How to stimulate innovation in Spanish firms

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Outline

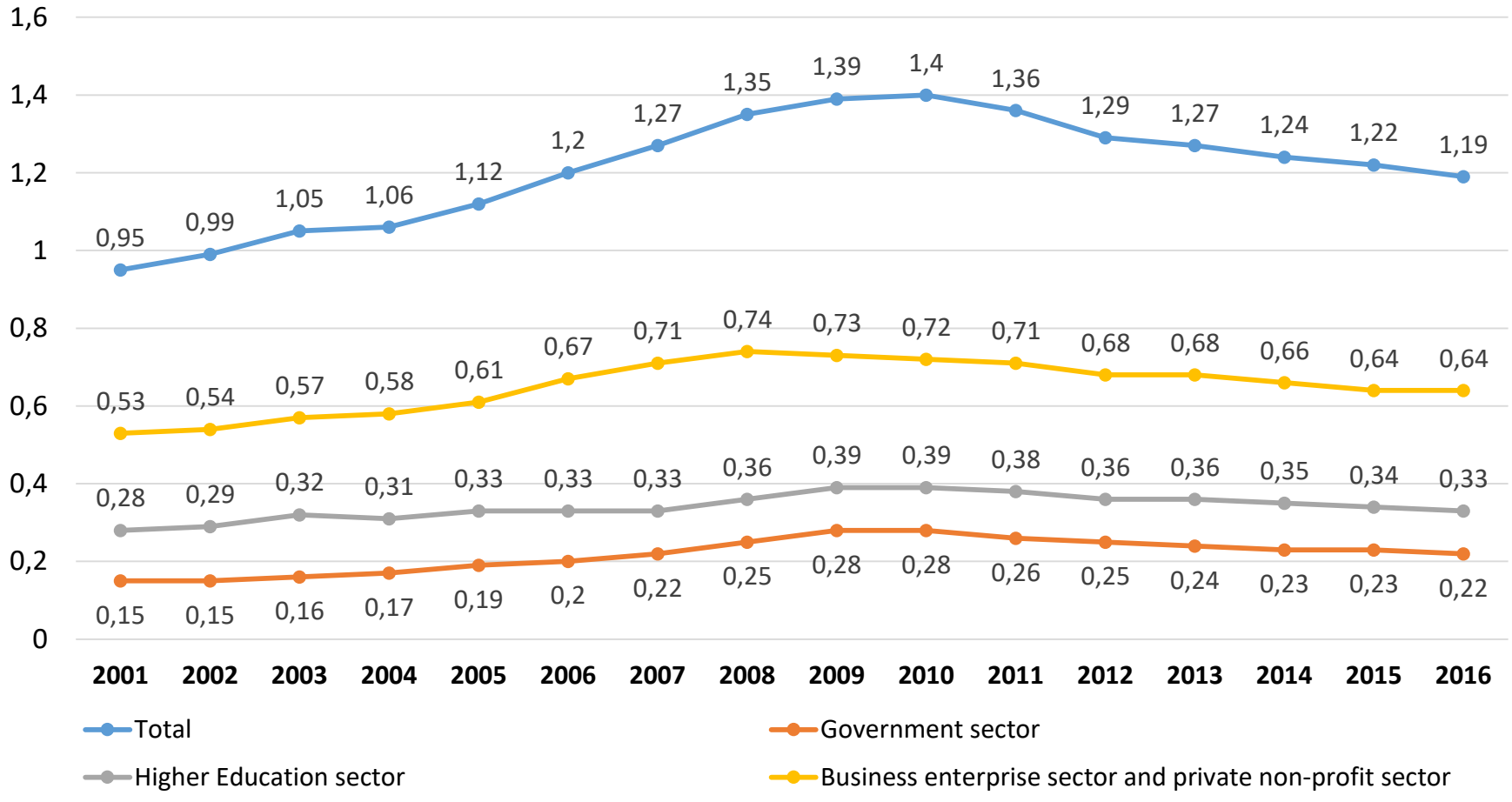
- **Innovation in Spanish firms:** The situation is far from being good compared with that of other European countries of similar size.

- **Strengths and weaknesses:** Besides public financial support, there are other factors conditioning firms innovation that a comprehensive view of innovation policy may take into account. Need for evaluating the strengths and weaknesses regarding these factors.

- **Public financial support:** In general, it increases private R&D effort, but the effect is heterogeneous depending on the type of firm and the specific features of the supporting programme. There is still room for improvement.

Innovation in Spanish firms

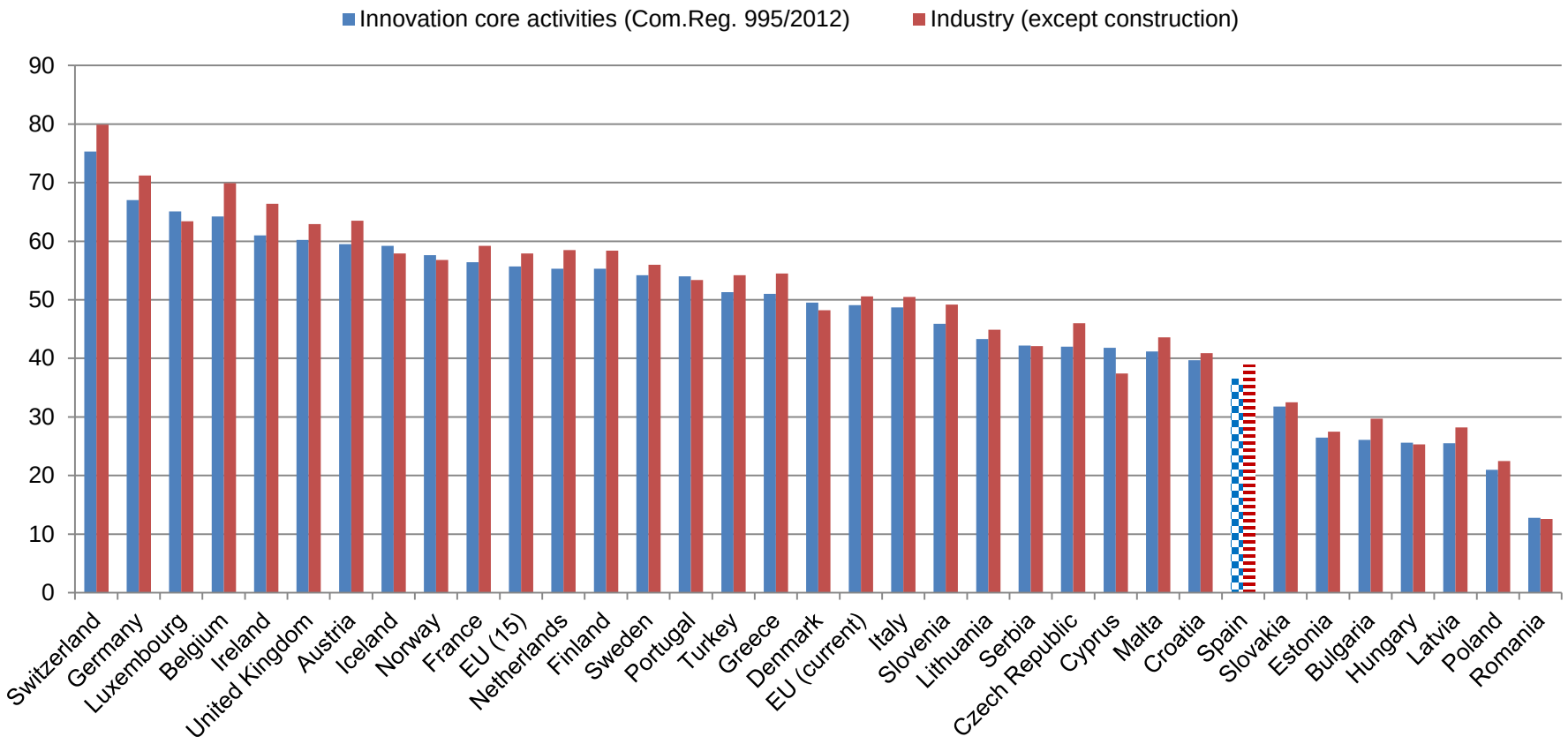
Intramural R&D expenditure (GERD) by sectors of performance (% of GDP)



Source: Spanish Statistical Institute (INE)

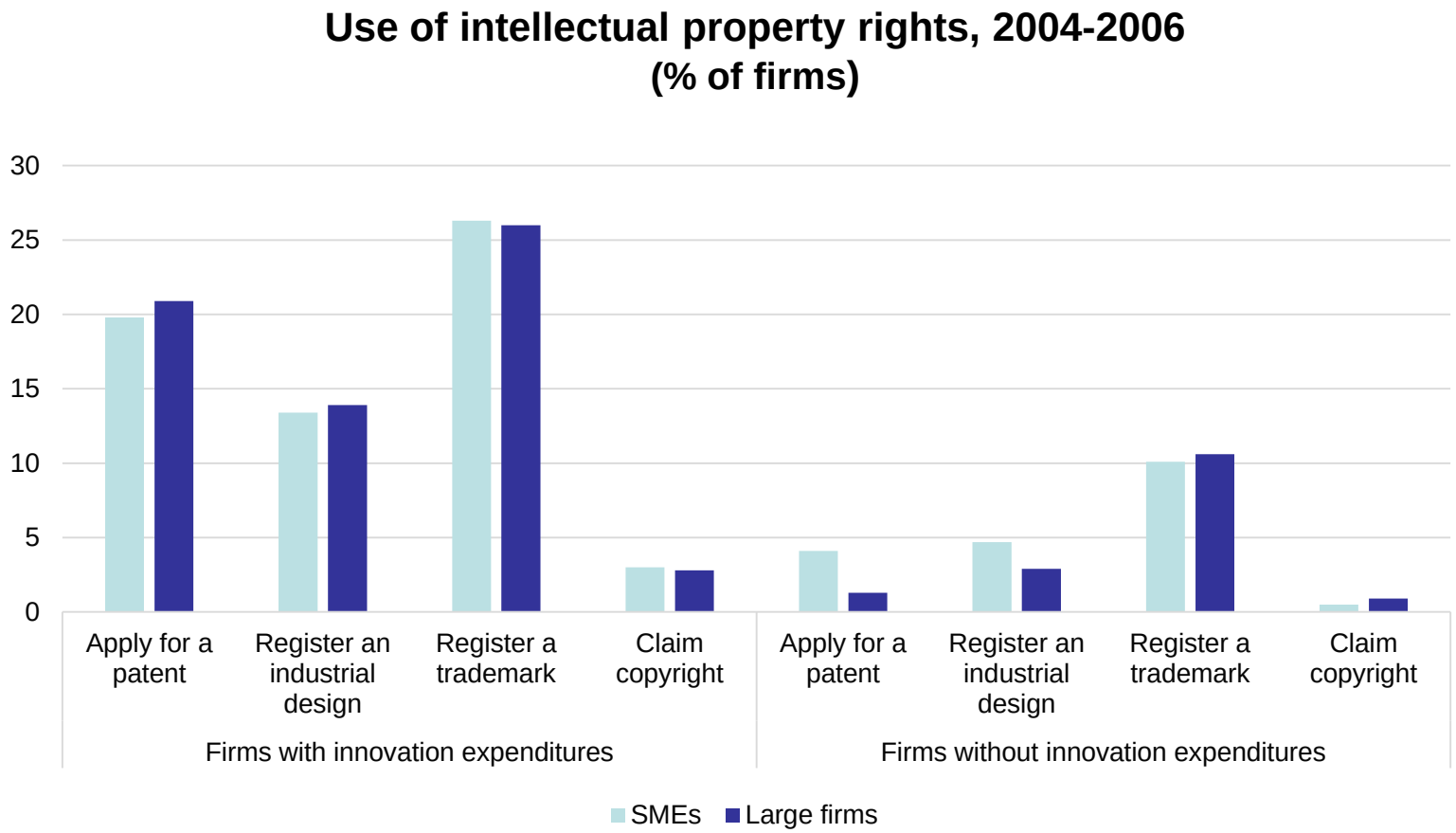
Innovation in Spanish firms

Innovative enterprises (including enterprises with abandoned/suspended or on-going innovation activities), 2014 (% of total number of enterprises)



Source: Eurostat. Community Innovation Survey 2014

Innovation in Spanish firms



Source: Own elaboration from Panel of Technological Innovation (PITEC). INE

Strengths and weaknesses

Two types of factors conditioning firms innovation and, therefore, innovation policy:

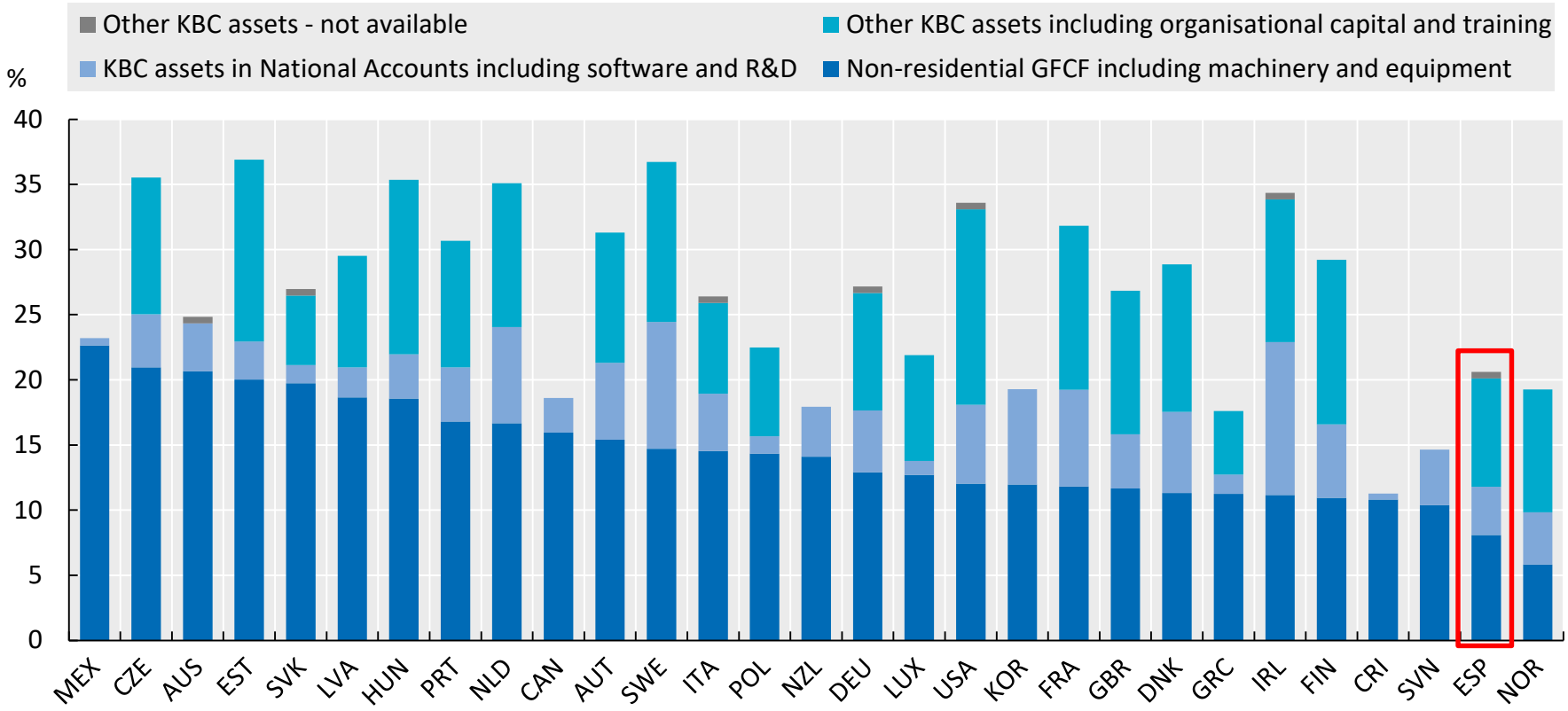
- Of macroeconomic type (Mulet, 2016):
  - Pool of available/accessible knowledge for companies
  - Physical, intellectual and digital capital
  - Human capital
  - Institutional architecture (regulatory and policy issues, access to external financing, legal certainty)

- Of microeconomic type (culture of innovation-abilities of the entrepreneur)
  - Awareness of innovation as a condition for survival (definition of strategy for innovation)
  - Capacity for surveillance of the environment (disruptive technology)
  - Management of complex processes capacity (training in new technologies, languages, forms of organization…)
  - Ability to assume risks (failures): how to fund the R&D&I?

Strengths and weaknesses

– Pool of available/accessible knowledge for companies
– Physical, intellectual and digital capital

Business investment in fixed and knowledge-based capital, 2015
(% of business sectors gross value added)

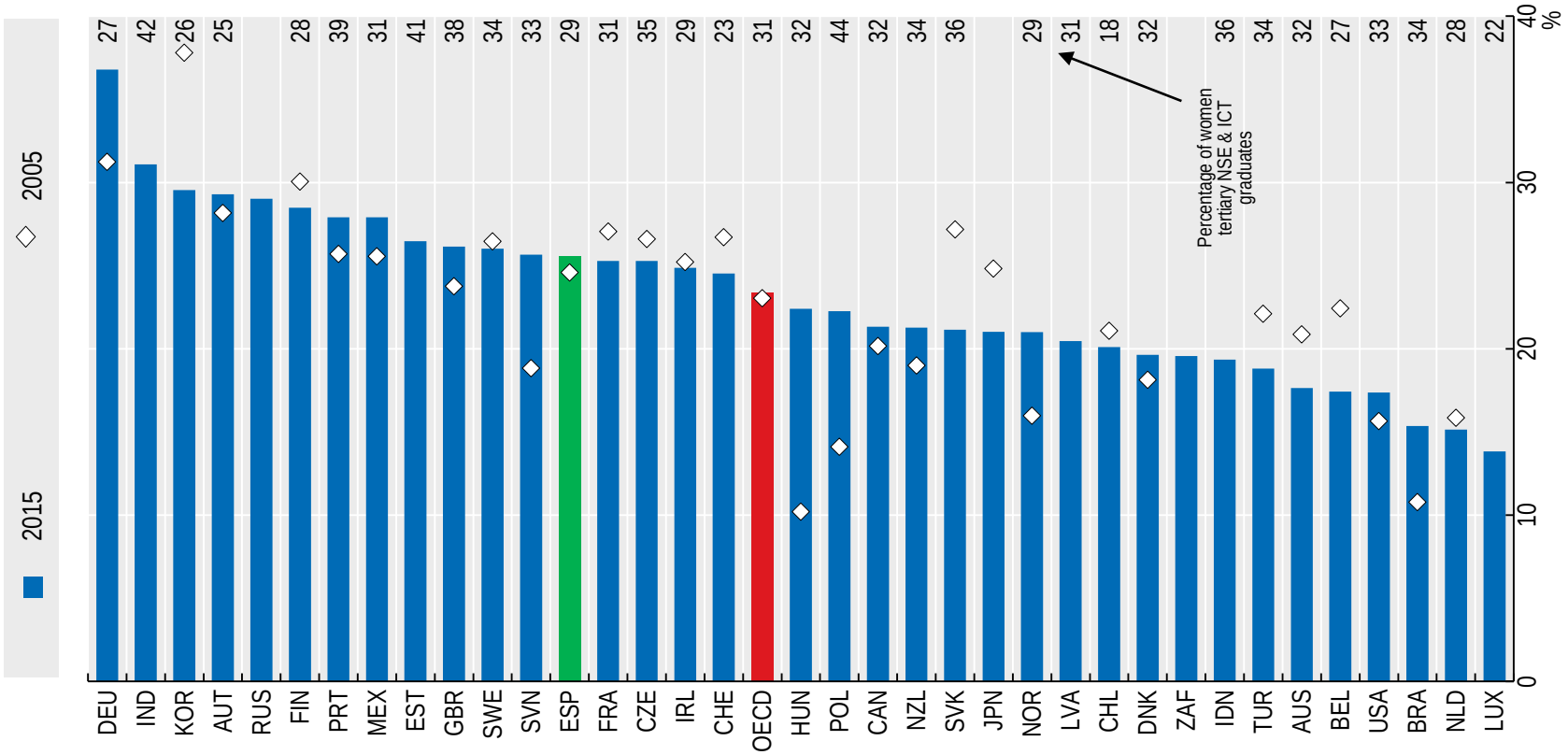


Source: OECD calculations based on Annual National Accounts Database, http://www.oecd.org/std/na, INTAN-Invest data, http://www.intan-invest.net; and U.S. Bureau of Economic Analysis data, May 2017. *http://dx.doi.org/10.1787/888933618707*

Strengths and weaknesses

– Human capital

Tertiary graduates in natural sciences, engineering and ICTs, 2005 y 2015
(% of all tertiary graduates)

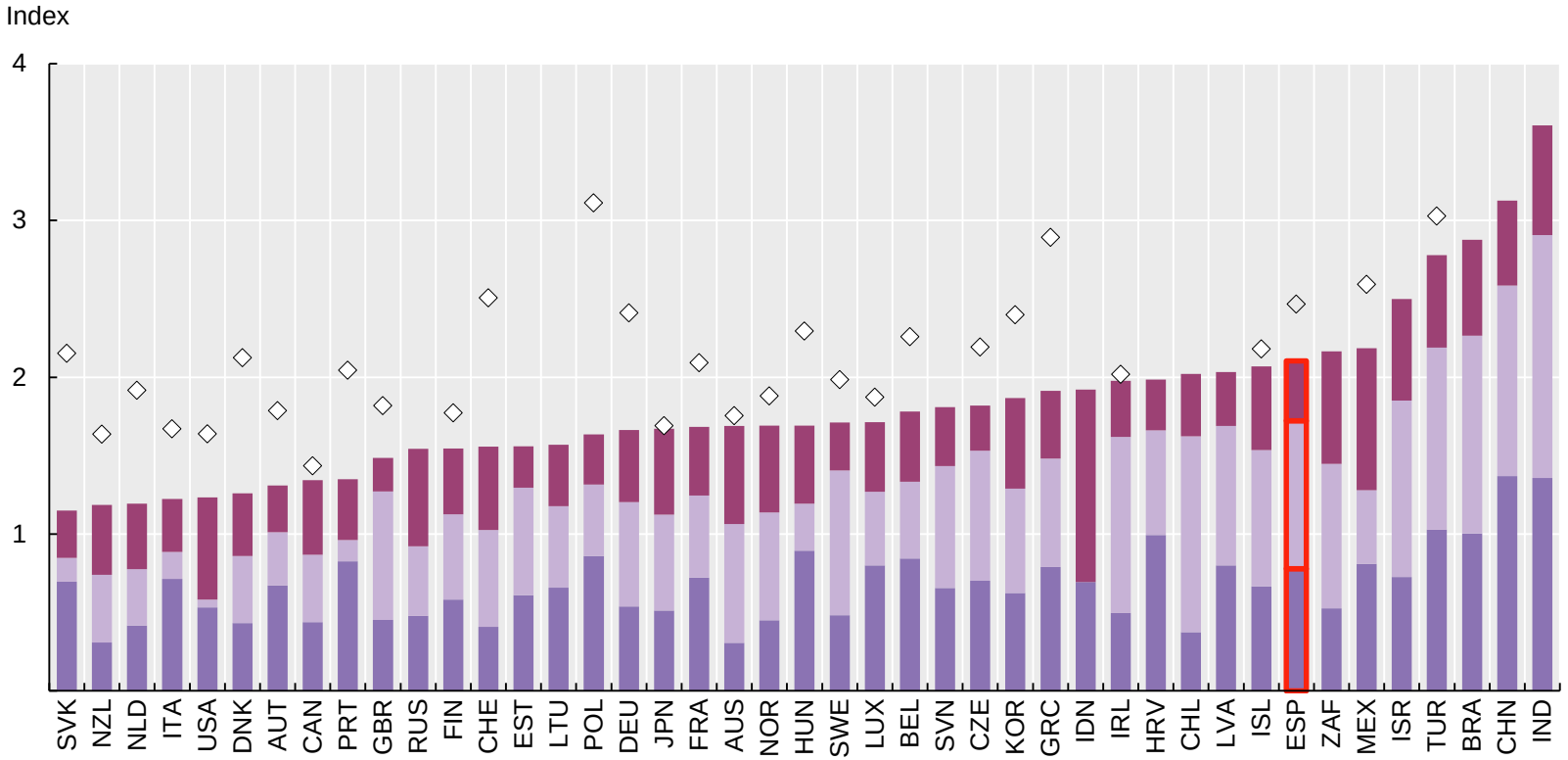


Source: OECD, based on OECD (2017), Education at a Glance 2017: OECD Indicators and OECD (2007), Education at a Glance 2007: OECD Indicators, OECD Publishing, Paris. http://dx.doi.org/10.1787/888933618460

Strengths and weaknesses

– Institutional architecture

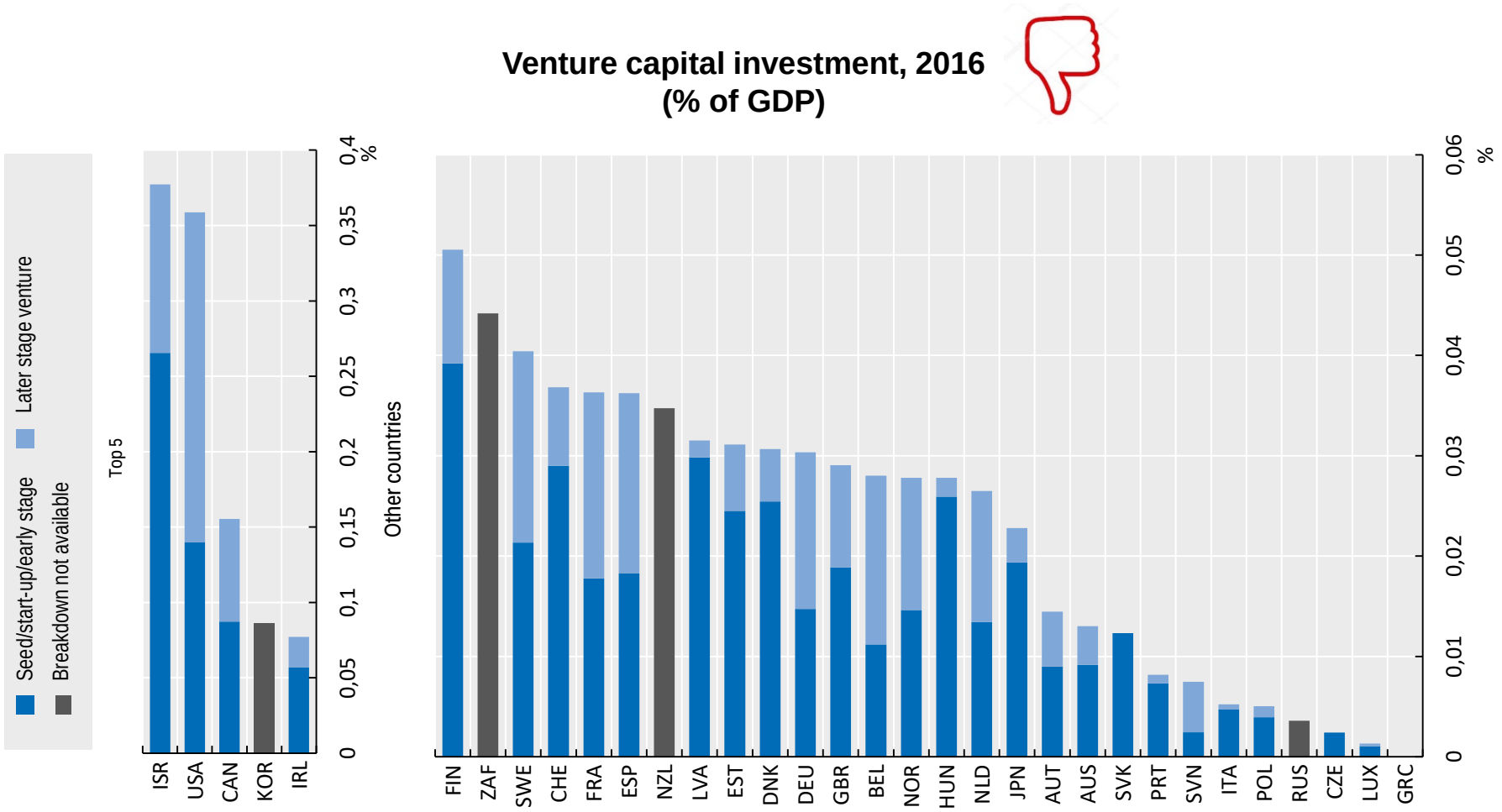
Barriers to entrepreneurship, 2015
(Scale from 0 to 6, from least to most restrictive)



Source: OECD, Product Market Regulation Database, www.oecd.org/economy/pmr, June 2015. http://dx.doi.org/10.1787/888933274385

Strengths and weaknesses

– Institutional architecture

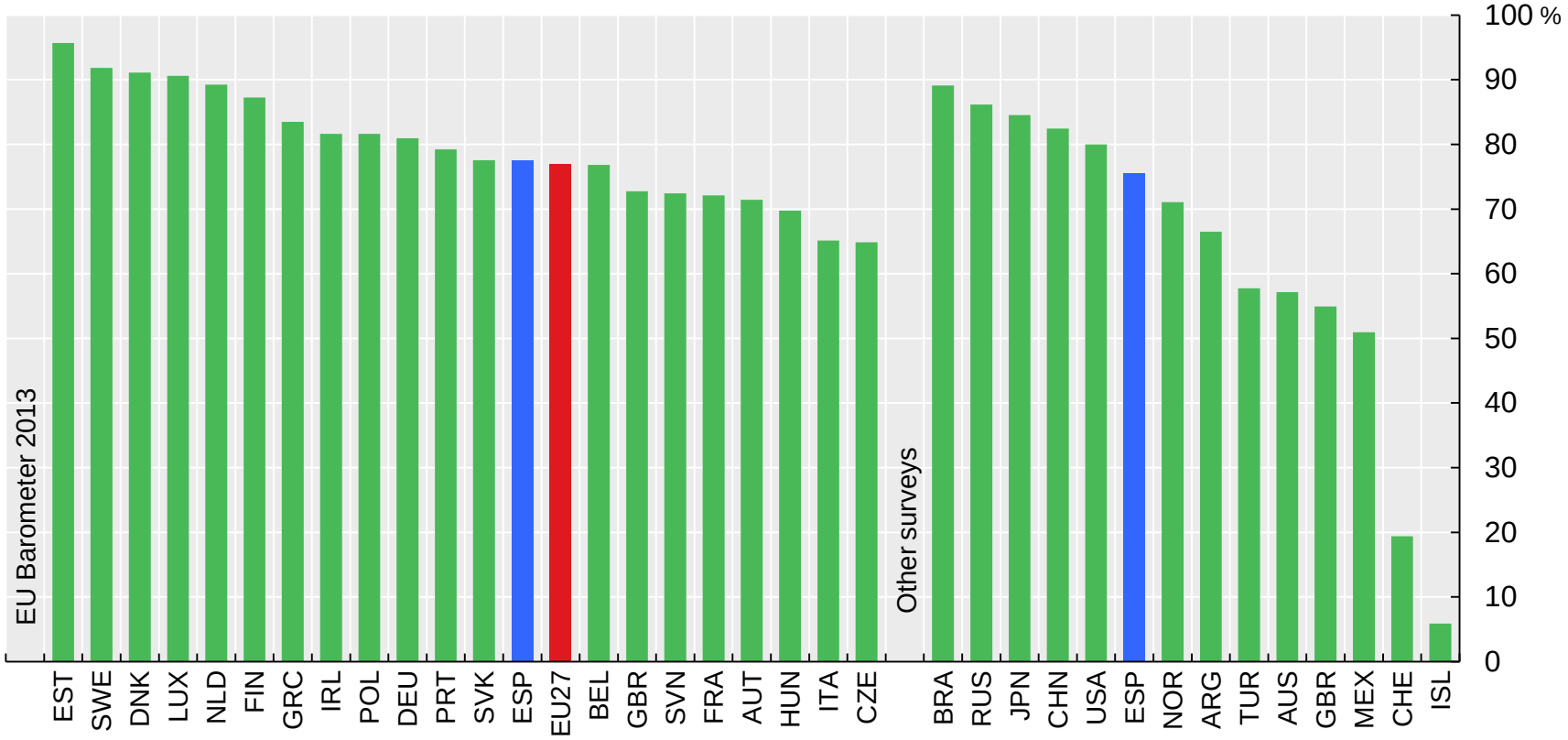


Source: OECD, based on OECD (2017), Entrepreneurship at a Glance 2017, OECD Publishing, Paris., June 2015.
http://dx.doi.org/10.1787/888933619467

Strengths and weaknesses

– Culture of innovation

Public perception of impacts of science and technology on society, 2013
(% of respondents with positive views, relative to all respondents with non neutral views)



Source: OECD calculations based on European Commission (2013), Special Eurobarometer 401; and other national sources, June 2015.

Strengths and weaknesses

– Culture of innovation

Efficient use of talent, 2015-2016

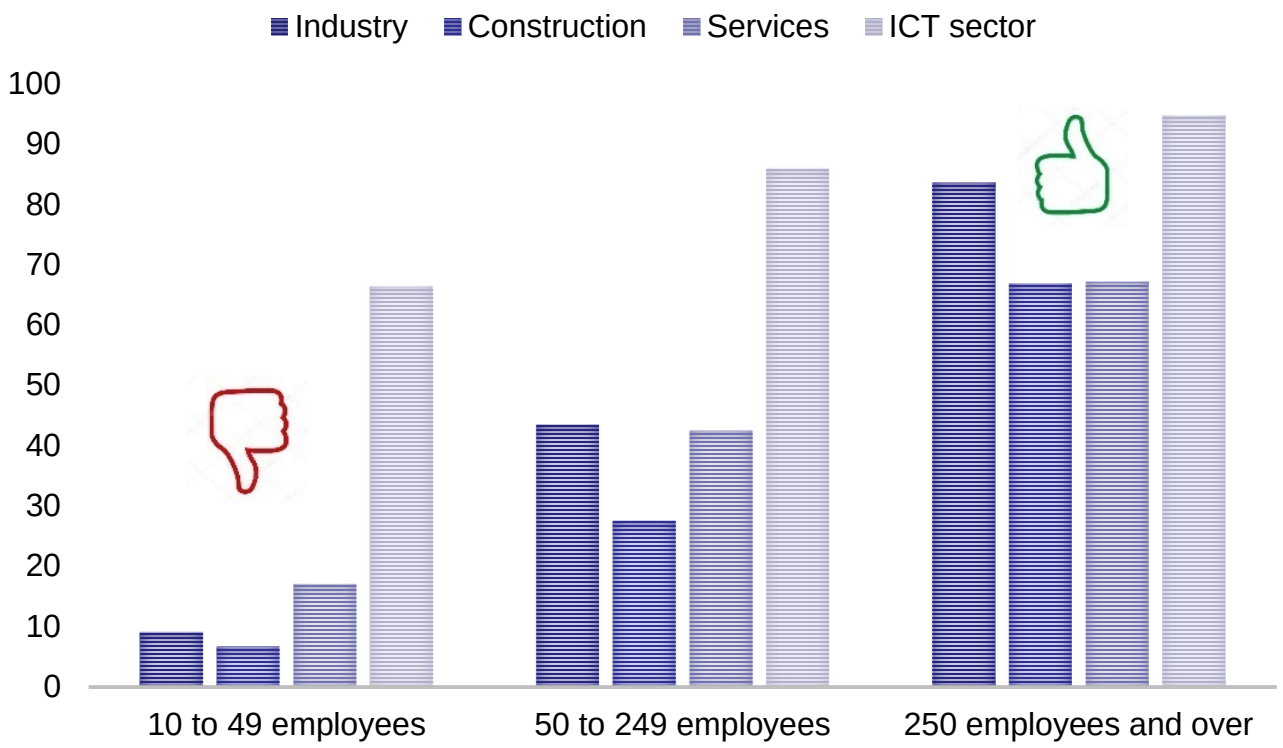
	Rank / 140	Score	Trend	Distance from best
Pay and productivity 1-7 (best)	115	3.4		
Reliance on professional management 1-7 (best)	49	4.5		
Country capacity to retain talent 1-7 (best)	94	3.1		
Country capacity to attract talent 1-7 (best)	98	2.8		
Female participation in the labor force ratio to men	53	0.9		

Source: Global Competitiveness Report 2015-2016.
http://reports.weforum.org/global-competitiveness-report-2015-2016/economies/#economy=ESP

Strengths and weaknesses

– Management of complex processes capacity (training in new technologies, languages, forms of organization…)

Companies that hired ICT experts by activity sector and company size, 2018 (first quarter) (% of companies)



Source: Survey on the use of ICT and Electronic Commerce (EC) in enterprises 2017-2018. Spanish Institute of Statistics (INE)

Effectiveness of public financial support

Many academic studies about the effectiveness of direct and indirect public financial aid in Spain.

Regarding **loans and subsidies**:

- In general, public aid increases private R&D effort (Busom, 2000; González et al., 2004; Herrera & Heijs, 2007; González & Pazó, 2008). However, for some companies, a full crowding-out between public and private spending cannot be rejected (Busom, 2000: 30%)
- Some companies, mainly small firms in low-tech sectors, would stop innovative activities without the subsidy (González et al., 2004; González & Pazó, 2008)
- With an expected funding of less than 10% of R&D expenditures, almost 50% of the big non-performing firms will switch to performing innovative activities. On the contrary, inducing 30% of the small firms to carry out R&D implies expected support accounting for up to 40% of the expenses (González et al., 2004).
- Firms can be induced persistently to perform R&D activities by means of public direct support (Arqué-Castells & Mohnen, 2015; Huergo et al., 2016)

Effectiveness of public financial support

When funding **R&D cooperative projects**, the public agency uses subsidies and loans to address different objectives (Santamaría et al., 2010):

- Some projects close to the market are well supported through loans, while basic research projects receive only selective support in the form of subsidies.
- The public agency selectively favors partnerships with universities and technology institutes through the award of subsidies. However, there seems to be less incentive for large consortia.
- There is significant diversity in the selection and funding of technological areas. There also are significant regional differences among financed projects.

As for **R&D tax incentives:**

- Fiscal incentives are effective to stimulate private R&D investment. The effectiveness is higher in firms with liquidity restrictions (Corchuelo, 2006)
- However, financial constraints are negatively correlated with the use of tax credits (Busom et al., 2010).
- Estimated short-run elasticities are lower than estimated long-run elasticities (Marra, 2008).

Effectiveness of public financial support

Comparing different instruments:

- Large firms mainly consider tax credits to reduce the tax burden in the corporate tax, while SMEs use public grants to alleviate financial constraints (Romero-Jordán et al., 2014)

- Subsidies may be better suited than tax credits to encourage firms, especially young knowledge-based firms, to start doing R&D (Busom, Corchuelo & Martínez-Ros, 2014)

- Being awarded any type of direct aid –national loans, national or supra-national subsidies– increases the probability of conducting R&D activities. In terms of being supported through a unique instrument of direct aid, the greatest effect corresponds to the case of European grants, where the impact is more than three times larger than the one of loans (Huergo & Moreno, 2017)

- The impacts of subsidies and loans reinforce each other when they are jointly awarded to SMEs. However, for large firms we cannot rule out the existence of crowding-out effect between subsidies and loans. (Huergo & Moreno, 2017)

Effectiveness of public financial support

R&D&I policy and economic crisis:

- The impact of the crisis on firms' innovation expenditures differs depending on:
  - firm size and the access to public subsidies (Busom & Vélez, 2016; Cruz-Castro, Holl, Rama & Sanz-Menéndez, 2015):
    - ✓ Firms with access to public funding in the pre-crisis period were less likely to abandon innovation activities during the downturn (CC&H&R&SM-2015).
    - ✓ SMEs were more affected by the trajectory of their sales, but those receiving public subsidies were less likely to abandon innovation projects, at least prior to 2009 (B&V-2016).
  - regional economic size and the type of the regional innovation system: regional R&D spending only reduces innovation abandonment rates in regions where a strong system of knowledge exploitation is in place (CC&H&R&SM-2015).

Three ideas

- **Innovation in Spanish firms:** The situation is far from being good compared with that of other European countries of similar size.

- **Strengths and weaknesses?:** Besides public financial support, there are other factors conditioning firms innovation that a comprehensive view of innovation policy may take into account. Need for evaluating the strengths and weaknesses regarding these factors.

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