NUS National University of Singapore | NUS BUSINESS SCHOOL

CompNet The Competitiveness Research Network

Why also Central Banks need Firm level data based analysis?

The experience of CompNet

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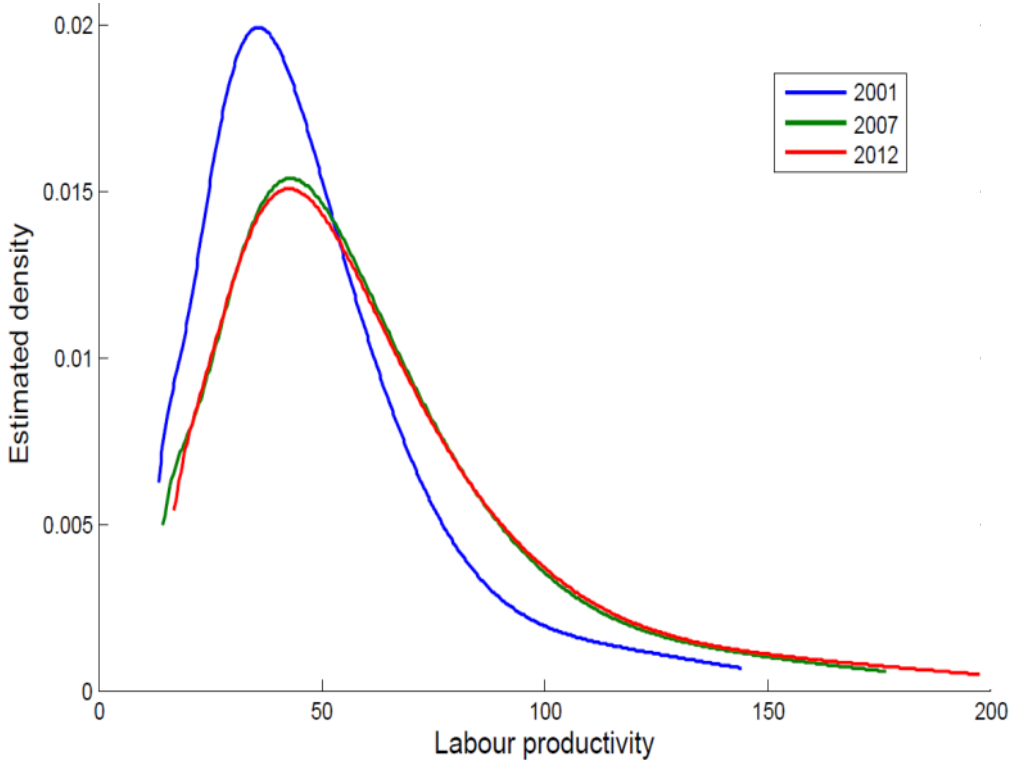
Outline

1. Pitfalls of “macro only” analysis: the role of the Competitiveness Research Network (CompNet)
2. The CompNet Firm level-based dataset: stylised facts and policy implications
3. CompNet: mandate, organisation, way ahead
4. Conclusions (Malta should be part of the CompNet team)

The rationale of firm-level perspective

- Firm performance distribution is **very disperse** and **asymmetric**
- Most firms are around an "average" LOW performance,
- and **only** a **few** which are **very productive** in the "**right-tail**" of the distribution (the so called "*happy few*")

Evolution of labor productivity distribution in France
Manufacturing sector - firms with 20+ employees



Why do economists care about firm heterogeneity?

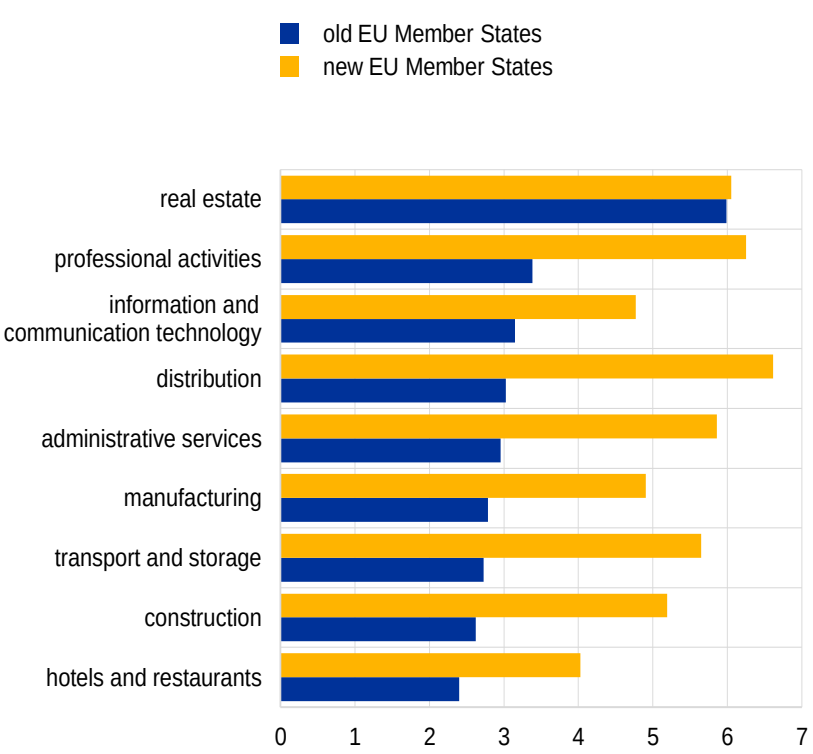
Because they want resources (capital and labour) reallocated from low to high productive firms, to increase the economy aggregate performance

➔ assessing this heterogeneity is also critical for **monetary policy**

Firms' performance is heterogeneous and asymmetric

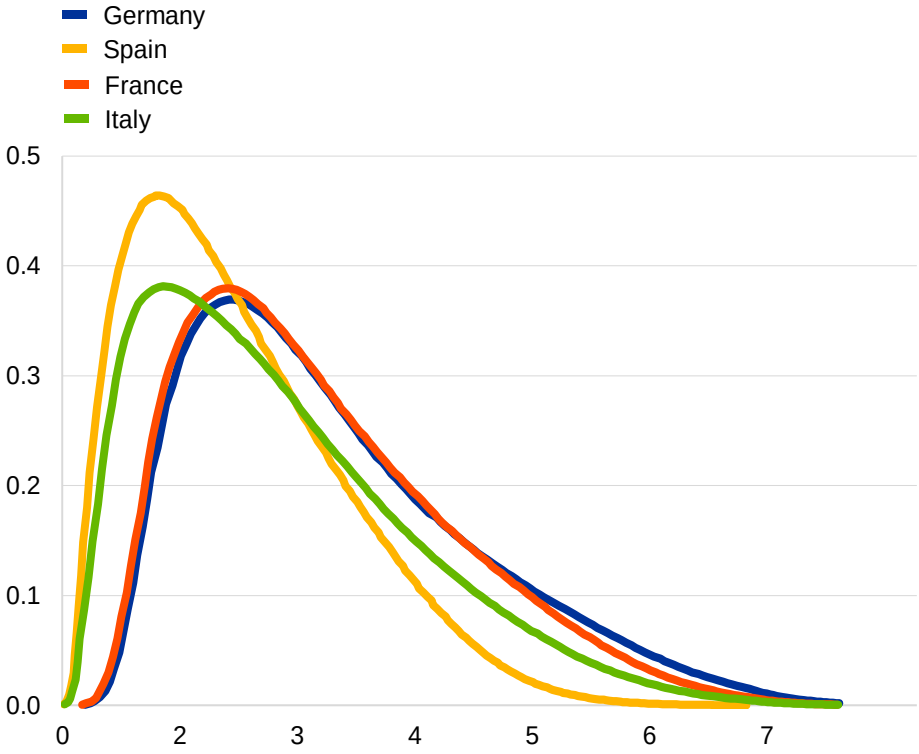
Dispersion of firm productivity within sectors (2001-13)

(productivity ratio of top 10% relative to bottom 10% firms in same 2-digit industry)



Source: ECB staff calculations based on CompNet data.
Notes: Computed at the 2-digit level, aggregated to the macro-sector with VA shares. Unweighted average across 19 countries. Data refers to the 20E sample.

Firm productivity distribution in manufacturing (2006-12)



Sources: ECB staff calculations based on CompNet data, Eurostat data and Statistical office of Germany – AFiD-Panel data for Germany.
Note: Re-scaled so the mean of the distribution equals GDP per capita. Data refers to the 20E sample.

The micro-founded Competitiveness Research Network (CompNet) dataset

- ✓ We use **existing** (no new surveys) firm-level data, mostly from business registers, to construct a wide set of relevant business indicators (productivity, costs, employment..)

- ✓ **Common codes** to **aggregate indicators** at industry, macro-sector and country level in order to solve confidentiality issues

- ✓ **Common methodology** to **harmonize** the resulting set of indicators across countries in terms of measures **definition**, treatment of **outliers**, **deflators** (based on Eurostat sectorial value added) and **PPPs**.

The micro-founded Competitiveness Research Network (CompNet) dataset

1. We have about 20 EU Country teams from National Central Banks, Statistical Institutes, Universities (plus Switzerland and Turkey)
2. Our aim is to **create a Minimum Common Set of indicators which are also cross-country comparable**
3. At the Center, our Secretariat which manages the data collection, **does not see** the raw firm level data (confidentiality is ensured), but sector averages
4. In addition, however, we have

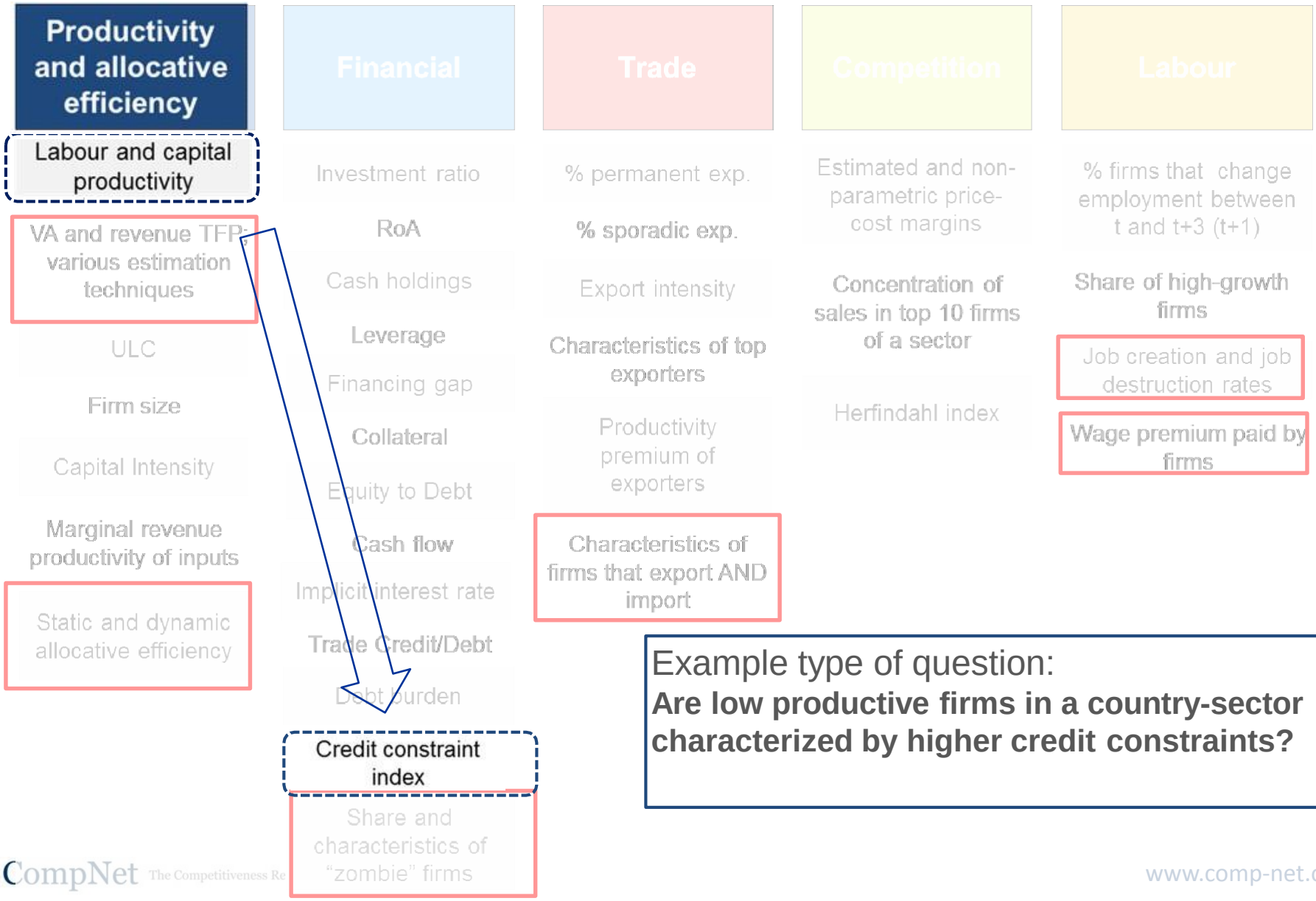
   ➔ the **full distribution** for the (more than **70**) **critical** business variables we collect

   ➔ most notably, the database includes more than **300** joint distributions linking different firms' characteristics

Five broad categories of variables are available (for 60 sectors)

Productivity and **allocative efficiency**	**Financial**	**Trade**	**Competition**	**Labour**
Labor productivity	Investment Ratio	% permanet exp.	Weighted PCM	% firms that increase/decrease employment productivity or ULC between t and t+3
TFP	RoA	% sporadic exp.	Sector-specific mark-ups	
ULC	Cash holdings	Export value		
LC per employee	Leverage	Export value added	Sector-specific collective bargaining power	Characteristics of growing and shrinking firms
Firm size	Financing gap	Productivity premium of exporters		
Capital intensity	Collateral		Concentration measures	Share of High-growth firms
Static Allocative Efficiency	Equity to Debt			
	Cash flow			
Dynamic Allocative Efficiency	Implicit interest rate			
	Trade Credit/Debt			
	Debt burden			
	Credit constraint index			

Example of joint distributions



Example type of question:

Are low productive firms in a country-sector characterized by higher credit constraints?

The 5th wave of the CompNet dataset (2017)

- **Data coverage(1)**

  # of firms: **83%**

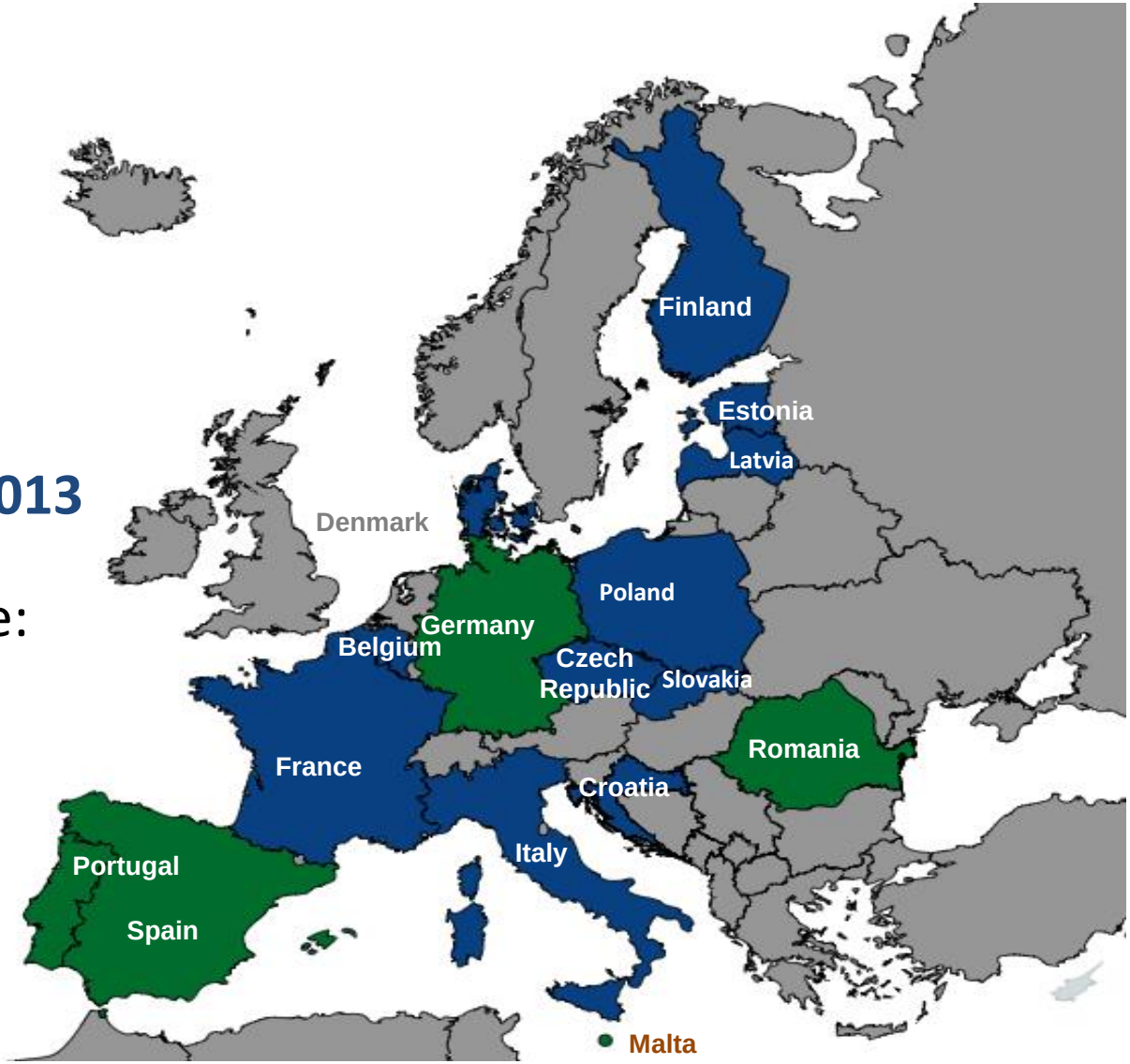
  # employees: **85%**

- Time period: **1995 – 2013**

- Geographical coverage:

  16 EU countries

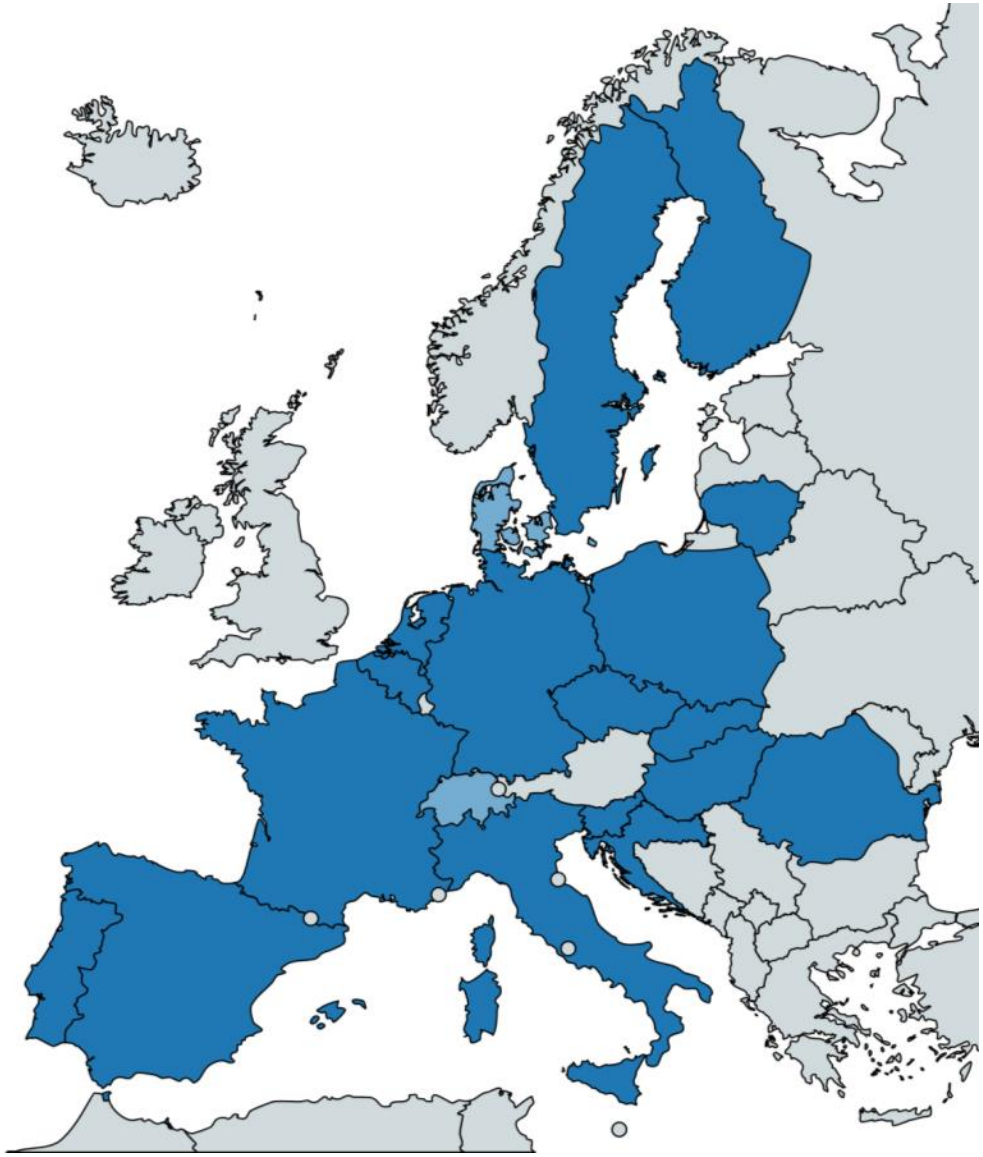
➔ **Malta was included…**



(1): years and countries available in the last round in comparison with Eurostat

The 6th vintage of the CompNet Dataset (2018)

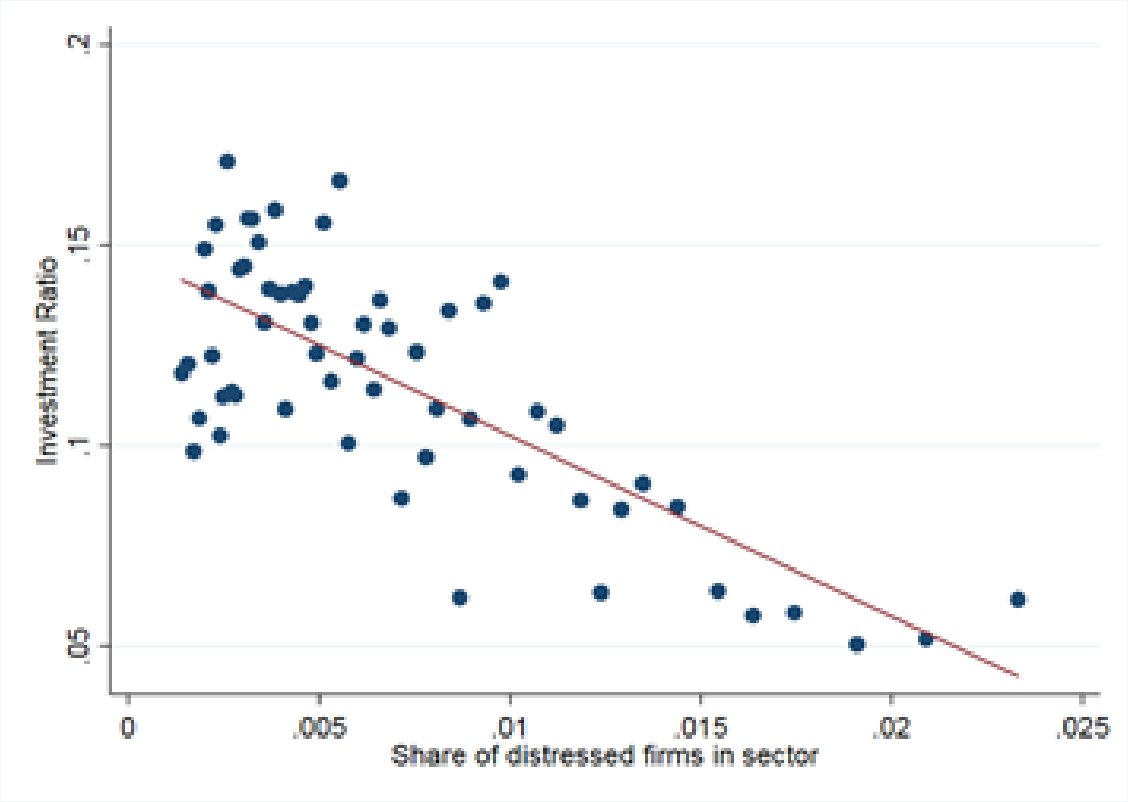
- Time period:
  - **1999 – 2015 (added 2 years)**
- Data coverage:
  - (up to) **90% in firms**
  - (up to) **86% in employees**
- Geographical coverage:
  - **19 EU countries**
  - **and two other in pipeline (CH,TU)**
- Data collection:
  - Richer set of **variables**
  - More efficient **codes**
- Data are available:
  - **on line** for CompNet members
  - **upon request** for others



Some examples of the results for Europe

Stylized facts: 1) Distressed firms and investments

Do distressed firms have a sizeable economic impact?



Sectors with a higher share of distressed firms show significantly **lower investment** ratios and job creation rates

Sector investment and share of distressed firms

(median investment of the 2-digit industry and share of distressed firms)

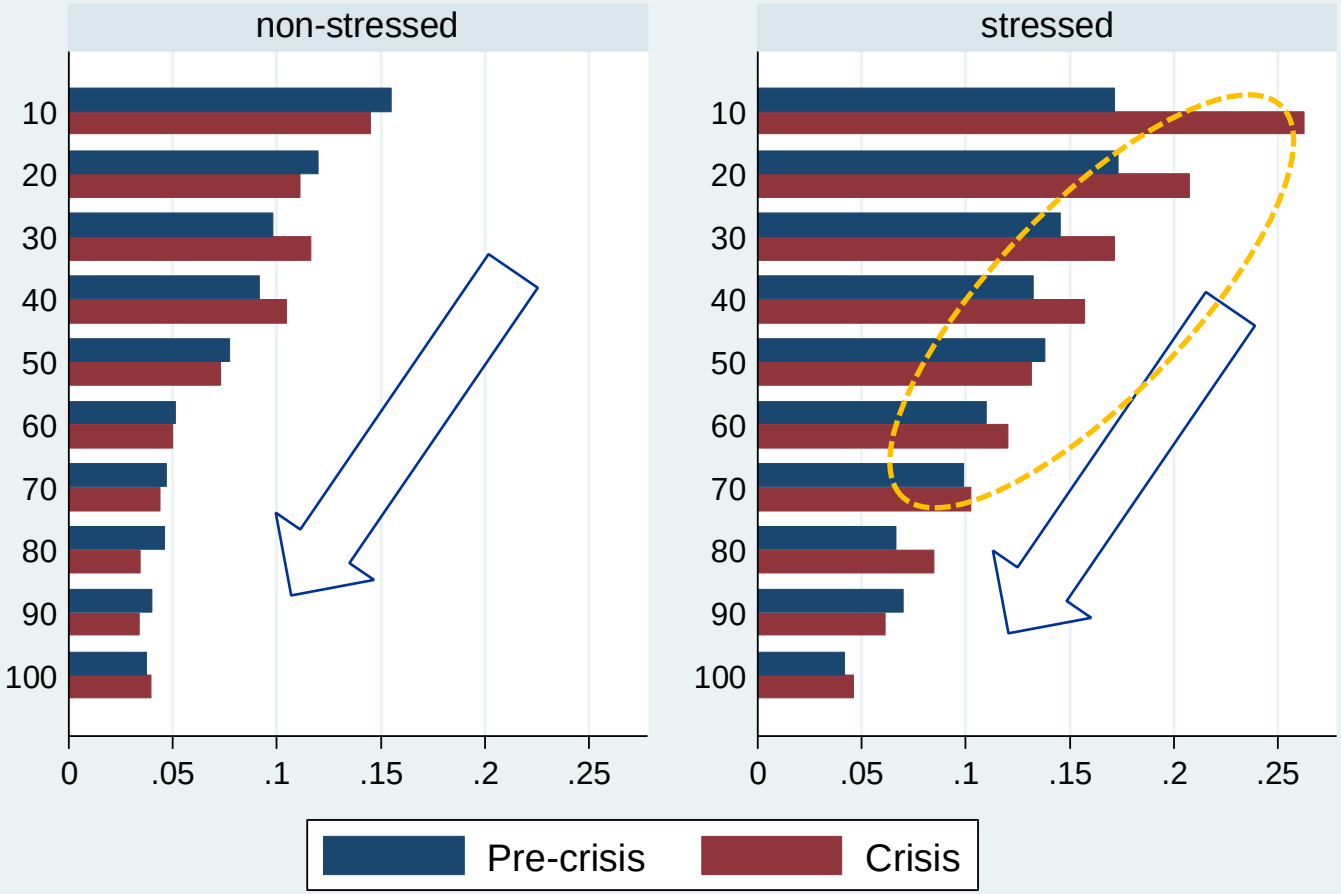
Source: 6th vintage of CompNet, full sample.
Notes: Firms with interest payments higher than operating profits for 3 consecutive years, conditional on positive profits. Countries included: BE, CZ, FI,HU, IT, LT, PT,RO, SP, SE. Binscatter controlling for country FE.

… Most productive firms are not credit-constrained

Share of credit constrained firms by deciles of labor productivity
ICC index estimated within CompNet

Least productive

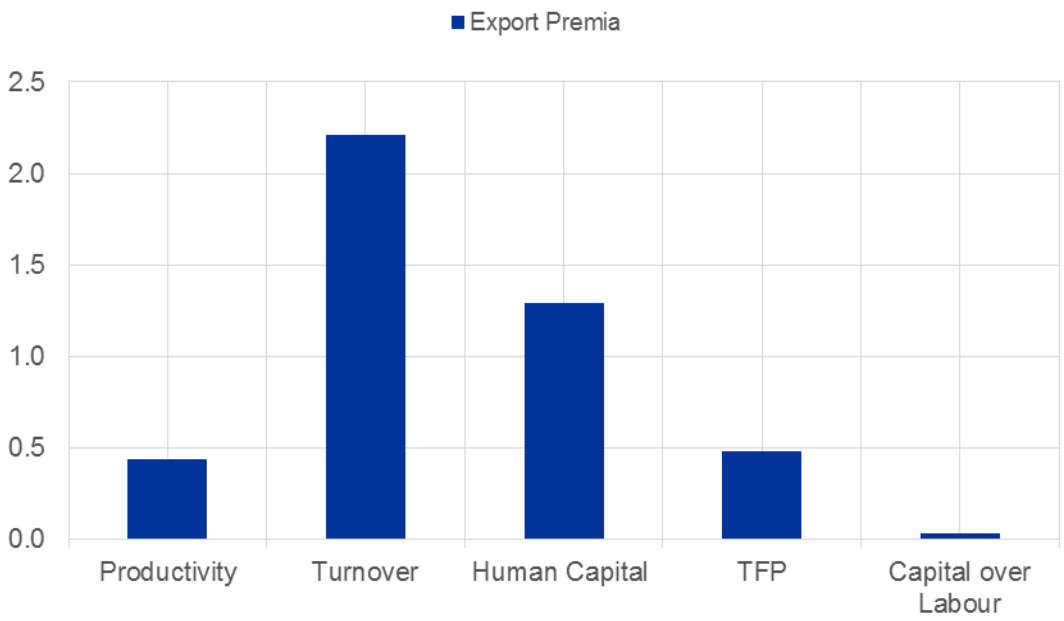
Most productive



2004-2008, 2009-2012, 20E sample; non-stressed: BE DE FI FR; stressed: ES IT SI

Stylized facts 2: How happy are the happy few?

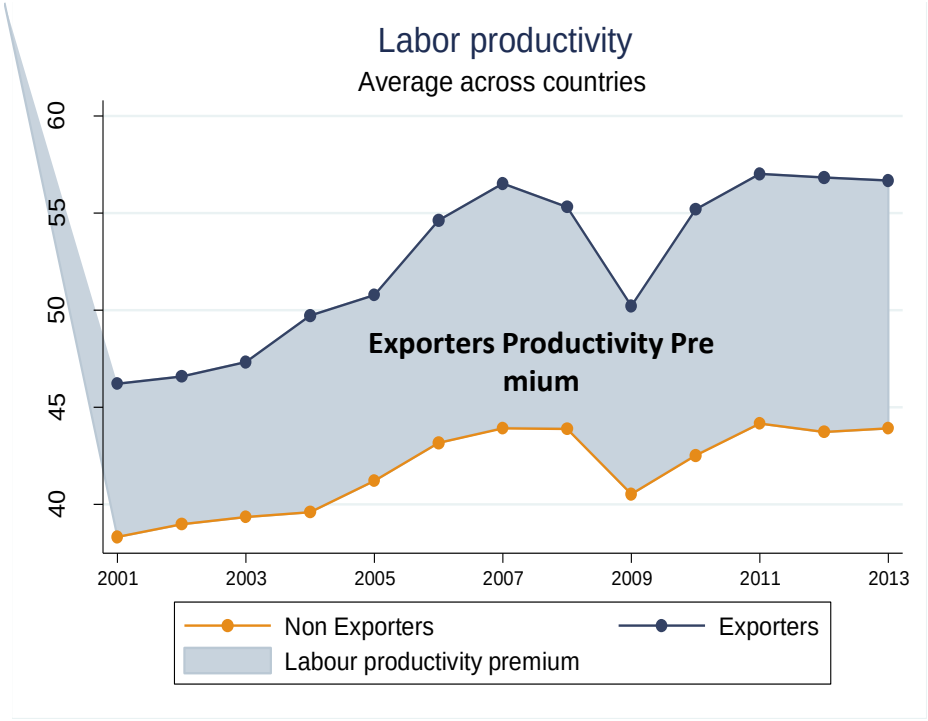
Performance premia of exporting firms over domestic firms in the same 2-digit industry
(Dummy coefficient for exporting firms after controlling for country and time FE)

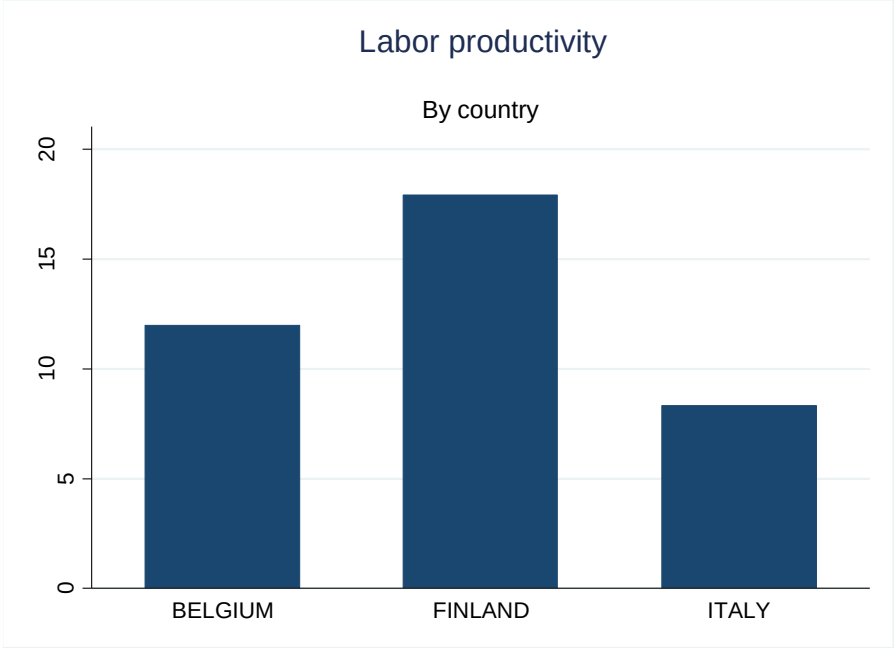


Sources: 6th vintage, CompNet, full sample
Notes: The chart shows the coefficients of the export dummy, indicating whether the firm is exporter or not, from OLS regressions where the dependent variable is the log of the performance indicators, controlling for country, time and sector dummies. Countries included are HR, FI, FR, HU, IT, RO, SI and SE.

- The chart shows the coefficient of a dummy for exporting firms relative to non-exporting firms in same sector
- Exporting firms are significantly larger, employ more skilled labor and are more productive
- We have data for 60 sectors and 18 countries, which can be useful for benchmarking

How important the external dimension is?





- Being an exporter is associated with higher levels of productivity (about 20%)
- Export productivity premium is highly heterogeneous, it varies sharply across countries
- During the crisis, the drop in productivity has been more pronounced for exporters

They seem to be more vulnerable to macro-economic shocks

Exports are concentrated in most productive firms – and these are few

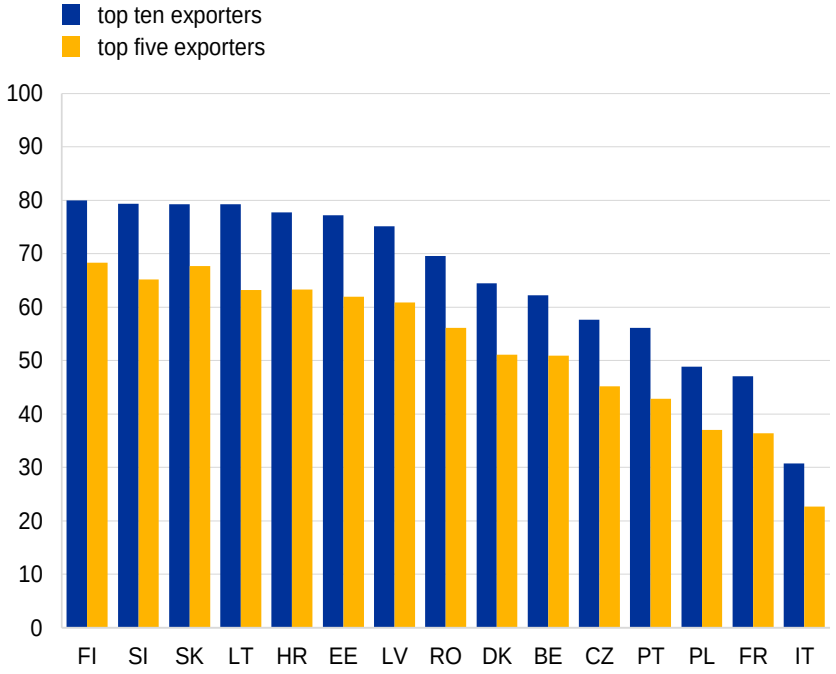
Exports by productivity decile

(average share of exports as % of total by productivity decile)

Source: ECB Economic Bulletin, March 2017, based on CompNet data
Note: Average across 15 EU countries: BE, EE, FR, IT, LT, LI, PT, SI, SK, FI, CZ, DK, HR, PO, RO.
Data refer to the 20E sample, adjusted threshold

Exports concentration (2001-13)

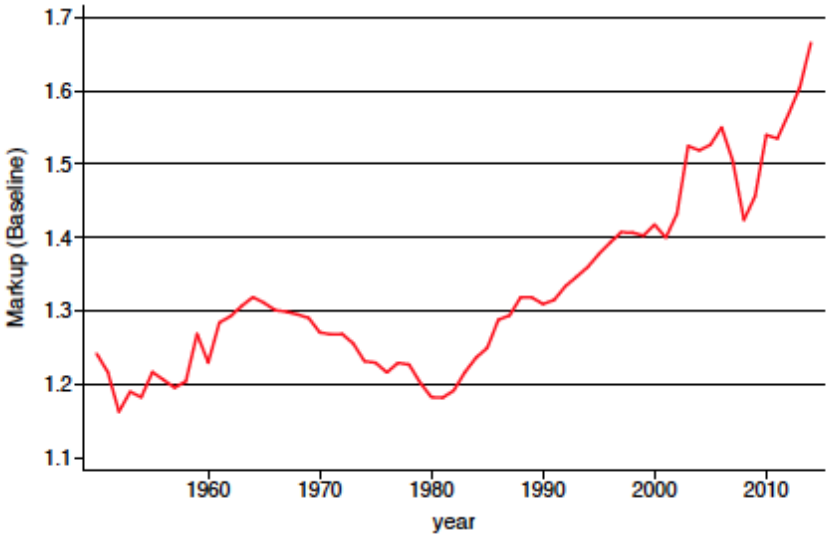
(share of exports of top 5 or 10 exporting firms as % of total)



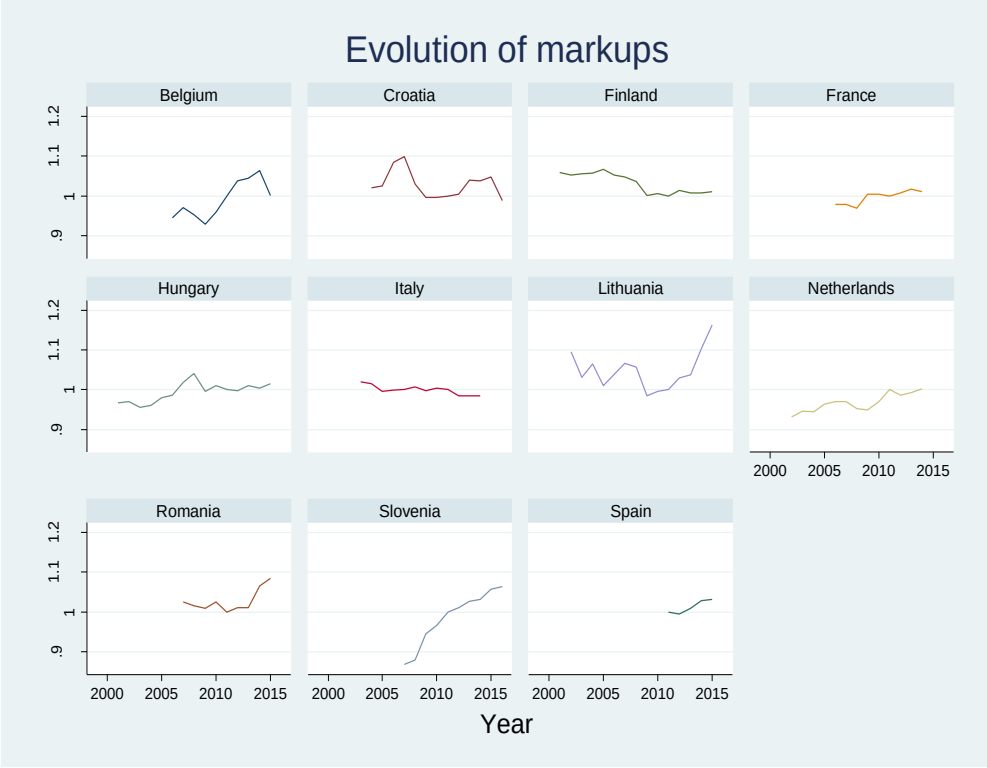
Source: ECB staff calculations based on CompNet data.
Note: Average across 15 EU countries: BE, EE, FR, IT, LT, LI, PT, SI, SK, FI, CZ, DK, HR, PO, RO.
Data refer to the 20E sample, adjusted threshold

Stylized facts: 3) Mark-ups in Europe are not growing as in the US

From de Loecker (2017) – evidence on mark-ups for US



In EU – generally positive trend, BUT much weaker than in US (de Loecker, 2017) (2011=1)

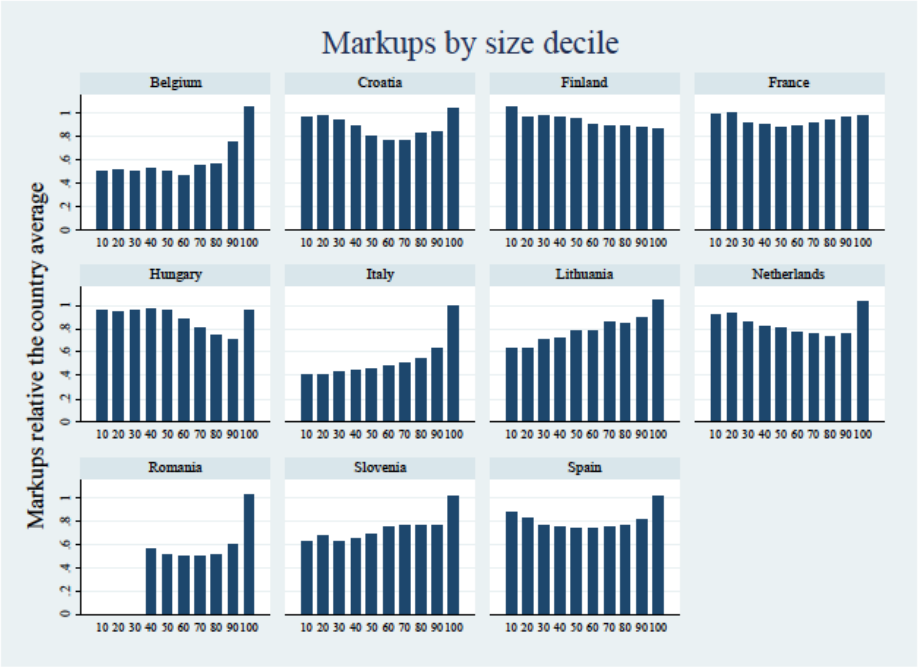


The dataset unveils the critical size and productivity dimension…

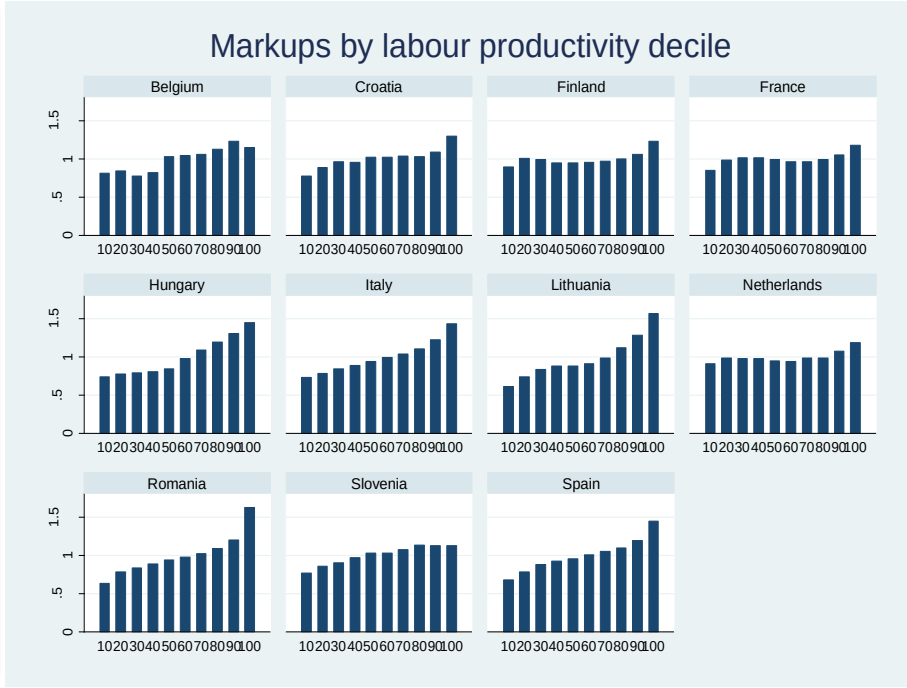
➔ ***Higher mark-ups are associated with higher firms size…***
…..and productivity

Figure 4.15: Median manufacturing sector mark-ups

across firm size deciles



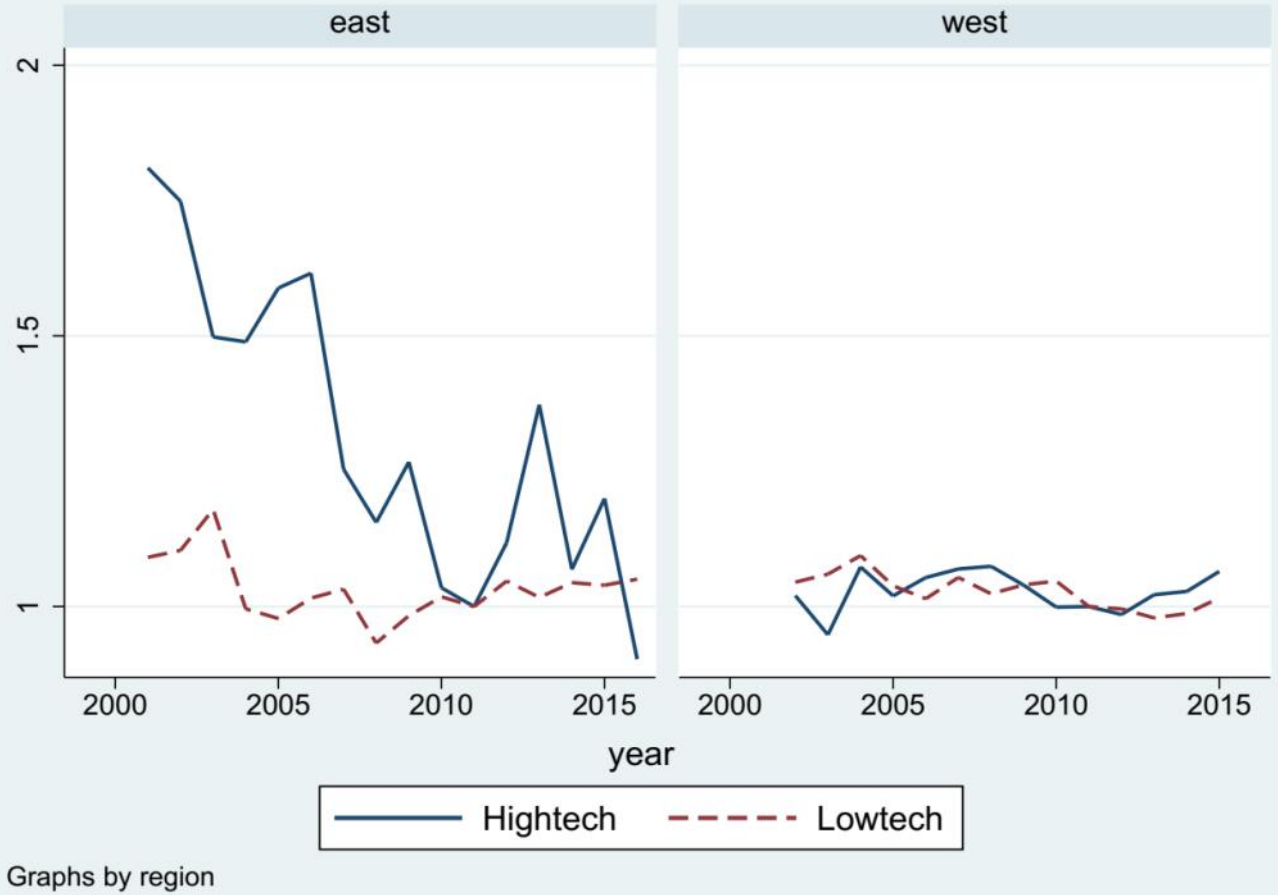
…and productivity deciles



Source: 6th vintage of CompNet data, full sample.
Notes: Median mark-ups are normalized by country averages.

… as well as by region and by technological content

➔ ***Mark-ups shrinking in Eastern Europe for the high tech sectors***

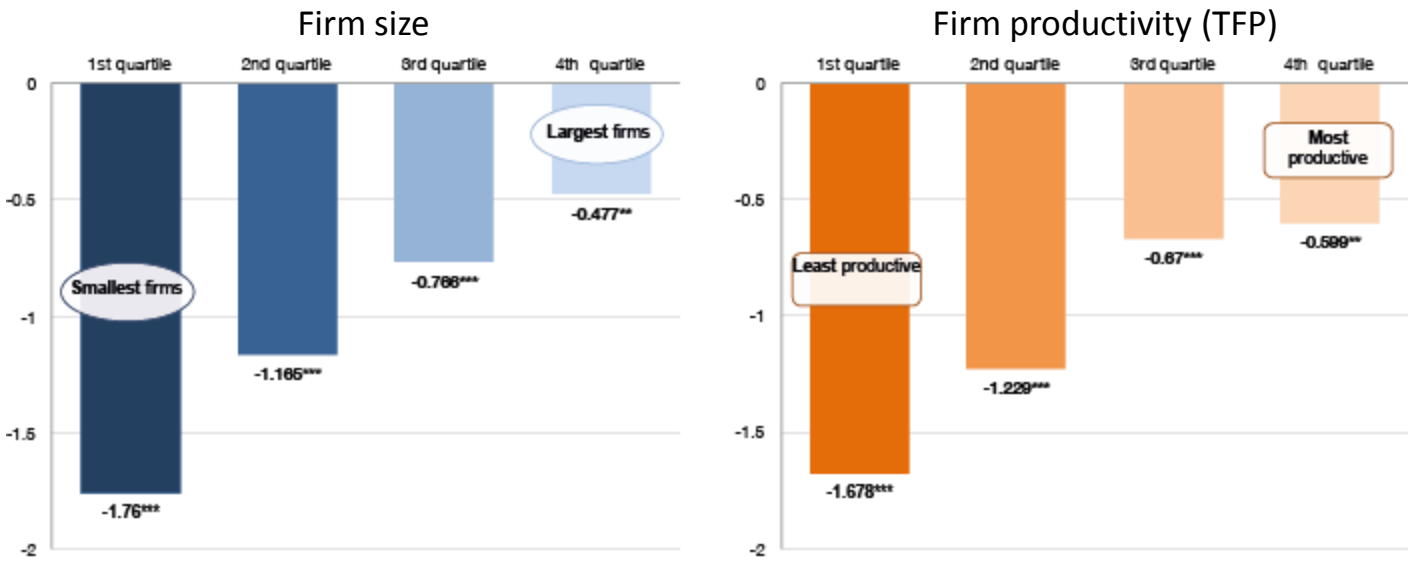


High-tech sectors including pharmaceutical, IT, manufacture of electrical equipment, machinery, motor vehicles and transport equipment.

Policy relevant research questions: 1) Exchange rate elasticities

Do exchange rate devaluations work?

→ The impact might change with respect to

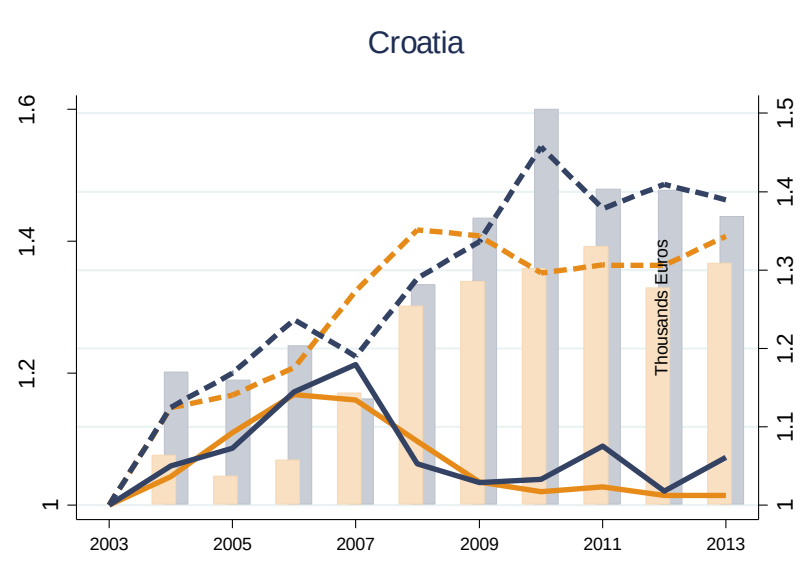


Important implications on aggregate export performance:

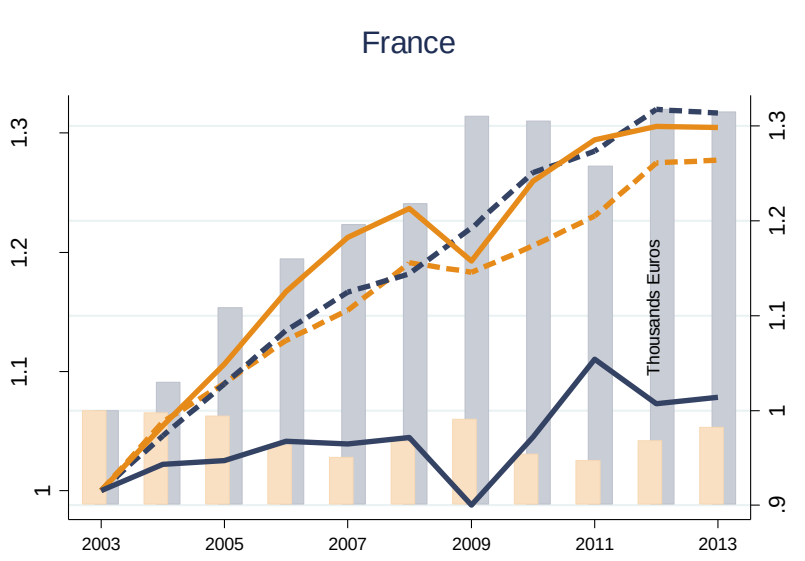
- The impact seems to be limited in the short run, as largely determined by the (low) reaction of the largest and most productive firms
- Exchange rate devaluation can be very effective in helping more vulnerable exporters to succeed in international markets

Source: Berthou, A. and di Mauro, F. (2015): "Exchange rate devaluations: When they can work and why", VOX.EU, 24 December.

Policy relevant research questions: 2) Assessing competitiveness (ULC)



Source: CompNet 20e sample - Manufacturing sector



Source: CompNet 20e sample - Manufacturing sector

High productive firms:
- L productivity (2003=1)
- L cost (2003=1)
- ULC (2003=1)

Low productive firms:
- L productivity (2003=1)
- L cost (2003=1)
- ULC (2003=1)

- In the last decade, there has been a growing gap between labour productivity and labour cost … but for different reasons:
  - *In Croatia, overall labour productivity stagnated or declined after the crisis*

  → *see ULC of all firms increasing*
  - *In France, costs were diverging, **but only for the least productive firms** (see histograms)*

  → *see ULC of most productive firms remaining subdue*

CompNet organization and mandate in brief

CompNet mandate

1. CompNet was born in 2012 as an initiative of the European system of Central Banks with a double mandate:

    1. Provide a forum for research on productivity/competitiveness related matters

    2. Provide top standard indicators on productivity drivers, which are firm-level based.

2. Since early 2017, CompNet is a self-managed Network financed by the ECB together with major European institutions (EC-Grow, EC-EcFin, EIB, EBRD), and academic institutions (IWH-Halle and Tinbergen).

3. Data providers include, in addition to several National Central banks, an increasing number of Statistical institutes

➔This allow to pursue the objective of improving quality of the dataset and its cross country comparability

Meet the CompNet Team

Steering Committee

Eric Bartelsman

Aurelija Proškutė

Ralph De Haas

Filippo Di Mauro

Ettore Dorrucci

Reint Gropp

Francisco Caballero

Mary Tovsak Pleterski

Debora Revoltella

Martin Suster

Sébastien Roux

Senior Adviser

Meet the CompNet Team

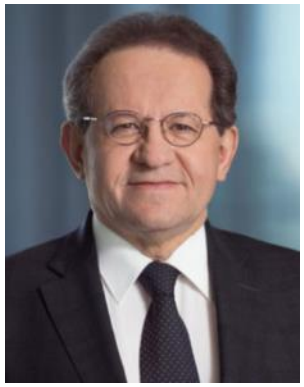
Advisory Board

Ufuk Akcigit

Carlo Altomonte

Eric Bartelsman

Marco Buti



Vitor Constancio

Jan De Loeker

William Maloney

Marc Melitz

Gianmarco Ottaviano

Sergei Guriev

Chad Syverson

Meet the CompNet Team

Executive Committee

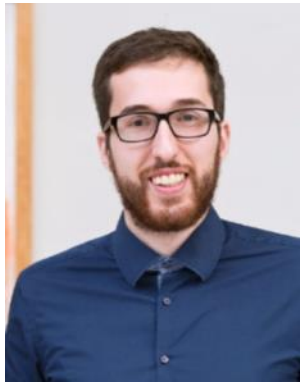
Filippo Di Mauro

Ettore Dorrucci

Steffen Muller

Research Team

Richard Brauer



Matthias Mertens

Roberta Serafini

Meet the CompNet Team

Secretariat

Peter Haug

Marco Christophori

Marta Colombo

Marco Lo Faso

Laura Köngeter

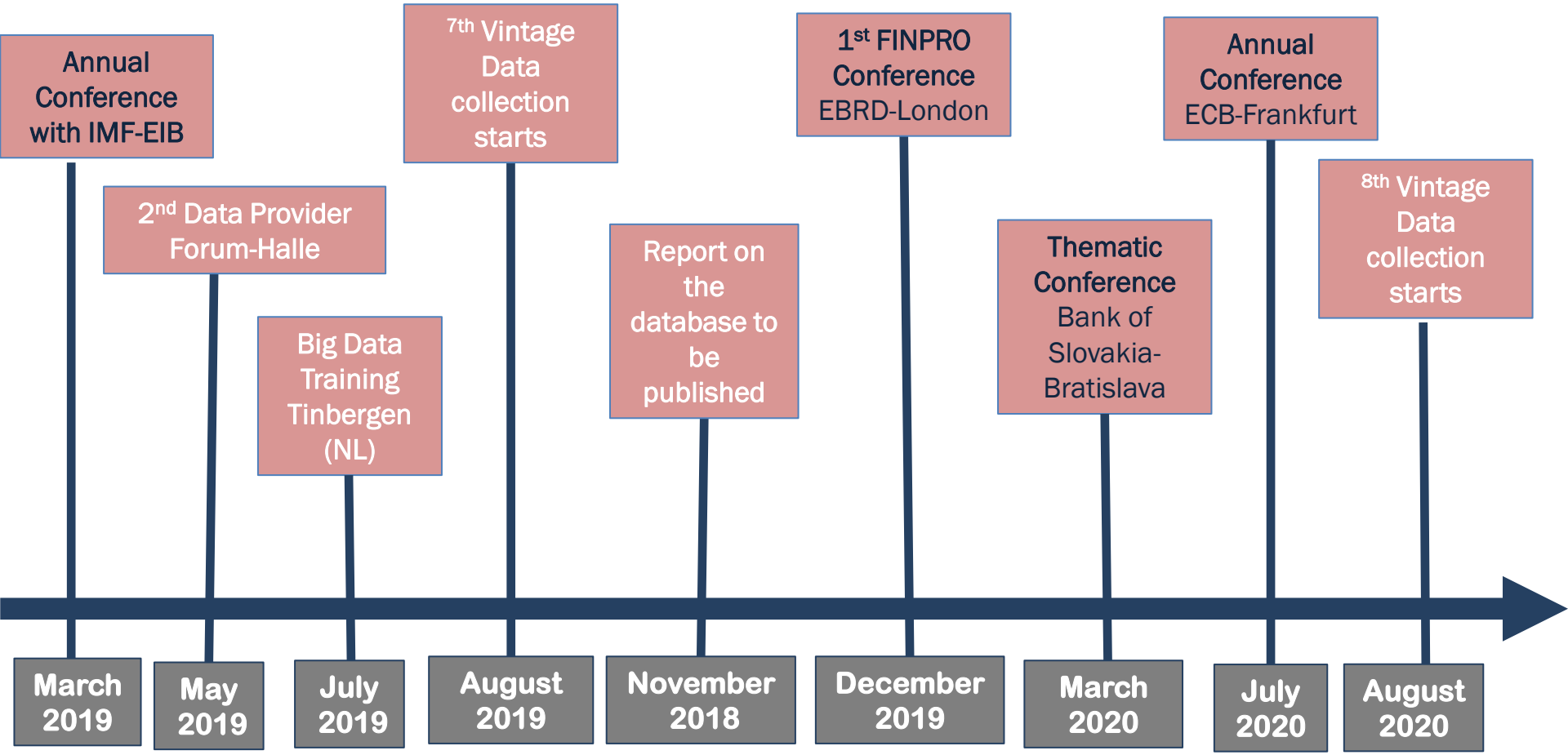
Johannes Amlung

Jonathan Deist

CompNet latest achievements and plans

- **Enlargement** of the Network:
  - More data providers (INSEE (France), Swiss Statistical institute, Central Bank of Turkey, Irish Statistical institute)
- Improvement of the **codes**
- Active in **research** …
  - over **40 ongoing research projects** based on CompNet data
  - **25 Working Papers** since 2016
  - **31 refereed journal articles** from members of the CompNet network
  - New IWH-CompNet Discussion Paper Series
- … and in **policy**
  - **European Commission: 9 Country Reports 2019** (Belgium, Germany, Croatia, France, Italy, Lithuania, Netherlands, Romania, Finland)
  - **VOX EU, February 2019, on 6th Vintage**
  - **ECB 2018 Non-Euro Area Surveillance Report**

CompNet – 2019/2020



TIMELINE AND MILESTONES

Conclusions

- There are well established determinants for higher firm productivity
- This includes financial health, labor costs, size of the firm, as well as its export status
- Firm level data show that the relative importance of such determinants varies tremendously across countries and sectors
- Correctly formulated policies must incorporate such information, including and most notably among Central Banks
- The (firm-level based) CompNet database is by now the top standard in the EU in terms of **coverage** and cross **comparability**
- **(Re) Join us**

Thanks for your attention

www.comp-net.org

ANNEX

Why do we need CompNet? Firms are heterogeneous

Firm-level data is confidential, and relies on existing administrative databases: cross-country comparability is hindered

- One possibility is to use firm–level data for a given country
  - But benchmarking with other countries not possible
- Another is to use ORBIS data, from BvD
  - Limited coverage and representativeness for a number of countries
  - Limited information on employment and exports
- CompNet uses a micro-distributed methodology to fill the gap
  - Departs from firm-level data available at data providers
  - Collects distributions of competitiveness-related indicators to preserve confidentiality
  - Uses of same protocol in all countries to ensure harmonization

What is new in CompNet

CompNet has been enriched with the participation of other European policy institutions, as well as NSIs and research centres (IWH)

- Wide country coverage and cross-country comparability have become a "must" of the network
- Reorganization has brought a pause to the data compilation process; this has been important to:
  - Rethink and improve existing indicators
  - Include a new dimension of analysis: the region (NUTS2)
  - Improve coding: efficiency, comparability, confidentiality checks
  - Incorporate new indicators relevant for stakeholders (distressed firms, job flows, human capital…)
  - Incorporate new countries to the database (SE, NL)

Country information: 18 countries as of October 2018

Country information as of today

Country	Time Span	Sample Available	Export Information	Regional Information	Coverage vs. population	
					Employment	Number of firms
BE	2004-2015	Full and 20e	No	Yes	44%	19%
CZ	2003-2015	20e	Yes	Yes	72%*	72%*
DE**	1999-2014	20e	Yes	No	17%*	9%*
DK	2000-2015	Full and 20e	Yes	Yes	53%	87%
ES	2009-2015	Full and 20e	No	Yes	25%	15%
FI	1999-2015	Full and 20e	Yes	Yes	50%	45%
FR	2004-2014	Full and 20e	Yes	No	57%	41%
HR	2008-2015	Full and 20e	Yes	No	52%	38%
HU	1999-2015	Full and 20e	Yes	No	57%	44%
IT	2001-2014	Full and 20e	Yes	Yes	39%	11%
LT	2000-2015	Full and 20e	No	Yes	69%	37%
NL	2000-2014	Full and 20e	No	No	35%	18%
PL	2005-2015	20e	Yes	Yes	75%*	74%*
PT	2006-2015	Full and 20e	No	No	56%	31%
RO	2005-2015	Full and 20e	Yes	Yes	68%	76%
SI	2005-2016	Full and 20e	Yes	Yes	50%	28%
SE	2003-2015	Full and 20e	Yes	No	40%	32%
SK	2000-2015	20e	Yes	Yes	86%*	90%*

Sources: CompNet 6th vintage and Eurostat, 2011.
Notes: *20e sample.**For Germany data only available for the Manufacturing sector.

Sample representativeness: employment by size class

Use of indicator-specific population weights also for the full sample have improved a lot the representativeness of the samples

Representativeness in terms of employment

Country \ Size Classes	1 - 9 Employees	10 - 19 Employees	20 - 49 Employees	50 - 249 Employees	> 250 Employees
Belgium	21.5% (26.3%)	12.8% (7.78%)	20.3% (12.4%)	24.4% (16.8%)	20.8% (36.5%)
France	30.4% (25.7%)	14.5% (8.05%)	19.2% (11.3%)	24.9% (15.9%)	10.8% (38.9%)
Germany*	-	-	5.06% (7.33%)	27.5% (24.7%)	67.2% (53.4%)
Italy	23.0% (41.0%)	18.3% (11.8%)	21.2% (10.8%)	25.7% (14.2%)	11.6% (21.8%)
Netherlands	16.9% (26.2%)	13.4% (8.50%)	20.1% (11.5%)	30.1% (20.9%)	19.2% (32.8%)
Spain	33.3% (37.7%)	17.2% (9.54%)	20.2% (11.4%)	17.2% (14.6%)	11.8% (26.6%)

Note: representativeness is measured in 2011, number in parenthesis refer to the figures in Eurostat

* Figures rely on the 20e sample

Here for macro-sectors and firms and for all countries.

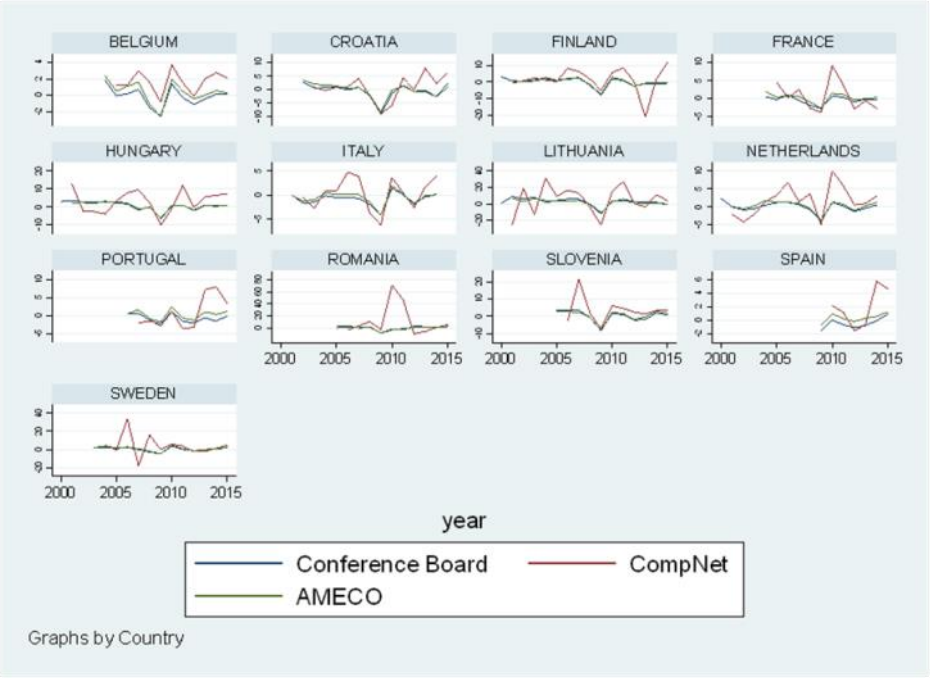
Overview

Productivity: checking the data

Wide range of parametric and non-parametric productivity indicators to let the researcher choose the most convenient

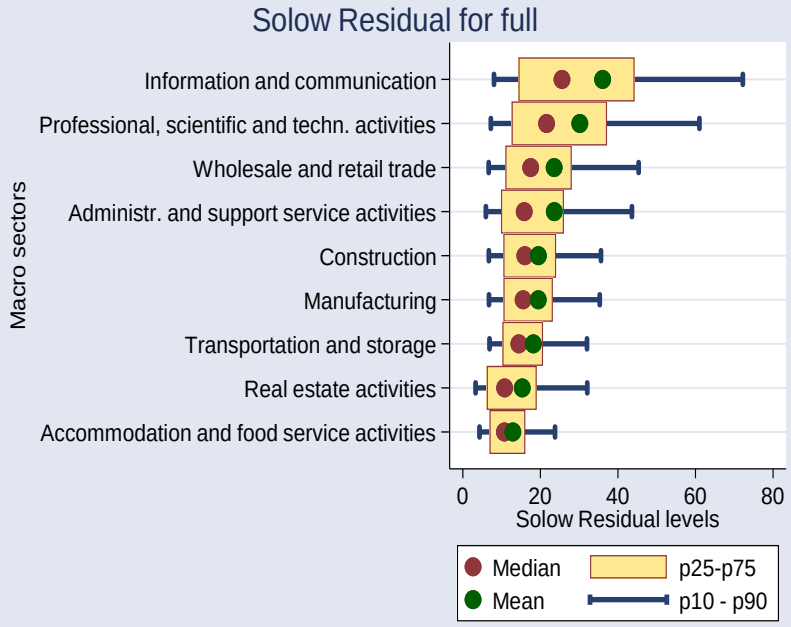
Validation: TFP in CompNet, AMECO and Conference Board

(TFP growth rates)



Granularity: TFP distribution by sector, western countries

(TFP levels)

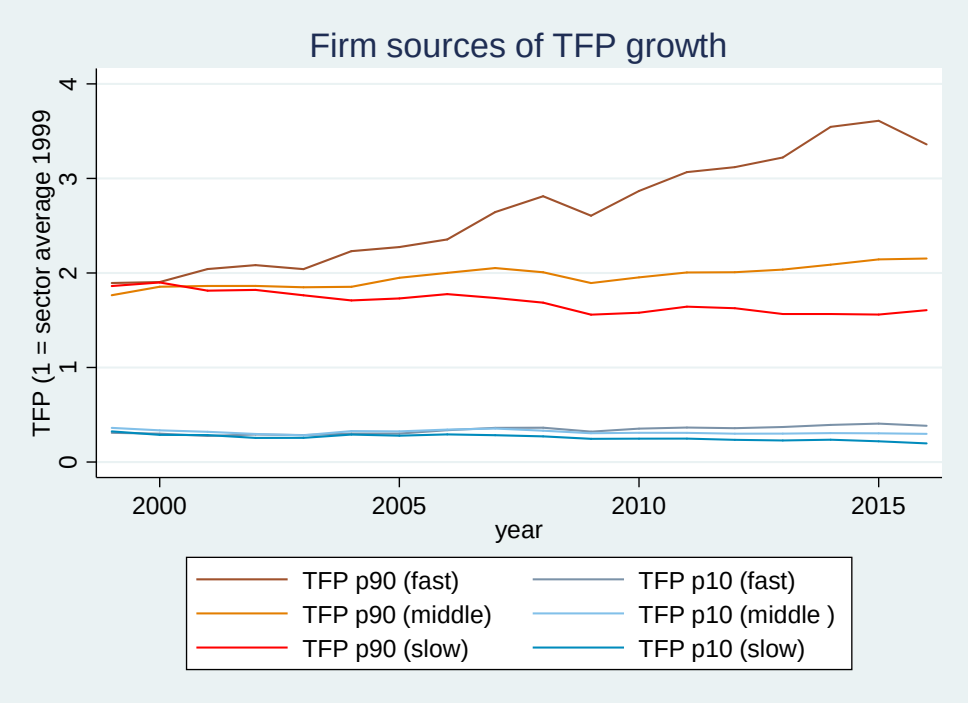


Source: 6th vintage of CompNet full sample, AMECO and Conference Board.
Notes: The TFP indicator used for CompNet is the SR.

Sources: 6th vintage of CompNet, full sample, year 2010.
Note: Countries included are BE, DK, FI, FR, IT, NL, PT, ES and SE.

Productivity: growth in the age of superstars

Dynamics of high and low productive firms in fast-low growing sectors



Sources: 6th vintage of CompNet data, full sample.
Notes: TFP is indexed to average productivity in 1999, which is the start year.

What makes the difference between fast and slow growing sectors (in terms of TFP)?

- The chart shows the dynamics of top and bottom productive firms in 3 types of sectors:
  - Fast growing: top-third of distribution of TFP growth
  - So-so: middle third of the TFP growth distribution
  - Slow growing: bottom third
- What distinguishes fast growing sectors is the super-performance of top firms

Overview

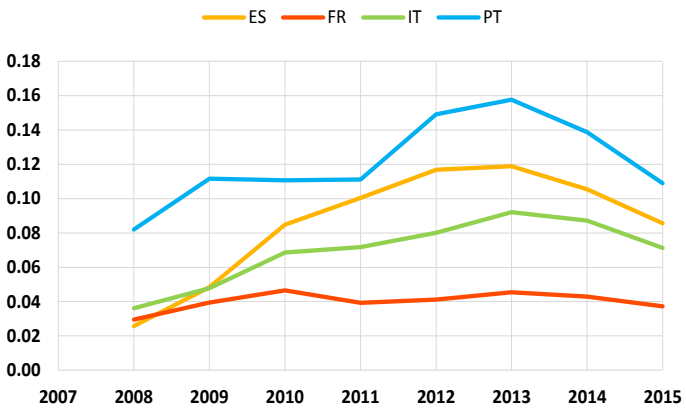
Distressed firms: checking the data

Non-viable firms still in the market; we use different definitions (interest coverage ratio, negative profits excluding HGF)

Validation: CompNet, ORBIS and SAFE

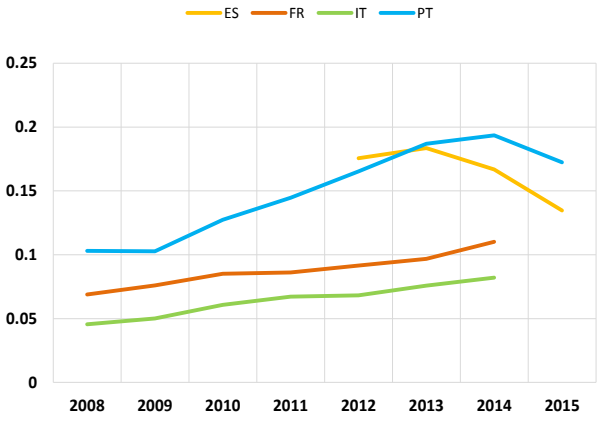
(share of distressed firms)

ORBIS: Storz et al. (2017)



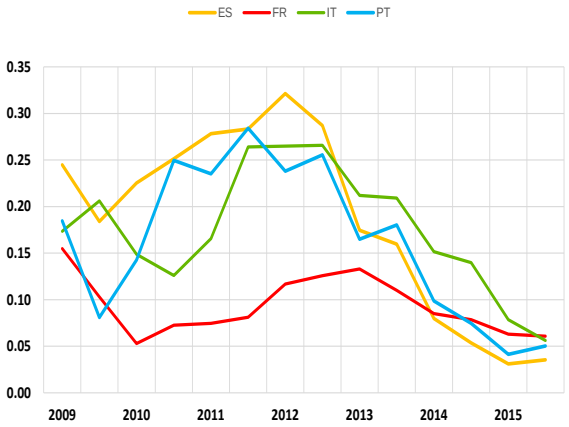
Source: ORBIS.
Note: Distressed firms are defined according to Storz et al. (ECB WP, No. 2104/2017): Non-financial firms with negative investment, negative return on assets and EBITDA to financial debt of less than 5% for two consecutive years.

CompNet: Persistent negative profits



Sources: 6th vintage of CompNet, drawing from the full sample.
Notes: Not high growth captures firms with negative operating profits for three consecutive years, excluding the firms that experienced high growth in employment during that period.

SAFE: Deterioration relative to previous 6 months



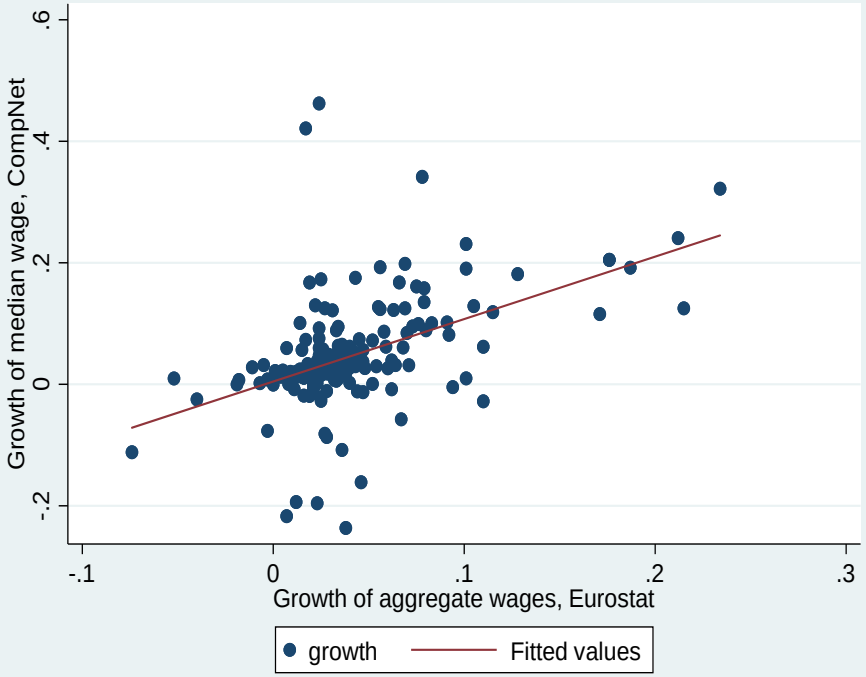
Sources: SAFE survey.
Notes: Distressed firms are defined as firms experiencing lower turnover, lower profits and higher interest expenses compared to the previous six months.

Overview

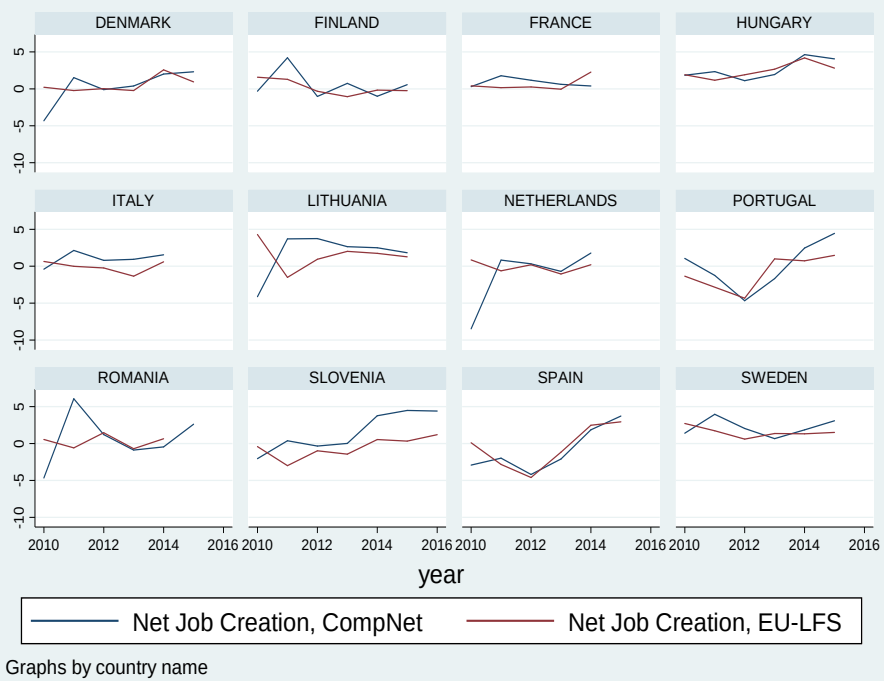
Wages and job flows: checking the data

Gross wages + employers' social security contributions per employee; for the first time we also collect job flows

Validation: wage growth of median firm vs. growth of aggregate wages in Eurostat
(growth rates)



Validation: net job creation in CompNet and in Eurostat's longitudinal LFS
(ULC levels, computed at the 2-digit industry)



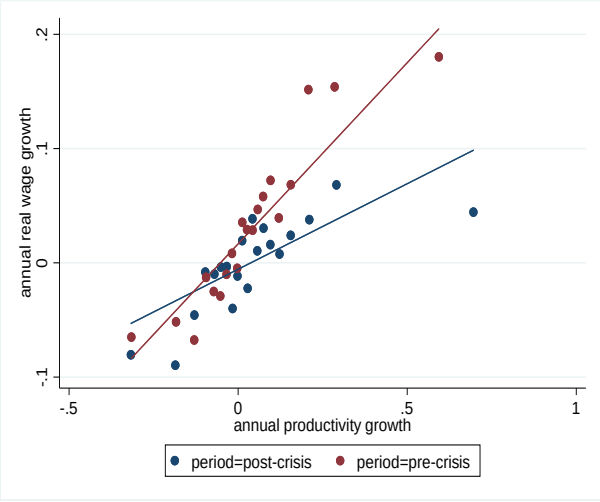
Sources: 6th vintage of CompNet 20E sample and Eurostat.
Notes: countries included are BE, HR, CZ, DK, FI, FR, DE, HU, IT, LT, NL, PL, PT, RO, SK, SI, ES and SE over the period 2000-2015.

Source: 6th vintage of CompNet data full sample and Labour market transitions from the EU-LFS
Notes: JCR in Eurostat computed as flows from U and I to E; JDR as flows from E to U or I.

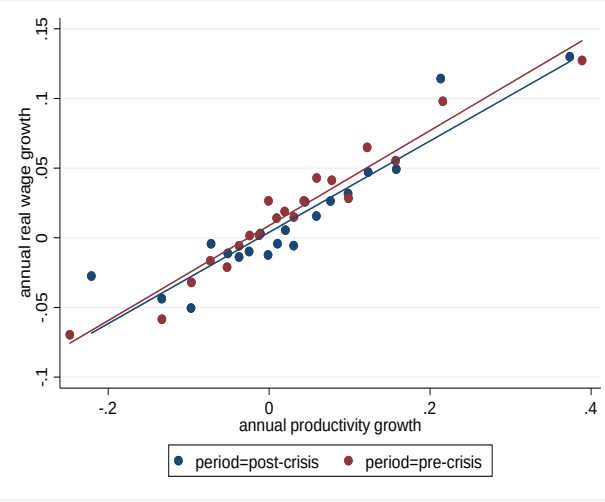
Wages: subdued wage growth in the post-crisis period

Median real wage and productivity growth of firms at tails of the TFP distribution in each country-sector-year, ***pre*** *and* ***post****-crisis*
(growth rates in binscatter)

Bottom 10% productive firms in sector



Top 10% productive firms in sector



Sources: 6th vintage of CompNet, 20E sample.
Notes: countries included are Notes: countries included are BE, DK, DE, FI, FR, IT, NL, PT and SE.
Pre-crisis period is 2004-2007 and post-crisis 2013-2015.

Is real wage growth subdued in the post-crisis period?

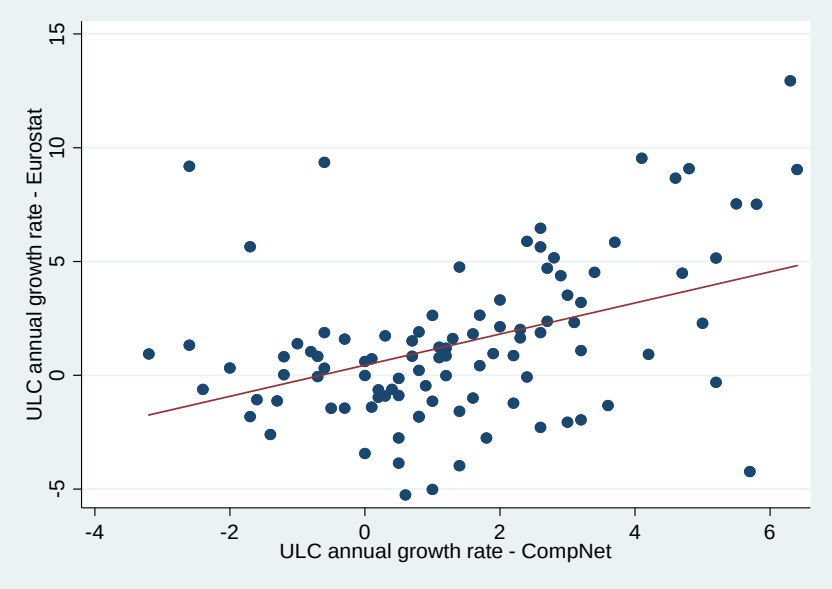
- The (left) right chart shows the link real wage-productivity growth in (low) high productive firms in pre- and post-crisis

- We find lower wage growth for each level of productivity growth in the post-crisis period only for LOW productive firms

Unit Labor Cost: checking the data

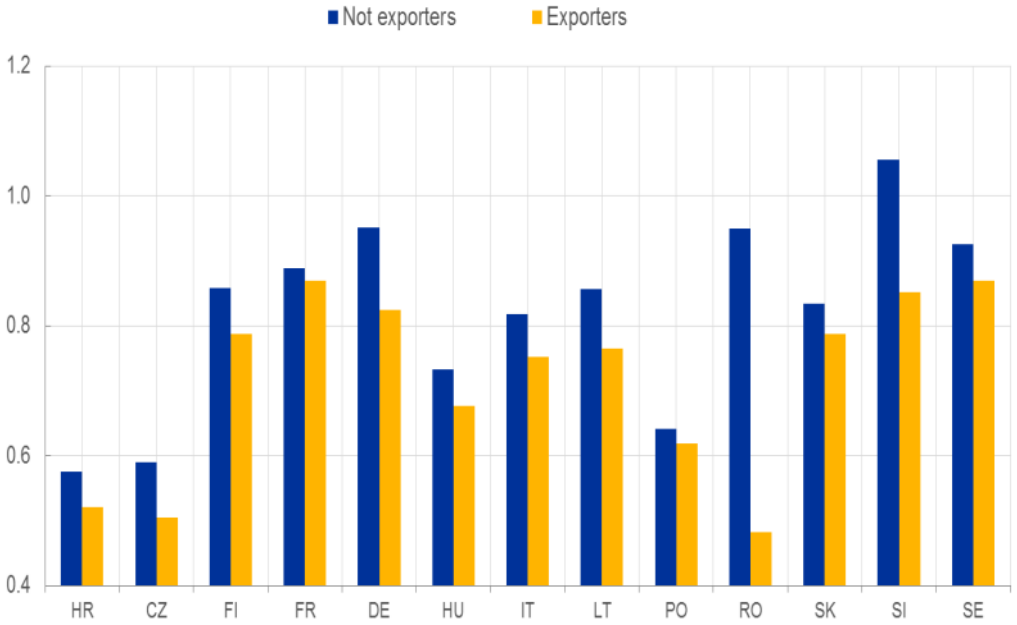
Computed as nominal labour cost per employee over real productivity of the firm, it is key for competitiveness analysis

Validation: ULC growth of median firm vs. growth of aggregate ULC in Eurostat
(growth rates)



Sources: Eurostat and 6th vintage of CompNet, sample of firms with at least 20 employees.
Notes: countries included are BE, HR, DE, CZ, FI, FR, HU, IT, LT, PL, NL, PT, ES, SK, SI, and SE over the period 2006-2015.

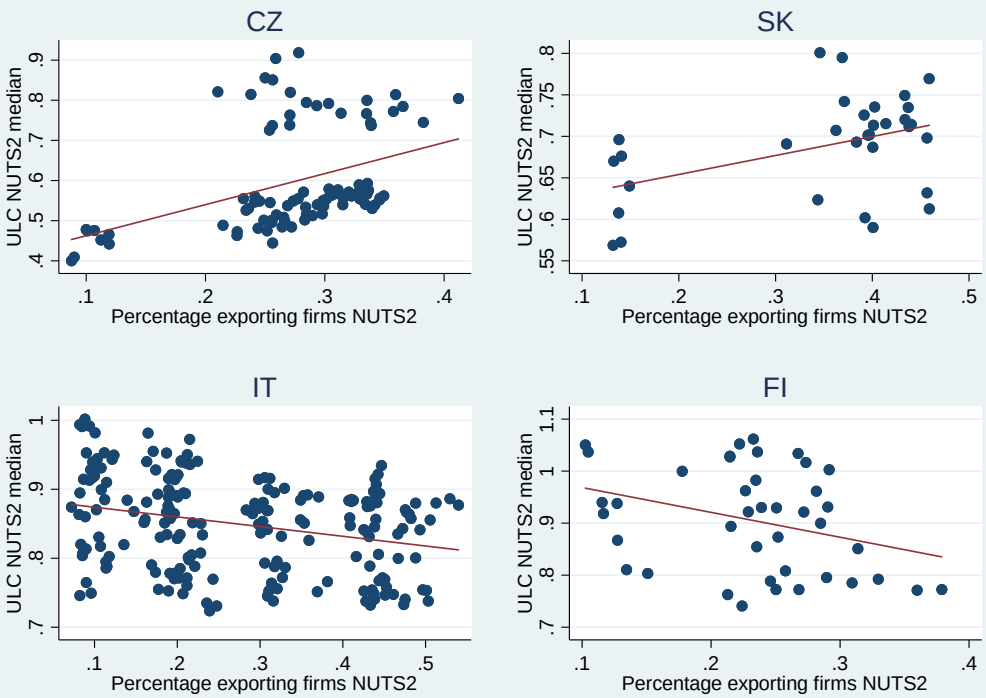
Granularity: ULC of exporters is lower across all countries
(ULC levels, computed at the 2-digit industry)



Sources: Own calculations on 6th vintage of CompNet, sample of firms with at least 20 employees.

Productivity: regional competitiveness

ULC growth and international exposure of regions



Sources: 6th vintage of CompNet, sample of firms with at least 20 employees
Notes: countries included are Czech Republic (CZ), Italy (IT), Slovakia (SK), Finland (FI) with 38 NUTS2 regions; 2005-2015.

Are more internationally exposed regions more competitive?

- The chart shows ULC growth of the median firm in each NUTS2 region vs. the international exposure of the region
  - International exposure measured as the share of exporting firms in each region
- In western Europe, more exposed regions show lower increases in ULC
- Not in Eastern Europe: GVCs?

Overview

Sample representativeness: employment by macro-sector

Use of indicator-specific population weights also for the full sample have improved a lot the representativeness of the samples

Country	Manufacturing	Construction	Services
Belgium	29.7% (27.5%)	12.3% (17.7%)	57.9% (54.7%)
Croatia	34.3% (43.4%)	12.3% (25.4%)	53.3% (31.1%)
Denmark	23.3% (31.3%)	12.8% (15.3%)	63.7% (53.3%)
Finland	30.6% (31.0%)	13.7% (16.9%)	55.6% (51.9%)
France	22.4% (24.9%)	14.3% (16.3%)	63.2% (58.6%)
Hungary	32.9% (34.9%)	8.90% (11.6%)	58.1% (53.3%)
Italy	37.8% (33.1%)	10.3% (15.5%)	51.8% (51.3%)
Lithuania	27.2% (30.2%)	12.7% (18.1%)	59.9% (51.5%)
Netherlands	19.5% (17.1%)	10.7% (13.7%)	69.6% (69.1%)
Portugal	28.4% (24.1%)	13.7% (15.6%)	57.8% (60.2%)
Romania	35.7% (40.1%)	12.4% (15.2%)	51.8% (44.6%)
Slovenia	45.9% (43.6%)	9.23% (18.5%)	44.7% (37.8%)
Spain	24.3% (21.8%)	12.9% (16.3%)	62.6% (61.7%)
Sweden	21.2% (28.0%)	13.9% (17.1%)	64.8% (54.8%)
Czech Republic*	52.3% (56.2%)	6.88% (9.34%)	40.8% (34.3%)
Germany**	-	-	-
Poland*	44.9% (54.7%)	8.21% (11.5%)	46.8% (33.6%)
Slovakia*	50.2% (64.3%)	5.95% (9.43%)	43.7% (26.1%)

Sample representativeness: firms by size class

Use of indicator-specific population weights also for the full sample have improved a lot the representativeness of the samples

Country \ Size Classes	1 - 9 Employees	10 - 19 Employees	20 - 49 Employees	50 - 249 Employees	> 250 Employees
Belgium	21.5% (26.3%)	12.8% (7.78%)	20.3% (12.4%)	24.4% (16.8%)	20.8% (36.5%)
Croatia	27.2% (9.29%)	13.9% (13.0%)	17.4% (15.1%)	26.4% (27.8%)	14.9% (34.6%)
Denmark	41.1% (23.0%)	14.0% (9.55%)	17.8% (12.6%)	19.3% (21.6%)	7.57% (33.1%)
Finland	28.7% (28.2%)	14.0% (8.73%)	18.5% (11.2%)	24.9% (18.4%)	13.7% (33.3%)
France	30.4% (25.7%)	14.5% (8.05%)	19.2% (11.3%)	24.9% (15.9%)	10.8% (38.9%)
Hungary	37.2% (37.1%)	15.1% (8.58%)	15.4% (9.34%)	20.5% (16.7%)	11.6% (28.1%)
Italy	23.0% (41.0%)	18.3% (11.8%)	21.2% (10.8%)	25.7% (14.2%)	11.6% (21.8%)
Lithuania	23.4% (28.8%)	13.9% (11.1%)	20.2% (15.7%)	29.4% (23.0%)	12.8% (21.1%)
Netherlands	16.9% (26.2%)	13.4% (8.50%)	20.1% (11.5%)	30.1% (20.9%)	19.2% (32.8%)
Portugal	36.5% (32.1%)	16.4% (11.8%)	19.4% (13.7%)	19.8% (18.4%)	7.66% (23.8%)
Romania	29.3% (21.7%)	13.3% (8.17%)	18.4% (12.4%)	28.2% (23.3%)	10.5% (34.2%)
Slovenia	24.3% (36.9%)	11.7% (9.96%)	16.3% (8.53%)	28.6% (22.6%)	18.8% (21.8%)
Spain	33.3% (37.7%)	17.2% (9.54%)	20.2% (11.4%)	17.2% (14.6%)	11.8% (26.6%)
Sweden	39.8% (21.9%)	17.7% (9.72%)	22.3% (13.4%)	17.9% (20.0%)	2.01% (34.8%)
Czech Republic*	-	-	16.2% (16.5%)	38.3% (32.8%)	45.3% (50.5%)
Germany*	-	-	5.06% (7.33%)	27.5% (24.7%)	67.2% (53.4%)
Poland*	-	-	13.4% (13.6%)	40.2% (34.4%)	46.2% (51.9%)
Slovakia*	-	-	13.9% (14.6%)	34.3% (32.9%)	51.7% (52.4%)

Within-cell (non) bias

Average firm in each macro-sector/size class cell in Compnet very similar to that in the population (other countries in report)

Belgium				
Sector	10-19 Employees	20-49 Employees	50-249 Employees	>250 Employees
Manufacturing	13.64 (13.24)	31.23 (30.90)	104.9 (103.8)	598.4 (736.3)
Construction	13.42 (13.23)	30.31 (29.94)	82.15 (97.46)	312 (514)
Services	13.48 (13.27)	30.37 (30.06)	90.19 (98.68)	718.2 (1301.9)

Croatia				
Sector	10-19 Employees	20-49 Employees	50-249 Employees	>250 Employees
Manufacturing	13.44 (13.22)	30.22 (29.88)	106.1 (102.2)	541.6 (548.5)
Construction	13.56 (13.35)	30.21 (29.71)	90.44 (99.08)	361.5 (587)
Services	13.25 (12.59)	29.84 (26.34)	91.45 (84.95)	387.3 (463.0)

Denmark				
Sector	10-19 Employees	20-49 Employees	50-249 Employees	>250 Employees
Manufacturing	14.09 (13.29)	31.34 (30.87)	98.45 (97.56)	585.6 (779.0)
Construction	13.80 (13.42)	29.83 (29.42)	80.15 (89.66)	n.a.
Services	13.83 (13.44)	29.90 (26.58)	87.52 (97.87)	410.0 (720.3)

Finland				
Sector	10-19 Employees	20-49 Employees	50-249 Employees	>250 Employees
Manufacturing	14.08 (13.28)	31.20 (30.29)	99.61 (102.1)	501.1 (790.4)
Construction	13.78 (13.77)	29.15 (29.20)	78.66 (90.14)	n.a.
Services	13.84 (14.98)	30.16 (31.54)	90.61 (116.1)	391.4 (886.1)

Hungary				
Sector	10-19 Employees	20-49 Employees	50-249 Employees	>250 Employees
Manufacturing	13.82 (13.75)	31.82 (31.59)	103.2 (106.3)	582.5 (769.3)
Construction	13.51 (13.45)	28.36 (29.54)	92.19 (92.90)	n.a.
Services	13.46 (13.41)	29.67 (30.04)	83.31 (96.65)	413.2 (940.48)

France				
Sector	10-19 Employees	20-49 Employees	50-249 Employees	>250 Employees
Manufacturing	13.51 (13.98)	31.16 (34.57)	103.2 (111.3)	511.8 (846.6)
Construction	13.35 (14.80)	29.94 (32.36)	80.32 (100.9)	n.a.
Services	13.30 (16.31)	30.60 (35.93)	95.09 (122.9)	410.7 (1763.)

Italy				
Sector	10-19 Employees	20-49 Employees	50-249 Employees	>250 Employees
Manufacturing	14.07 (13.33)	31.13 (30.08)	95.51 (96.78)	435.0 (722.3)
Construction	13.66 (12.90)	29.73 (28.81)	75.62 (85.76)	n.a.
Services	13.68 (12.94)	30.41 (29.69)	92.41 (97.66)	525.3 (1167.)

Lithuania				
Sector	10-19 Employees	20-49 Employees	50-249 Employees	>250 Employees
Manufacturing	13.65 (13.41)	30.98 (29.91)	98.80 (80.12)	436.9 (441.2)
Construction	13.52 (13.50)	29.97 (30.02)	89.33 (96.26)	374.2 (409.4)
Services	13.23 (13.18)	29.65 (32.31)	86.93 (78.39)	522.9 (784)