

CompNet The Competitiveness Research Network

COVID and Productivity

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The COVID crisis and productivity growth

Filippo di Mauro, Chad Syverson 15 April 2020

The world went into the COVID crisis in the midst of a 15-year-long productivity growth slowdown. This column considers the channels through which the crisis might shift the growth rates of productivity and output. Globalisation, labour mobility and small firms may all fall victim to the crisis if the world does not succeed in reopening borders, refraining from trade and currency wars and focusing on policies to boost productivity. On the upside, the broad adoption of new technologies – such as IT skills during the epidemic – and strong reallocation pressures may provide an independent boost on productivity as we come out of the crisis.



After the initial wave of the pandemic recedes, productivity will (have to) become yet again a primary concern of economists and policymakers. There are a number of reasons why this crisis might further impair productivity growth, including higher transactions costs (Baldwin and Weder di Mauro 2020), lower mobility, and a reduced scope of resource reallocation across firms sectors and countries. There might also

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Outline

- COVID came in the midst of a 15-year-long productivity growth slowdown.
- We use growth and productivity accounting decomposition to identify the factors at play and infer initial impacts
- On the negative side... Globalisation, labour mobility and small firms may
- On the upside broad adoption of new technologies

Caveats and methodology

- *Measured* productivity will fall in the short run because labour hoarding
- The pace of unwinding of this effect will depend on the speed of the recovery and future policy decisions
- **We look at future productivity growth through the growth accounting lens (Growth=growth of L and K + TFP)**
- Looking at L and K is important
 - unmeasured changes in K and L will be labelled as TFP
 - Measured changes in K affect labour productivity growth

- pandemic is unlikely to substantially affect the size of the potential labour force
- It may have an affect on human capital...but the sign on the impact on productivity is uncertain, both in the short
 - schooling was disrupted
 - ..but it is counter-cyclical
- ...and the medium term
 - Lost of job/skills
 - IT skill upgrade

Capital

- Not large changes in capital/ No large catch-up growth from capital investment
- ➔ Impact on growth/productivity via capital may be limited
- With caveats
 - Certain capital are destroyed (e.g. some tourist destinations)
 - But there will be likely additions (e.g. public health)
- ➔ OVERALL, Health infrastructure is investment in “Tail events”. Pandemic are hopefully every century and may not necessarily push up productivity
- ➔ Unless companies are forced to do things differently....this will have an opposite/positive effect

Disaggregating productivity

TOTAL ECONOMY

Aggregate TFP growth

SECTORS

Intra-sectorial TFP growth:

Each sector gains productivity

90%

Inter-sectorial TFP growth:

Productive sectors gain weight

10%

WITHIN SECTORS

Within-firm productivity growth:

Firm increases its own efficiency

50%

Allocative efficiency:

Available resources in the sector are allocated across firms to maximize output

50%

Within-Firm productivity (1)

- **Intangible assets/inputs** are an important determinant of firms' productivity levels.
- They have considerable **irreversibilities**, i.e. require sunk investments to replicate if they are destroyed
- Policies preserving continuity of firms' operations can help limit productivity losses
- **Knowledge capital** (R&D, ICT expenditure)
 - Will firms innovate and become 'smarter'?
 - intangibles and productivity are positively correlated (CompNet 2020).

Within-Firm productivity (2)

- **The macro burden.**

- Higher taxes and inflation, following fiscal and monetary actions could weigh on capital and labour remuneration and accumulation.
- This may reduce future productivity growth

- **Cross-country barriers.**

- De-globalisation threatens the productivity gains from GVC participation
- Firms will dedicate resources to increase resiliency to future shocks but will involve a contemporaneous loss of output.
- Finding the needed labour skill sets may be difficult

→ Overall, here, hard to find some positive outcomes on productivity

Resource reallocation between firms/dynamic efficiency (1)

▪ Firm size.

- Small firms are likely to exit
- exit and reallocation might lead to productivity gains

- Caveats:
 - will selection take place on productivity or other factors (market power, rent-seeking ability..)?
 - Role of the initial state

- ➔ The issue is therefore “what is driving business survival?”

▪ Zombie firms.

- massive government interventions may create ‘zombies’
- ..and generate misallocation
- ...new, higher-productivity businesses may have difficulty to enter.
- Deepening further the problem of business formation rates, which have been trending down for long time already
-and could also be further aggravated by the likely impact that **uncertainty** will have on investment and business formation

Reallocation across sectors

- Sectors such as air traffic, hotels, certain kinds of retail... are likely to see persistent drops in activity
- Unlike other sectors like healthcare, communications, and IT
- This reallocation will have consequences for aggregate productivity, which will be country/regions specific
- Hard to predict

Conclusions

- The policy focus is on controlling Covid-19 and planning/implementing a gradual reopening.
- Some longer-term, possibly irreversible damage may become visible soon
- Globalisation, labour mobility, small firms may all be victims of the crisis
- On the upside, new technologies adoption may boost productivity

**Thanks for your
attention.**

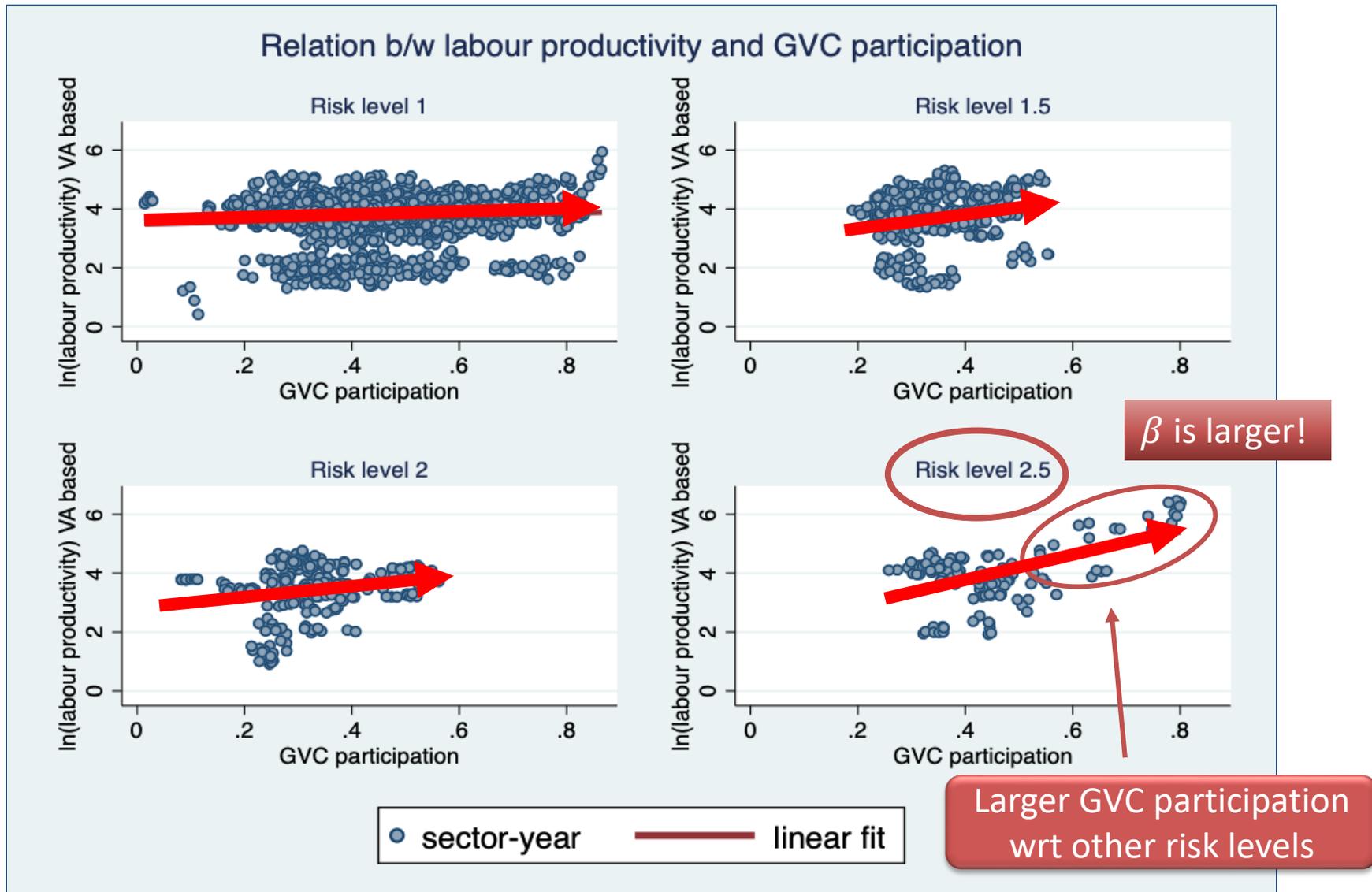
**Have a look at our
2020 Firm Productivity
report**

ANNEX SLIDE

Productivity and Covid-19 related risk

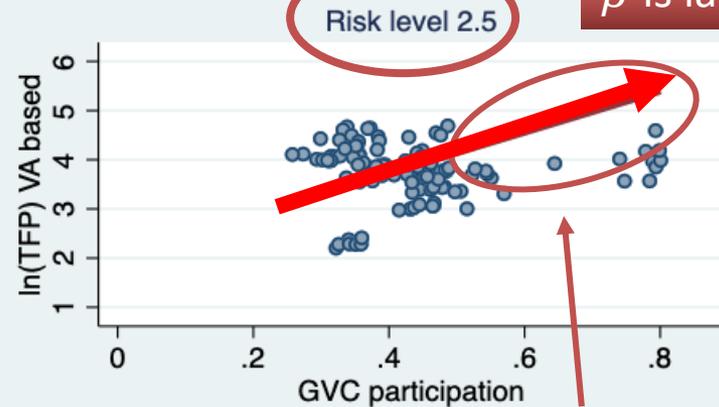
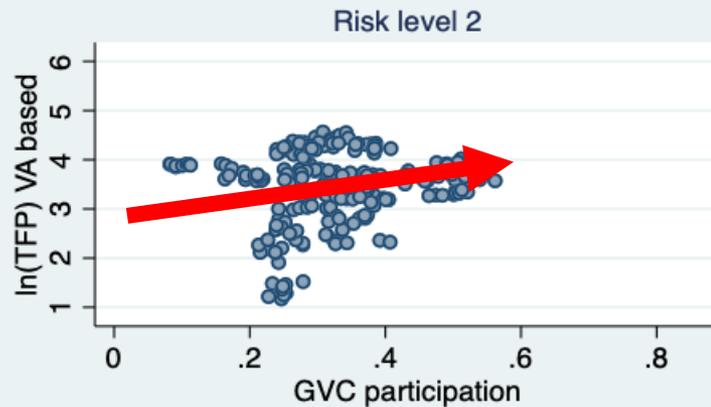
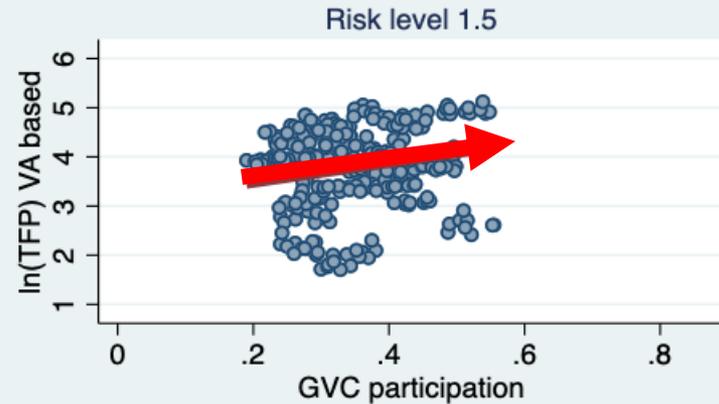
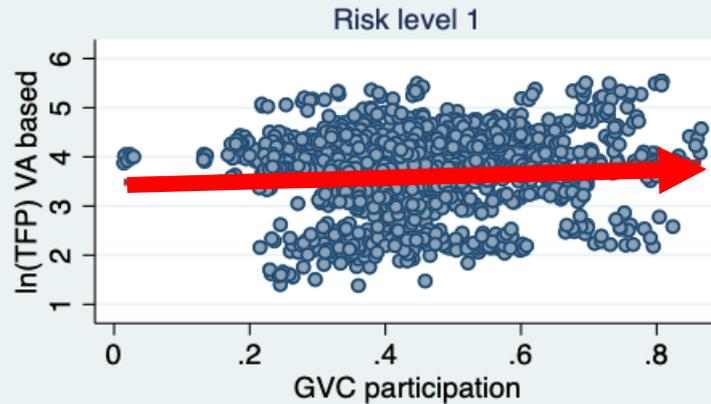
- The risk associated to Covid-19 is correlated to productivity via two main channels:
 - Exposition of firms to the contagion risk (e.g.: workers need more space to operate safely)
 - Risk of disruption of the Global Value Chains
- The Italian Government agency INAIL developed a metric to quantify the risk of exposure to the virus that firms have to face.
- We exploited the sectorial breakdown to merge this information with data at the industry level from WIOD (for GVC) and CompNet (for TFP).

Labour productivity, GVC and risk level



TFP, GVC and risk level

Relation b/w TFP and GVC participation



β is larger!

● sector-year — linear fit

Larger GVC participation wrt other risk levels

Estimating the elasticity

- To estimate this elasticity we employed a simple strategy

$$\ln(TFP_{c,s,t}) = \beta_0 + \beta_1 GVC\ share_{c,s,t} + \vartheta X + FE_c + FE_s + FE_t + FE_{risk} + \varepsilon_{c,s,t}$$

where:

- TFP is the within sector TFP, computed from the OP decomposition
- GVC share is the degree of embeddedness in GVC (WIOD I-O tables)
- X is a vector of control variables
- FE are the fixed effects vectors at the country, sector, year and risk level
- $\varepsilon_{c,s,t}$ is a vector of residuals

Regression result

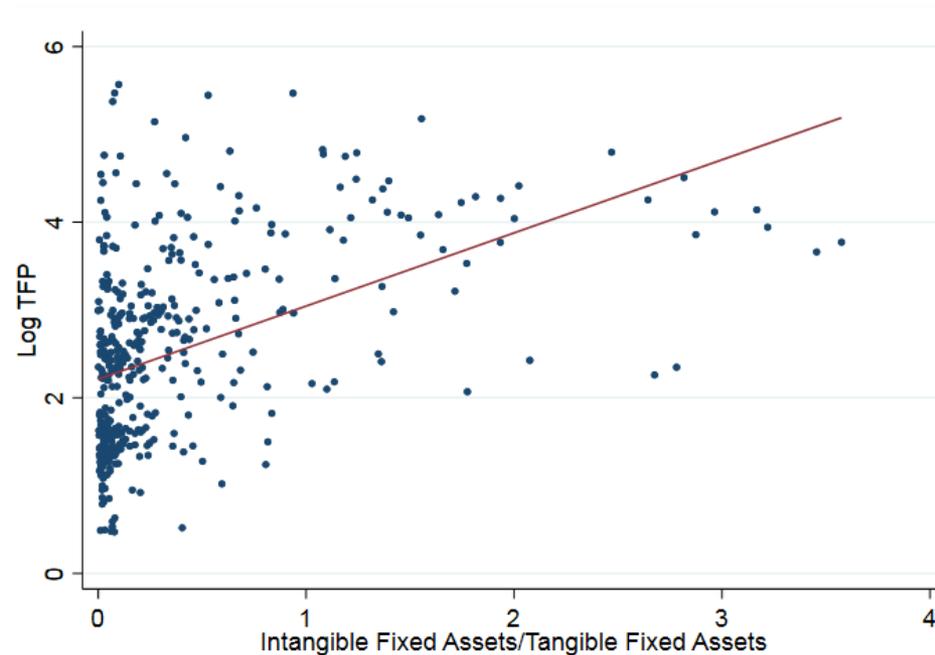
VARIABLES	(1) Within sector TFP	(2) Within sector TFP	(3) Within sector TFP	(4) Within sector TFP
GVC participation	1.918*** (0.125)	1.122*** (0.139)	0.847*** (0.170)	0.851*** (0.163)
Average firm size		0.00563*** (0.000557)	0.000454 (0.000894)	-0.00135* (0.000744)
Ratio of Capital to Employees		-0.000186 (0.000129)	-0.000159 (0.000147)	-0.000109 (0.000148)
Ratio of Intermediates to Employees		0.00136*** (0.000145)	0.000301*** (7.80e-05)	0.000423*** (7.03e-05)
Country FE	NO	NO	YES	YES
Sector FE	NO	NO	YES	YES
Year FE	NO	NO	YES	YES
Risk class FE	NO	NO	NO	YES
Constant	4.034*** (0.0512)	4.106*** (0.0550)	4.787*** (0.104)	4.670*** (0.0983)
Observations	2,270	1,844	1,844	1,771
R-squared	0.176	0.295	0.818	0.834

Robust standard errors in parentheses. Regression weighted by the number of employees in a sector x year x country. Risk class defined according to INAIL classification (average between exposition to the virus and proximity risk).

*** p<0.01, ** p<0.05, * p<0.1

Intangible Input Use and Productivity in Europe

Productivity and intangible inputs use across sectors (2016)

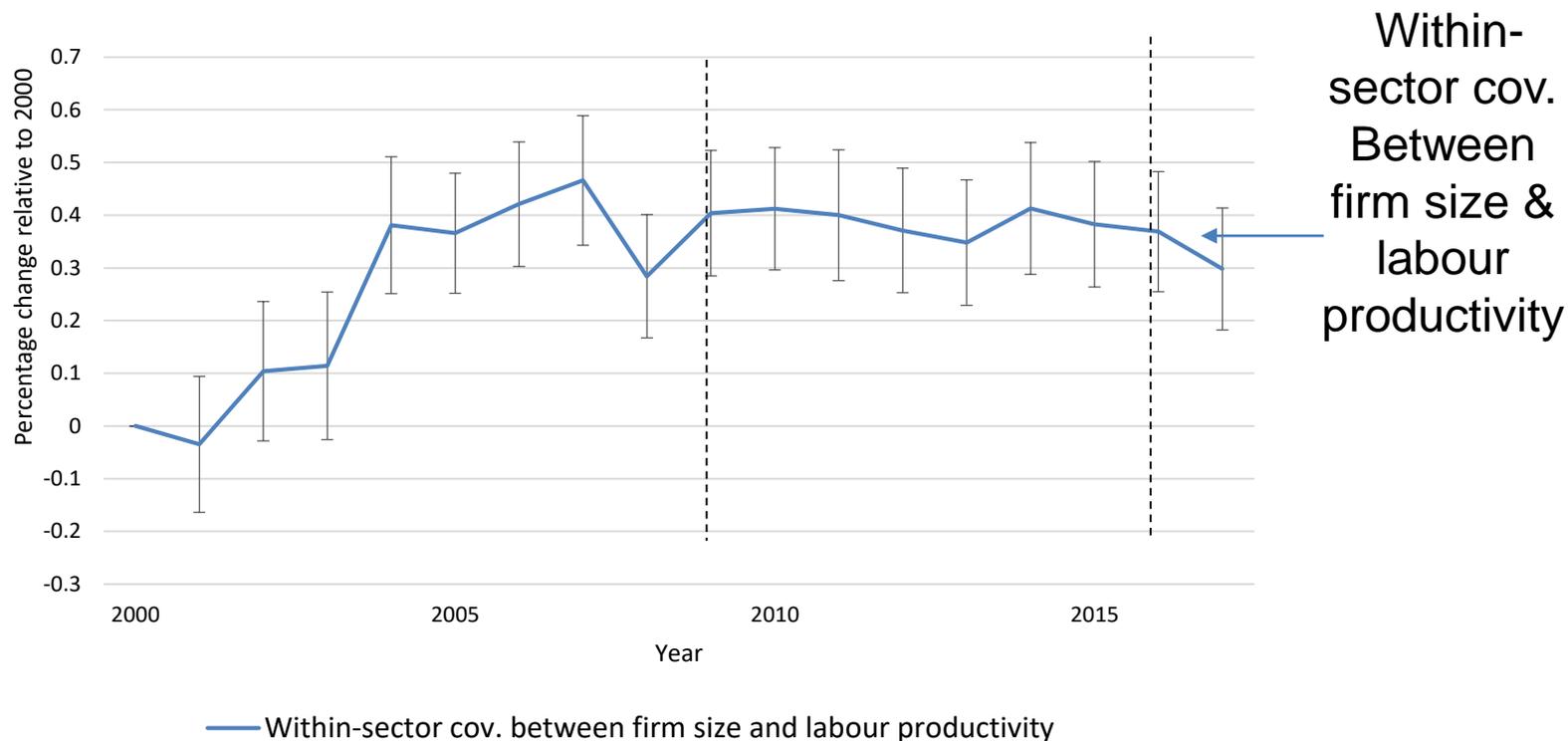


Notes: Figure plots the relation between aggregate intangible fixed asset intensity and revenue-based log total factor productivity. All available sectors and countries are pooled. 20e sample.

- Intangibles – patents, licences, copyrights, trademarks and goodwill - are increasingly important for production process and
- ..are positively related to productivity,
- ...but are also highly concentrated

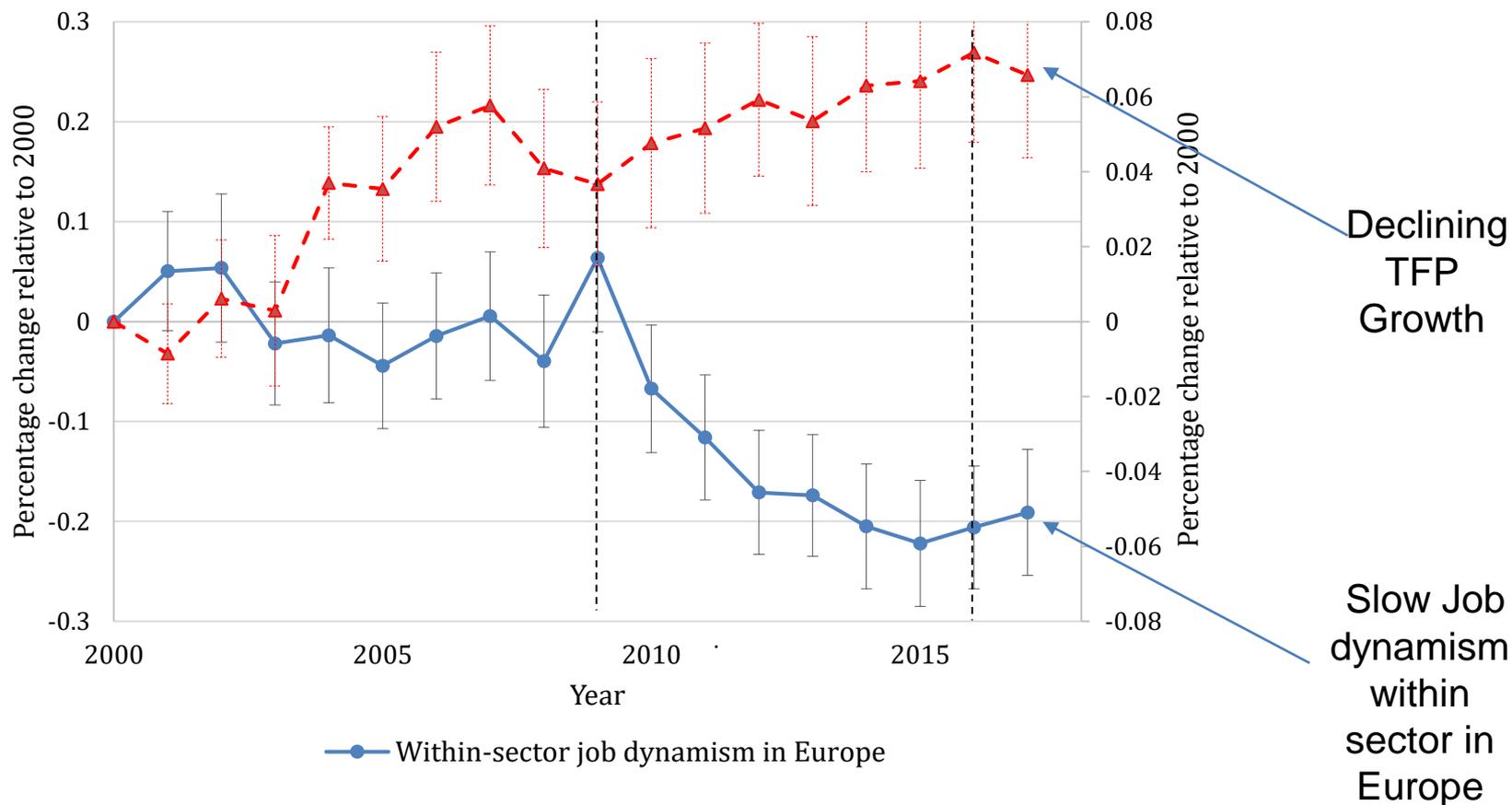
- COVID: what are the possible impacts?
 - Widening the adoption of intangible input use (Productivity +)?
 - Simple reallocation of economic activity to firms able to adjust to new modes of production?

Reallocation in European sectors



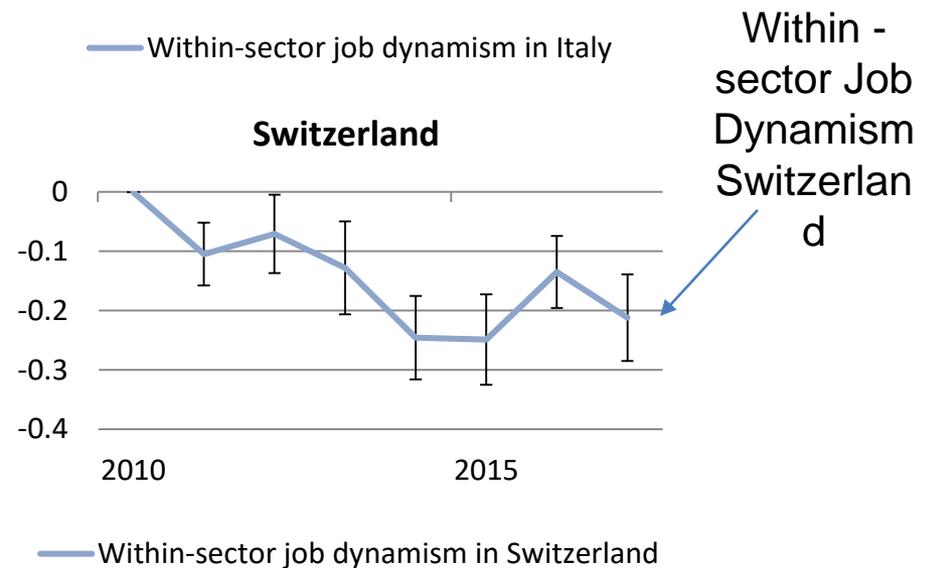
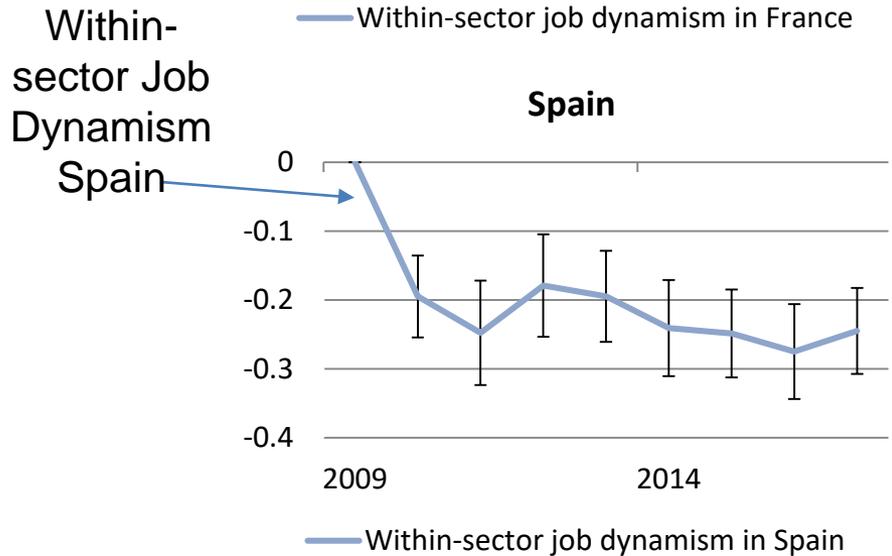
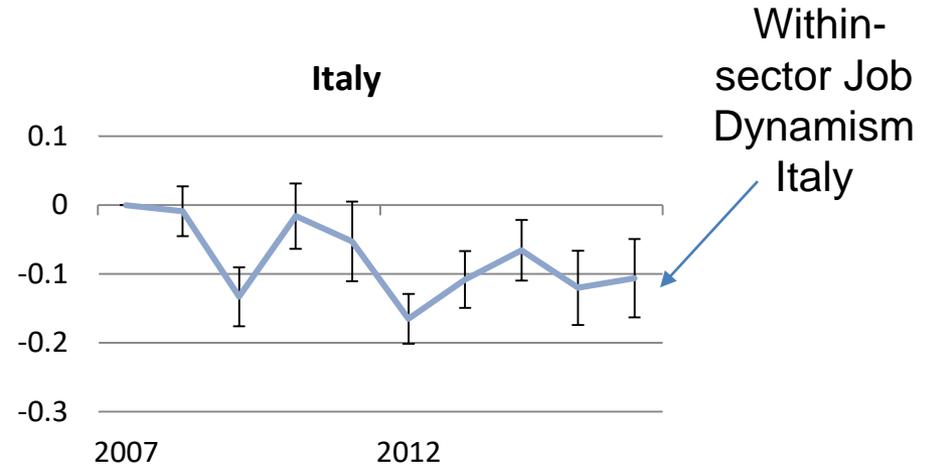
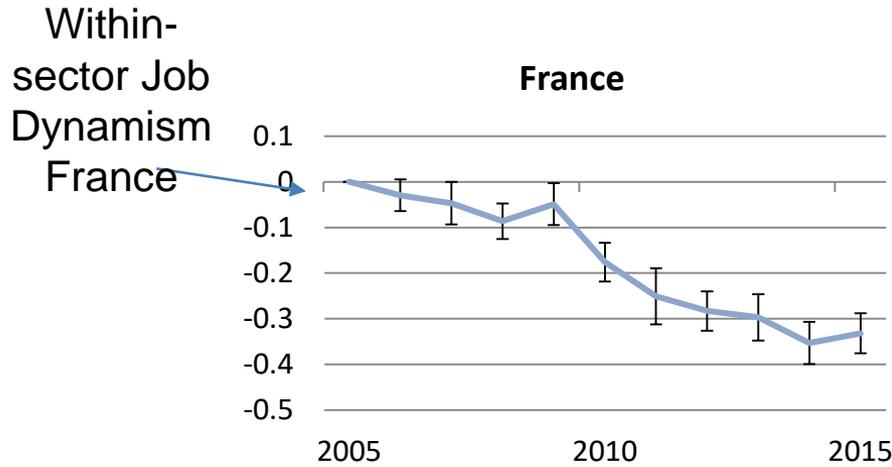
- Allocative efficiency growth has stopped in the latest years.
- This might have contributed to the slowing of TFP aggregate growth

Slowing job dynamics coincide with slowing TFP growth



- Job dynamism (job creation and destruction; blue line) fell
- econometric estimation show that it had a negative impact both on TFP growth and reallocation processes

Slowing job dynamism in nearly ALL countries



CompNet and Coronavirus crisis: a map for action

Which research questions

- How will the crisis affect aggregate productivity?
- How will the crisis affect productivity dispersion? (across firm dimension, sectors, countries)

Which data: How can CompNet contribute?

- Distributions
- Sectoral data
- Regional data

Which other data can be useful:

- High frequency data (business data, VAT authorities)
- Home working /automation diffusion
- Covid Risk by sector
- **Any other you have or recommend to use?**

To recap: plenty of questions with a few guesses for now on the COVID impacts that we are trying to verify, namely on

- Technology adoption (+)
- Cleansing / reallocation (+)

- Supply chain disruptions (-)
- Financial frictions (-)

→ Any other channels we should look at?

Countries in CompNet

Table 1: Countries, Samples and Time Span

Country	Full Sample	20E	Time Span
Belgium	X	X	2003-2017
Croatia	X	X	2002-2017
Czech Republic	X	X	2005-2017
Denmark	X	X	2000-2016
Finland	X	X	1999-2017
France	X	X	2004-2016
Hungary	X	X	2004-2017
Italy	X	X	2006-2016
Lithuania		X	2000-2017
Netherlands	X	X	
Poland		X	2005-2017
Portugal	X	X	
Romania	X	X	
Slovakia		X	2000-2017
Slovenia	X	X	2002-2017
Spain	X	X	2008-2017
Sweden	X	X	2003-2016
Switzerland	X	X	2009-2017
Germany		X	2001-2016