The Innovation Gap of Italy’s Production System: Roots and Possible Solutions

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Motivation

- Financial crisis; sovereign debt crisis; the lack of coherent, sizable structural reforms...
- In this framework, Italy is still lagging behind in many respects (innovation, productivity, competitiveness, etc)
- The proportion of GDP spent on R&D is lower in Italy than in the leading European countries (in 2011, 1.3 %, 1.9% in the EU)
- Private-sector spending is particularly low by international standards
- Italy’s backwardness stems both from less frequent engagement in R&D by firms and from lower spending on it
**Figure:** National System of Innovation

- **Innovative firms**
  - R&D
  - ICT
  - Physical investment
  - Knowledge based capital

- **Education system**
  - Human capital
  - R&D performer
  - Partnerships
  - Technology transfer

- **Financial system**
  - Venture capital
  - Seed capital
  - Business angels

- **Government**
  - R&D performer
  - Technology transfer
  - Boosting innovation
  - Regulation
Innovation is impeded, even more than by the specialization in traditional products, by firms small size and largely family-based management model.

Share capital, preferable to bank loans for financing businesses with uncertain results and pronounced information asymmetries, is less common than in other countries.

The allocation of resources to the most innovative enterprises is held back by the institutional and regulatory framework.
Focus on:

1. Peculiarities of Italian manufacturing firms
2. R&D and ICT investment: which one matters more for productivity?
3. Organizational innovation and productivity
4. Human capital (skills and kind of contract)
Peculiarities of Italian manufacturing firms

- **Sectorial specialization?** The share of value added of traditional sectors (textile and clothing, leather and shoes, wood and wooden products) is nearly 14% (nearly 3 times wrt France, 5 times wrt Germany).

- At the aggregate level, this translates in less R&D and a lower share of innovative firms.

- But this is true even within narrowly defined sectors

- **Exercise**: what if Italian sectorial specialization was the same as Germany (in terms of sectorial composition of value added)?
  - gap narrowed by 25% in terms of R&D to VA ratio
  - gap narrowed by 10% in terms of share of innovative firms
Firm size? Italian firms are smaller (average firm size is 4, 13 in Germany).

This is bad for R&D and its financing (less absorptive capacity)
also for innovation and productivity.

Exercise: what if Italian firm size distribution was the same as Germany?
  - gap narrowed by 50% in terms of share of innovative firms
Peculiarities of Italian manufacturing firms

- An excessive dose of “familism”? 

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<thead>
<tr>
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<th>Family firms</th>
<th>within family firms</th>
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<tbody>
<tr>
<td>Family-managed</td>
<td>80.0</td>
<td>62.2</td>
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<td>CEO in the family</td>
<td>84.5</td>
<td>25.8</td>
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<tr>
<td>FR</td>
<td>89.8</td>
<td>28.0</td>
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<td>DE</td>
<td>85.6</td>
<td>66.3</td>
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<tr>
<td>IT</td>
<td>80.5</td>
<td>70.8</td>
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<td>UK</td>
<td>70.8</td>
<td>10.4</td>
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Our computations based on the EFIGE database

- Family-managed firms are less likely to invest in R&D (14.4 pp less wrt family firms)
- and less likely to introduce product or process innovation (4.3 pp less)
Are Italian firms special? We take a look at the mechanics.

Is the relationship between R&D, innovation and productivity the same in IT, FR, DE and UK?

Estimating a structural model (extended CDM) we compare parameters estimate of Italy with those for the other countries.

Returns (in terms of productivity) of R&D investment are the same.
R&D and ICT investment: which one matters more for productivity?

- We estimate a model that allows possible complementarities with innovation activity (mainly R&D and ICT)
- ICT and R&D: complements or substitutes?

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<th>Investing in ICT</th>
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<tr>
<td></td>
<td>N</td>
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<tr>
<td>N</td>
<td>24.8</td>
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<tr>
<td>Doing R&amp;D</td>
<td>Y</td>
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<tr>
<td>TOT</td>
<td>31.7</td>
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Our computations based on the EFIQE database
R&D and ICT investment: which one matters more for productivity?

- The question is whether marginal returns to R&D increase as ICT investment increases and vice versa.
- They are both relevant, but the channels through which two kinds of investment exert their effects are not the same.
- We do not find complementarity between R&D and ICT in either labor productivity or innovation equations.
- Both R&D and ICT are positively correlated to the likelihood of having innovation, much higher for R&D.
- ICT more important for product and organizational innovation than process; physical investment is more important for process innovation.
Organizational innovation and productivity

As a spillover of the previous topic, we tried to assess the relationship between different kinds of innovation and labor productivity.

Organizational innovation is positively related to productivity
  - directly
  - indirectly, magnifying the effects of process innovation.

“Suggestive evidence”, as measuring problems are serious

Innovation as measured in surveys, appears to be uni-dimensional, not multi-dimensional. More later.
Evidence that skilled labor is a complement to R&D and ICT investment.

In Italy the share of university graduates in the workforce is considerably lower than in the other main European countries.

This may reflect a shortage of highly-educated workers, or demand that continues to favor less skilled work.

Estimating a structural econometric model on data taken from sample surveys of firms and households, it can be shown that human capital supply factors outweighed demand, holding sectoral composition constant.
Restrictive regulation of the labour market can curb innovation both by hampering the redistribution of resources and by discouraging increases in production by firms that intend to undertake innovative projects, with potentially high but uncertain returns.

On the other hand, stable employment relationships can strengthen incentives to build up human capital, both for firms and workers.

In Italy there is a negative correlation between the share of temporary workers in a firm’s workforce, R&D expenditure, patenting activity (extensive and intensive margins), profitability, and TFP.
THANK YOU!

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