



THE ROOTS OF THE PRODUCTIVITY SLOWDOWN

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Based on the work of:

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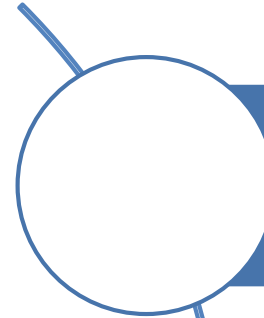
... exploiting two databases

 **DynEmp**

- Business Demography
- Employment

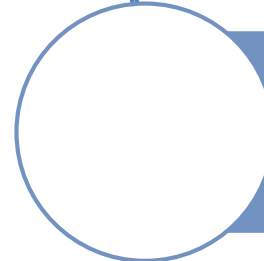
 **MultiProd**

- Productivity
- Mark-ups
- Concentration
- Intangibles
- Wages & Labour share



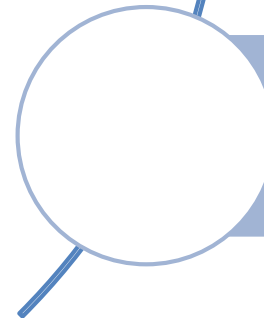
Coverage

- Over 40 countries around the world



Data quality

- Representative data from Statistical Institutes

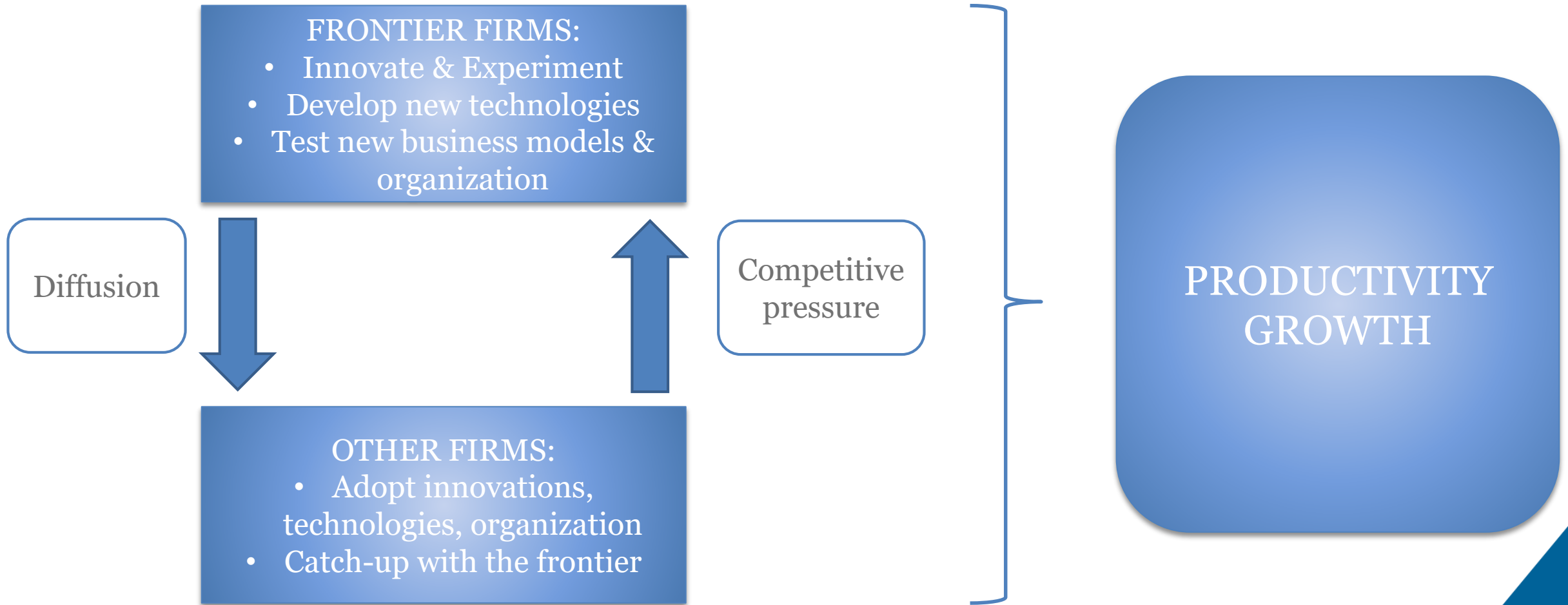


Harmonisation

- Variables, Routines



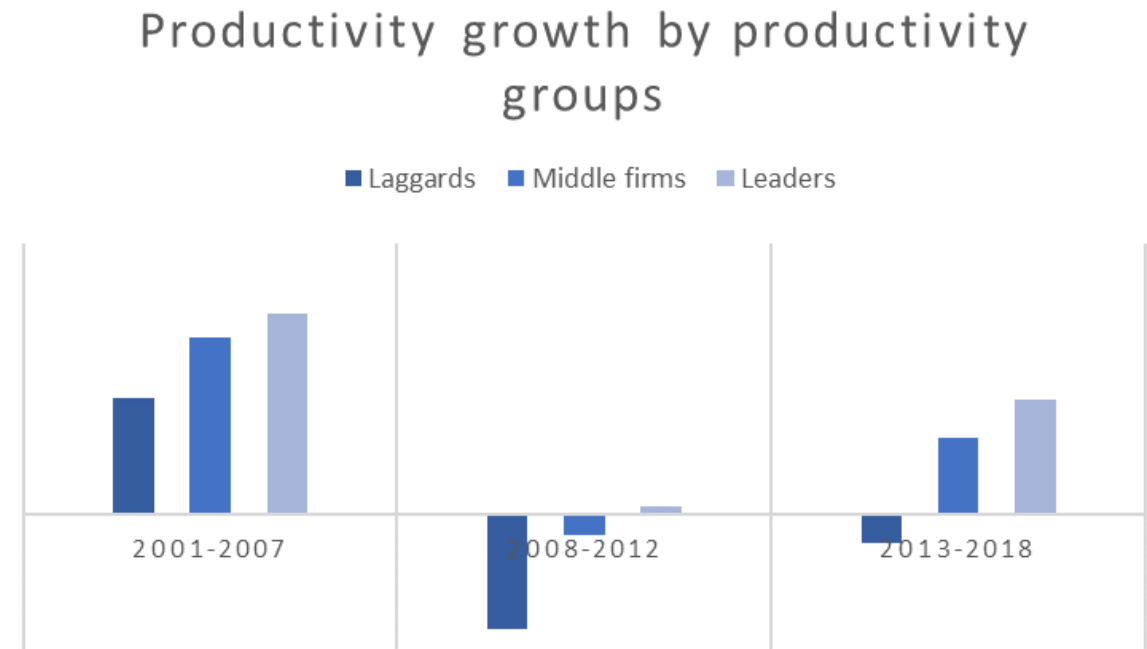
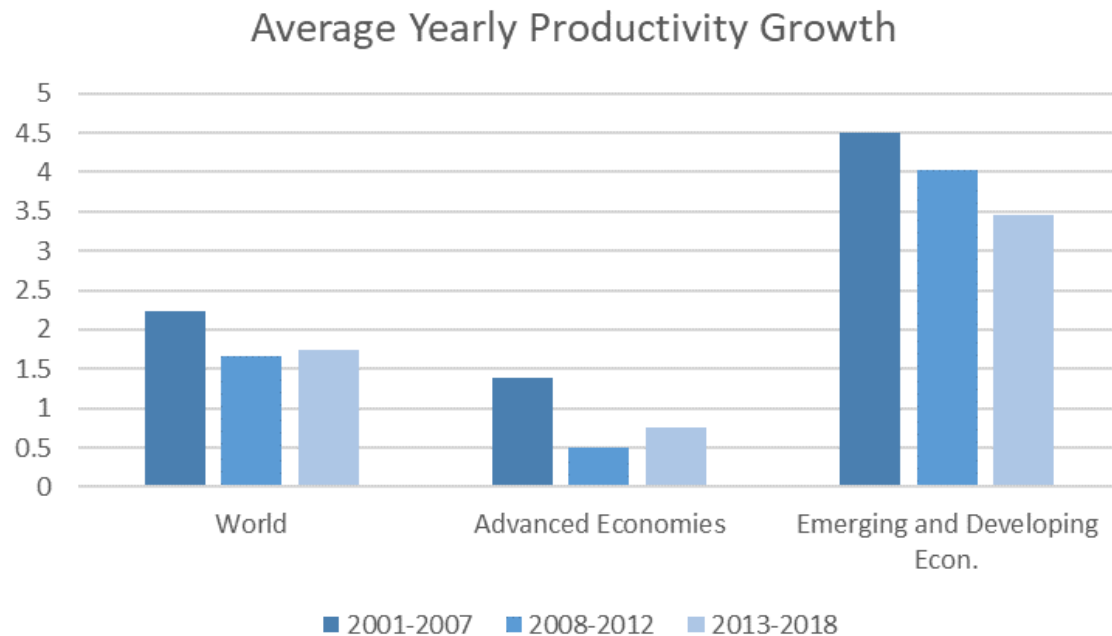
Innovation and diffusion are key for productivity growth





While innovation and digitalisation transform our economies, productivity growth is slowing down...

- Over the past decades the global economy has undergone an unprecedented transformation thanks to increased innovation and digitalization.
- Yet this transformation fails to be reflected in aggregate productivity growth





...with increasing divergences between the best and the rest and declines in the speed of catch-up...

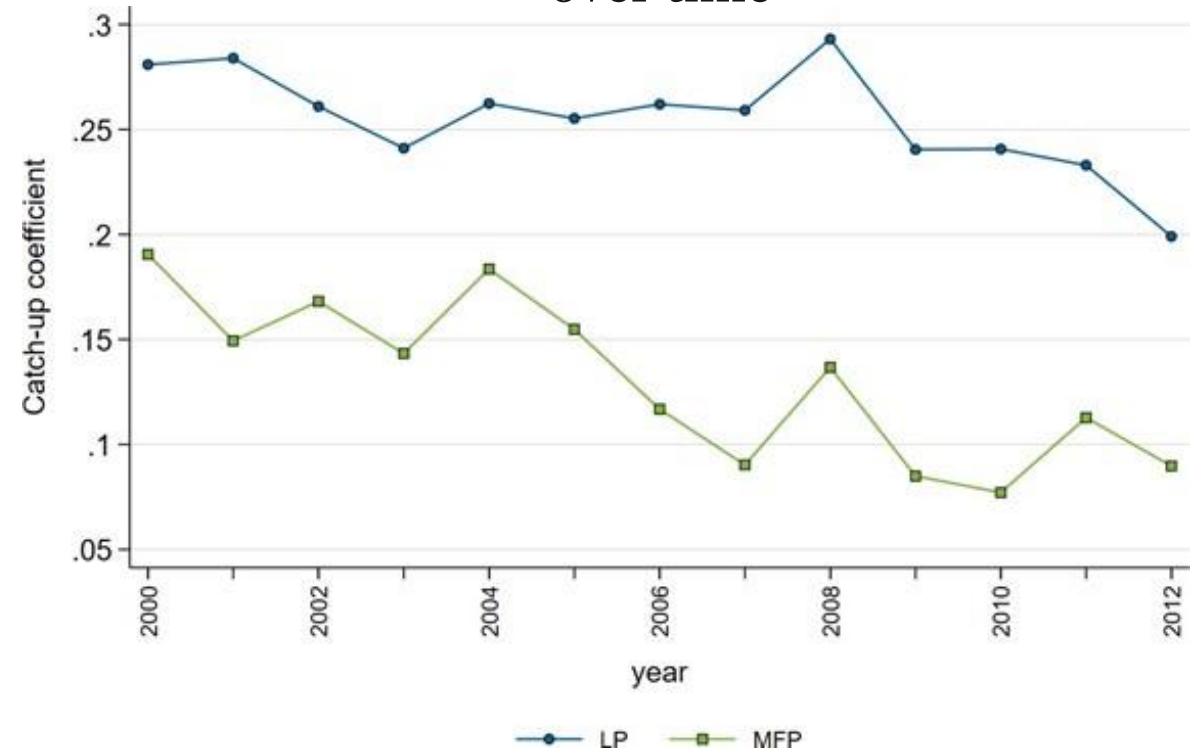
Productivity dispersion has increased over time



Notes: productivity dispersion (90-10 ratio in MFP à la Woolridge) within manufacturing and market services, normalised to 2000.

Source: [Corrado, Criscuolo, Haskel, Himbert, Jona-Lasinio \(2020\)](#)

The speed of catch-up of laggards has slowed down over time



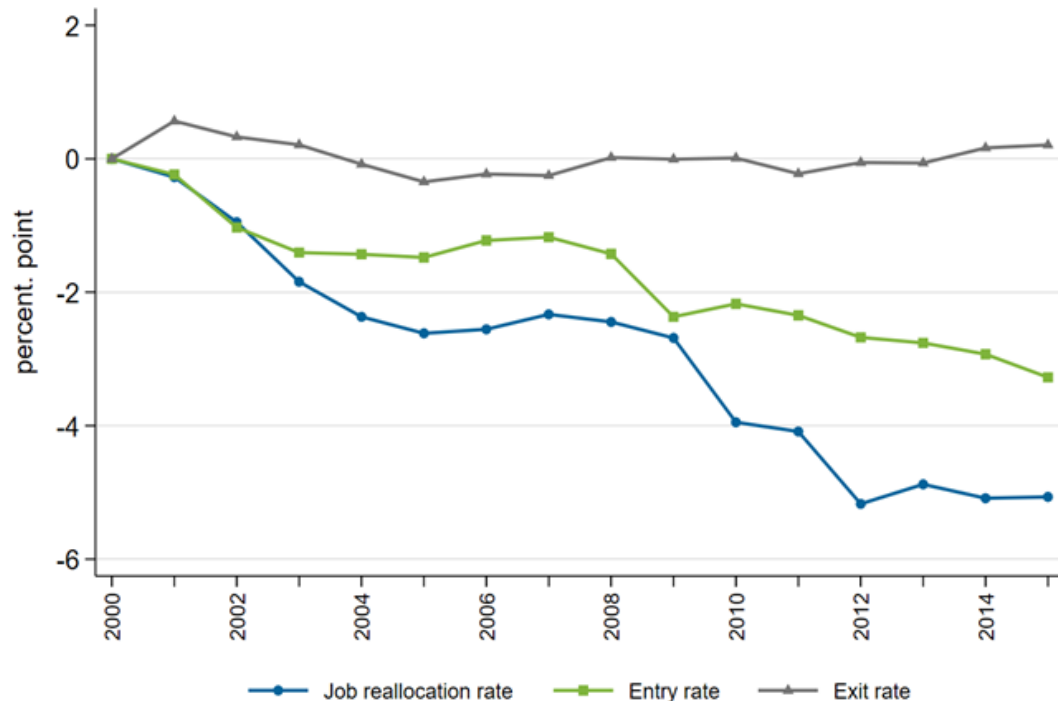
Note: estimates for the catch-up effect over time in manufacturing and market services.

Source: [Berlingieri, Calligaris, Criscuolo and Verlhac \(2020\)](#)



...accompanied by declining business dynamism, increasing industry concentration, higher mark-ups

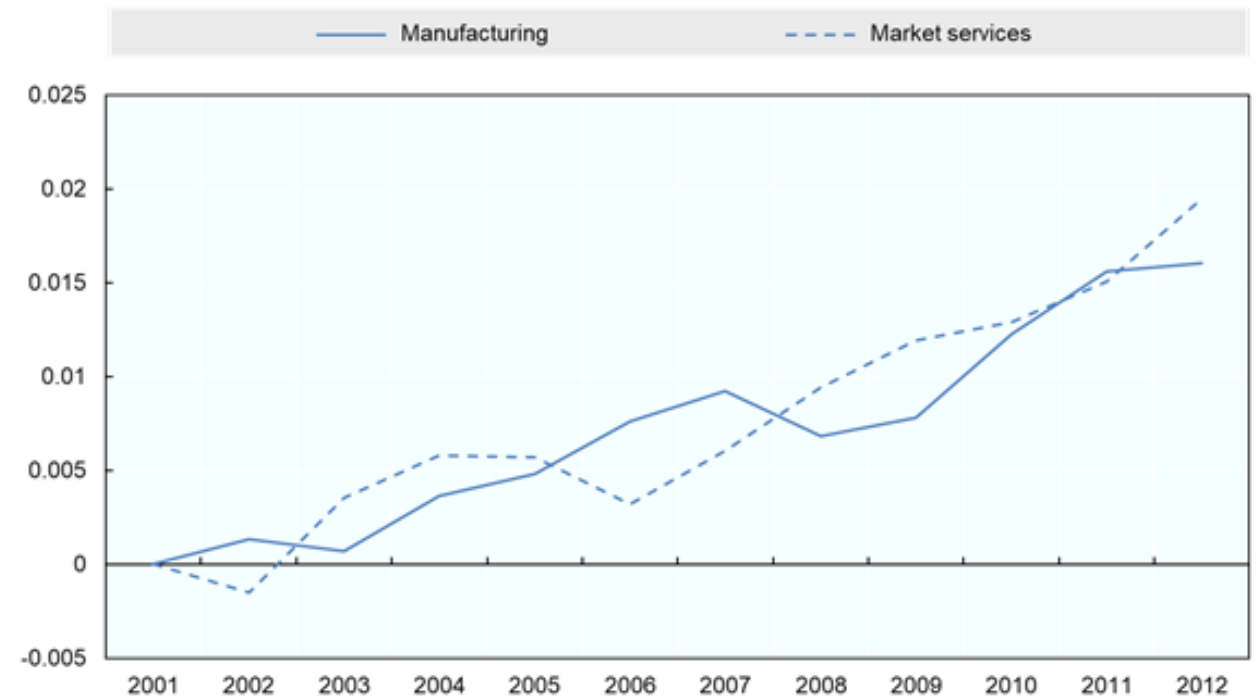
Entry rates and job reallocation rates have decreased over time



Notes: Averages within country-sectors. Cumulative changes in percentage points from the DynEmp dataset.

Source: [Calvino, Criscuolo and Verlhac \(2020\)](#)

The share of sales accounted for by 10% largest firms has been increasing



Note: share of sales of the firms in the top decile of the sales distribution in each country and 2-digit industry from the MultiProd dataset.

Source: elaboration based on

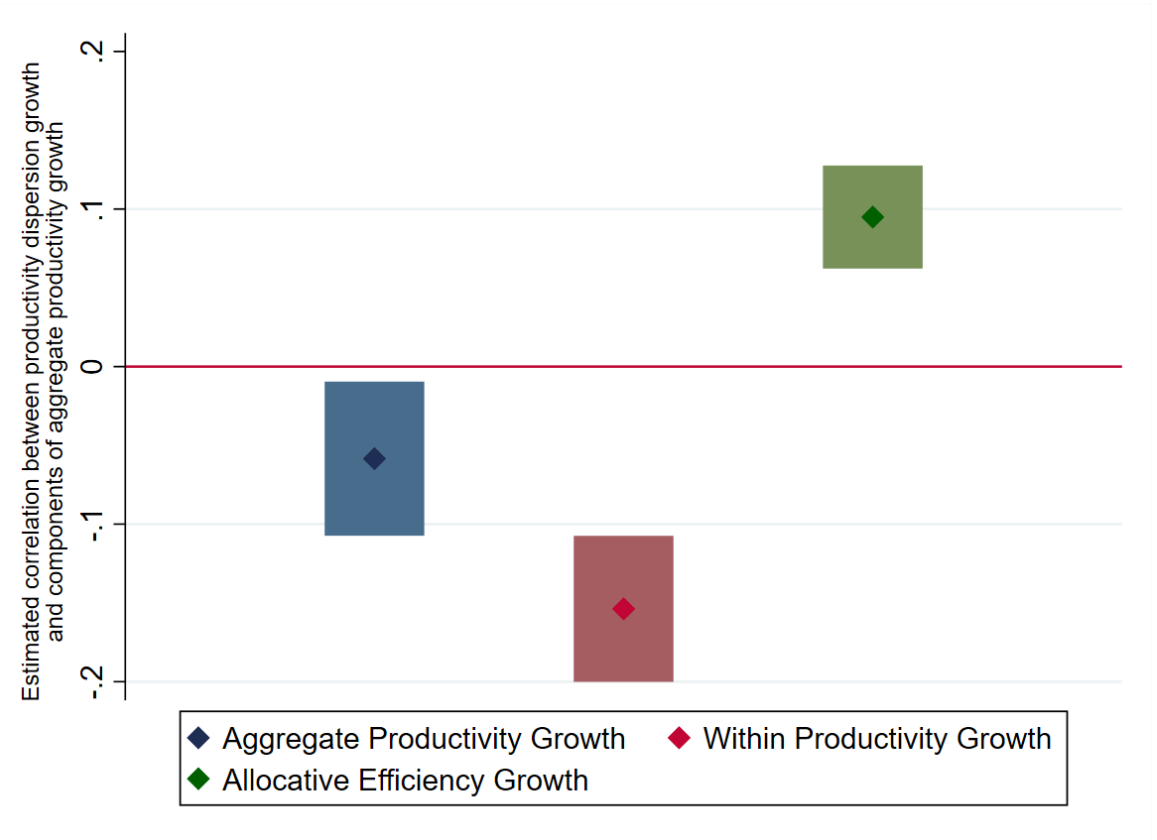
[Bajgar, Berlingieri, Calligaris, Criscuolo, Timmis \(2019\)](#)



...that point to a slowdown in the diffusion machine...

- The productivity divergence increases the allocative efficiency of resources
- But lowers within-firm growth, mostly among less productive firms
- The latter effect dominates

Correlation between growth in labour productivity dispersion and components of aggregate productivity growth



Note: Countries included are BEL, CAN, EST, FIN, FRA, HUN, HRV, ITA, LVA, PRT, SVN, SWE.

Source: based on [Desnoyers-James, Himbert, Manaresi, Reinhard \(2021\)](#)



Why diffusion has slowed-down?

- Key role of the **digital transformation (digital technologies + intangibles)**
 - Digital technologies *may* lower entry costs, ease sharing of ideas, ease market penetration
 - BUT they need complementary investments in intangibles:
 - Digitized information (e.g., software & databases)
 - Innovative properties (e.g., R&D, intellectual property products)
 - Economic competencies (e.g., managerial capabilities, training and skills, brands)



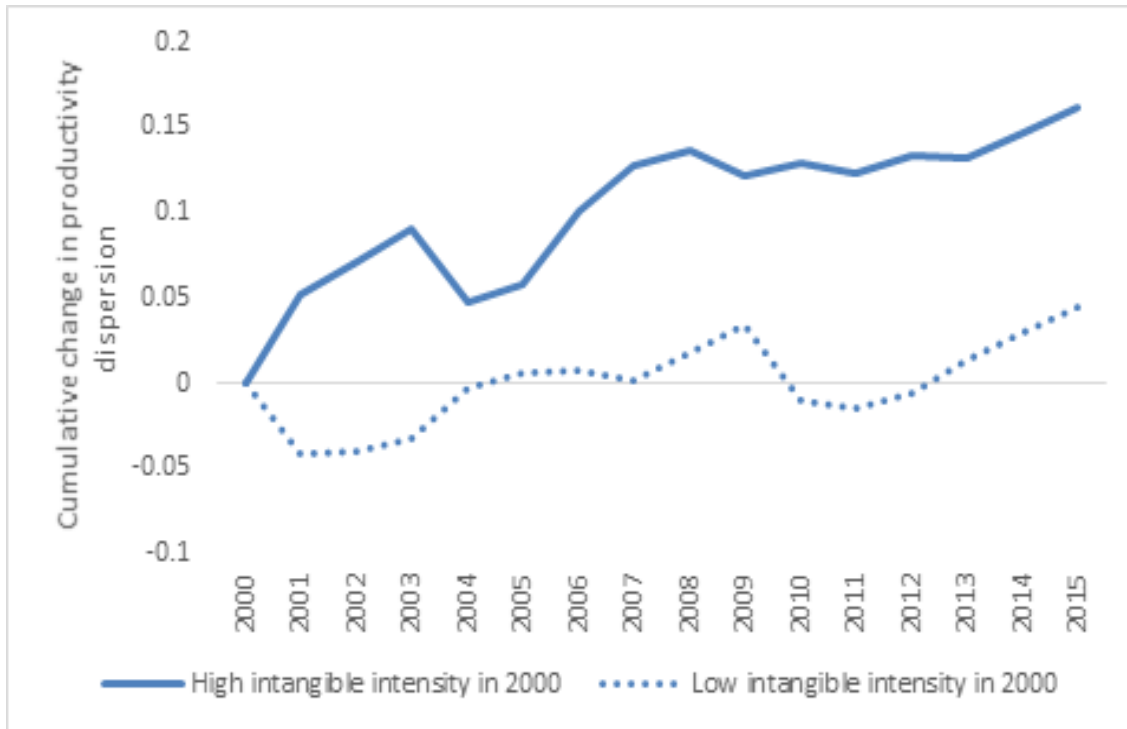
Why diffusion has slowed-down?

- Some key features of intangibles:
 - Scalability (high fixed / low marginal costs)
 - Network externalities
 - Sunkness => hard to finance
 - Complementarities
- Winner-takes-most dynamics
- This may generate
 - **Higher barriers to diffusion**, lower experimentation and dynamism
 - Advantages for larger firms that gain market shares and apply higher mark-ups



Indeed, intangible- and digital-intensive sectors experience stronger divergence...

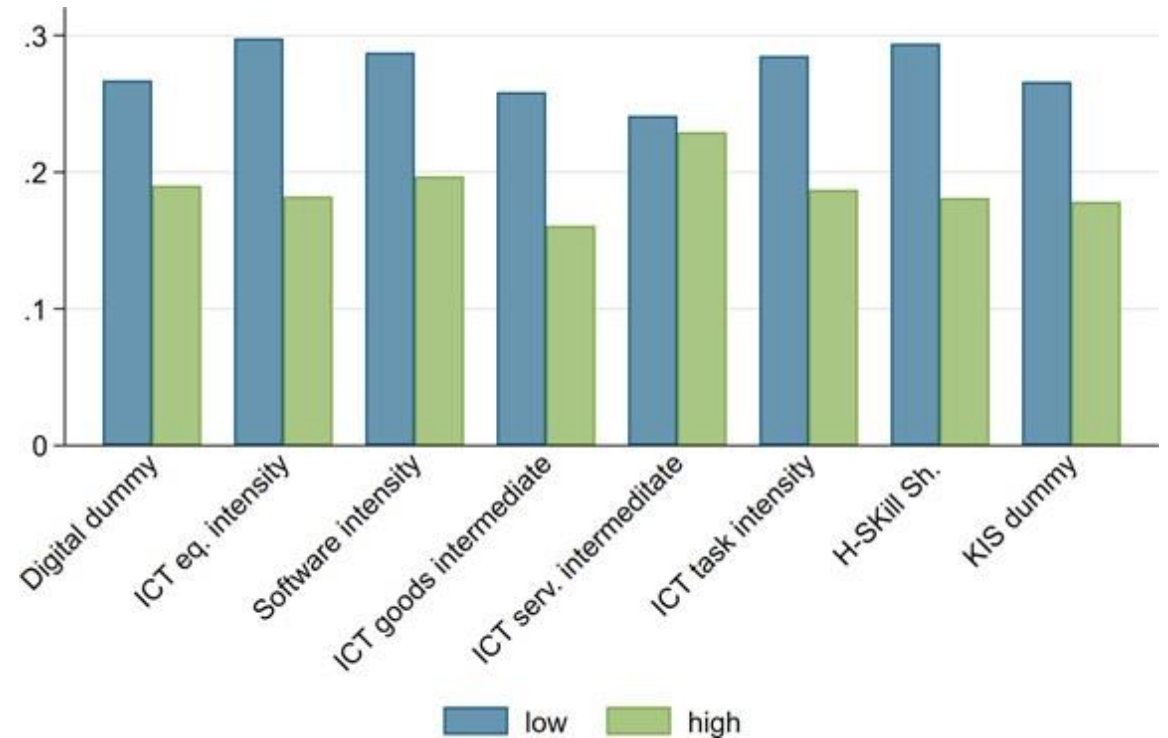
Productivity dispersion grows more in intangible-intensive sectors



Notes: productivity dispersion (90-10 ratio in MFP à la Woolridge) for high and low intangible intensive sectors, normalised to 2000.

Source: [Corrado, Criscuolo, Haskel, Himbert, Jona-Lasinio \(2020\)](#)

Laggards catch-up at a lower speed in more digital and knowledge-intensive industries



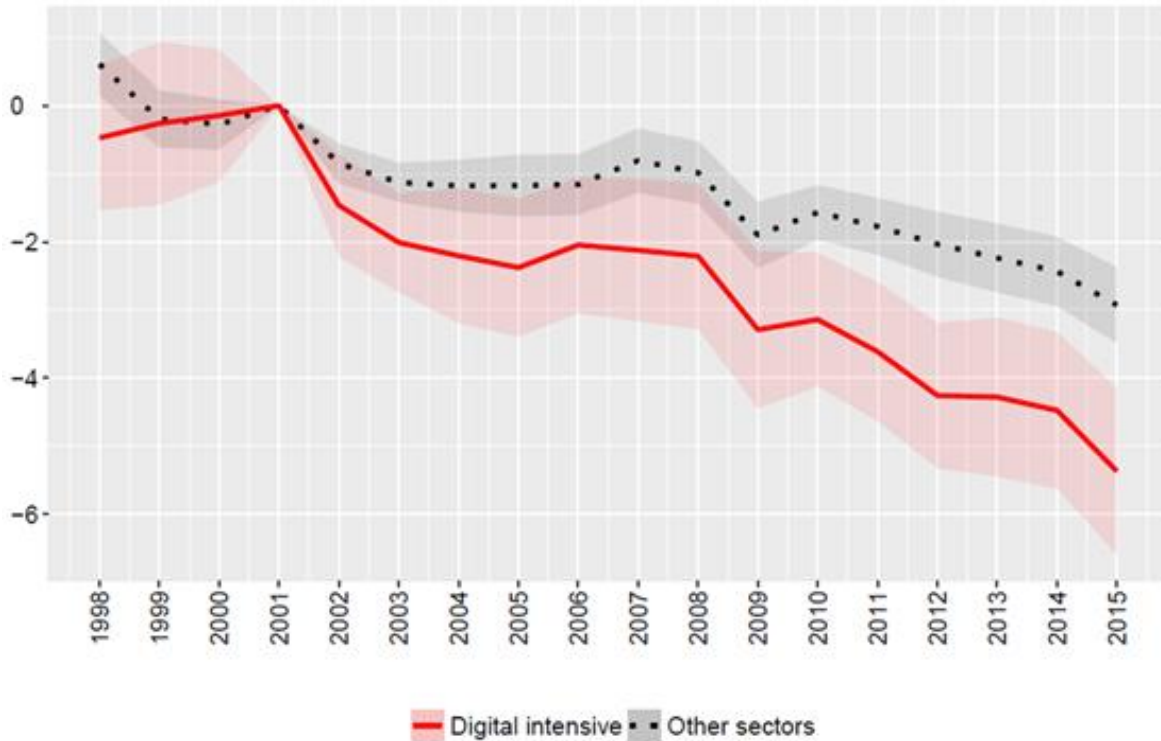
Note: difference in LP growth, due to the catch-up effect in industries with low vs. high values of the indicators considered.

Source: [Berlingieri, Calligaris, Criscuolo and Verlhac \(2020\)](#)



...faster declines in dynamism and higher increases in concentration

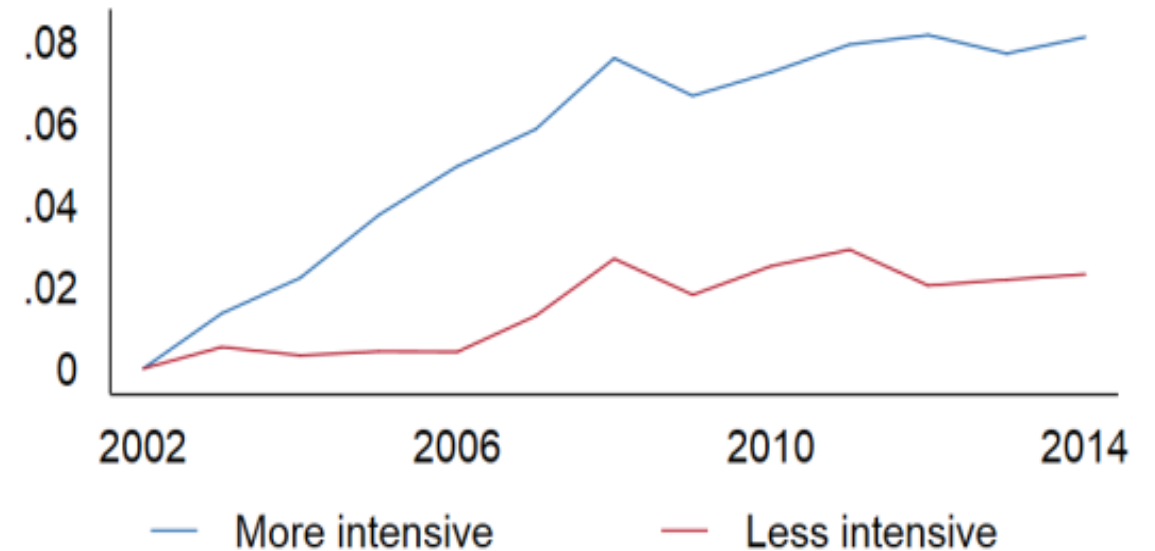
Entry rates declined faster in digital intensive sectors



Notes: averages within country-sectors. Cumulative changes in percentage points.

Source: [Calvino and Criscuolo \(2019\)](#)

Increases in concentration have been higher in intangible intensive sectors



Note: Top 8 concentration. Changes in the (unweighted) mean concentration across country-industry pairs.

Source: [Bajgar, Criscuolo and Timmis \(2020\)](#)



How to foster the diffusion of the digital transformation?

- Which intangibles are most needed to boost the adoption and effective use of digital technologies in the economy?
- Which policies should be prioritized to support the digital transformation?
- The answer must be country-specific.



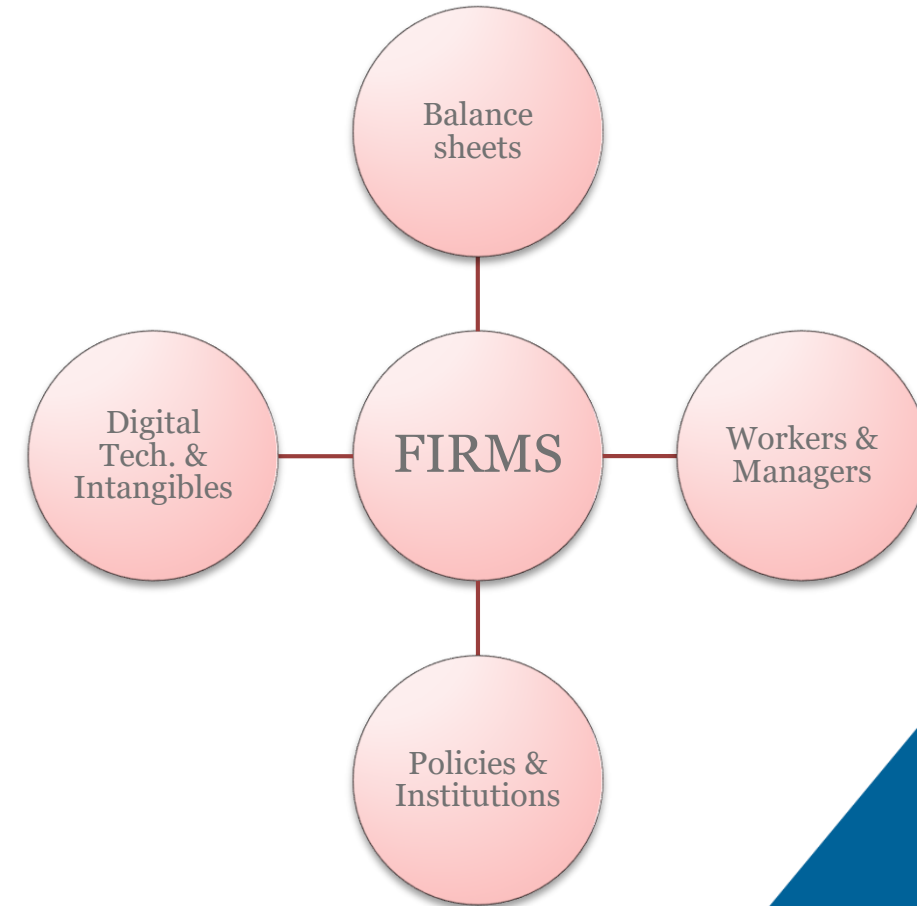
Closing the Italian Digital Gap

- Aims:
 - understanding key triggers of the digital transformation of Italian firms
 - focus on mSMEs, sectoral heterogeneity, geographic divide
 - identify policies to support growth through digital diffusion



Strategy

- partnership with Italian Statistical Institute & Bank of Italy, supported by the Italian Ministry of Economic Development
- a comprehensive data framework
- analysis of determinants of firm adoption within and outside the firm + policy evaluation

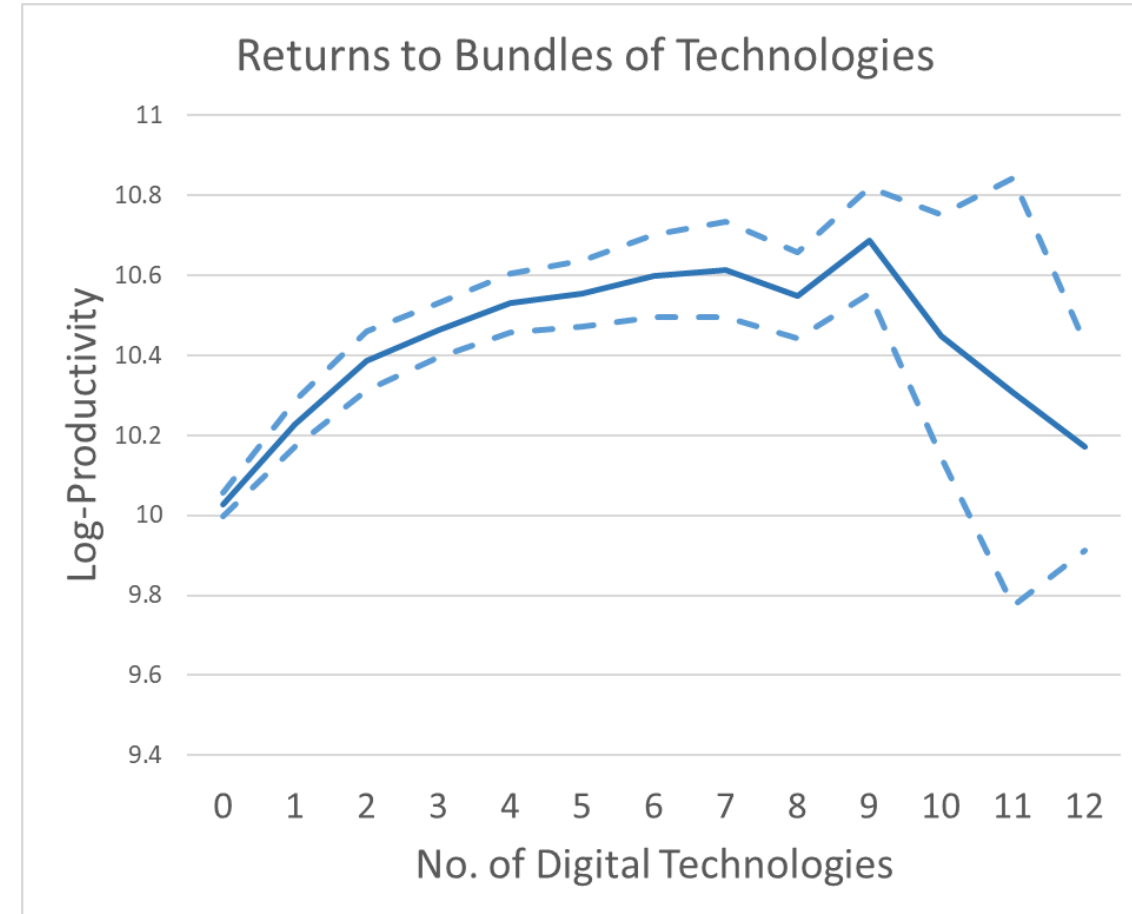




1. Complementarities are pervasive

- Across technologies

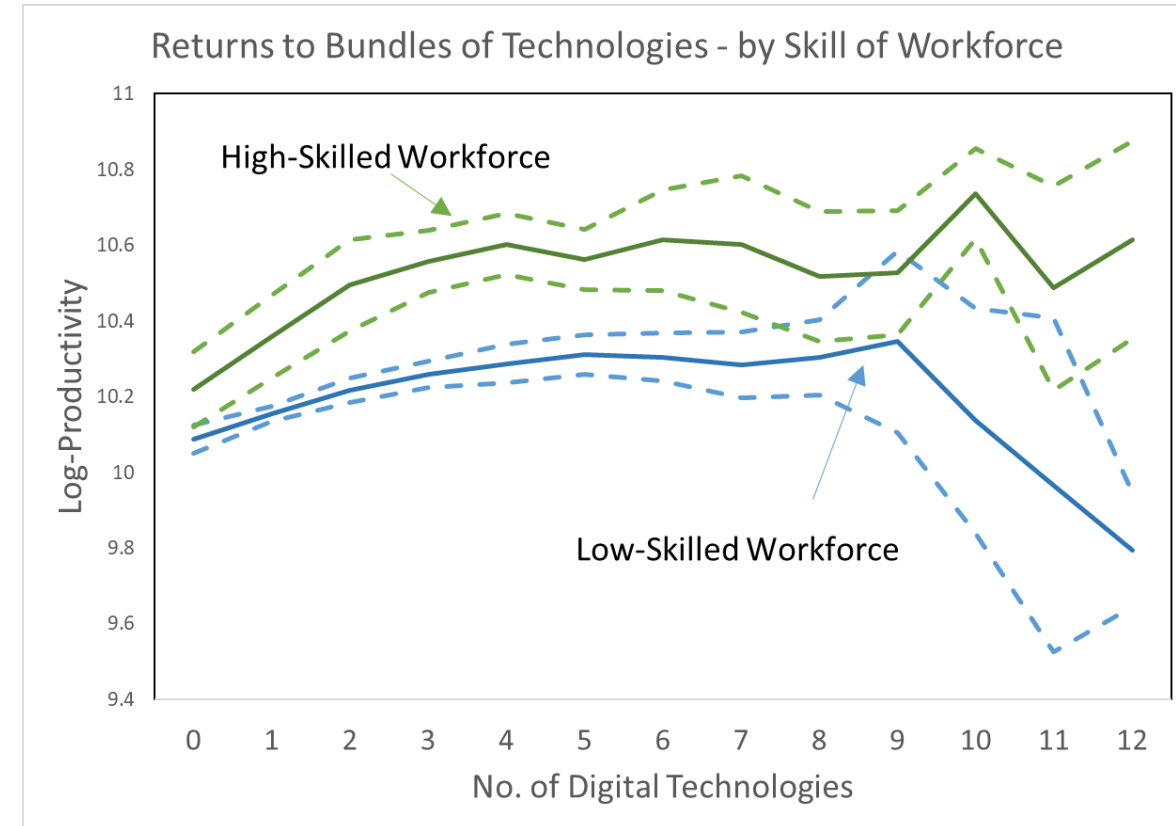
- successful adopters of more advanced tech. (big data, AI, IoT, ...) bundle together several digital tech., with larger productivity gains
- policy implications:
 - Policies targeted to one technology may spillover to others
 - Coherent policy framework to act on several technologies





2. Complementary skills

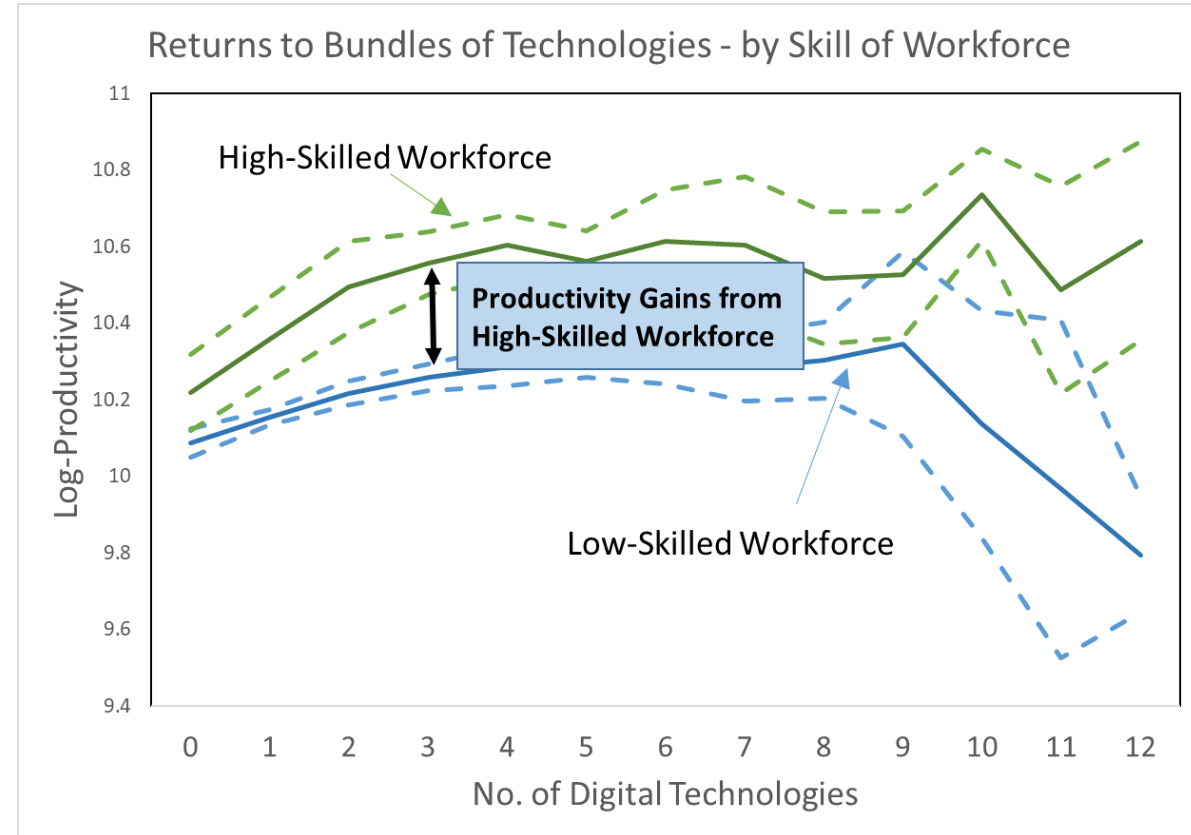
- Skilled workers allow the firm to manage technical complexity
- Their role is particularly important for micro and small firms





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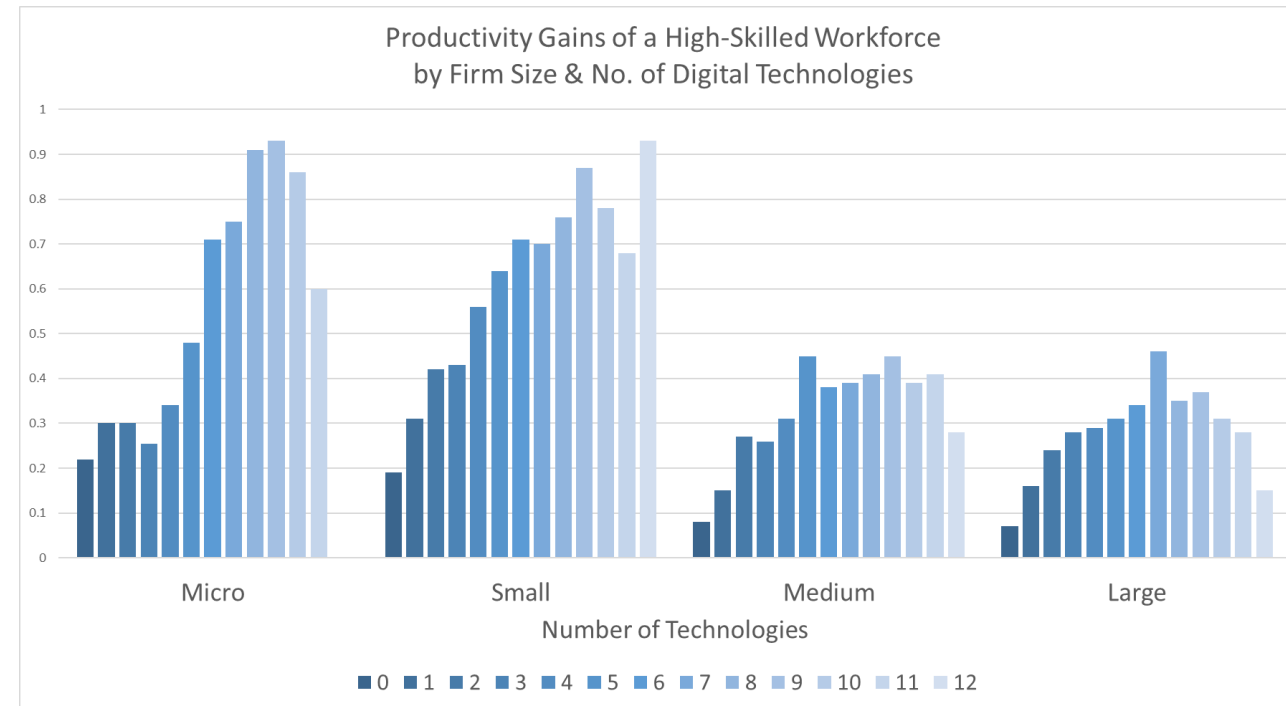
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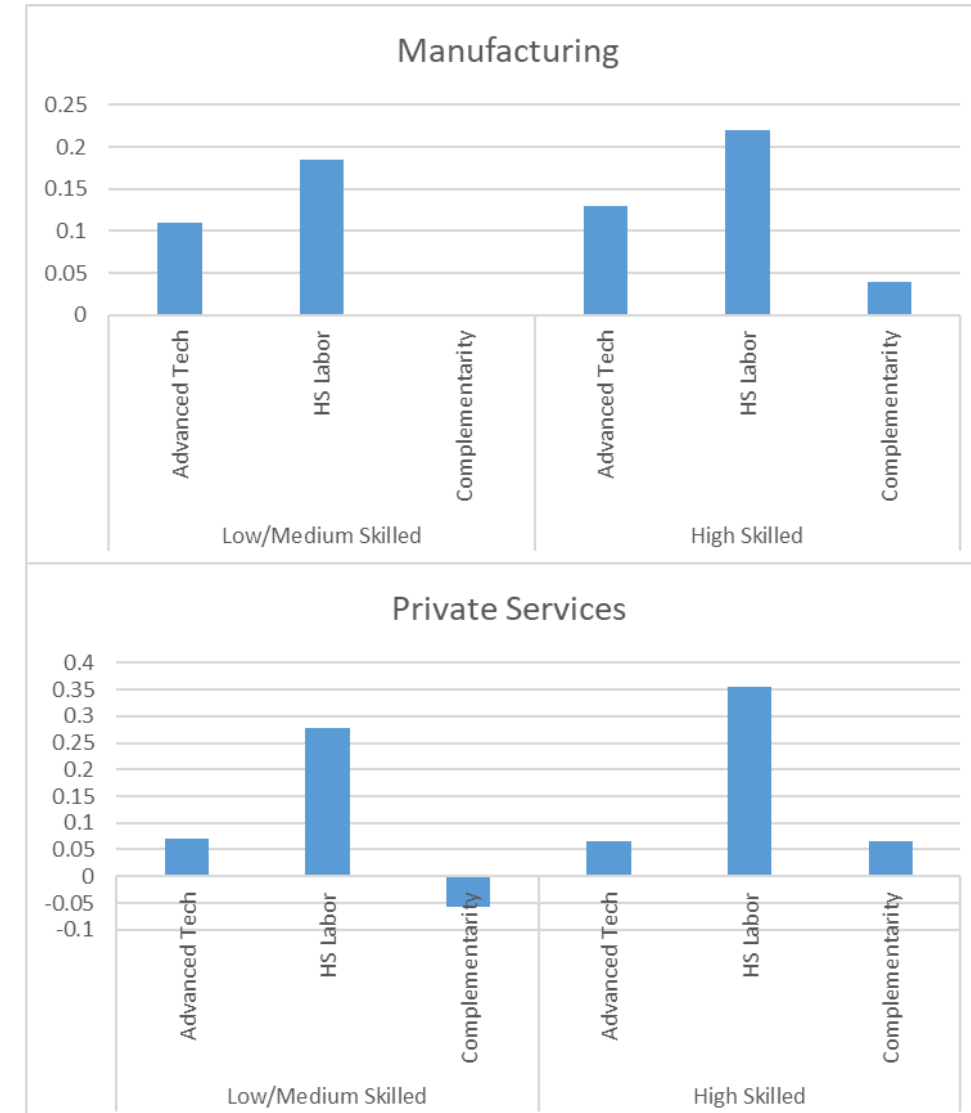
- Skilled workers allow the firm to manage technical complexity
- Their role is particularly important for micro and small firms
- Policy levers:
 - local STEM programs,** boost technology adoption of mSMEs
 - training matters**





3. The role of management

- Managerial capabilities are key to boost returns to:
 - digital technology adoption
 - skills of workforce
 - their complementarities
- Key to explain North/South divide in digitalization
- Policy levers:
 - boost awareness on the importance of managerial and organizational capital among mSMEs
 - foster competition, to incentivise investments in managerial skills
 - support the use of consulting services, coaching & mentoring





4. Lessons from a policy evaluation

- “Hyper-amortization”: enhanced tax depreciation allowance for I4.0 tangible assets purchased from end of 2016 onwards
- Policy boosts investments in both eligible I4.0 technologies & non-eligible DT (technological complementarities)
- Significant real effects (+ 12% productivity, + 3 p.p. high skilled workforce)
- Managerial skills are key to boost the positive effects of the policy among micro and small firms



Conclusions

- The digital transformation has generated great opportunities but also contributed to the slowdown in productivity growth
- The process cannot be reverted, but it can be improved through policies aimed at fostering innovation and boosting diffusion
- These policies can bring double dividends:
 - Levelling the playing field
 - Advancing on the SDGs and the green transition
- Particularly important amid the COVID-19 pandemic:
 - policies should tackle long-term challenges and foster inclusiveness
 - ... to *build back better*



THANK YOU!

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