EUROPEAN CENTRAL BANK

EUROSYSTEM

CompNet The Competitiveness Research Network

Assessing European Competitiveness: the CompNet approach

February 2016

Policy motivation and inspiration

Why is competitiveness analysis important, also for a Central Bank?

- Trade liberalisation and - globalisation in general - increase **international competitive pressures**
- Within the euro area, competiveness asymmetries are at the **bulk of the crisis**
- Need to assess competitiveness issues in order to identify the appropriate **structural reforms**, i.e. those that "[…] *lift the path of **potential output**, either by raising the inputs to production or by ensuring that those inputs are used more **efficiently**"* and *"make economies more **resilient** to economic shocks by facilitating price and wage flexibility and the swift **reallocation** of resources within and across sectors*" **M. Draghi, Sintra - May 2015**

CompNet goals and governance

The Competitiveness Research Network (**CompNet**) was created in March 2012 with the mandate from the General Council to:

Provide robust theoretical and empirical link between drivers of competitiveness and macroeconomic performance for research and policy analysis

To do so, CompNet has used a **multi-dimensional** approach (i.e. a set of complementary macro, firm-level and cross-border indicators) also adopting a rather **broad definition of competitiveness** (e.g. productivity)

Since June 2015 CompNet is a **self-governed network** managed by a 10 persons Steering Committee (of which 3 are from the ECB – Dorrucci, Karadeloglou and Lopez-Garcia). Chair is Filippo di Mauro.

The Network comprises about 300 economists from NCBs, International organisations and academics

Outline

In what follows will highlight some of the main policy relevant results out of the extensive literature (about 50 WPs and 10 journal papers) generated so far over the three dimensions:

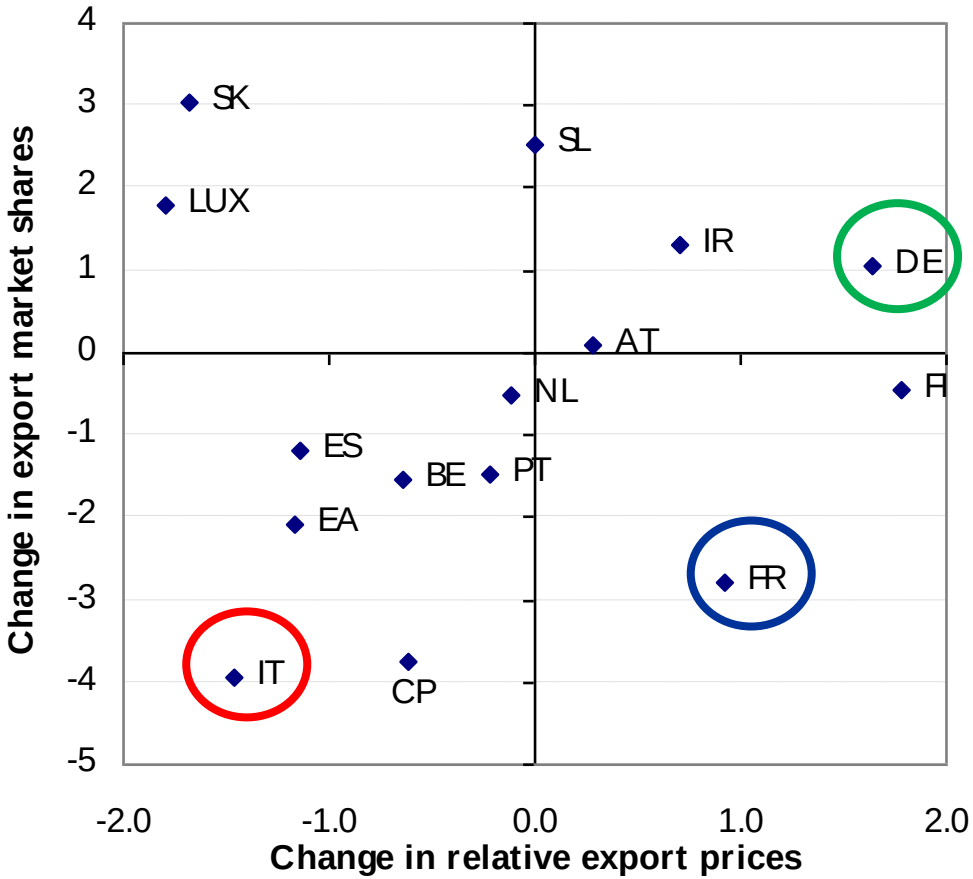
1. - Macro
2. - Global value chains
3. - Firm level

1) The macro perspective: the issue

- Traditional macroeconomic **price/cost** indicators alone are **unable** to provide a comprehensive explanation of trade developments.

Price competitiveness and export market shares

Average annual percentage changes, Pre-crisis (1999-2008Q3)



Source: ECB calculations.

Note: Price competitiveness is proxied by relative export prices (competitors over domestic prices). **A positive value corresponds to a gain in price competitiveness.**

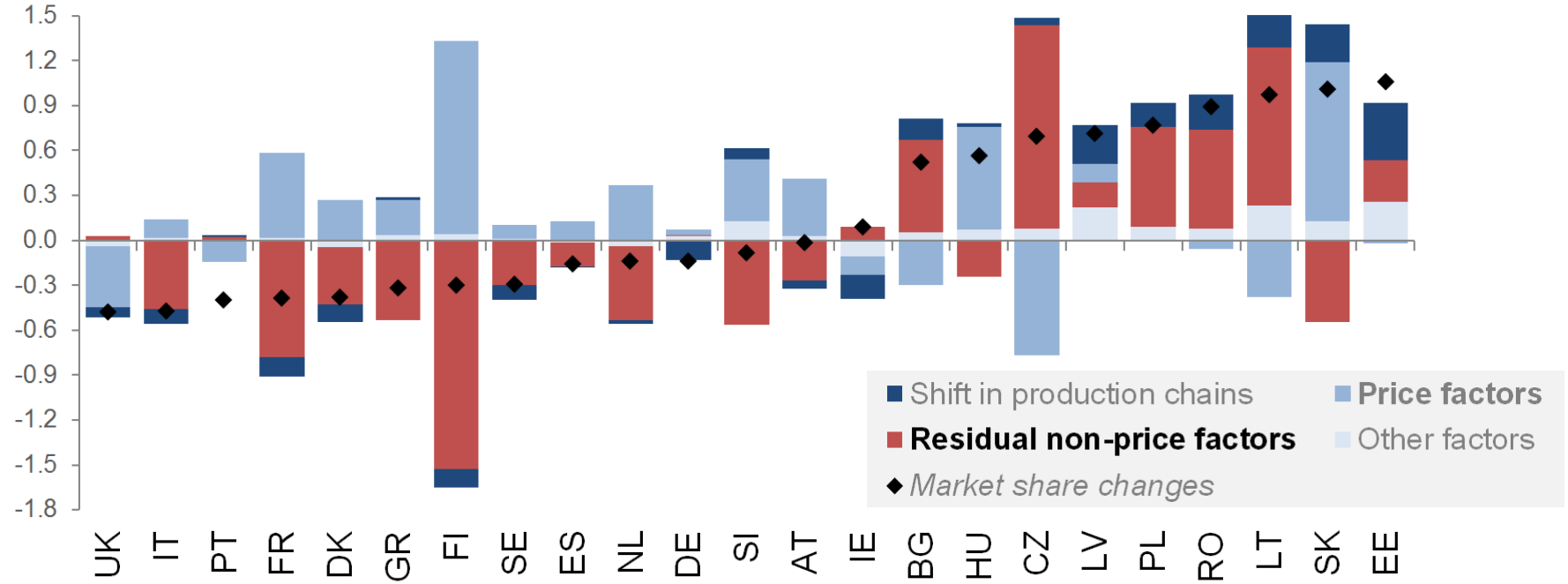
Pre-crisis export performance in **Germany** and **Italy** is positively correlated with changes in price competitiveness (gain for Germany, losses for Italy).

This is not the case for **France** (which lost export shares though it gained price competitiveness).

Other factors must have been at **play**

1) One result: Non-price factors are critical for trade assessment

- As it can be seen by decomposing the changes in value-added export market share



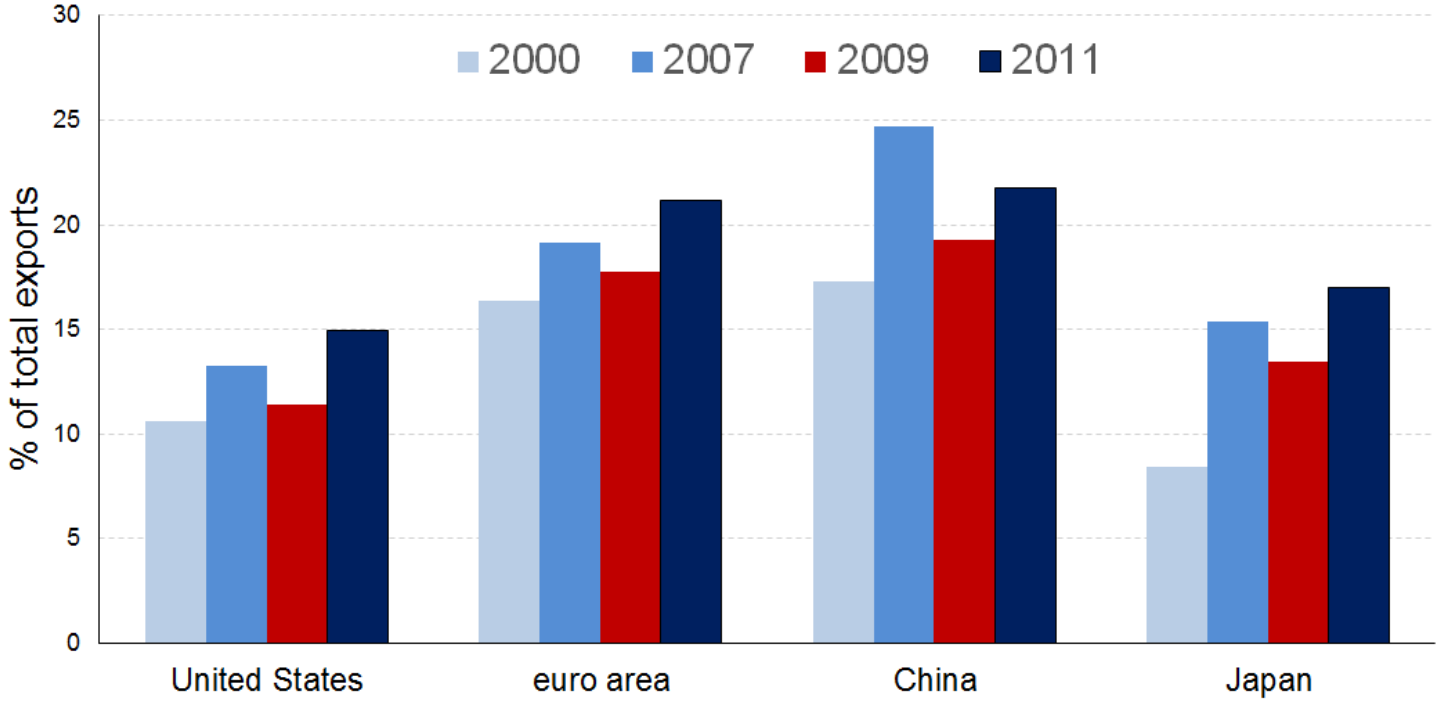
Notes: 1996-2011 period
Sources: Benkovskis, K. and Wörz, J. (2015)

CompNet papers focused on a number of **non-price factors** such as:

i) **quality** and consumer **taste**
ii) the extent of the **globalisation** of **production** processes
iii) **domestic conditions** faced by exporters
iv) the role of the **geographical** and product structure of exports

2 -The Global Value Chain (GVC) dimension: the issue

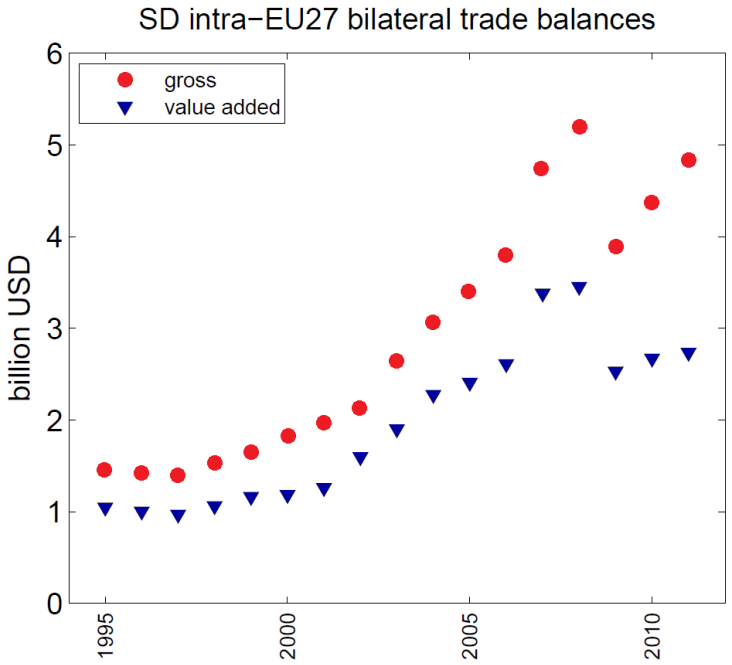
- Gross Exports incorporate a **large foreign value added** component, **which is increasing** in all major economies, as share of total exports



Source: Amador et al. (2015).
Note: The euro area is taken as a whole (i.e. intra-euro area trade flows are disregarded).

Traditional trade indicators must be therefore **complemented** with **value-added** based measures

2) One implication: de-emphasize the intra-EU imbalance



Note: Standard deviation of intra-EU27 bilateral trade balances in gross and value added terms.
Source: Nagengast and Stehrer (2014)

1. **Increase** of intra-EU **imbalances** over time
2. **Growing divergence** between gross and value added balances

Gross **bilateral** balances have become increasingly **less representative** of value added balances, and lead to an **overestimation** of **intra-EU imbalances**

As a consequence:

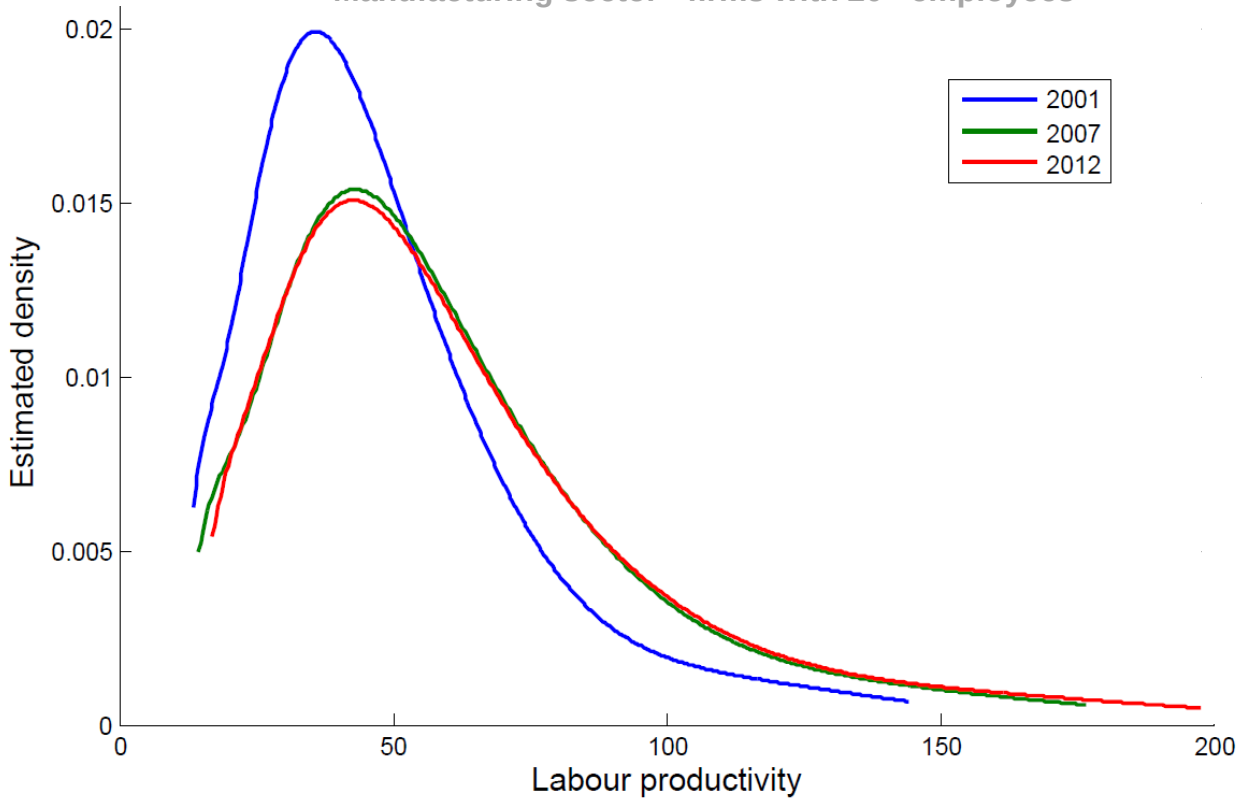
- A sizeable portion of gross bilateral trade balances **cannot be influenced** by the **direct trading partners themselves**
- **Gross** bilateral trade balances can **not** be **used** therefore as **a policy objective**. Better to focus on the overall country balance and use in parallel measures in V.A. terms

3 - The rational of firm-level perspective

- Firm performance distribution is **very disperse** and **asymmetric**
- Rather than most firms around an "average" performance, there are lots of firms which have low productivity and **only** a **few** which are **very productive** in the "**right-tail**" of the distribution (the so called "*happy few*")

Evolution of labour productivity distribution in France

Manufacturing sector - firms with 20+ employees



3 - Implications of heterogeneity for research and policy

1. **Aggregate** indicators alone, when interpreted as if they had been generated by the behavior of a **representative firm**, risk to give **partial** (if not wrong) messages and consequently **incomplete policy recommendations**
2. **Impacts** of a macro **shock** or **policy** depend on the shape of the **underlying distribution**

CompNet set up in the last years a **novel firm-level micro-aggregated database (20 EU countries)** in order to:

- set up a new research infrastructure **to overcome confidentiality** and **comparability** issues of balance-sheet information of European firms
- take into account the **link** between their **productivity** and **trade/financial/labour/regulation conditions**

List of indicators available

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			

And also joint-distributions: an application

Productivity and **allocative efficiency**	**Financial**	**Trade**	**Competition**	**Labour**
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Static Allocative Efficiency	Equity to Debt			
	Cash flow			
Dynamic Allocative Efficiency	licit interest rate			
	e Credit/Debt			
	Debt burden			
	Credit constraint index			

Example type of question:
Are low productive firms in a country sector characterized by higher credit constraints?

Important statistics are available

- Full distribution of each indicator (i.e. deciles) by sector (60) and year (1995-2012)
- Full set of firms' characteristics within a given level of aggregation for:
    - Exporting/non-exporting firms
    - Financially constrained/unconstrained firms
    - Growing firms/downsizing firms
- Plus, joint-distributions, which allows to investigate correlations between firms' characteristics.

For instance:

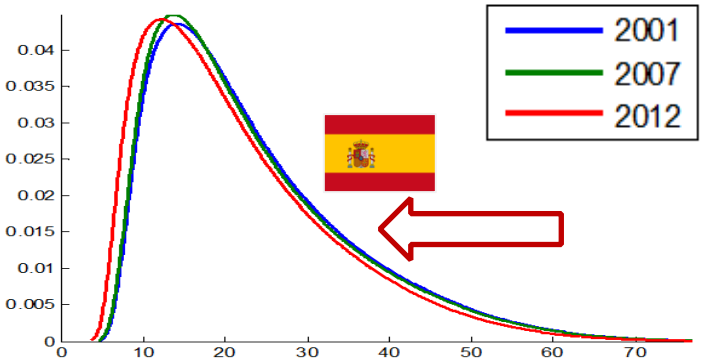
- Are high productive firms larger in size
- Are high productive firms more likely to export

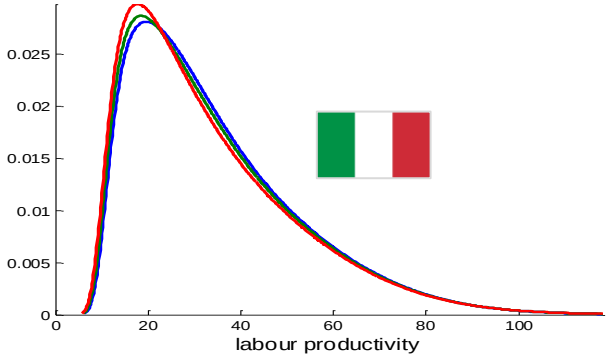
➔ *The data set contains about 200 cross correlations.*

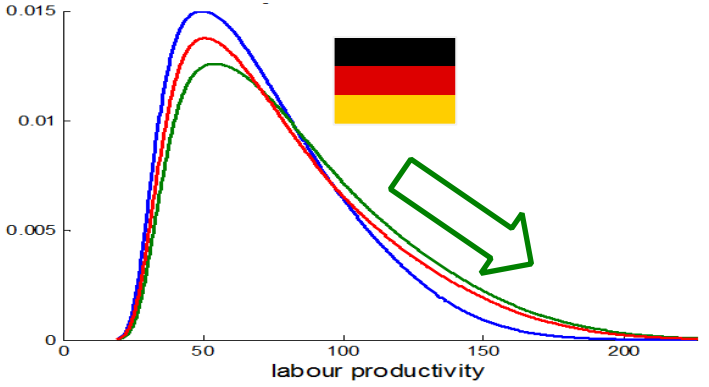
Some stylized facts from CompNet firm level data base

Evolution of productivity distributions

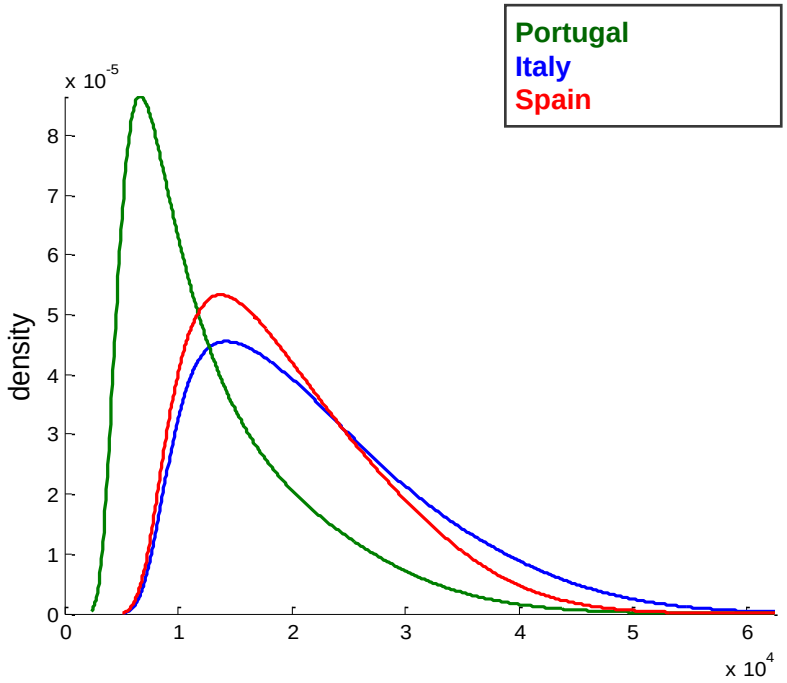
- Italy distribution unchanged,
- Spain worsened
- Germany improved







Cross country comparison of productivity distribution

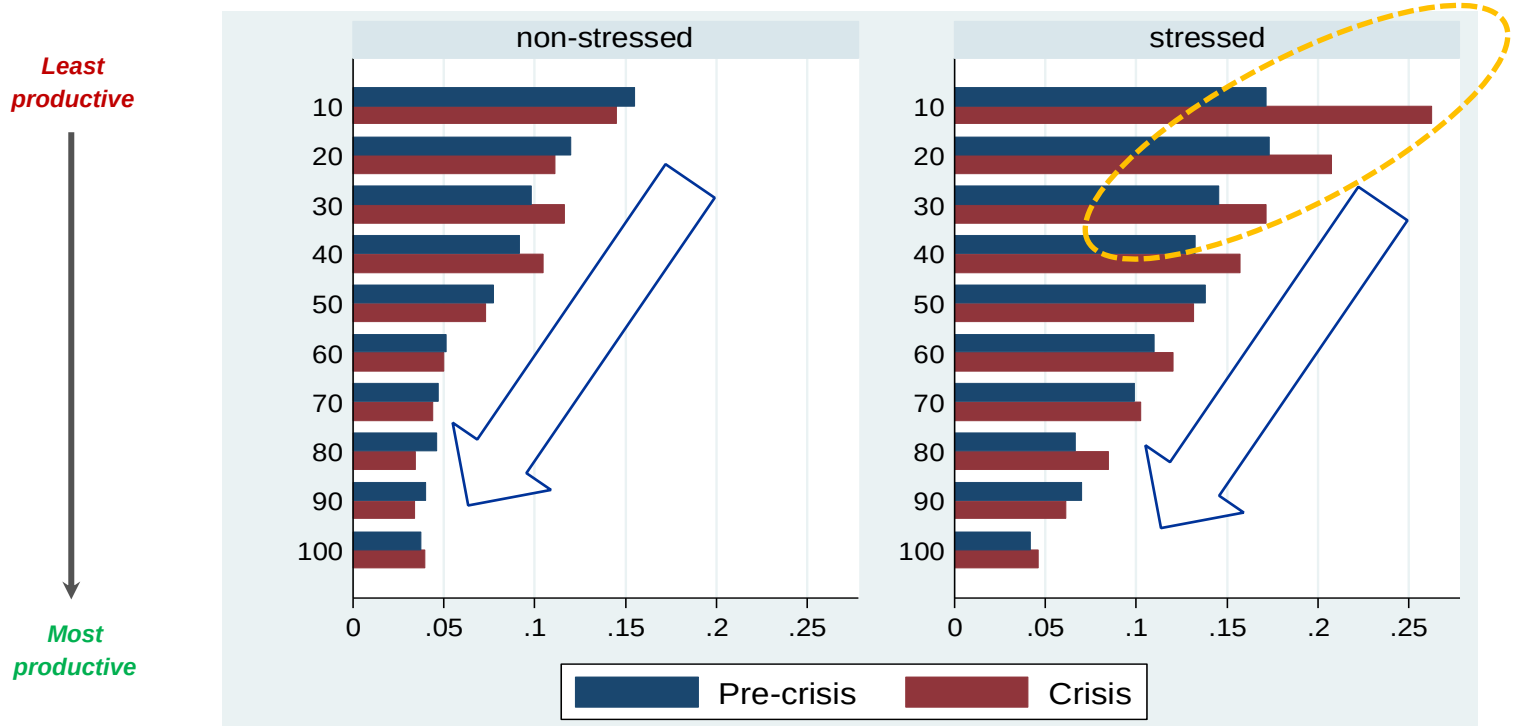


Firms with 20+ employees in Manufacturing sector average between 2006-2012.

Correlation between credit constraints and productivity

Share of credit constrained firms by decile of labor productivity

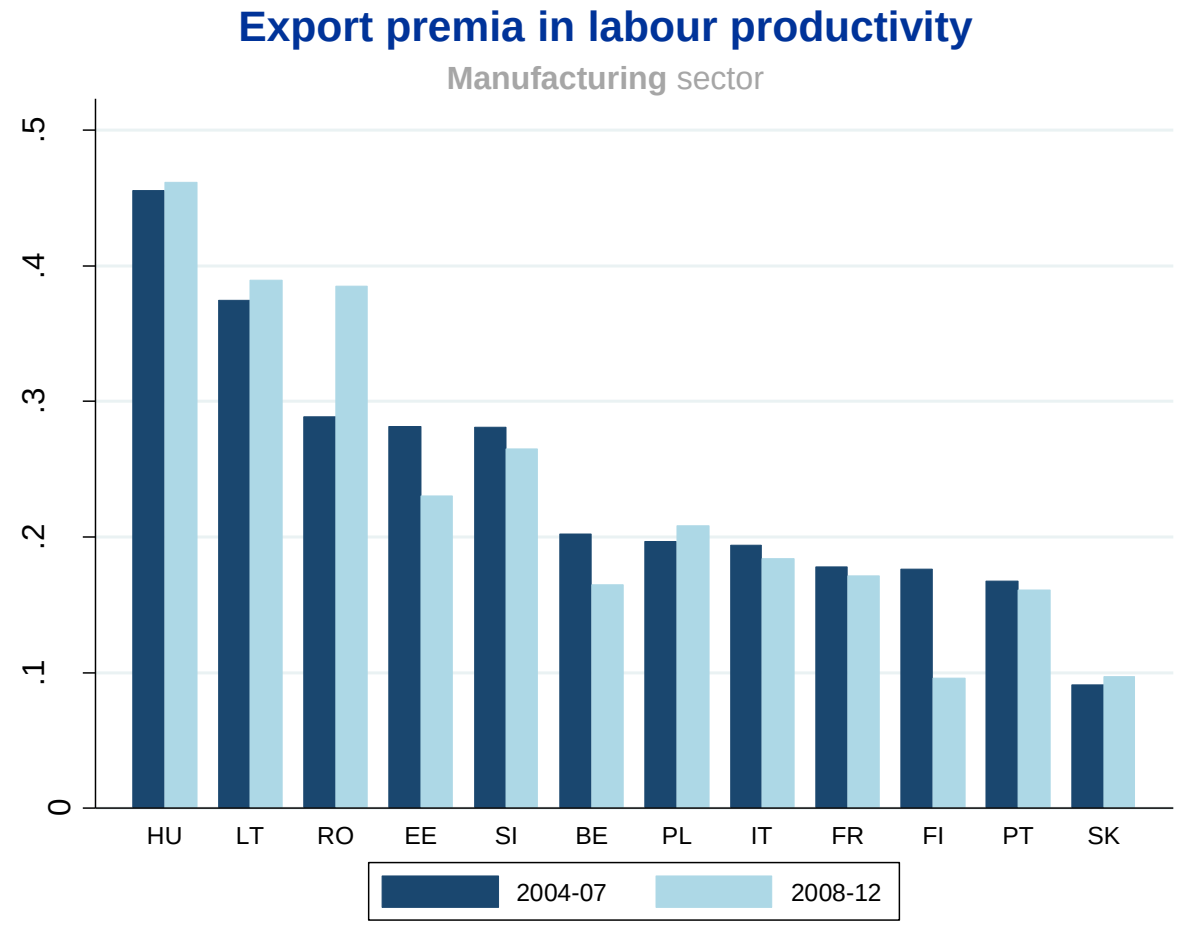
ICC index estimated within CompNet



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

- On average more productive firms are **less likely** to be credit constrained
- During the crisis the share of credit constrained firms increased more in stressed countries, particularly among least productive.
- Possible "cleansing" effect of the crisis

Only the most productive firms export

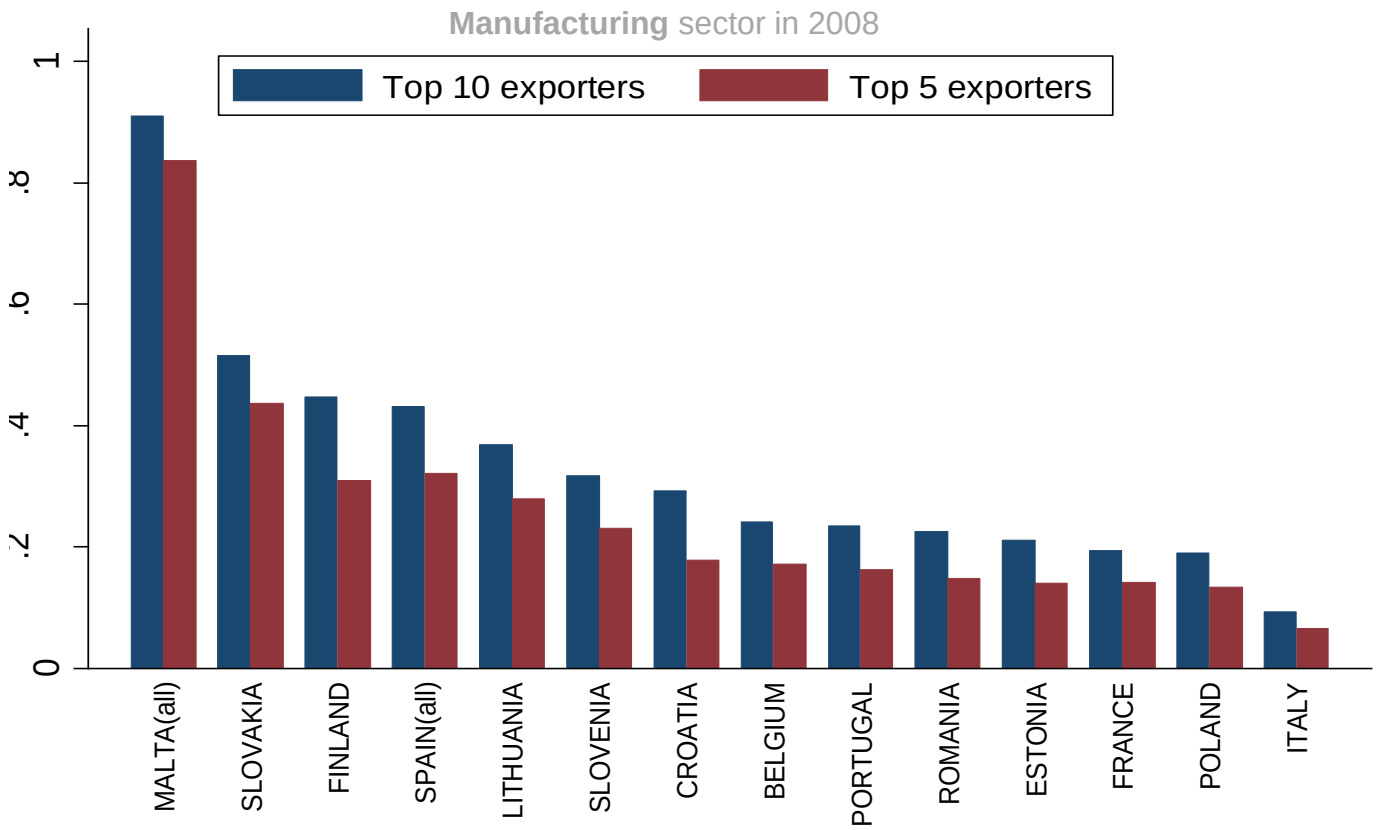


Source: Berthou et al. (2015)

- On average **exporters** are **20% more productive** than non-exporters in the same sector, although there are wide cross-country differences

Exports are highly concentrated

Share of top exporters on total country-level exports



Source: Berthou et al. (2015)

- **Top-10 exporters** account on avg. for **25%** of aggregate country-exports
- Relevant because idiosyncratic shocks affecting large (exporting) firms have important macro effects.

Wage-productivity growth misalignment

Evolution of wages and productivity of the top 10% and bottom 10% of the productivity distribution of French firms

Note: Firms with at least 20 employees in Manufacturing.
Source: Lopez-Garcia based on CompNet data

➔ The misalignment of wage and productivity is not an average phenomenon, but rather it derives from misalignments in least productive firms

Few examples of research works:

“from micro to macro”

Exchange rate elasticity of export

Response to exchange rate movements are **heterogeneous** across **firms** and therefore aggregate estimates of elasticities can be biased.

Berthou et al. (2015) find that export elasticity relative to ULC-REER is **inversely correlated** with **size** and **productivity**

Firm Size	ΔIn(REER)
1st quartile	-1.760***
2nd quartile	-1.165***
3rd quartile	-0.766***
4th quartile	-0.477*

TFP	ΔIn(REER)
1st quartile	-1.678***
2nd quartile	-1.229***
3rd quartile	-0.670***
4th quartile	-0.599**

Sources: Berthou et al. (2015).
Notes: *** p<0.01, ** p<0.05, *p<0.10. Includes controls for macro determinants and sector/firm characteristics.

➔ **Exports** by **largest** and **most productive** **firms** are **less sensitive** to exchanges rates movements

Asymmetric shocks and asymmetric distributions

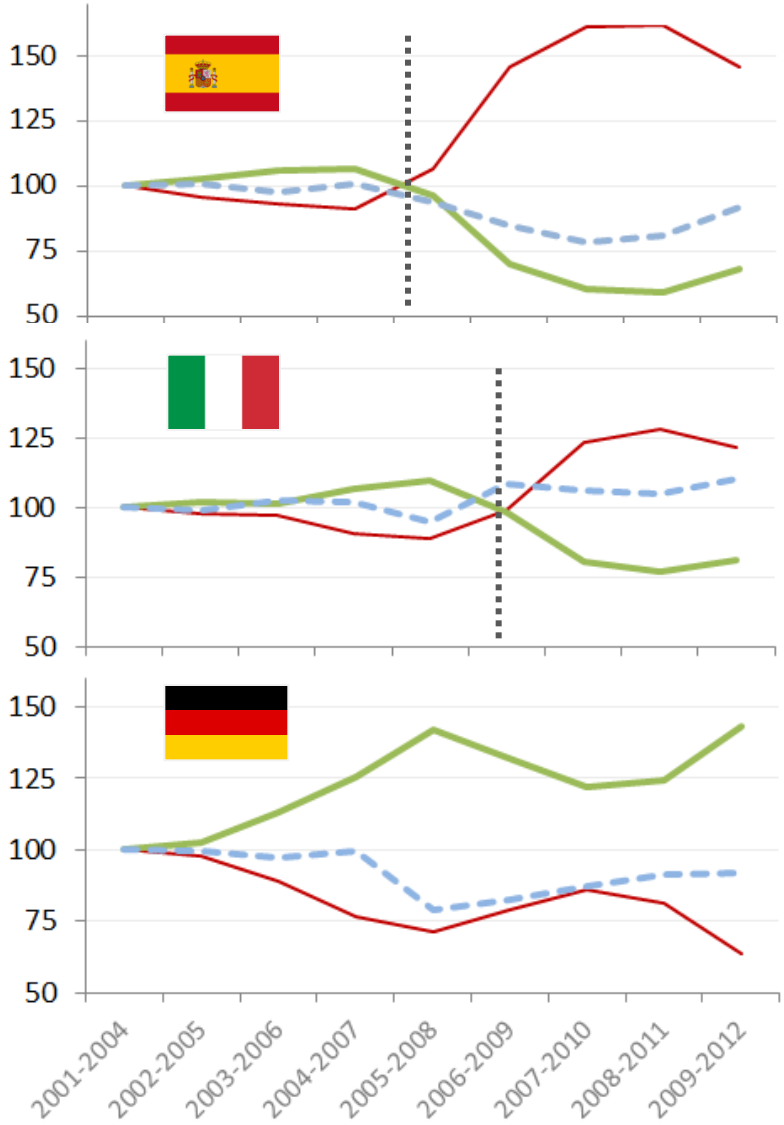
Demian and di Mauro (2015) show that **elasticity** of exports to exchange rate fluctuations is **lower** in sectors with a **higher dispersion** of **productivity**.

That there is an **asymmetry** between responses to an **appreciation** and **depreciation**.

Finally, that **size matters** ➔ only large exchange rate movements appear to have a significant impact on export.

Institutional factors and job reallocation

CompNet data allows to check the proportion of firms **expanding**, staying **equal** or **shrinking** in size over the period 2001-2012 (with base-year 2001)



1. **Pre-crisis: stable** firms' growth dynamics

2. **After crisis: generalized increase** of the proportion of firms **cutting employment**

3. **Different** impacts across countries in **timing** and **intensity**

How is job destruction related to wage-setting set-ups?

- Within ECB we have **merged WDN** and **CompNet** database to analyze if cross-country heterogeneity in labour market response to the crisis (*see previous slide*) can be explained by the relationship between

Different **levels** at which **bargaining negotiations** take place across firms in the euro area

Different **firm-level cost cutting strategies** (employment vs. wages) following the Great Recession

- Important from a policy perspective:

Whether and to what extent wage setting institutions **amplified** the **impact** of the economic crisis **on employment** through the **limitations they impose on wage adjustments**

Employment adjustment

The higher the share of firms **engaging** in multi-level/employer (i.e. **centralized system**, sectorial) bargaining

The greater the employment reduction at the firm-level over the Great Recession

Share of shrinking firms	
% of firms in **multi-level** bargaining	**0.2025***** (0.0459)
% of firms in **multi-employer** bargaining	**0.112***** (0.040)
% of firms in p**lant-level** bargaining	0.0697 (0.0537)
Constant	0.265*** (0.0219)
Country, sector dummy	yes
Size, time dummy	yes
N. Observations	362
R-squared	0.78

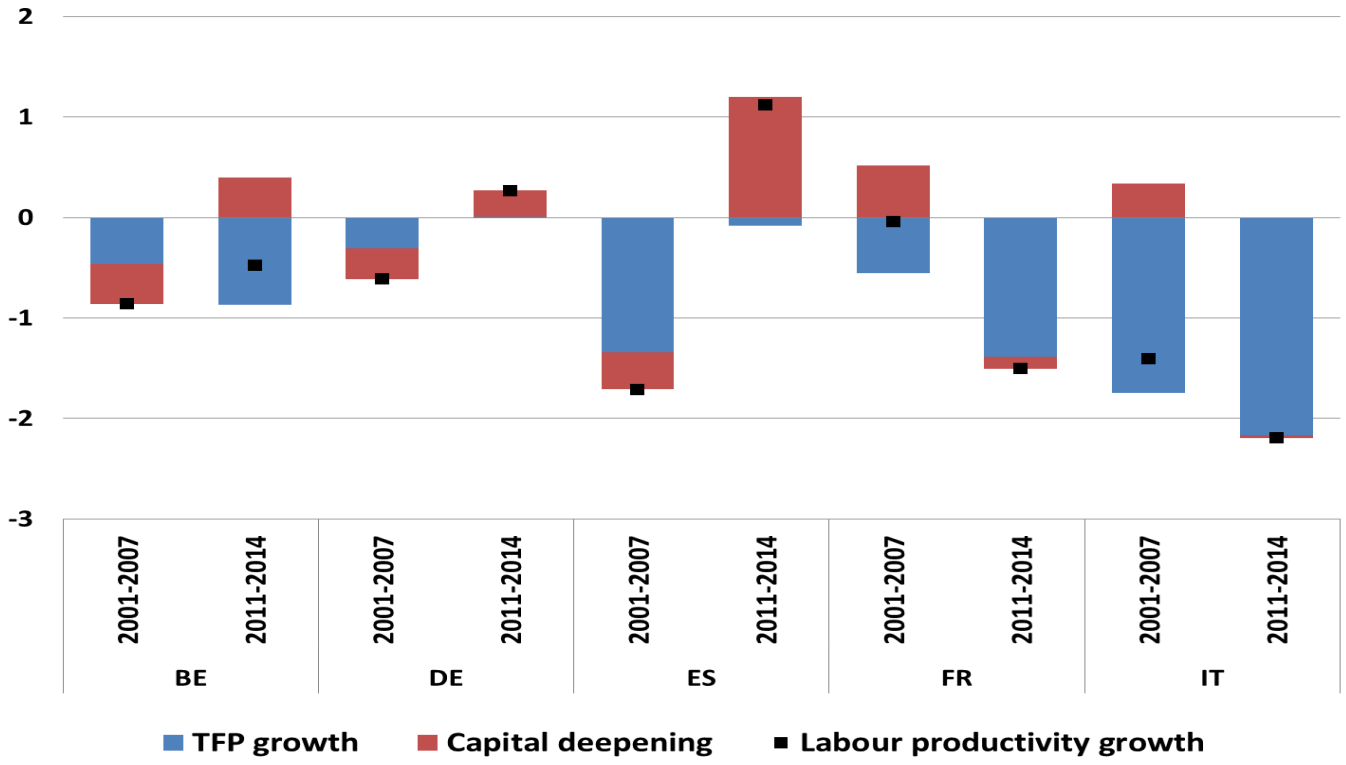
N.B. Robust also when controlling for sectorial TFP

Enhancing Total factor productivity by correcting resource misallocation

TFP growth is the main driver of labour productivity growth

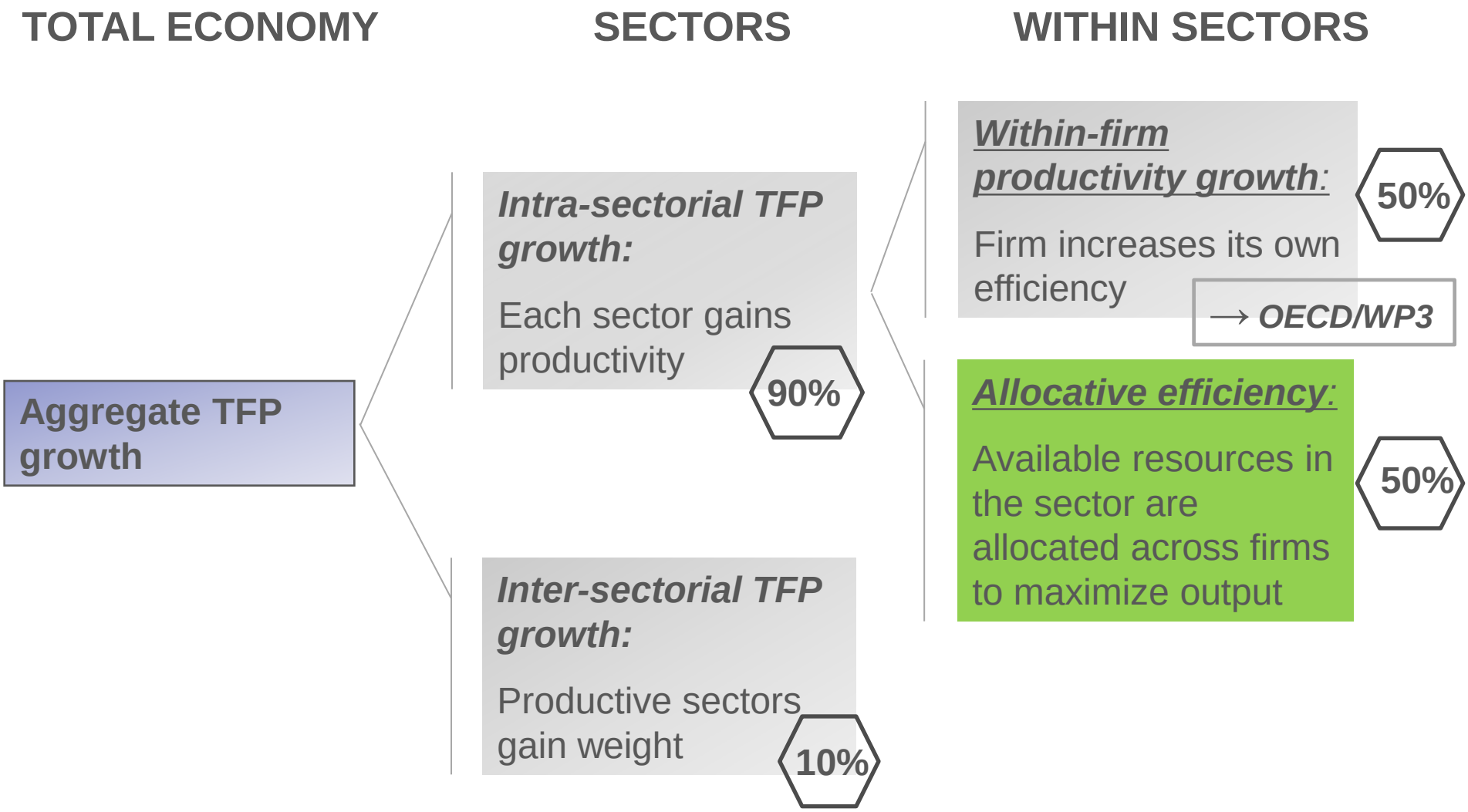
Weak TFP growth (blue bars) is behind the poor labour productivity performance in selected EA countries relative to the U.S. (black squares)

Contribution of TFP and capital deepening to changes in labour productivity relative to the U.S.
(average annual changes)



Source: Bergeaud, Cette and Lecat (2014)
Note: Capital deepening is defined as changes of capital stock per labour hour. Labour shedding can boost this component.

Intra-sectorial TFP growth = Within-firm + across-firm TFP growth



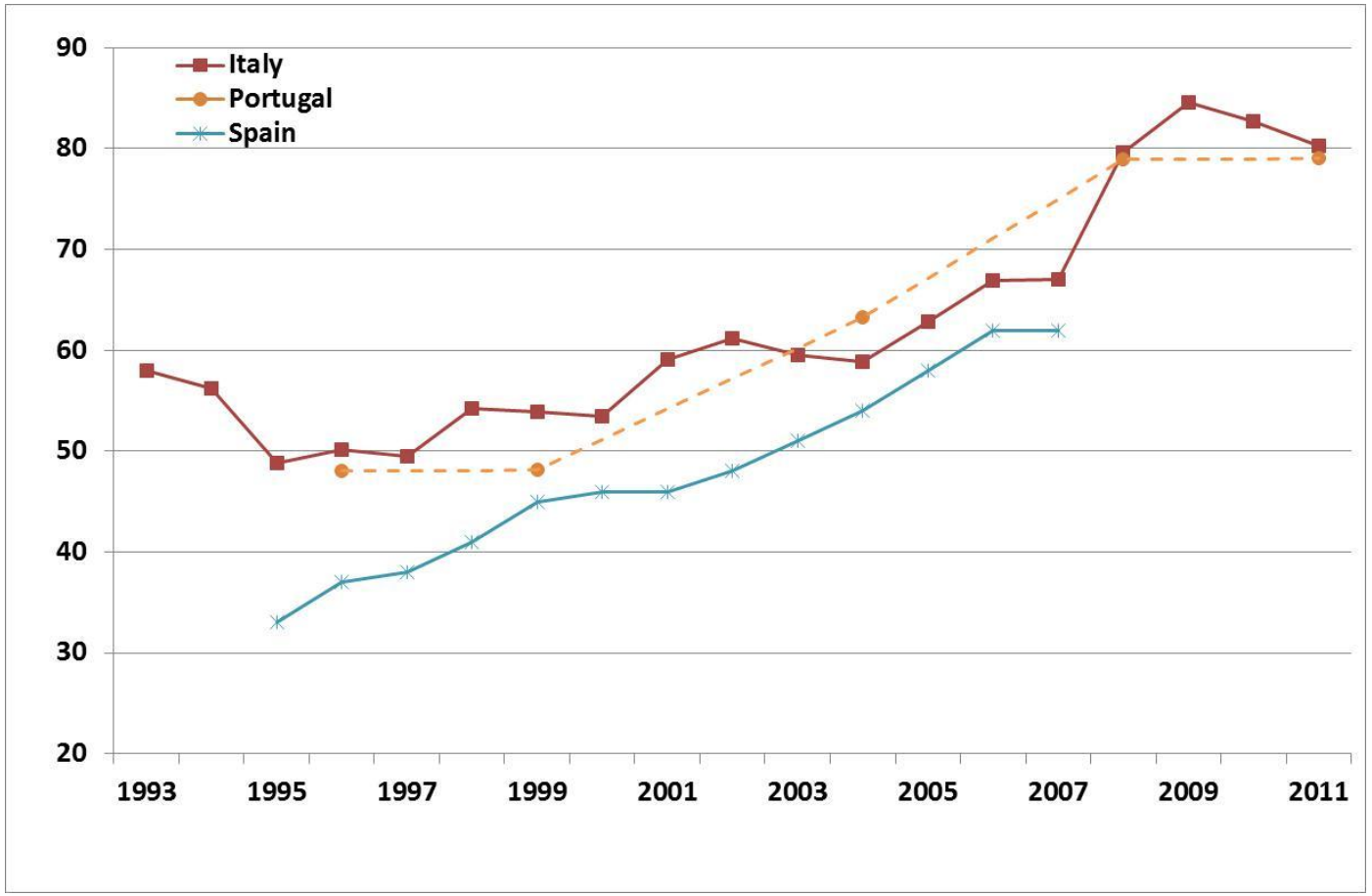
Notes: The "within sectors" numbers refer to the percentage contributions to U.S. manufacturing TFP growth taken from selected studies, averaged over various time spans.
Source: Lopez-Garcia

Increasing the efficiency of input allocation leads to significant TFP gains…

…which have been increasing since the mid-1990s

Potential TFP gains from reallocation

(percentage values)



Sources: Calligaris (2015); Dias et al (2013); Garcia-Santana et al (2015) based on Hsieh and Klenow (2009) methodology

Decomposition

Concluding Remarks

Policy contributions

- The **interaction** of the three CompNet **work-streams** (macro, firm-level and global value-chains) has delivered substantial **research results** and related policy implications which have been collected in the **report** *"Assessing European competitiveness: the contribution of CompNet research"* published in June 2015.

- Use for **policy-making** has **just started**

  - members of **ECB Executive Board** have frequently used CompNet analysis as background for their public speeches;

  - we are receiving many request of collaboration and data use by researchers in **EC DG-EC/FIN**, **OECD, EIB, IMF, World Bank** and several academic institutions

Final remarks

- CompNet database represents a **value-added** in terms of **coverage** and **comparability** of firm-level data among European countries but also in terms of availability of **new indicators jointly related to productivity**

- CompNet as a well functioning network can provide critical input and assistance to the to be established EU Competitiveness Board, given the results already achieved and the long standing interaction on competitiveness matters across EU country teams

- It is essential however for the sustainability of the project that statistical offices and statistical departments in Central Banks are more systematically involved in improving the micro data sources, also via merging with other existing initiatives (e.g. BACH)

- All relevant information, documents on objectives and output of the network can be found on CompNet website.

Thanks for your attention

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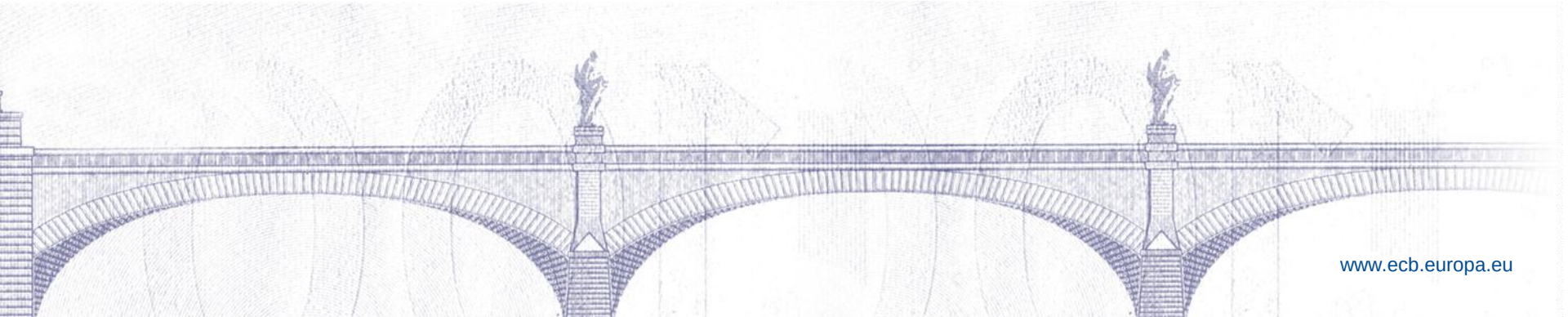


Back-up Slides

Future research plan

- We have identified for the future two directions:

1. **Resources allocation and growth**
   - secular stagnation
   - productivity puzzle
   - weak investments
   - role of intangibles and innovation

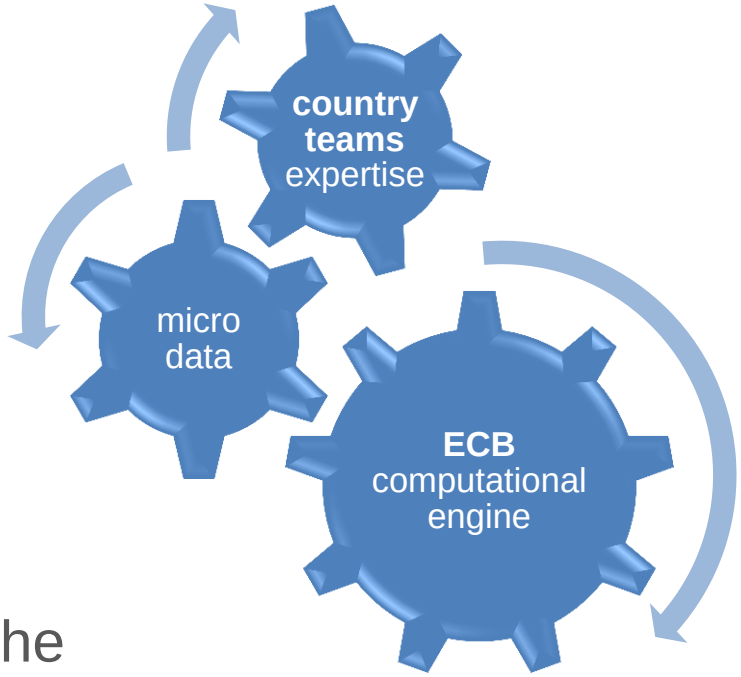
2. **International trade and Global Value Chains**
   - **complementing** the macro-analysis of GVCs with **firm-level** based information
   - the role of **skill-matching**

CompNet micro-aggregated database

Data collection approach

- ✓ **Common protocol** to **extract information** from **existing firm-level datasets** available within each NCB or NSI

- ✓ **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**.

Coverage of the database

Participants:

17 EU countries

13 of which in EA

+ 3 just joined (CZ, DK and LV)

Target population:

non-financial corporations (S11)

Period:

1995-2012

with delayed entrance of some countries

Sector:

9 macro-sector

1-digit industry

≈ 60 sectors

2-digit industry (NACE rev.2)