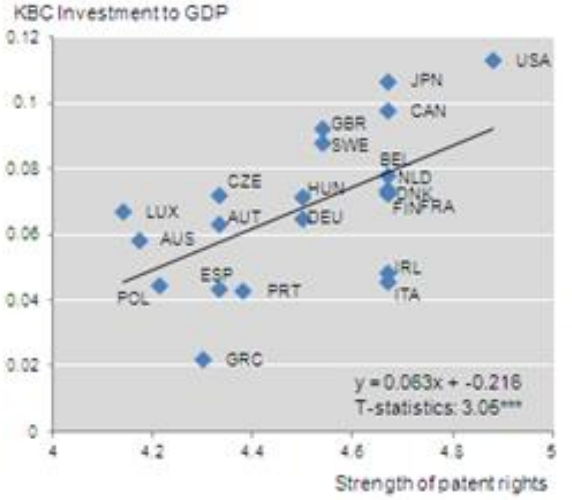
Job Protection Legislation



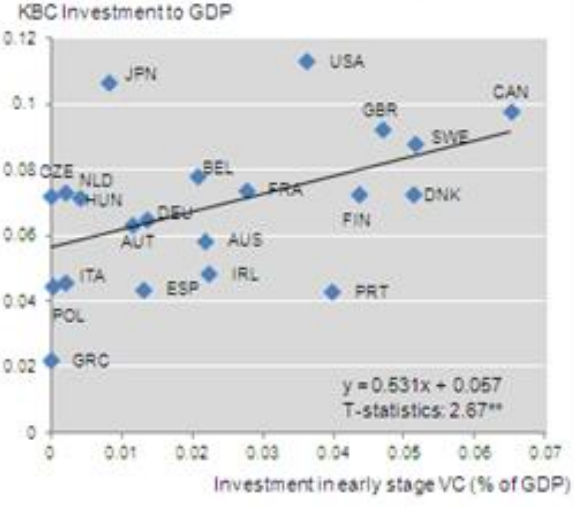
Banking regulation



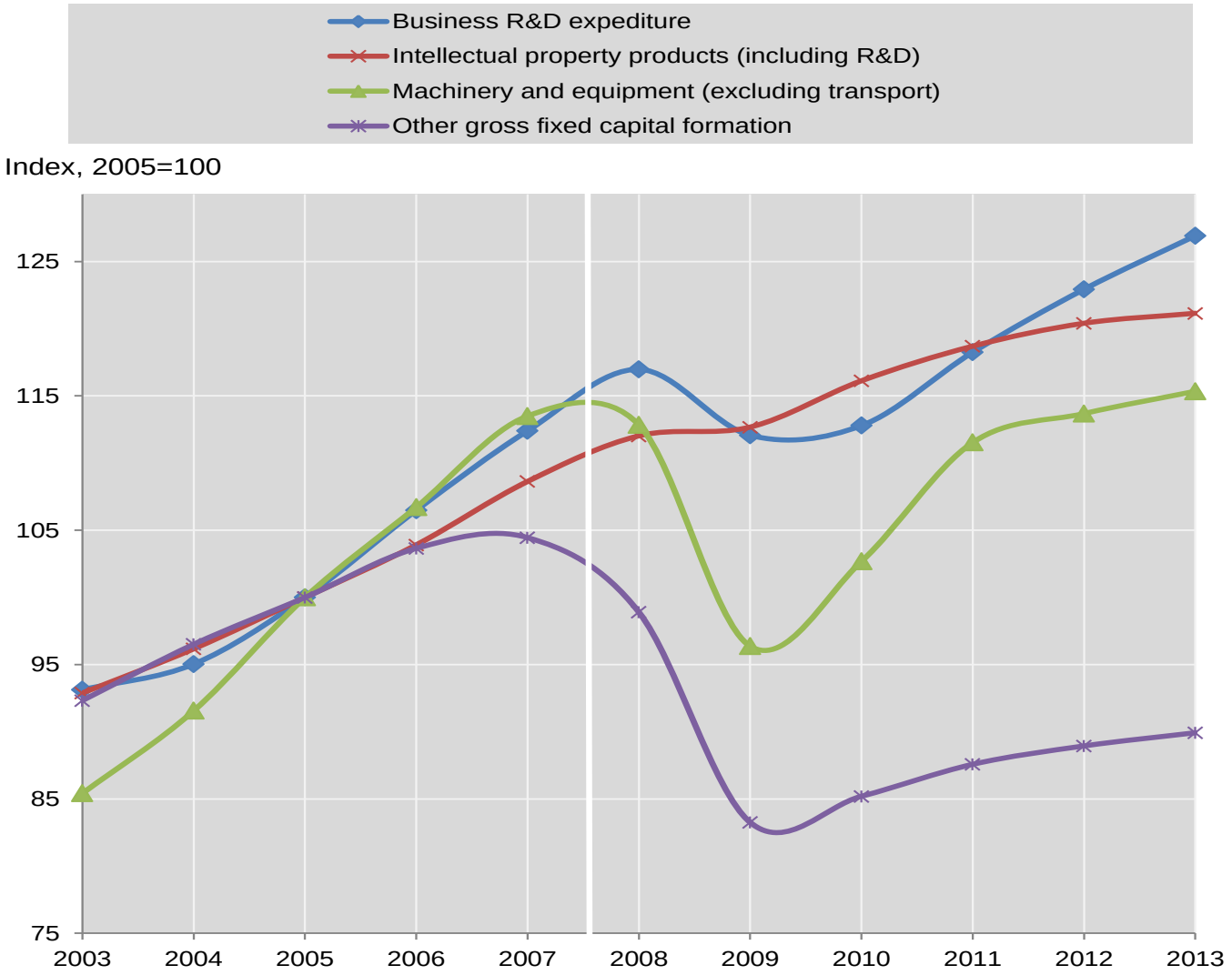
Strength of patent rights



Investment in early stage VC



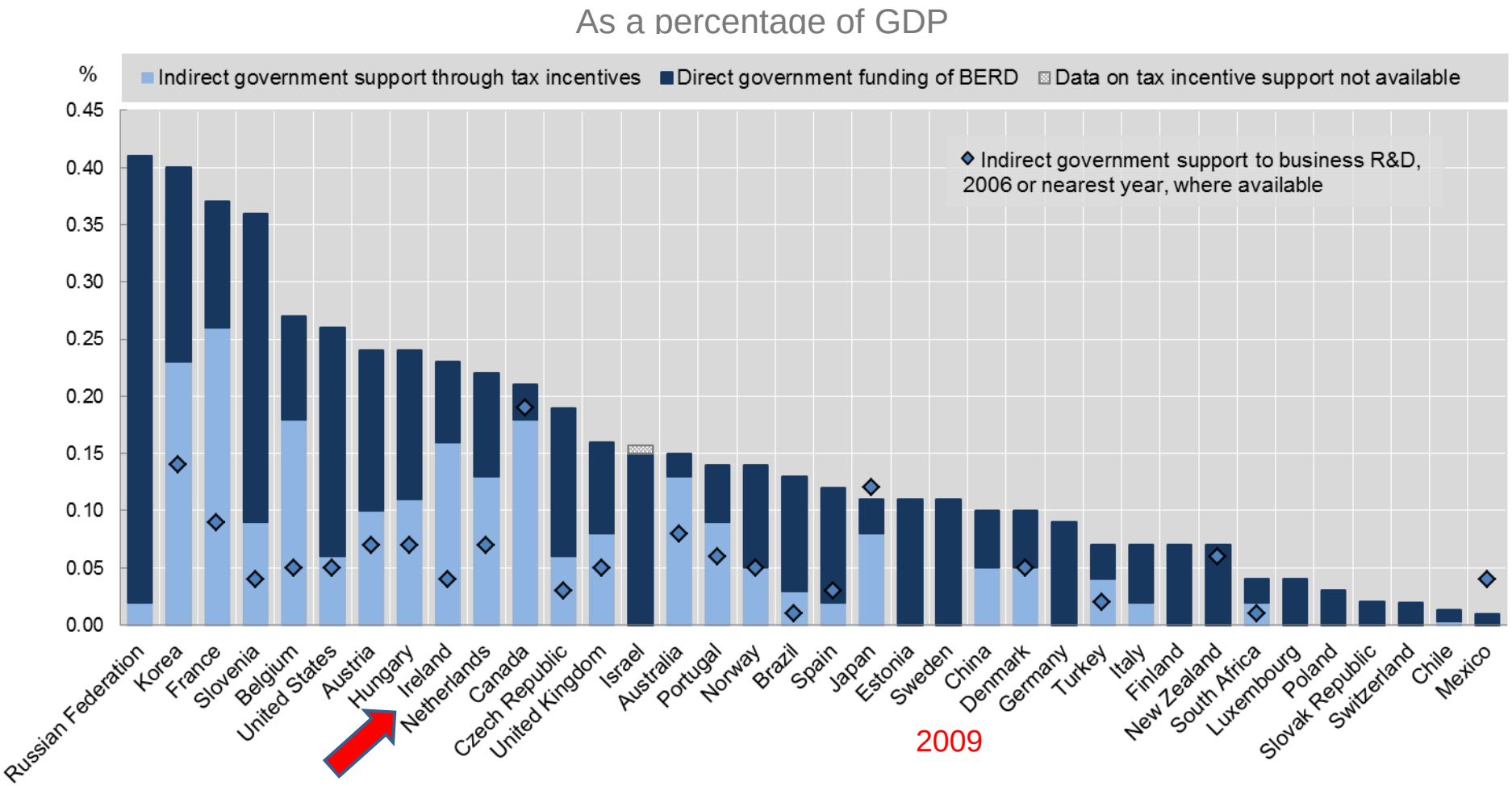
Business investment in knowledge assets weathered the crisis better and recovered earlier (Index, 2005=100)



Tax policies: an important framework condition

- **Tax policies have important impacts on decisions of firms and households to engage in innovation**:
  - Some forms of taxation are more harmful to innovation than others – design of tax policies is also important to make them more conducive to innovation.
  - High top marginal personal income tax rates can affect human capital formation and entrepreneurship.
  - Tax policies can also discourage risk-taking.
  - Also specific tax issues related to innovation, e.g. R&D tax credits and patent boxes.

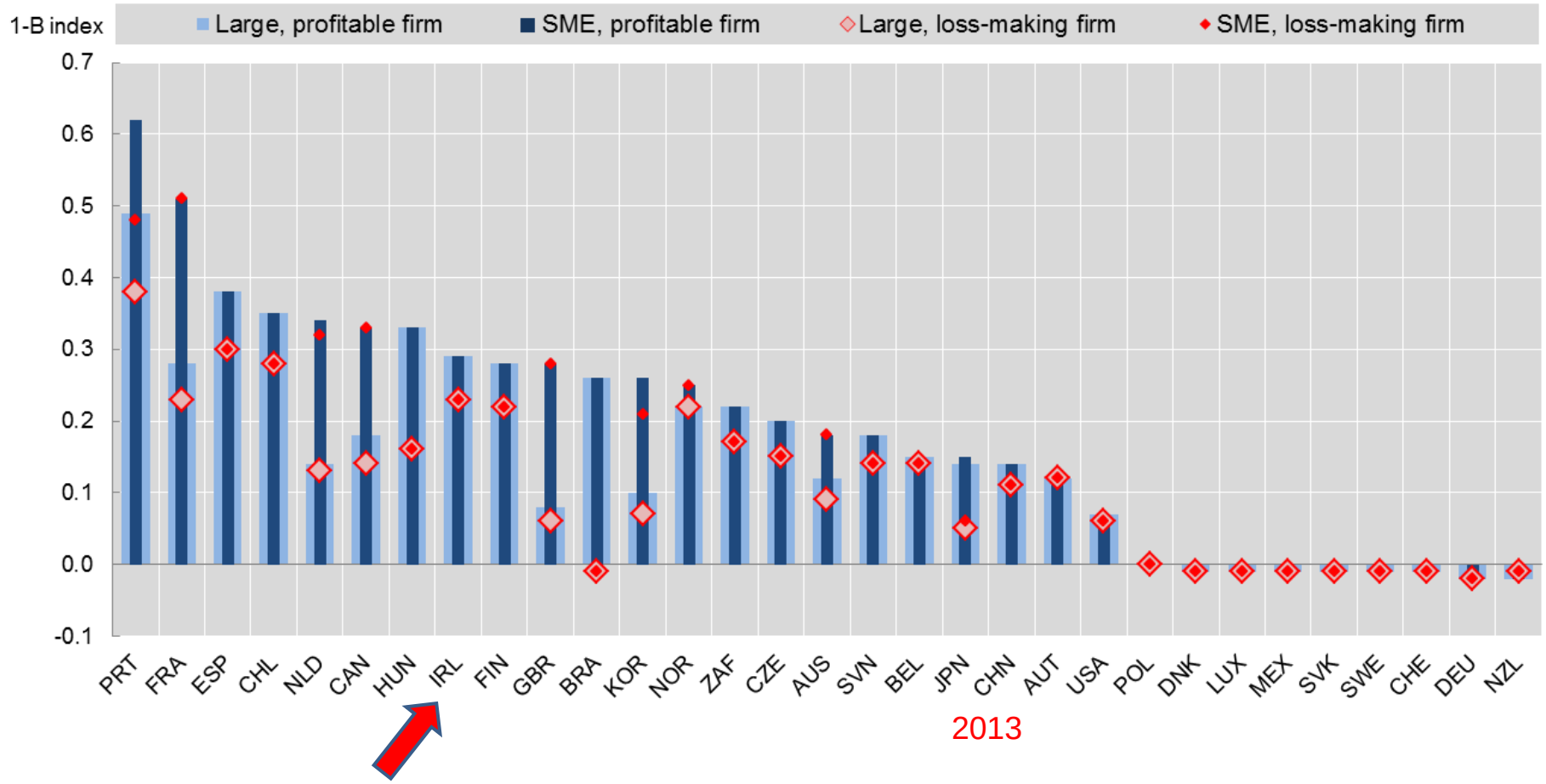
Direct funding of business R&D and Indirect R&D tax incentives (2012 and 2006)



Source: *OECD R&D Tax Incentive Indicators,* www.oecd.org/sti/rd-tax-stats.htm *(accessed: June 18 2015)*
http://www.oecd.org/sti/2.11.1_DirectGovFunding_Business_RDTaxIncentives_Dec152014.xls

Tax subsidy rates on R&D expenditures, 2013

1-B-Index, by firm size and profit scenario

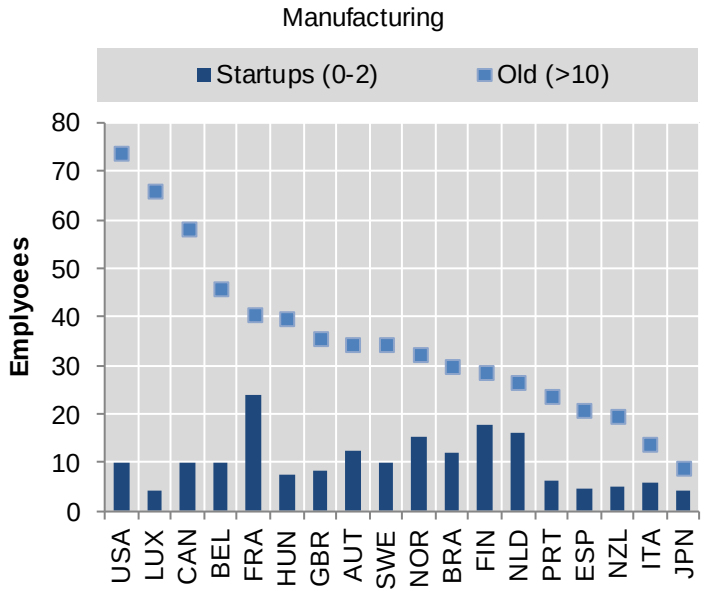


Source: *OECD R&D Tax Incentive Indicators, www.oecd.org/sti/rd-tax-stats.htm (accessed: June 18 2015)*
http://www.oecd.org/sti/2.11.3_ImpactTaxIncentives_CostRD_Jun2013.xls

Framework conditions affect the pattern of entrepreneurship

- **Great heterogeneity in firm performance**:
  - Getting the most out of experimentation requires dynamic reallocation.
  - Avoid policies that (unwittingly) constrain the growth of firms, e.g. regulations that affect firms above a certain size or support for which only smaller firms are eligible.
  - Avoid subsidies to incumbents and policies that delay the exit of less productive firms.
  - Reform product market regulations which inhibit competition, and reduce policy-induced barriers to exit (e.g. excessively strict bankruptcy codes).
  - In framing employment protection legislation, take account of the implications for innovation

Big differences in the scaling of firms across countries

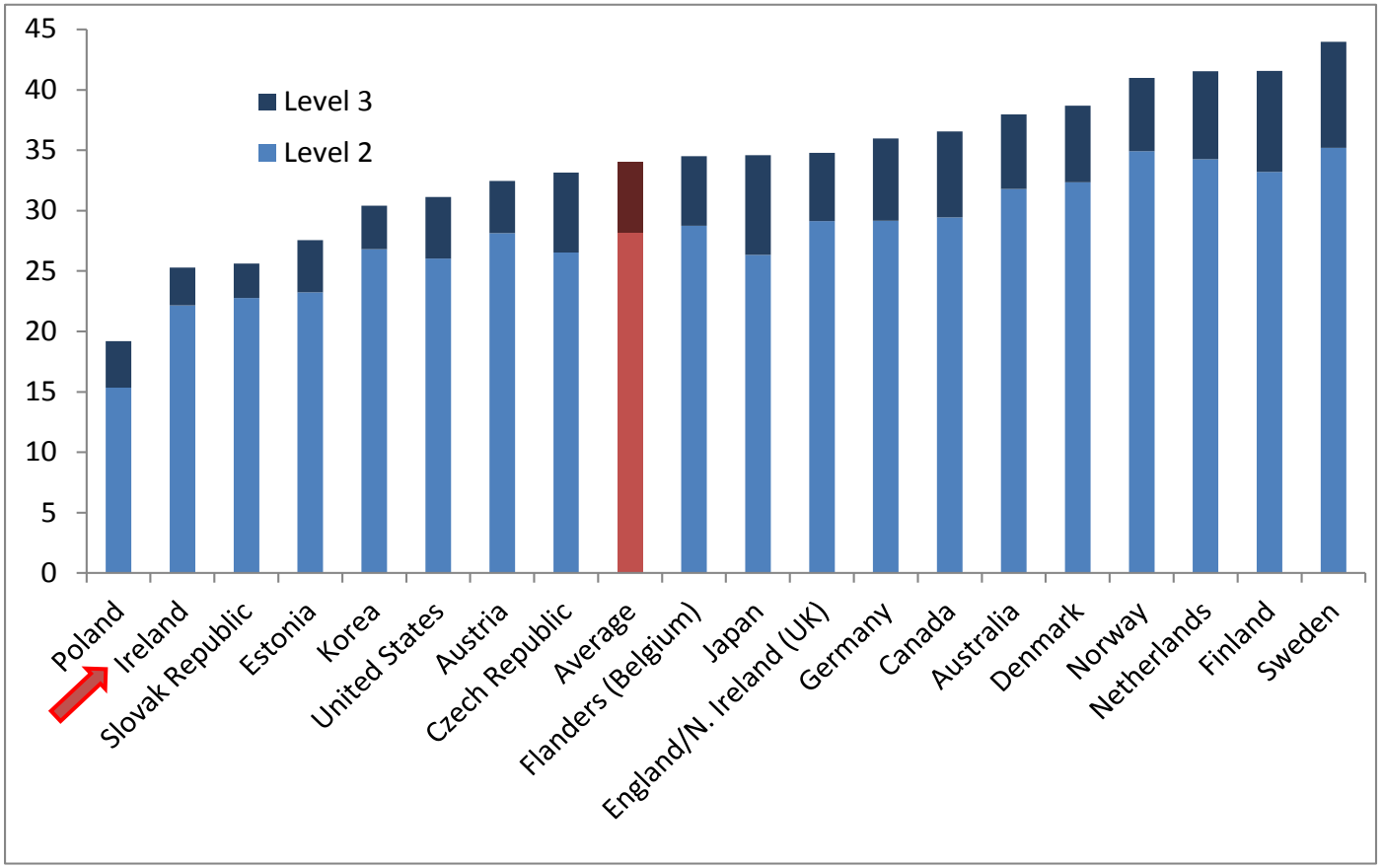


Framework conditions matter in accessing global value chains

- Trade-facilitating measures can help GVCs
- Industry policies to support upgrading in GVCs
- Services and investment in KBC are key sources of competitiveness in GVCs – they enable differentiation and customisation
- MNEs play important role in GVCs
- SMEs can capture value in GVCs (the small multinational)
- ICTs and digitalisation provides platforms for SMEs

Investing in talent and skills for 21st century

Proficiency in problem solving in technology-rich environments among adults
Percentage of 16-65 year-olds scoring at proficiency levels 2 and 3



Source: OECD Survey of Adult Skills (PIAAC), October 2013.

As knowledge-based investment rises, are framework conditions fit for purpose?

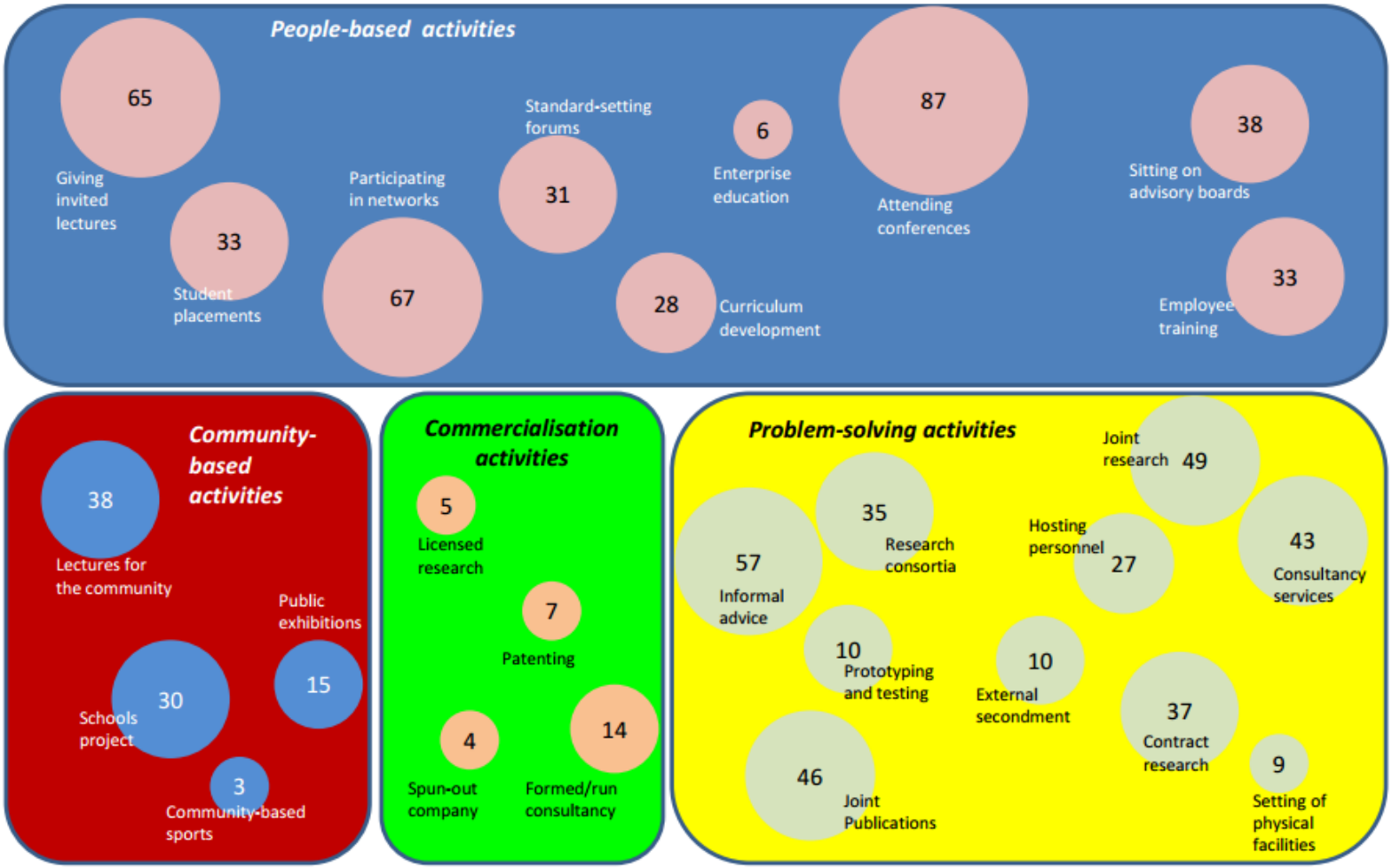
- IPR systems for 21st century innovation? (i.e. open innovation, open science, platforms)
- Regulations for the sharing and circular and the bioeconomy (e.g. bioplastics, 3D printed food)
- Labour market policies for the mobile and atomised workforce?
- Education policies for creativity and entrepreneurship or unemployment?
- What about research and innovation policies?

KNOWLEDGE TRANSFER AS A SPECIFIC FOCUS OF INNOVATION POLICIES

Innovation with public research roots

The reality is that commercial activities are a small part of what universities do!

(% share of external activities by UK academics)



Source: Cambridge Centre for Business Research, 2013. Cambridge Centre for Business Research Survey of Knowledge Exchange Activity by United Kingdom Businesses (Hughes, A., Kitson, M., Abreu, M., Grinevich, V., Bullock, A. and Milner, I.) UK Data Archive Study Number 6464. (CBR 2011b) . Presentation by Alan Hughes at OECD workshop on Knowledge Networks and Markets.
http://www.oecd.org/sti/inno/48846076.pdf

What is needed?

- A legal framework for intellectual property rights
- Leadership and vision that makes commercialisation and exchange with the outside world an explicit focus of the mission of the university /PRO
- A broad approach towards knowledge transfer => beyond patents
- Looking beyond venture capital funding :
- Contract research, P/PPs, PoC, crowdfunding, Prizes

Collaboration tools based on intellectual property and IP funds

- Facilitate access to the patent portfolios for entrepreneurship and SMEs
- The issue of “sleeping patents”
- IP licensing agreements such as Lambert Toolkit in the UK; cooperation agreements in Germany and Denmark
- Patent pools for SMEs and public research centers: ex: IP Platform for Life Sciences in Japan or France Brevets in France
- “Soft IP” (trademarks and copyrights) are becoming more prevalent - regulatory issues?

TTOs 2. 0

- Technology Transfer Offices (TTOs) have expanded their missions
- Convergence across countries towards a common set of organisational and financial models
- New bridging and intermediation structures
  - e.g. Innovation offices programme in Sweden
- Replacing or improving TTO structures
  - *Technology Transfer Alliances (e.g. Innovation Transfer Network (ITN) in the US, SATT in France, cTTO in Ireland)*
  - *For-profit models (e.g. UK, Denmark, Israel))*
  - *Internet-based models (e.g.* Flintbox at University of British Columbia)
  - *Free Agency model*

Boosting place-based academic entrepreneurship

- Creating a favorable climate for students and academic entrepreneurs such Aalto Center for Entrepreneurship (ACE) in Finland ;
- City-based and entrepreneurial models: such as Tech City and Tech Nation in the UK and Creative Economy and Innovation Centres in Korea
- Knowledge triangle approaches that integrate education, research and innovation (e.g. by bridging financing silos for education and research)

Promoting Open Science

- Research funder mandate open access (e.g. NIH, EU)
- New focus on open data ,
- Managing IP in business collaboration, nationally and globally
- Skills gaps and incentives
- Sustainable business models for open science

MAKING OPEN SCIENCE
A REALITY

OECD

Conclusion

- Innovation is needed to meet the global challenges
- Good framework conditions are positively correlated with investments in knowledge-based capital
- Research and innovation policies can leverage framework conditions but are not a substitutes
- Knowledge transfer policies are needed to enhance impact of public research investments and boost capacity and productivity in firms
- Traditional transfer policy giving way to more entrepreneurial, networked and decentralised governance models.
- Need for institutional experimentation in particular in ways universities/PROs organise their relationships with industry

Many thanks!

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oecd.org/sti/innovation