

PITFALLS IN INNOVATION POLICY

ICSB Conference – Paris April 8, 2019

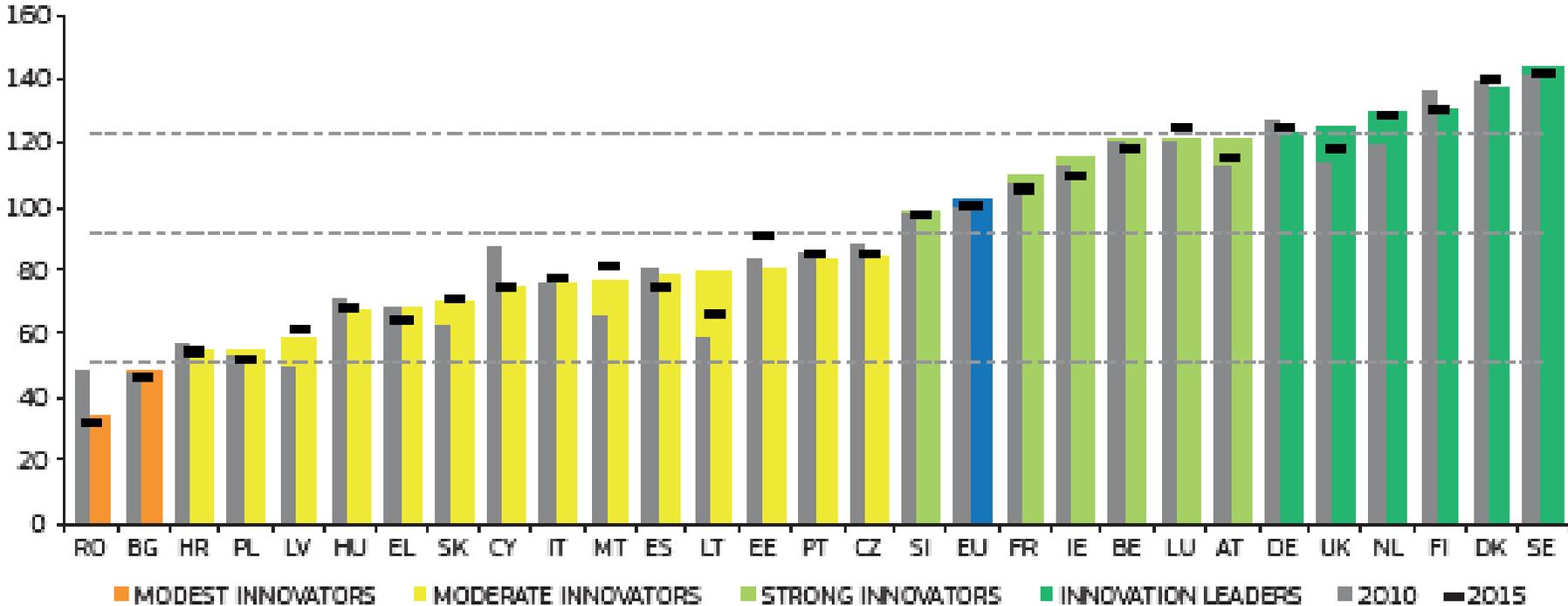
SALVATORE ZECCHINI

OECD WPSMEE, UN ECE TOS on Innovation

Wide Disparities in EU Countries' Innovation Performance (2010-2015)

(Source: EU Innovation Scoreboard 2017)

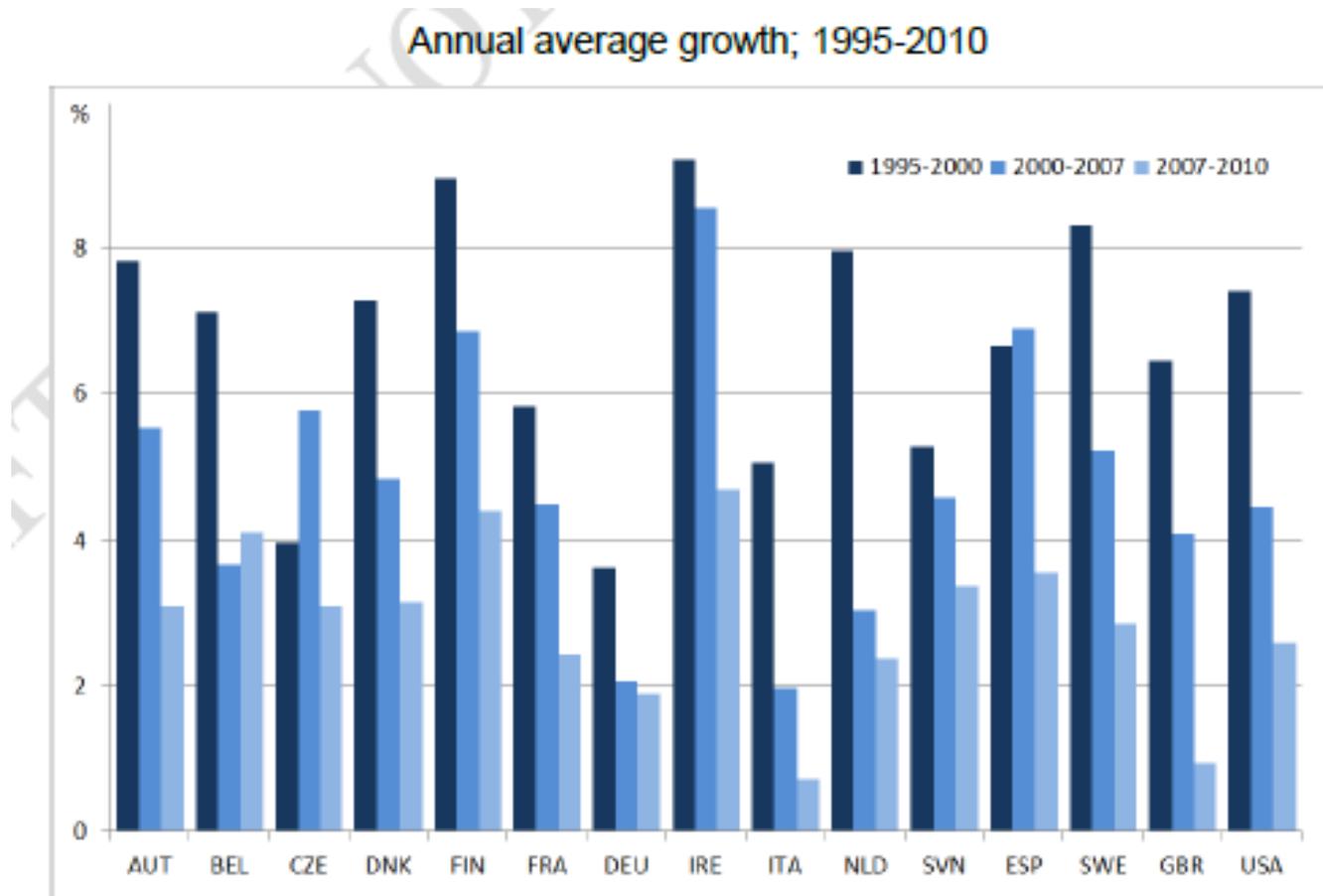
Figure 1: Performance of EU Member States' innovation systems



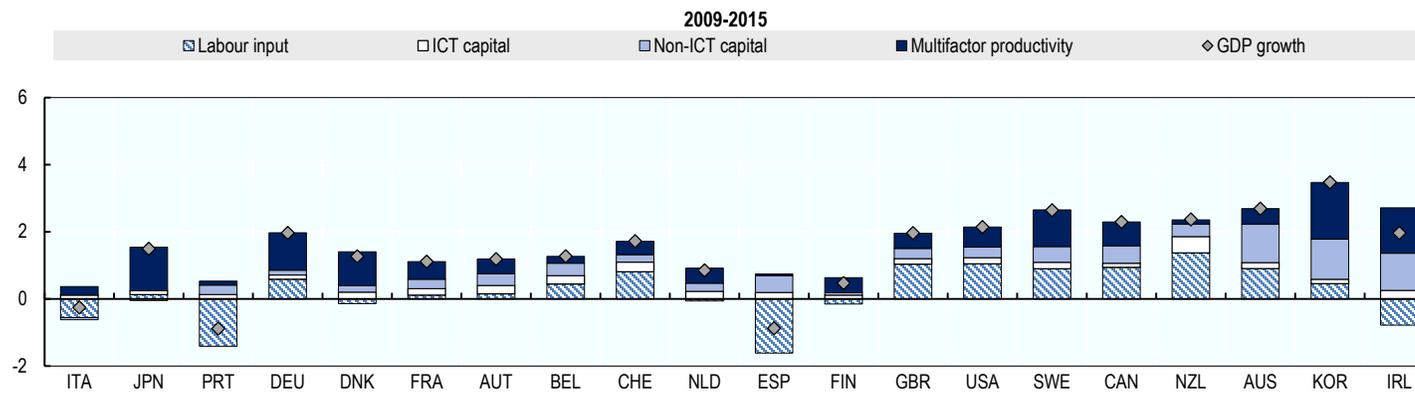
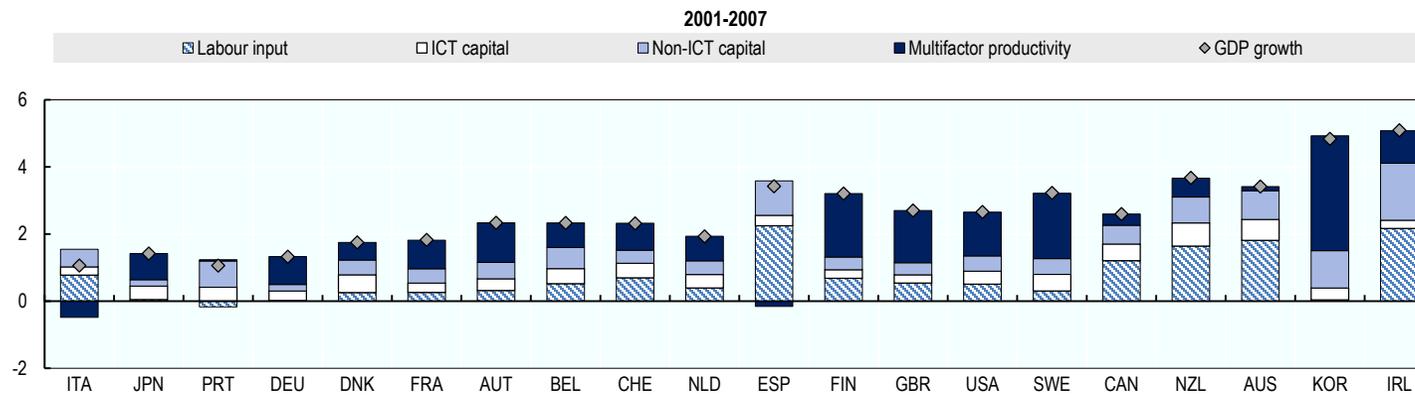
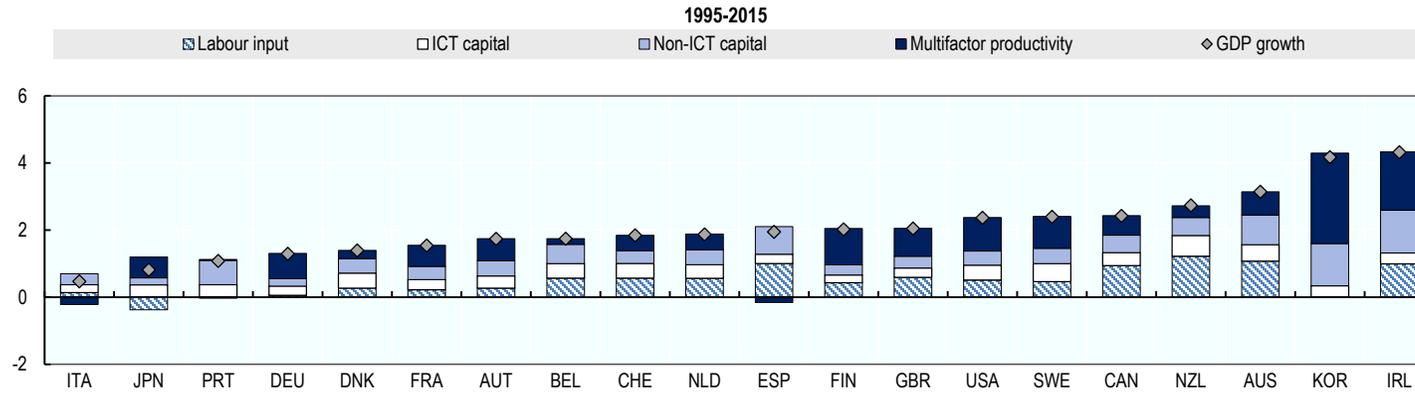
Coloured columns show Member States' performance in 2016, using the most recent data for 27 indicators, relative to that of the EU in 2010. The horizontal hyphens show performance in 2015, using the next most recent data for 27 indicators, relative to that of the EU in 2010. Grey columns show Member States' performance in 2010 relative to that of the EU in 2010. For all years the same measurement methodology has been used. The dashed lines show the threshold values between the performance groups in 2016, comparing Member States' performance in 2016 relative to that of the EU in 2016.

Investment in knowledge-based capital

(average growth per year 1995-2010 - Source: Corrado et al. 2012 and OECD, Albrizio, Nicoletti, 2016.)



Contributions to growth (% points per year-Source:OECD)



SMEs, innovation, productivity, economic growth

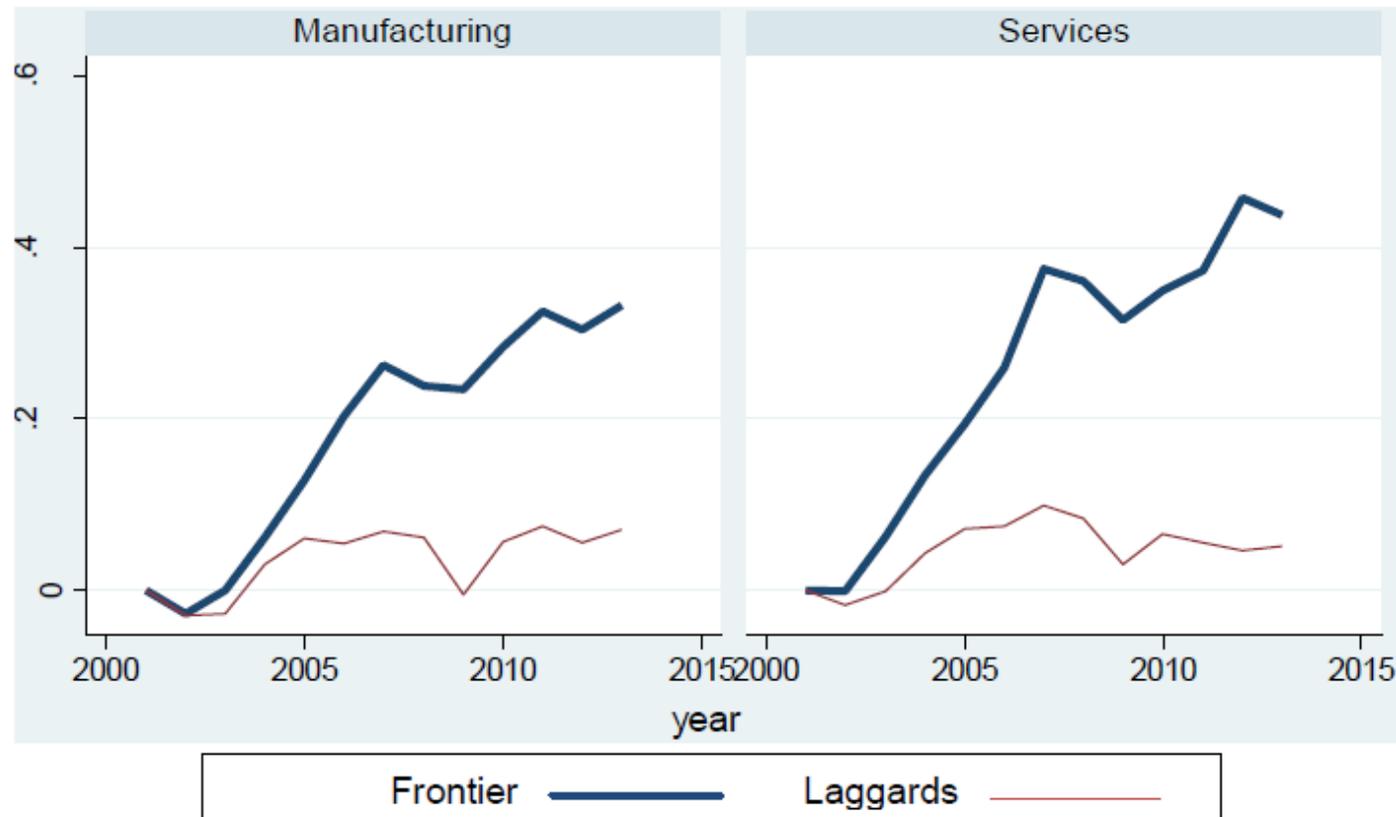
- Innovation and productivity are two crucial factors for economic growth and can explain a good portion of the slowdown of OECDs economies in past decades.
 - SMEs have contributed to this poor performance, being a major component of enterprise systems and the laggards in innovation and productivity
- This should not have been the case in the new «entrepreneurial economy» where R&I are no longer the preserve of large firms
 - Size still matters!
 - Focus of this presentation: SME concentration in the low innovation/prod.ty end of firm distribution; issues in innovation; pitfalls in innovation policy.

Widening difference in labour productivity growth between frontier and lagging firms

(Source: OECD – Andrews, Criscuolo, Gal 2016)

Figure 2. A widening labour productivity gap between global frontier firms and other firms

Labour productivity: value added per worker (2001-2013)

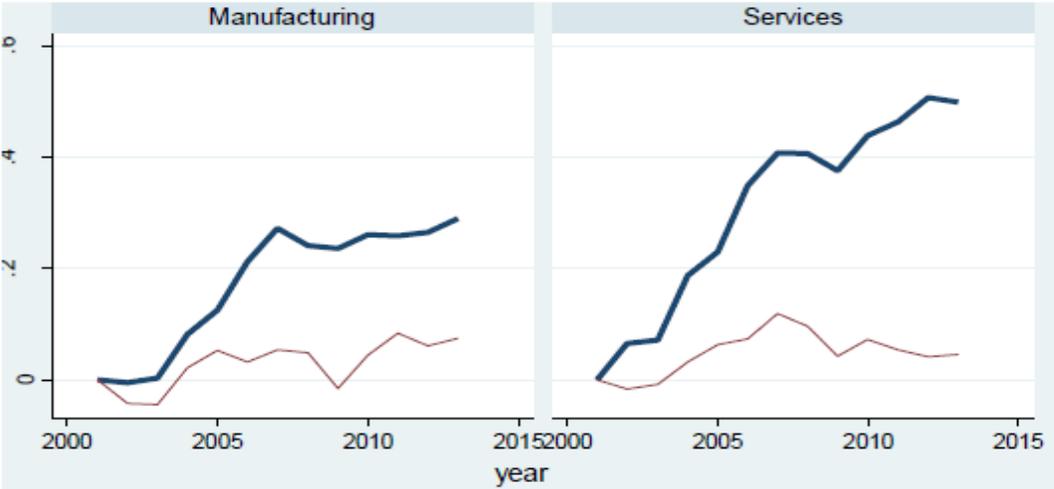


Widening labour and mfpr gaps in manufacturing and services – Value added per worker 2001-2013

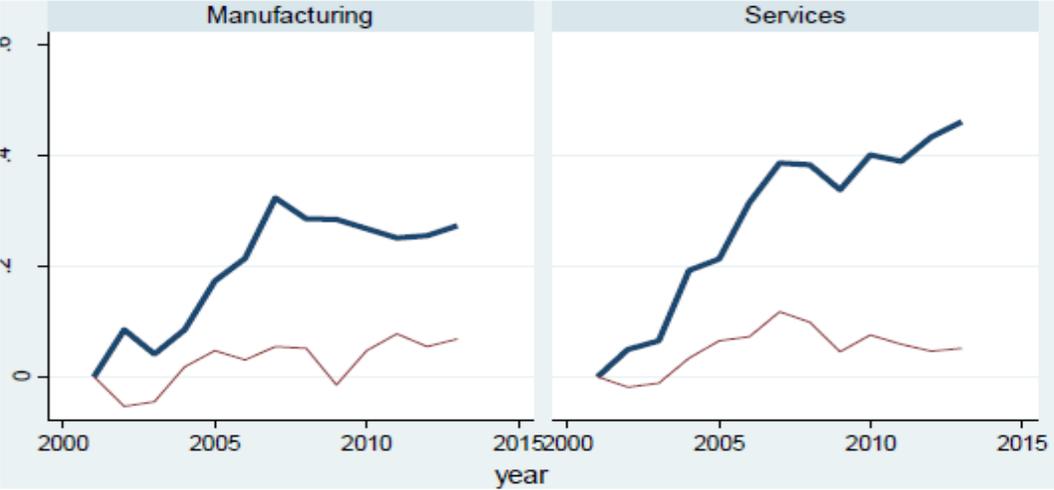
(source: OECD - Andrews, Criscuolo, Gal, 2016)

. The widening labour productivity gap is mainly driven by MFP divergence

A: Labour Productivity



B: Multi-Factor Productivity (MFPR)



Small firms are among the laggards in manufacturing, but in services size matters less
(Source: OECD, Ibidem)

A: Labour productivity based frontier definition

| Variables | Sector: manufacturing | | | | | | | Sector: services | | | | | | |
|-----------------------------------|-----------------------|---------|--------|----------------|---------|-----|------------|------------------|---------|--------|----------------|---------|-----|------------|
| | Laggard firms | | | Frontier-firms | | | Difference | Laggard firms | | | Frontier-firms | | | Difference |
| | Mean | St.dev. | N | Mean | St.dev. | N | | Mean | St.dev. | N | Mean | St.dev. | N | |
| Productivity | 10.7 | 0.6 | 21,191 | 12.0 | 0.4 | 825 | 1.3 *** | 10.4 | 0.7 | 22,053 | 11.9 | 0.7 | 627 | 1.5 *** |
| Employees | 49.3 | 52.1 | 21,191 | 45.1 | 33.8 | 825 | -4.2 *** | 59.5 | 156.6 | 22,053 | 38.0 | 24.8 | 627 | -21.6 *** |
| Capital-labour ratio ¹ | 86.1 | 115.3 | 21,191 | 274.5 | 425.5 | 825 | 188.4 *** | 76.4 | 214.0 | 22,053 | 677.5 | 2,071.1 | 627 | 601.1 *** |
| Revenues ² | 11.8 | 21.6 | 21,191 | 39.0 | 58.8 | 825 | 27.3 *** | 14.8 | 54.0 | 22,053 | 57.9 | 133.0 | 627 | 43.1 *** |
| Markup (log) | 0.1 | 0.4 | 21,191 | 0.1 | 0.4 | 825 | 0.05 *** | 0.1 | 0.4 | 22,053 | 0.3 | 0.5 | 627 | 0.19 *** |
| Wages ¹ | 34.2 | 16.7 | 21,191 | 54.6 | 20.1 | 825 | 20.4 *** | 34.5 | 16.7 | 22,053 | 56.6 | 23.4 | 627 | 22.1 *** |

B: MFPR based frontier definition

| Variables | Sector: manufacturing | | | | | | | Sector: services | | | | | | |
|-----------------------------------|-----------------------|---------|--------|----------------|---------|-----|------------|------------------|---------|--------|----------------|---------|-----|------------|
| | Laggard firms | | | Frontier-firms | | | Difference | Laggard firms | | | Frontier-firms | | | Difference |
| | Mean | St.dev. | N | Mean | St.dev. | N | | Mean | St.dev. | N | Mean | St.dev. | N | |
| Productivity | 10.4 | 0.6 | 21,317 | 11.6 | 0.4 | 706 | 1.3 *** | 10.3 | 0.7 | 22,147 | 11.7 | 0.7 | 538 | 1.4 *** |
| Employees | 48.3 | 46.8 | 21,317 | 73.7 | 126.0 | 706 | 25.4 *** | 59.1 | 155.3 | 22,147 | 53.4 | 115.6 | 538 | -5.6 |
| Capital-labour ratio ¹ | 89.3 | 125.1 | 21,317 | 214.3 | 406.0 | 706 | 125.1 *** | 81.1 | 245.5 | 22,147 | 579.6 | 2,131.7 | 538 | 498.5 *** |
| Revenues ² | 11.5 | 19.9 | 21,317 | 50.5 | 74.1 | 706 | 39.0 *** | 14.4 | 40.1 | 22,147 | 80.2 | 268.0 | 538 | 65.7 *** |
| Markup (log) | 0.1 | 0.4 | 21,317 | 0.0 | 0.4 | 706 | -0.02 | 0.1 | 0.4 | 22,147 | 0.2 | 0.5 | 538 | 0.12 *** |
| Wages ¹ | 34.3 | 16.7 | 21,317 | 56.3 | 18.9 | 706 | 22.0 *** | 34.6 | 16.8 | 22,147 | 56.8 | 23.9 | 538 | 22.2 *** |

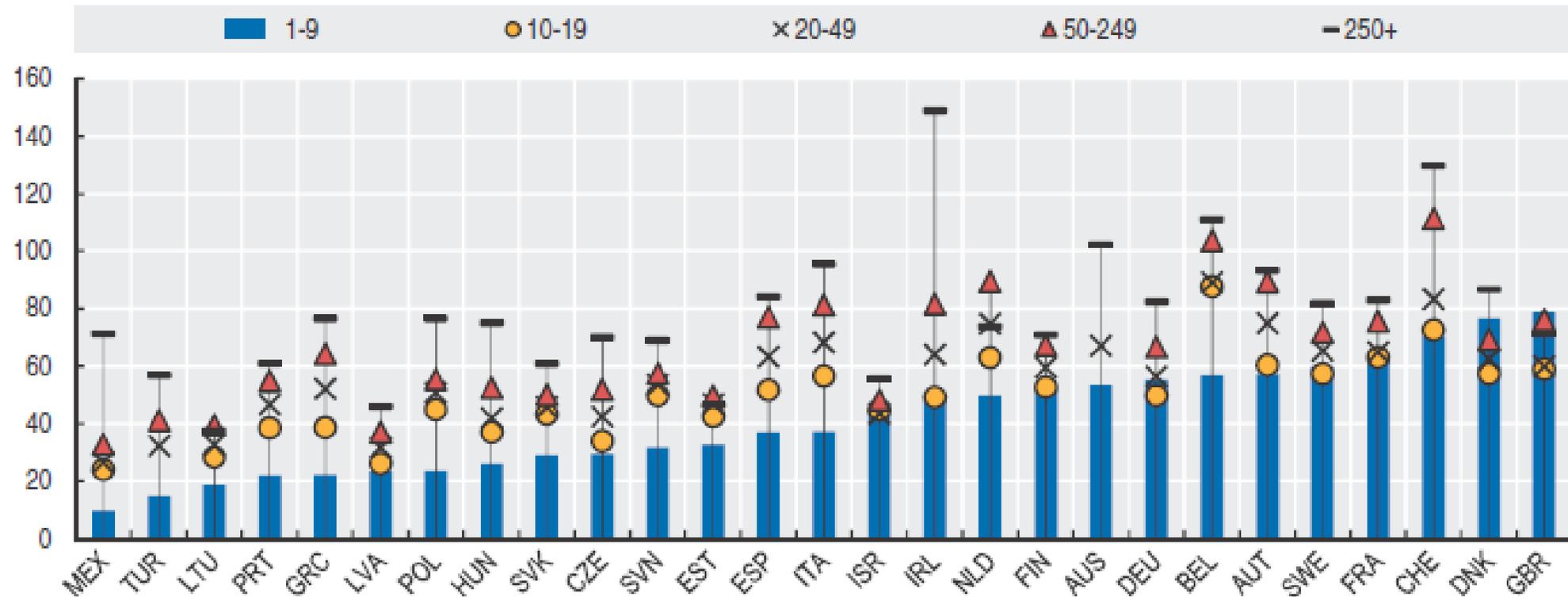
C: Mark-up corrected MFPR based frontier definition

| Variables | Sector: manufacturing | | | | | | | Sector: services | | | | | | |
|-----------------------------------|-----------------------|---------|--------|----------------|---------|-----|------------|------------------|---------|--------|----------------|---------|-----|------------|
| | Laggard firms | | | Frontier-firms | | | Difference | Laggard firms | | | Frontier-firms | | | Difference |
| | Mean | St.dev. | N | Mean | St.dev. | N | | Mean | St.dev. | N | Mean | St.dev. | N | |
| Productivity | 10.3 | 0.8 | 19,844 | 11.7 | 0.4 | 887 | 1.4 *** | 10.2 | 0.9 | 21,823 | 11.6 | 0.7 | 776 | 1.4 *** |
| Employees | 48.6 | 46.9 | 19,844 | 79.1 | 119.1 | 887 | 30.5 *** | 58.9 | 156.8 | 21,823 | 58.5 | 73.0 | 776 | -0.4 |
| Capital-labour ratio ¹ | 95.1 | 138.9 | 19,844 | 114.1 | 272.6 | 887 | 18.9 ** | 88.7 | 330.8 | 21,823 | 211.6 | 1,389.1 | 776 | 122.9 ** |
| Revenues ² | 12.0 | 22.5 | 19,844 | 34.7 | 51.4 | 887 | 22.7 *** | 15.3 | 58.0 | 21,823 | 36.7 | 59.6 | 776 | 21.5 *** |
| Markup (log) | 0.1 | 0.4 | 19,844 | -0.2 | 0.2 | 887 | -0.3 *** | 0.1 | 0.4 | 21,823 | -0.2 | 0.3 | 776 | -0.2 *** |
| Wages ¹ | 34.5 | 16.5 | 19,844 | 60.6 | 15.8 | 887 | 26.1 *** | 34.2 | 16.5 | 21,823 | 60.7 | 21.2 | 776 | 26.5 *** |

Labour productivity by firm size

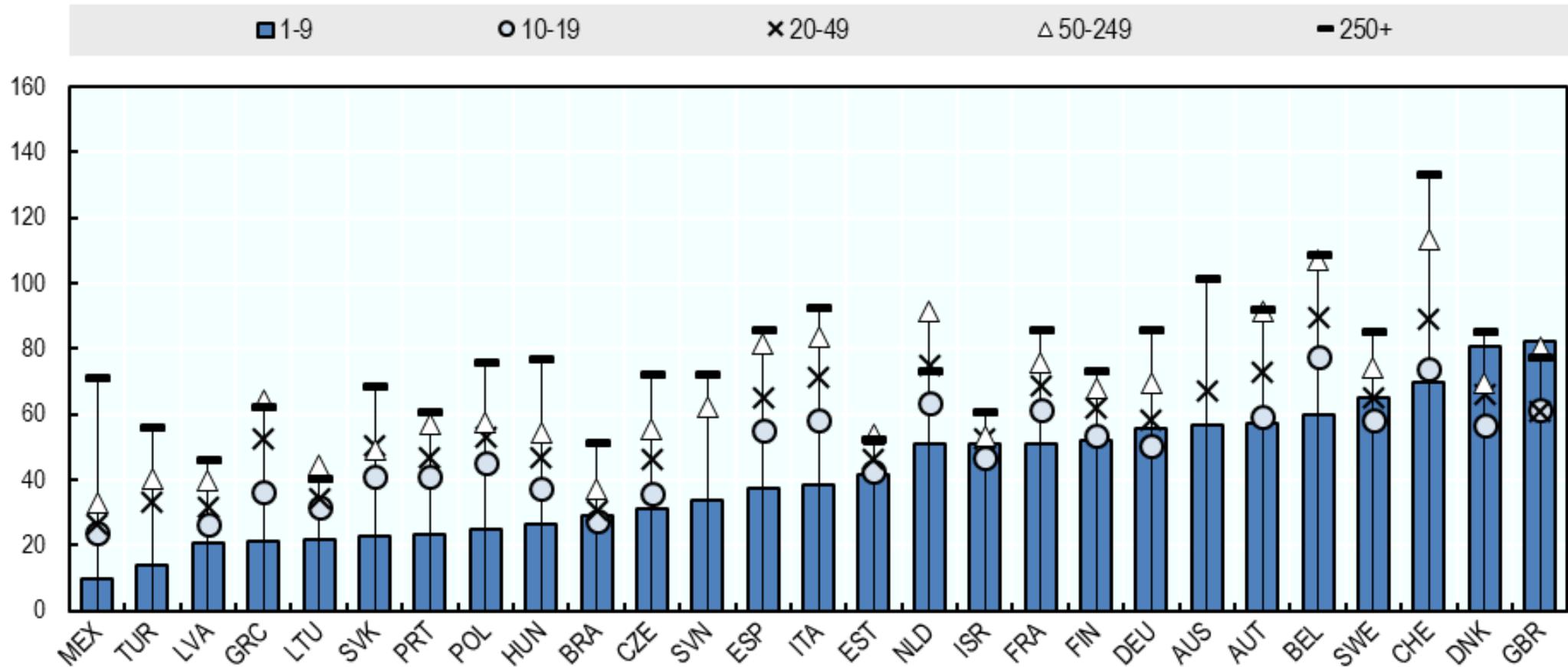
(Source: OECD Entrepreneurship at a glance 2016)

Value added per person employed, thousands of USD, current PPPs, 2013, or latest available year



Labor productivity by firm size – year 2014

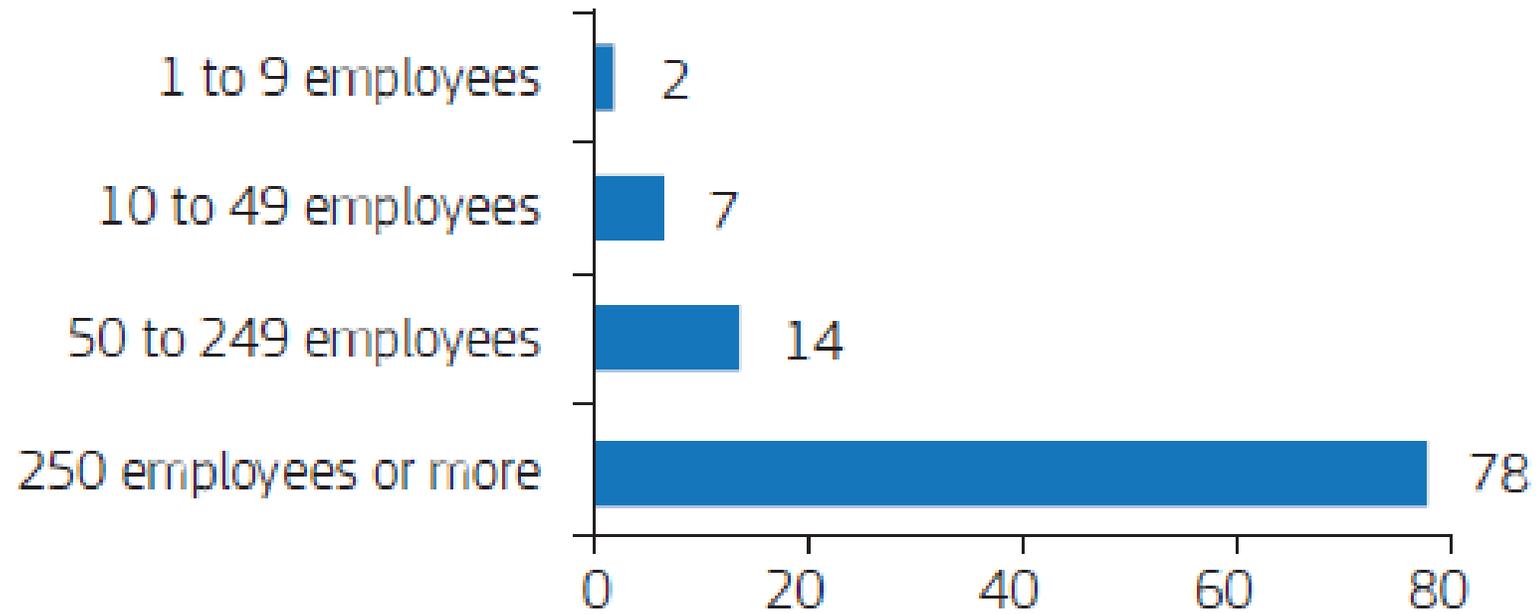
(Source: OECD Compendium of prod.ty indicators 2017)



Investment in innovation by firm size

(Source: EU Innovation scoreboard 2017)

Share of business R&D expenditures by enterprise size

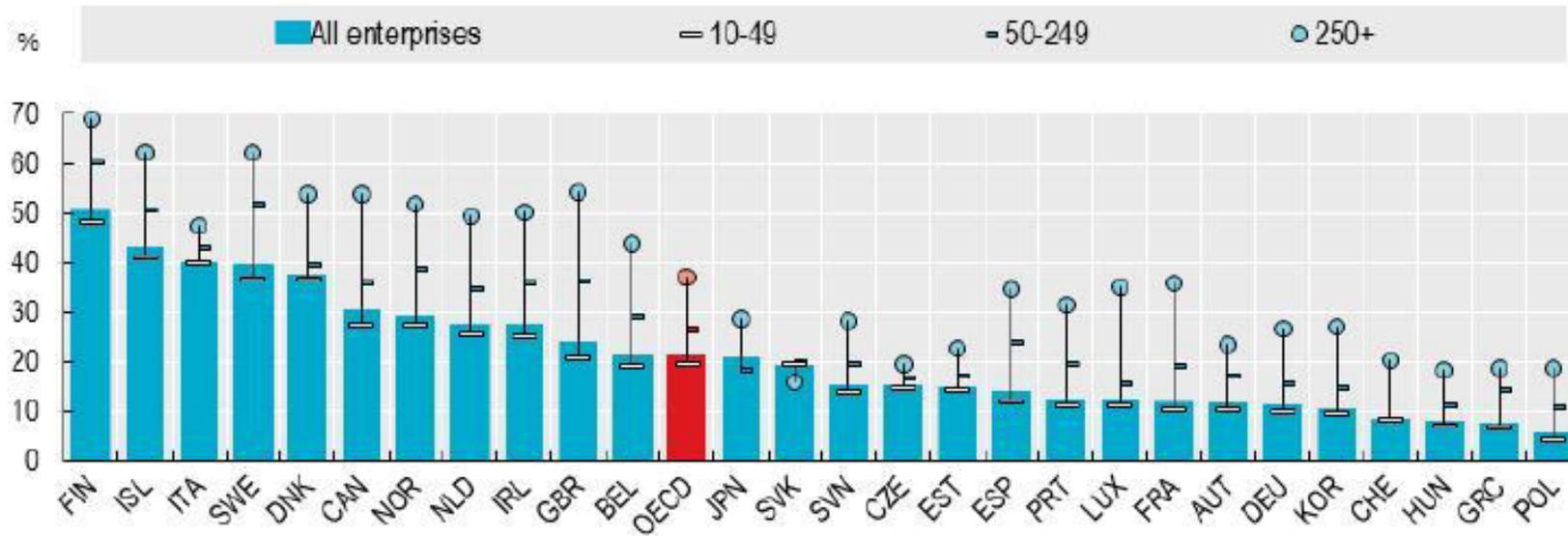


Average 2011-2014 data for EU28

SMEs lag behind in digitalization

(Source: OECD, Enhancing SMEs...2017)

Enterprises using cloud computing services by size, as a percentage of enterprises in each employment size class, 2014



Notes: Unless otherwise stated, sector coverage consists of all activities in manufacturing and non-financial market services. Only enterprises with ten or more persons employed are considered. Size classes are defined as: small (from 10 to 49 persons employed), medium (50 to 249) and large (250 and more). For Canada, data refer to enterprises with expenditures on "Software as a Service" (e.g. cloud computing). Medium-sized enterprises have 50-299 employees. Large enterprises have 300 or more employees. For Japan, data refer to businesses with 100 or more employees. Medium-sized enterprises have 100-299 employees. Large enterprises have 300 or more employees. For Canada and Korea, data refer to 2012 instead of 2014. For Japan and Switzerland, data refer to 2011 instead of 2014. For Switzerland, data refer to enterprises with five and more employees.

Source: OECD (2015), OECD Digital Economy Outlook 2015, OECD Publishing, Paris.

There has been an increasing failure to diffuse innovation

- Several barriers to innovation diffusion
- Lack of market competition is one of them, but obstacles are all along the various components of the innovation system
- Government policy is called upon to address these mkt failures
- But it turns out to be itself a source of failure
- Governments often fail to grasp the systemic nature of innovation
- Systemic in the sense of a system of interactions involving several actors and requiring specific targeting of measures, specialized infrastructures and policy coordination across different policy makers.
- Several pitfalls, starting from lack of a long-term vision of direction towards which to orient businesses

Taxonomy of a holistic innovation policy

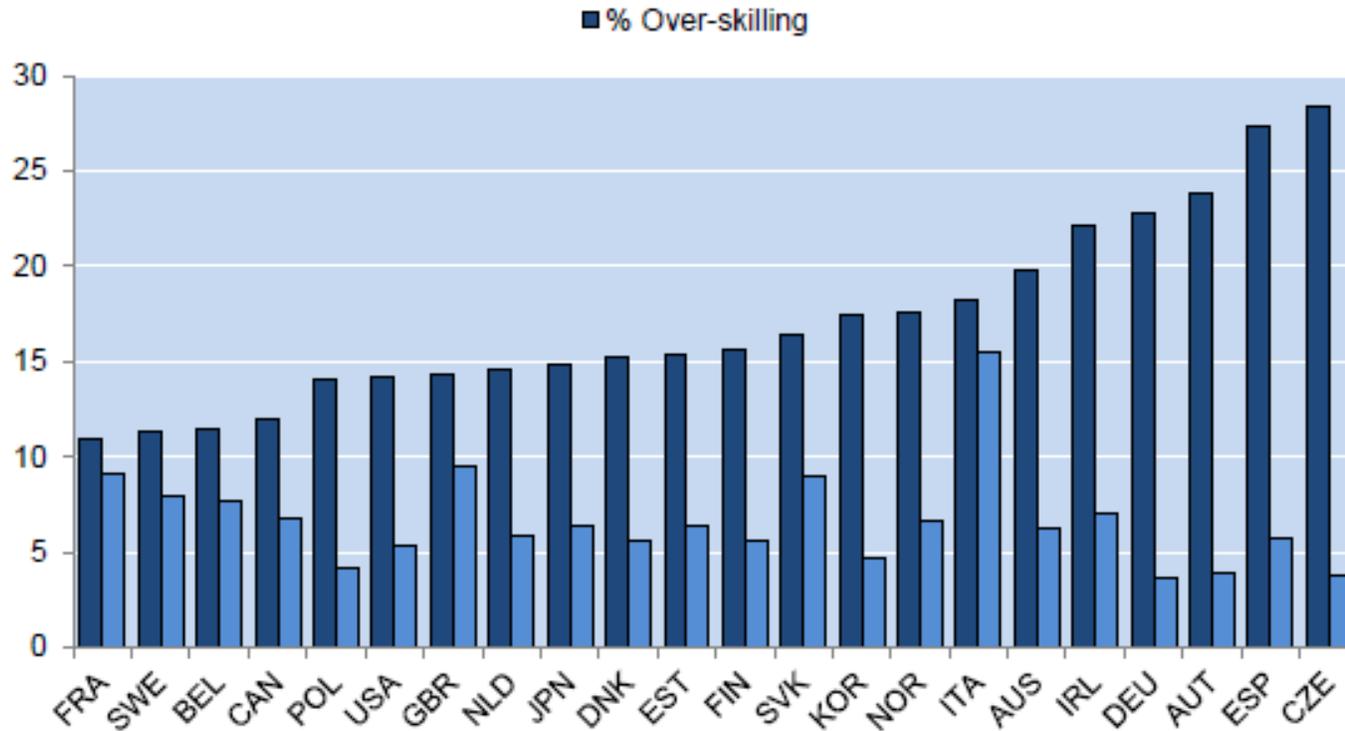
| | |
|---|--|
| Knowledge creation (innovation supply) | <ul style="list-style-type: none"> Investment cost vs. business risk Disconnection between research and business Lack of knowledge and information infrastructures Lack of know-how, quality human resources Difficulties in university/research spillovers into business, start-ups, |
| Knowledge demand (innovation demand) | <ul style="list-style-type: none"> System inertia, habits Limited market scope Country's sectoral specialization Bias towards existing technologies and approaches Regulations and standards Difficulty in firm's absorption of new knowledge Lack of public procurement |
| Knowledge/innovation diffusion across firms | <ul style="list-style-type: none"> Innovation chains and networks Clusters of innovative firms Innovation/ technology parks Incubators/accelerators Lack of specialized bodies for technology transfer, both private and public ones |
| Enabling environment | <ul style="list-style-type: none"> Conducive finance (private and public) Skilled labor, training facilities Barriers to competition (hard market entry, incumbents) Information infrastructures Externalities limiting appropriability of returns, inadequate protection/enforcement of IPRs and "industrial" property (trade-marks, design, etc.) Quality education and research facilities Innovation/entrepreneurial culture in society |
| Innovation policy governance | <ul style="list-style-type: none"> Lack of an Innovation Policy and foresight Lack of an Innovation strategy Fragmented policy approach Lack of horizontal and vertical coordination across Government Lack of policy predictability and stability Intricate implementation procedures and bureaucratic hindrances Lack of policy effectiveness Lack of monitoring and periodic evaluation of innovation measures |

Main Pitfalls in policy making

- Lack of long-term vision: hence, spot measures and piecemeal approach
- Supply-driven approach, focused on R&D knowledge producers
- Either top-down approach or bottom up one, no balance between the two
- Innovation policy focused only on industry, leaving aside services
- Absence of a holistic approach spanning from education to labor, finance and trade
- Lack of intra-governmental coordination in a multi-layer and multi-authorities system
- Skills mismatch and lack of labour qualified in new tech
- Underrating the problem of diffusing innovation across SMEs through pro-active policy
- Lack of recognition of SMEs' specific needs when designing measures that apply to all firms
- Inappropriate choice of policy instrument
- Lack of ex-post policy evaluation to learn how to improve measures

Skills mismatch 2011-12

(source: OECD, McGowan, Andrews, 2015)



Note: The figure shows the percentage of workers who are either over- or under- skilled and the simulated gains to allocative efficiency from reducing skill mismatch in each country to the best practice level of mismatch. The figures are based on OECD calculations using OECD, Survey of Adult Skills (2012).

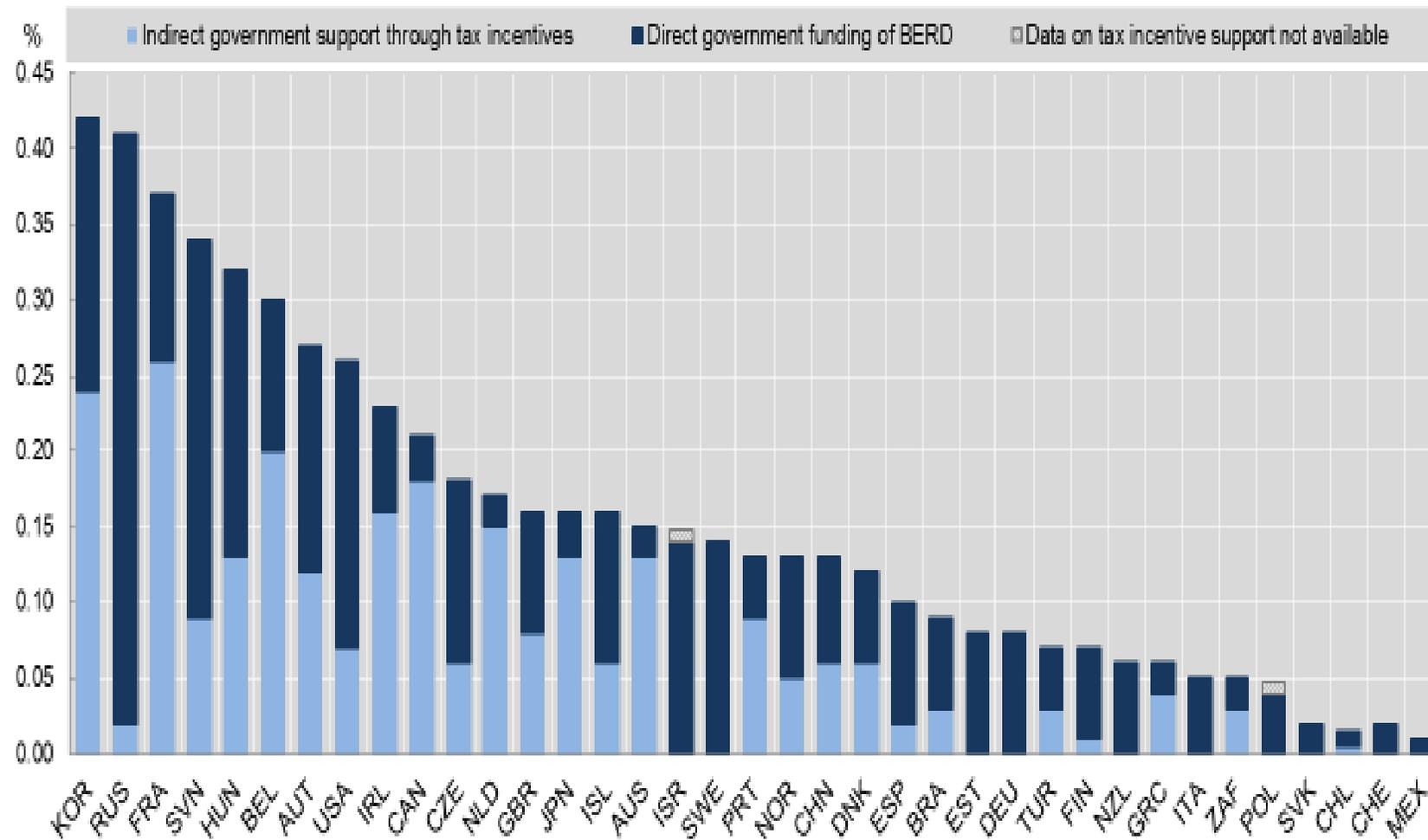
Source: Adalet McGowan, M. and D. Andrews (2015b).

For instance: Italy's innovation policy pitfalls in 2000-2015

- Incentives without a plan or strategy
- National Plan for R&D didn't deal adequately with innovation
- Fragmentation of measures as well as of policy makers
- Policy coordination was missing: duplications and gaps
- Inefficiencies in selecting beneficiaries
- Lengthy and complex procedures to disburse financial support
- Focus mainly on manufacturing, while little attention to services
- Failure of Industria 2015 program
- Instrument choice not attuned to needs of different firm classes
- Amount of resources inadequate and below those committed by partners

Direct Government Support and Tax Incentives for Business R&D (Year 2013 – as a % of GDP)

Source: OECD, R&D Tax Incentives: Design and Evidence, 2016



Overall, breed innovation culture across society.
Without it, widespread innovation will always be a mirage.

- No optimal policy model fits all
- Each country should analyze strengths and weaknesses beforehand
- Determine general policy orientation
- Choose appropriate tools according to firms' needs
- Monitor implementation
- Evaluate results and make adjustments