THE ROOTS OF THE PRODUCTIVITY SLOWDOWN

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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

FRONTIER FIRMS:
• Innovate & Experiment
• Develop new technologies
• Test new business models & organization

OTHER FIRMS:
• Adopt innovations, technologies, organization
• Catch-up with the frontier

PRODUCTIVITY GROWTH

Competitive pressure

Diffusion
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

![Graph showing productivity dispersion increase over time in manufacturing and market services.]

Note: 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

![Graph showing catch-up coefficient decline over time in manufacturing and market services.]

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

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

Notes: Averages within country-sectors. Cumulative changes in percentage points from the DynEmp dataset.
Source: Calvino, Criscuolo and Verlhac (2020)

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)
Some key features of intangibles:

- Scalability (high fixed / low marginal costs)
- Network externalities
- Sunkness => hard to finance
- Complementarities

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

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

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)

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

Increases in concentration have been higher in intangible intensive sectors

Notes: averages within country-sectors. Cumulative changes in percentage points.
Source: Calvino and Criscuolo (2019)

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
• 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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- 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
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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