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EUROPEAN CENTRAL BANK

EUROSYSTEM

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CompNet approach to competitiveness: Results and policy use

ECB –

Frankfurt 27 January 2014

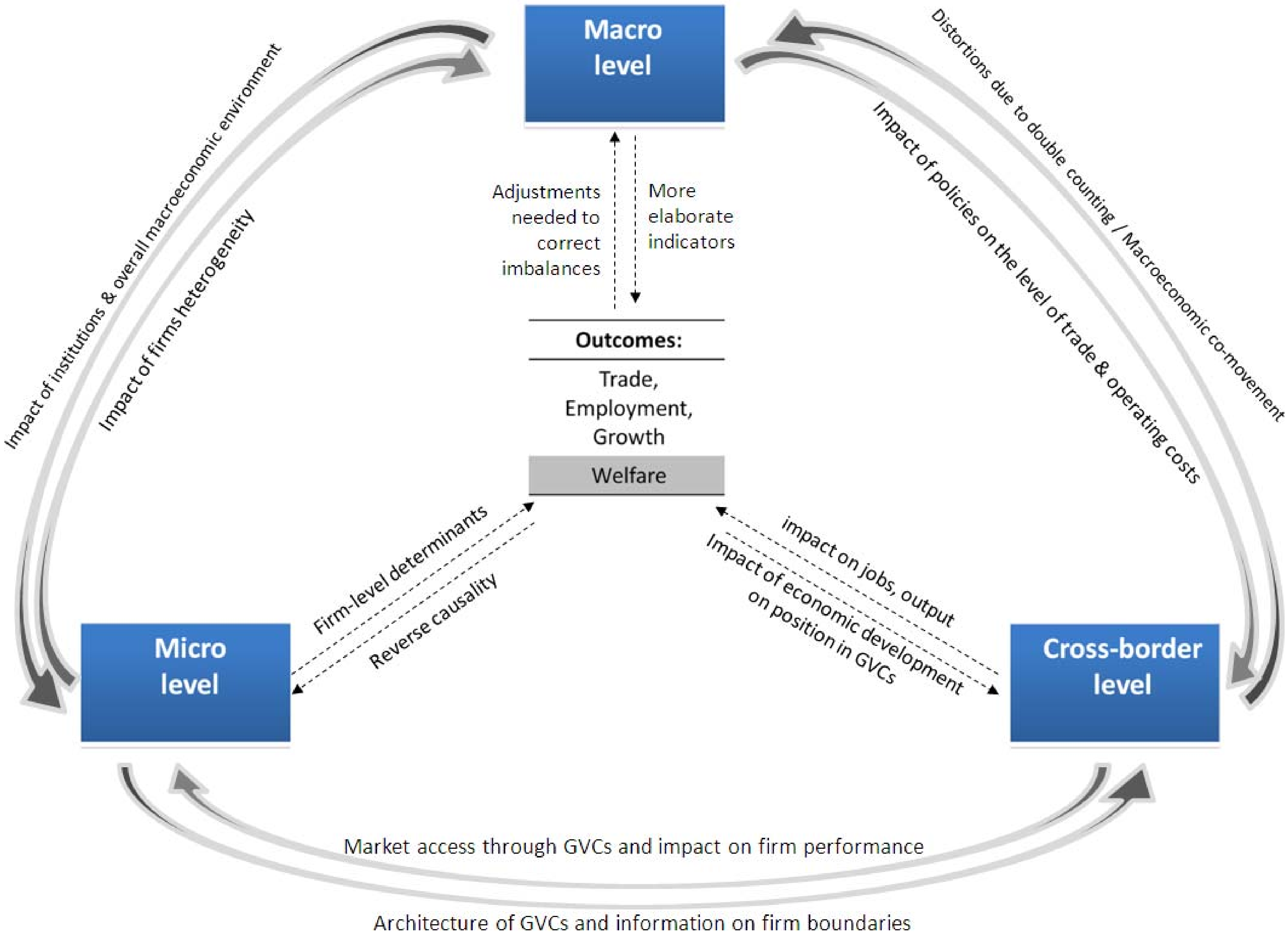
Prologue

- **Definition: "A competitive economy, in essence, is one in which institutional and macroeconomic conditions allow productive firms to thrive. In turn, the development of these firms supports the expansion of employment, investment and trade" (M. Draghi,** 30 November 2012)

- **"We are seeing the beginning of a recovery that is still weak, still fragile, and still uneven….. some countries, such as Greece, had made meaningful progress on structural reforms while other peripheral nations had not, raising the risk of further instability. (M. Draghi, Davos 24 January 2014)**

➔ CompNet objective: Provide a robust theoretical and empirical link between the <u>drivers</u> of competitiveness and macroeconomic <u>performance</u>…for research and policy analysis

The holistic approach to competitiveness of CompNet



WS1 Approach – General

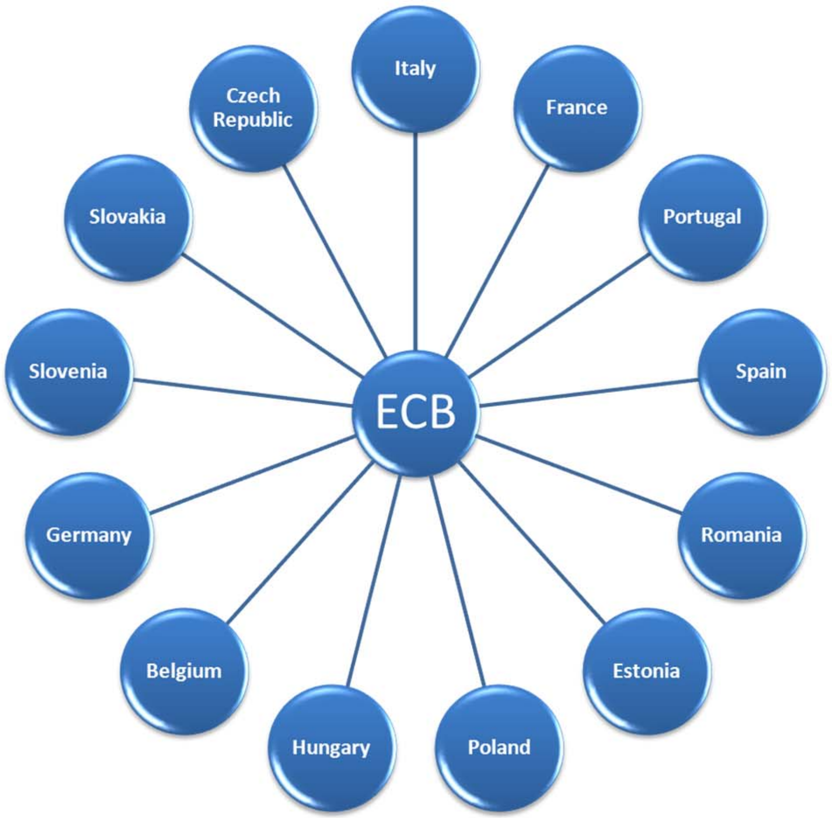
- Develop indicators capturing more complex dimensions over and above the traditional price/cost based indicators.

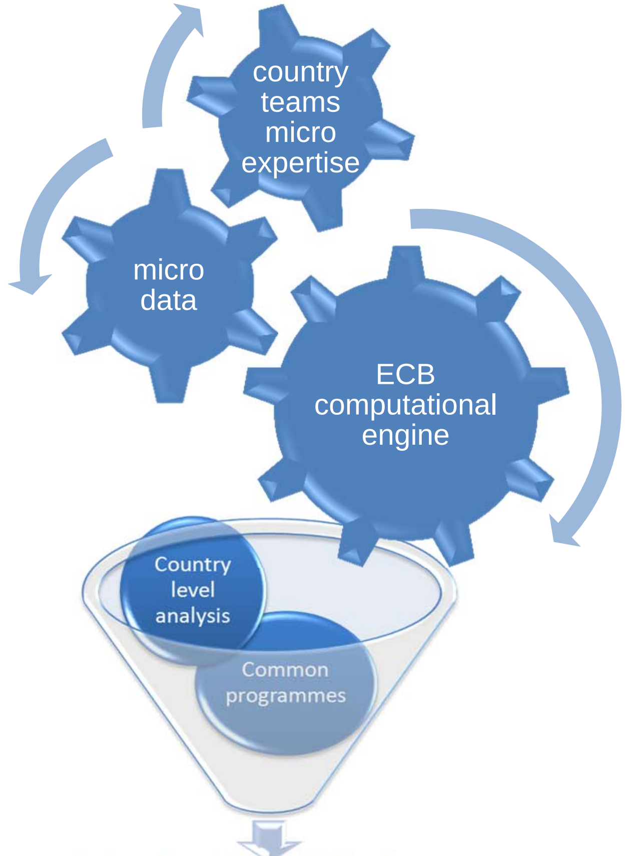
- Value added:
  - Indicators are based on product-level statistics (e.g. about 5,000 products)
  - Apply novel methodologies

- Examples of indicators **(for complete list, check http://www.ecb.europa.eu/home/html/researcher_compnet.en.html):**
  - Non-price factors *(K.Benkovskis, J.Wörz)*
  - Barometer of competitive pressure (*K.Benkovskis, M.Silgoner, K.Steiner, J.Wörz*)
  - Export sophistication index (*E.Bobeica*)
  - Shift-share analysis (*G.Gaulier, D.Taglioni, S.Zignago and M.Dyadkova, G.Momchilov*)
  - Contribution to trade balance (*C.Osbat, S.Ozyürt, T.Karlsson*)
  - Alternative HCIs based on trade in services (*M.Schmitz*)
  - Trade-weighted national unit labour costs (*M.Silgoner*)
  - Measures of integration in Global value Chains (*S.Christodoulopoulou and I.Rubene*)

- Use the indicators for policy analysis

CompNet: WS2 working approach





Solved confidentiality issues and uniform results

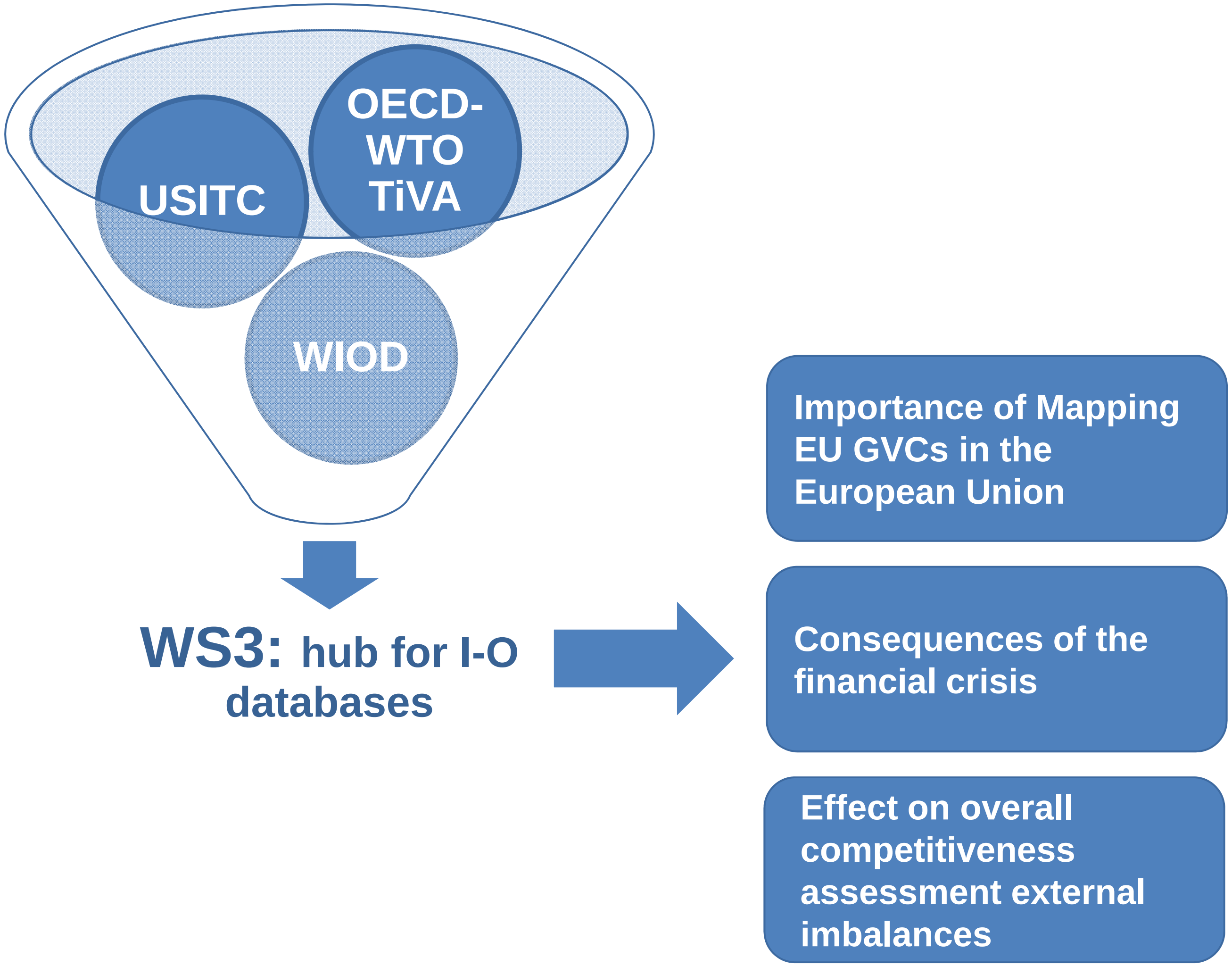
Data Dissemination

Further Modules (Trade, Financial constraints)

Common co-authored publication

Created a strong ESCB Team, which uses a working procedure with huge potential

WS3 Approach



Outline

- CompNet Micro-founded analysis (PL-G)
  - The potential for research
  - Using the novel firm level data base
- The proposed use for policy analysis (CO)
  - The “drilling down” approach
  - Interaction country desks at the ECB with CompNet
  - A few examples

CompNet Micro-founded analysis

What data do we already have?

What have we already learnt?

What new data will be collected in spring?

Which new lines of research could we open with your input?

How could we use this data for policy and research?

Research time-line: Micro-based Database v1

Start of firm-level data collection

Set-up of a new research infrastructure

- **NCB teams**
- **Coordination ECB-NCB**
- **Ensuring full comparability**

Firm-level based database v1: Productivity and cost-related indicators

What is available?

- Average, sd, skewness and full distribution of productivity, TFP, ULC, size, capital intensity and labour cost of firms (details)
- Static and dynamic indicators of allocative efficiency
- Data is aggregated at the 2-digit NACE industries for 11 Countries over 1995-2011 (details)

Oct. 2012

Dec 2013

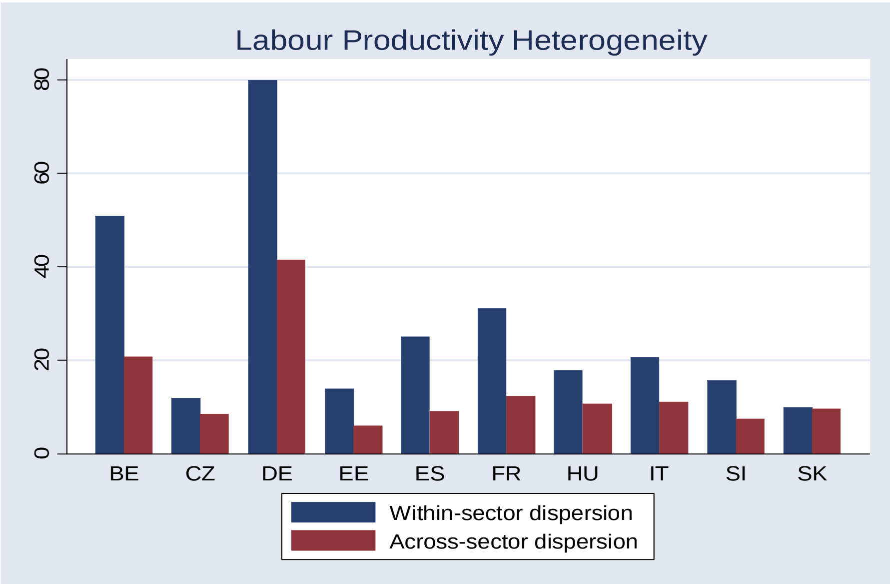
Output:

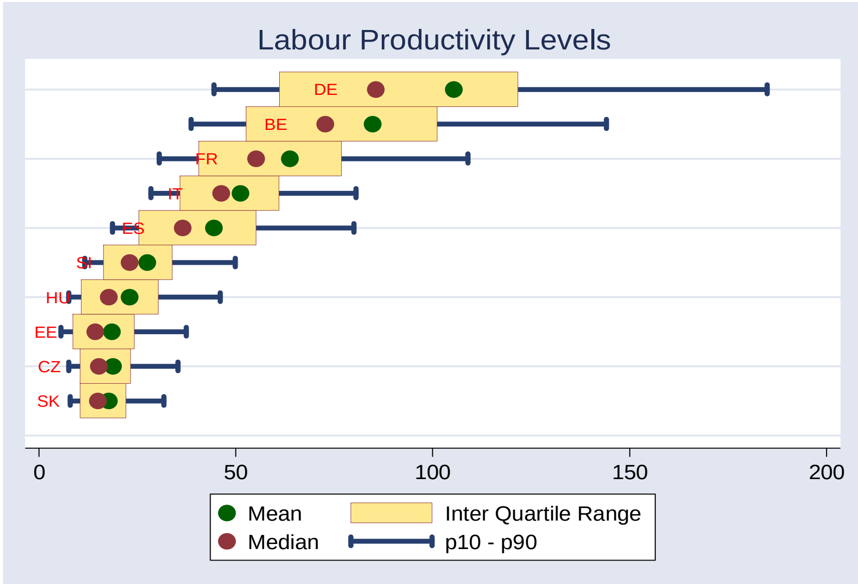
- **Completion of paper documenting the database**
- **Co-authored by all teams**

Several research papers from small dedicated teams

Initial findings (1): Huge dispersion and skewness

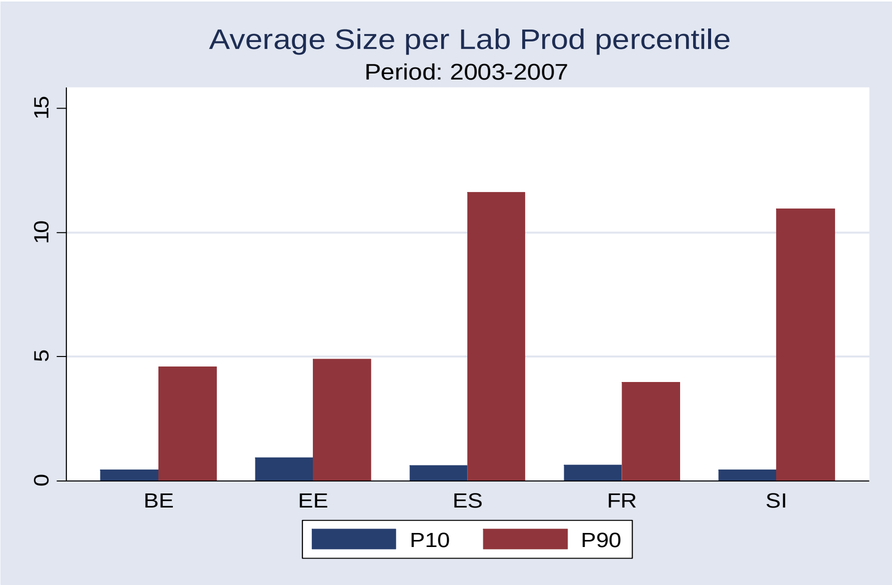
- Firms are very heterogeneous, even within the same 2-digit sector
- Firm performance distribution is very asymmetric:
  - Few high productive firms and a large mass of low productive ones
- Important findings from a policy point of view:
  - The impact of macro/policy shocks depends on the underlying distribution
  - Average labour productivity of a sector is not representative

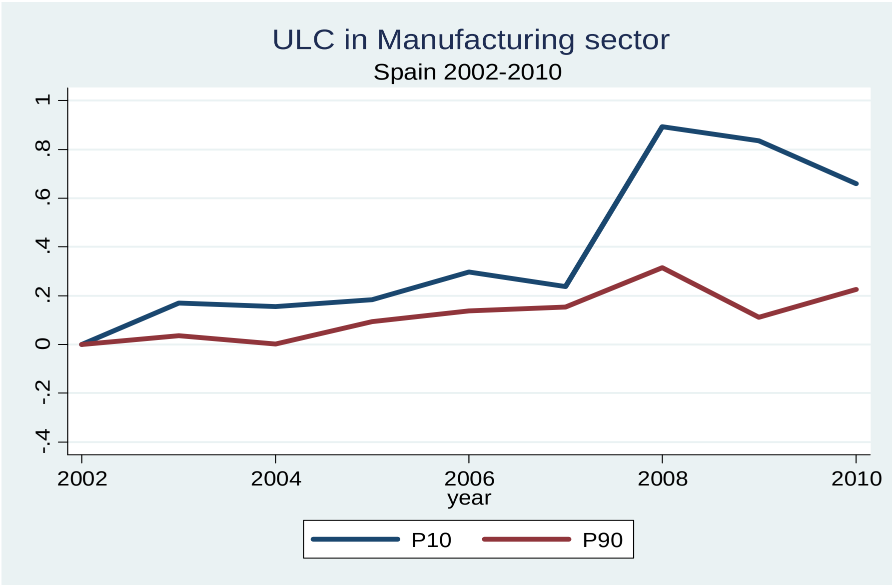




Initial findings (2): Different dynamics in tails of distribution

- Most productive firms (top 10%) are up to 10 times larger than the median productive firm in the same 2-digit sector
- ULC of firms at the bottom and the top of the productivity distribution (p10 and p90) have reacted very differently to the crisis

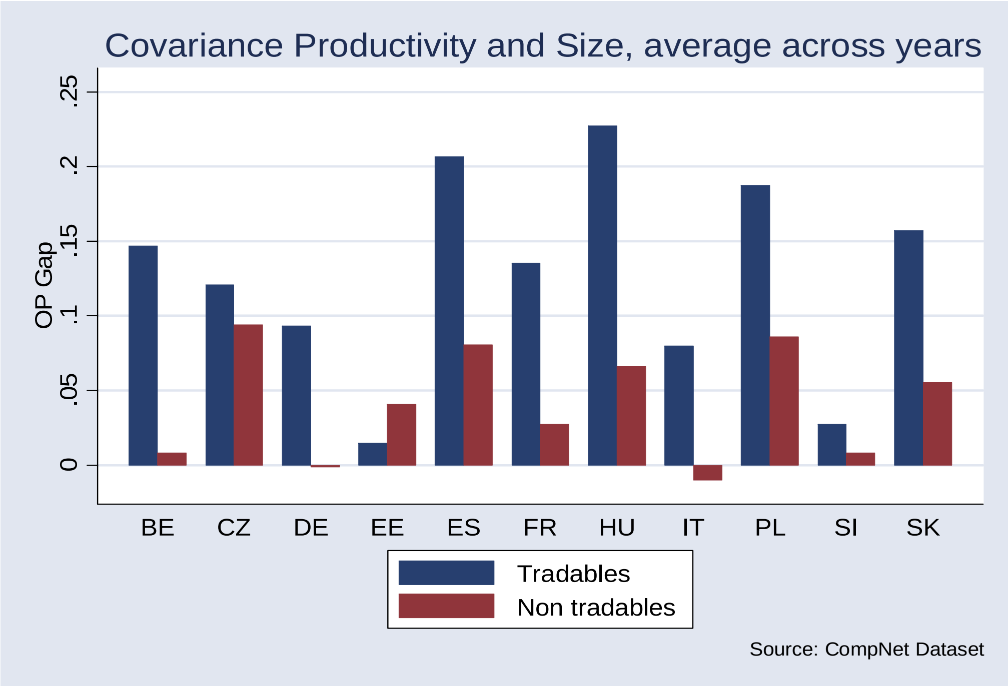




Initial findings (3): Allocative efficiency differs

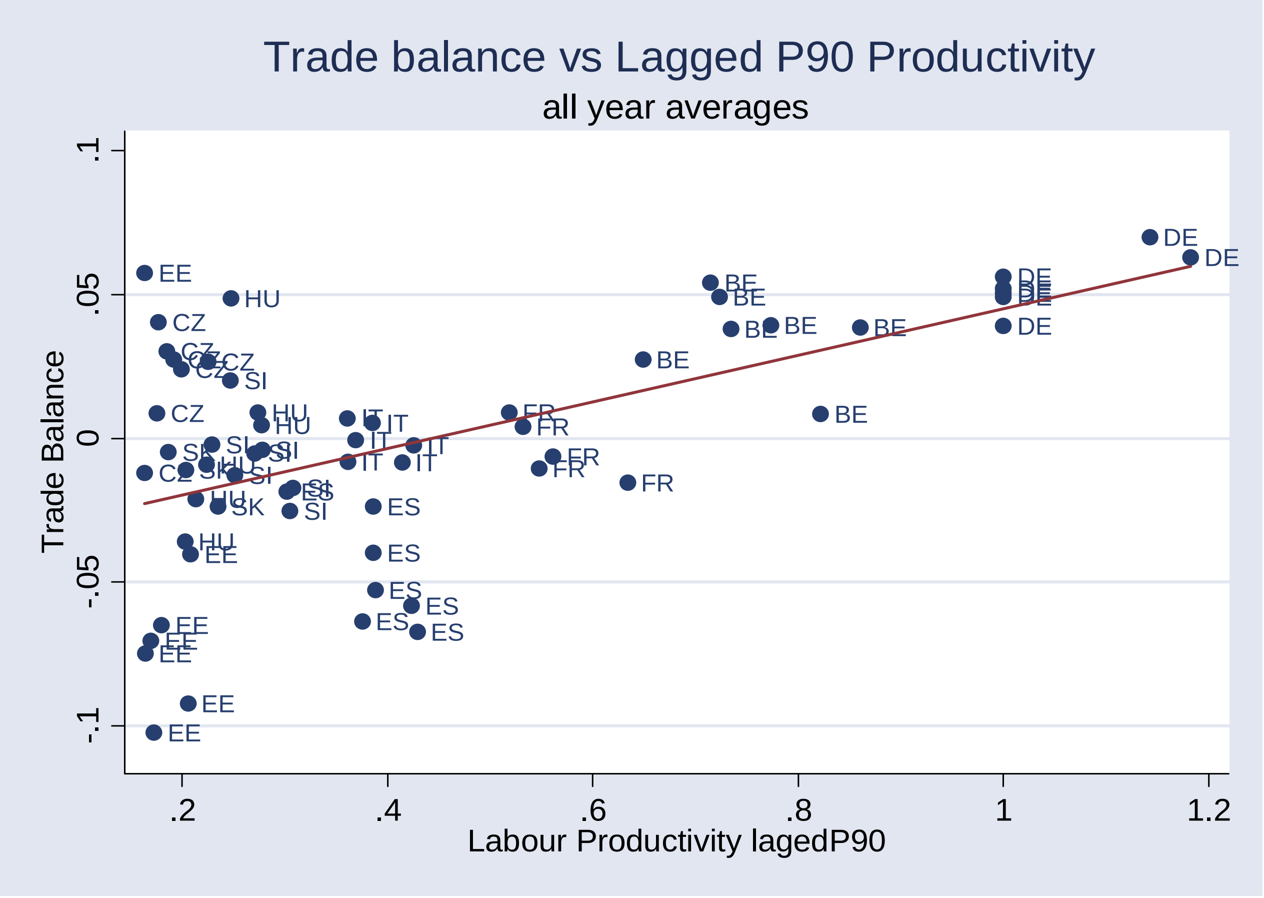
- In well functioning markets, the most productive firm should be the largest
  - This is an efficient allocation of resources
  - Allocative efficiency approximated by the covariance (at the 2-digit sector level) between relative productivity and size (details)

- Improving the allocation of resources fosters aggregate productivity



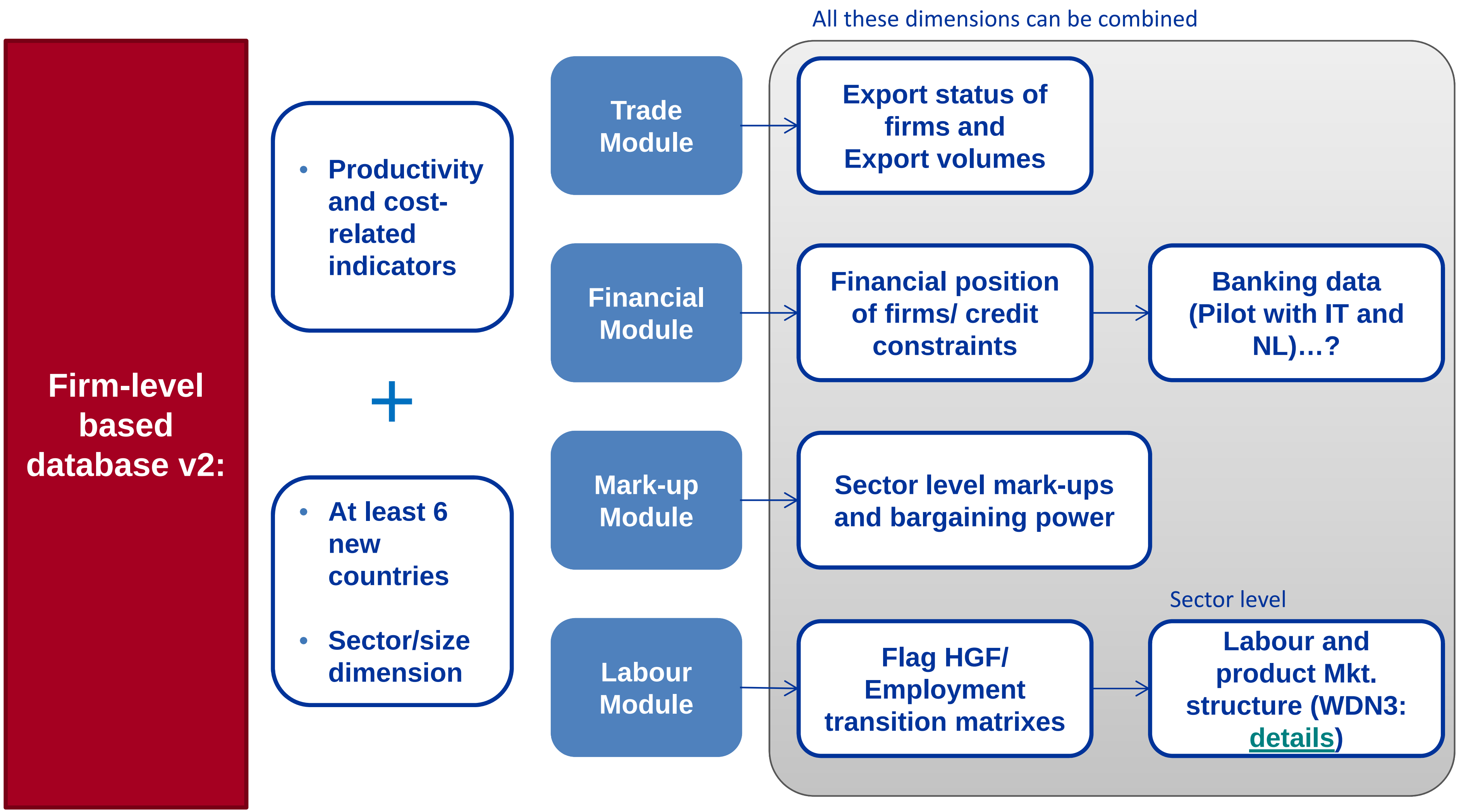
- Striking differences in tradables vs. non-tradables
- Highly correlated with sector-specific market regulation

Initial findings (4): Correlation with aggregate developments



- Close correlation between the p90 level of the productivity distribution and aggregate trade balance
- Better fit than with average/median productivity
- Regressions

January – March 2014: Expansion of the database

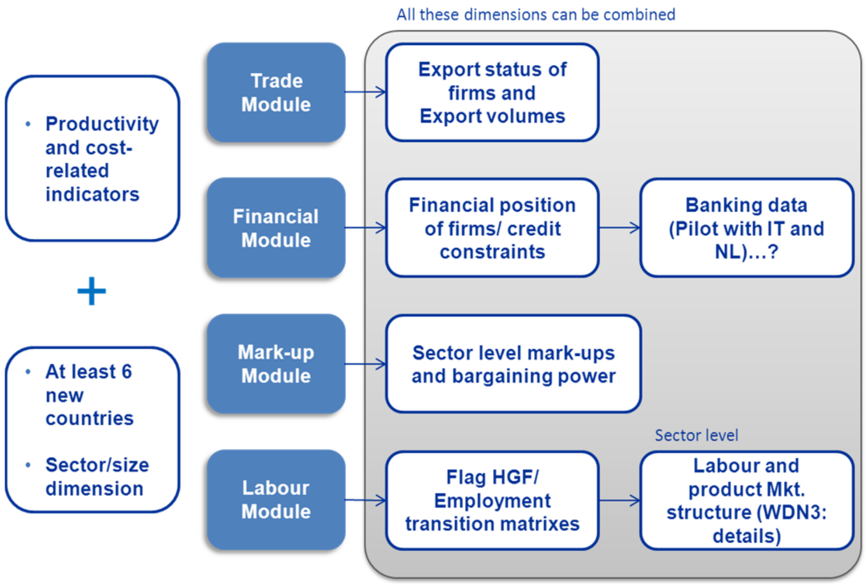


Output

- Several research papers from small dedicated teams
- Data available for policy analysis

Think big!

CompNet 2.0



Possible policy and research questions

- What is the productivity premium of exporting firms? Has it changed with the crisis?
- Are productive firms credit constraint in some countries?
- Are credit constraints hampering exports?
- Are sector mark-ups and bargaining power related to sector regulation?
- Do sector with higher mark-ups distribute less efficiently resources?
- Are firms growing at a different path within the same sector? Is this related to credit constraints? Is this related to regulation?

How can we use all this information for policy work

Zoom out again to the “competitiveness toolkit” idea:

- Integrating macro, firm-level and GVC information
- Model-based benchmarking using Bayesian Model Averaging (BMA)
- Structured in a way that also facilitates “free-style” user analysis

Objective:

- User-friendly
- Incorporates CompNet results
- Flexible: different degrees of “depth” depending on time and specific skill

Competitiveness Assessment Toolkit I: econometric analysis

Comprehensive cross-country dataset

(27 European countries, period 2002-2012)

Macro *indicators*

(>100 indicators and growing)

Business conditions, labour market, institutional, financial, infrastructure, human capital, detailed trade

+

Micro indicators

(Firm-level information from the entire distribution of firms)

TFP, ULC, productivity, cost of employees, …

Econometric analysis

BMA

Estimate millions of models to identify robust link between trade outcomes and indicators

BMA output

Use estimates to identify set of most relevant indicators for trade performance (but use all, as they are implicitly weighted)

Use clustering techniques to identify the relevant peer country group to use for benchmarking

Use of results

Cross-country comparison

Identification of robust competitiveness drivers

Taylor-made policy advice

[More details on the variables]

Competitiveness Assessment Toolkit II: Drill-down approach

What issue do I want to look at?
(e.g. market share, productivity growth…)

→

What will be my LHS measure?
(market share, long-term growth,…)

→

What are the potential determinants?

→

Diagnosis

Weakness related to e.g.

- Excessive concentration in slow growing markets
- …

Possible ways to collaborate to advance understanding:

1. Without specific intervention of CompNet → **User-friendly interface to be used independently by country desks: (examples in following slides utilise the software "Tableau")**

- Firms' size distribution by sector in comparison with EU average
- Correlation firm size/productivity
- Measures of allocative efficiency

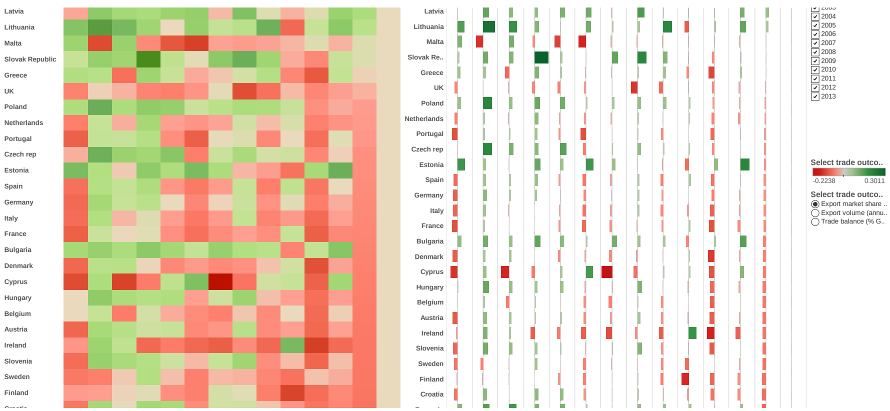
2. With specific intervention of CompNet → **Identify policy questions to study with additional data and models available through CompNet research:**

- Regression of firms' productivity vs. financial constraints
- Add data dimensions
- Review models to encompass new questions

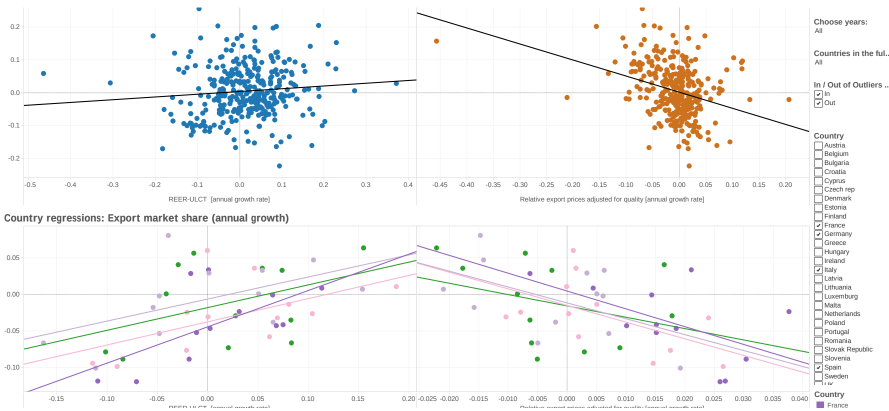
Use of the data: 4 "Drill-down approach" examples

[Drill-down example workbook]

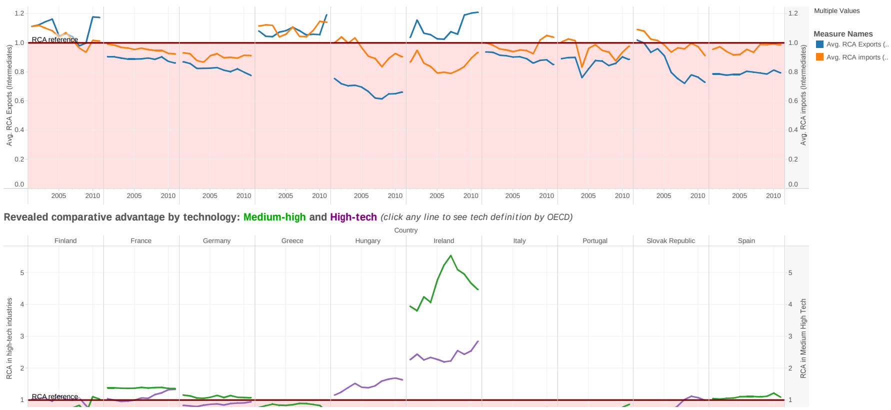
1) Choose a trade outcome



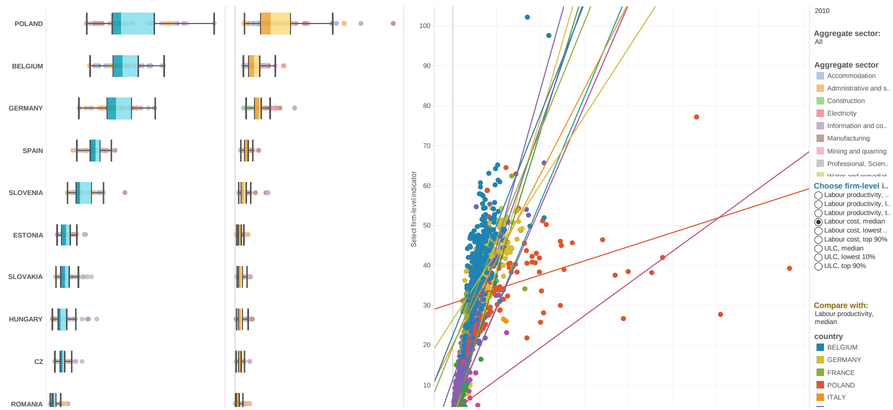
2) Compare it with relative price growth



3) Revealed comparative advantage

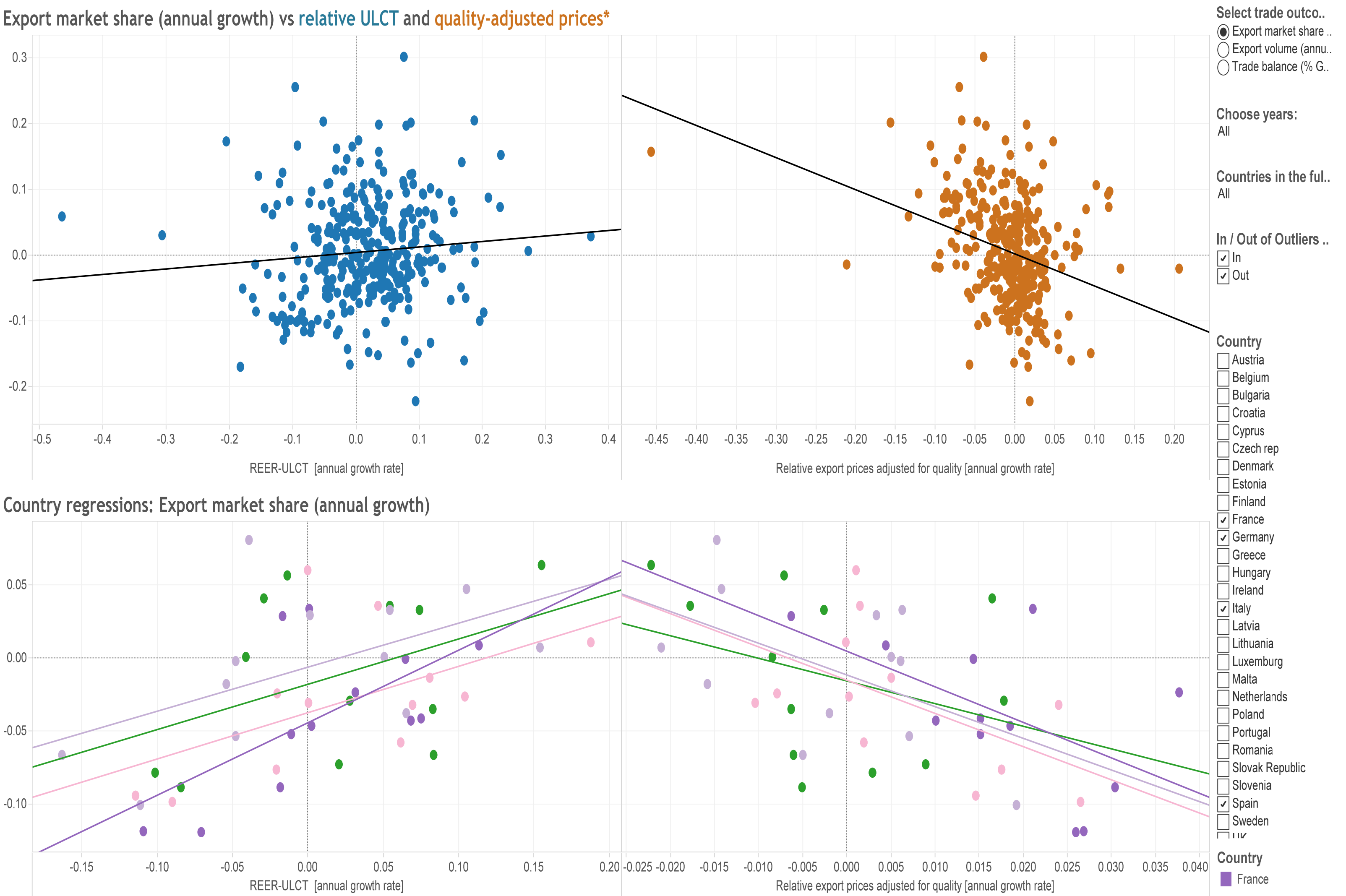


4) Use firm-level indicators



1) Choose a trade outcome ➔ Export market share

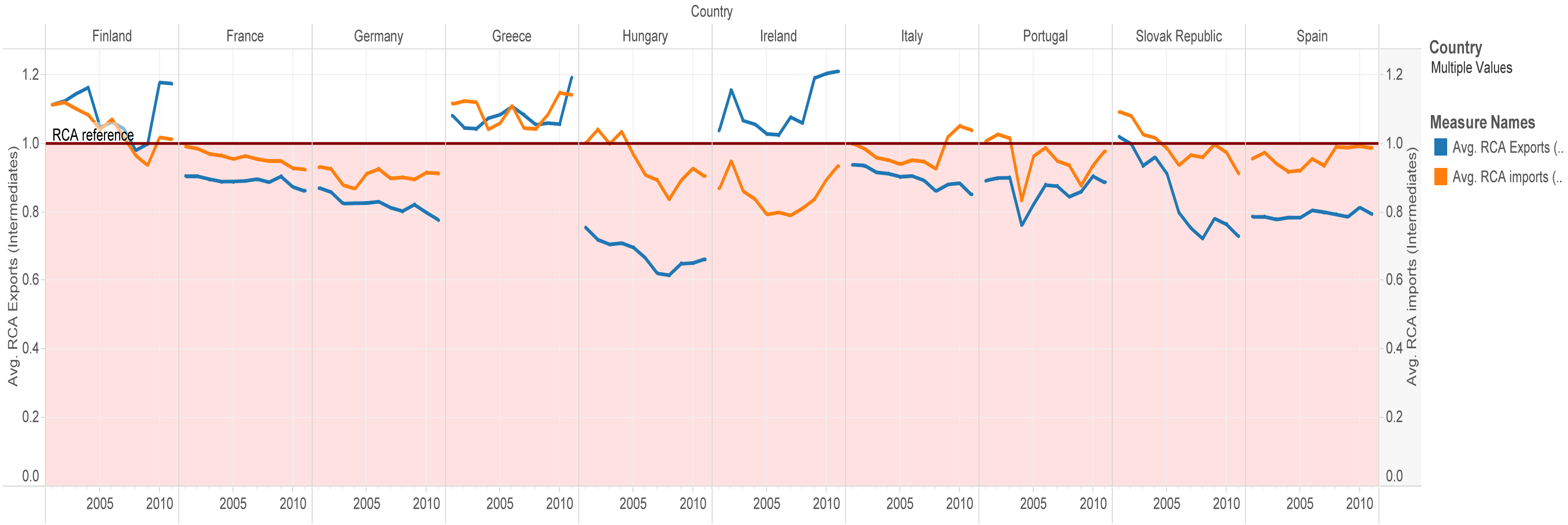
2) Trade outcomes and relative prices ➔ adjusting for quality matters



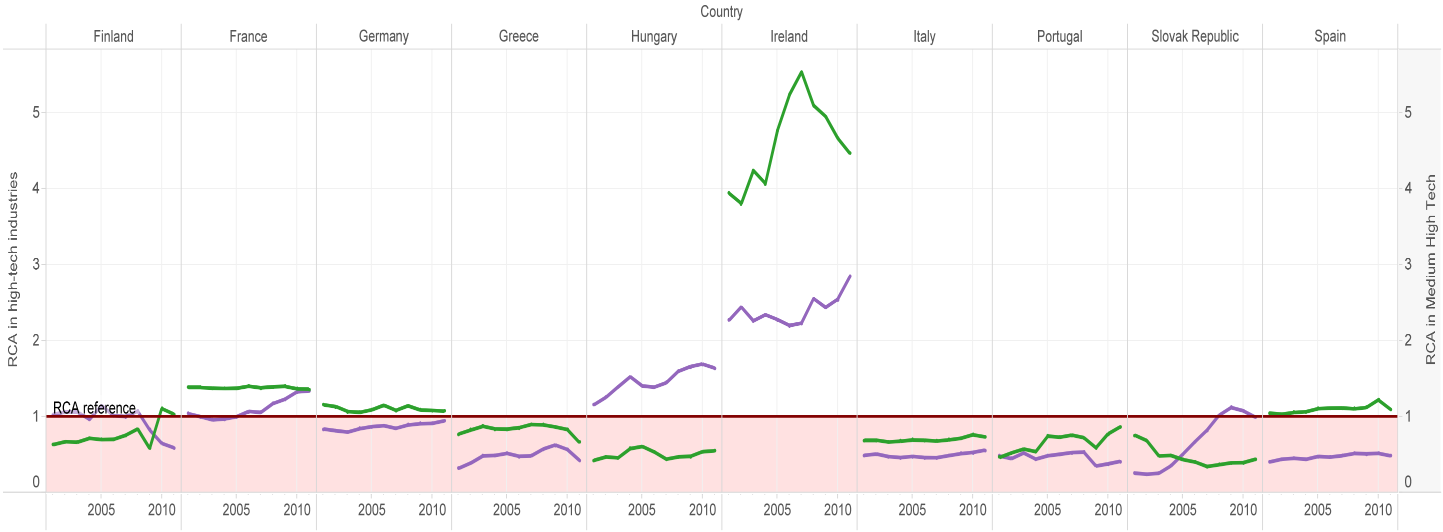
*Reference:
Konstantins Benkovskis and Julia Wörz, "*Non-price competitiveness of exports from emerging countries*", ECB WP #1612, November 2013.
http://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1612.pdf

3) Revealed comparative advantage

Revealed comparative advantage in intermediates: Exports and Imports



Revealed comparative advantage by technology: Medium-high and High-tech *(click any line to see tech definition by OECD)*



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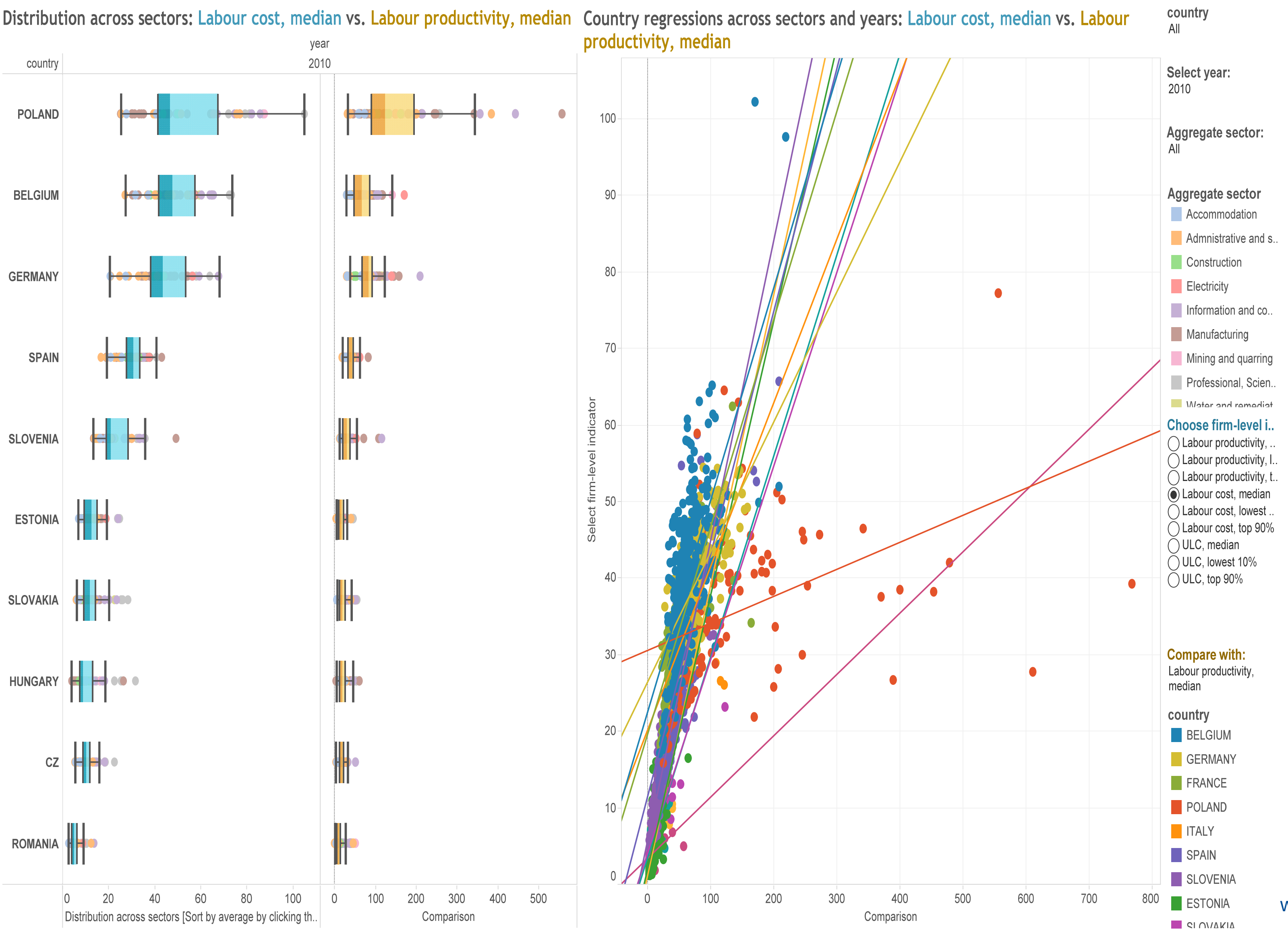
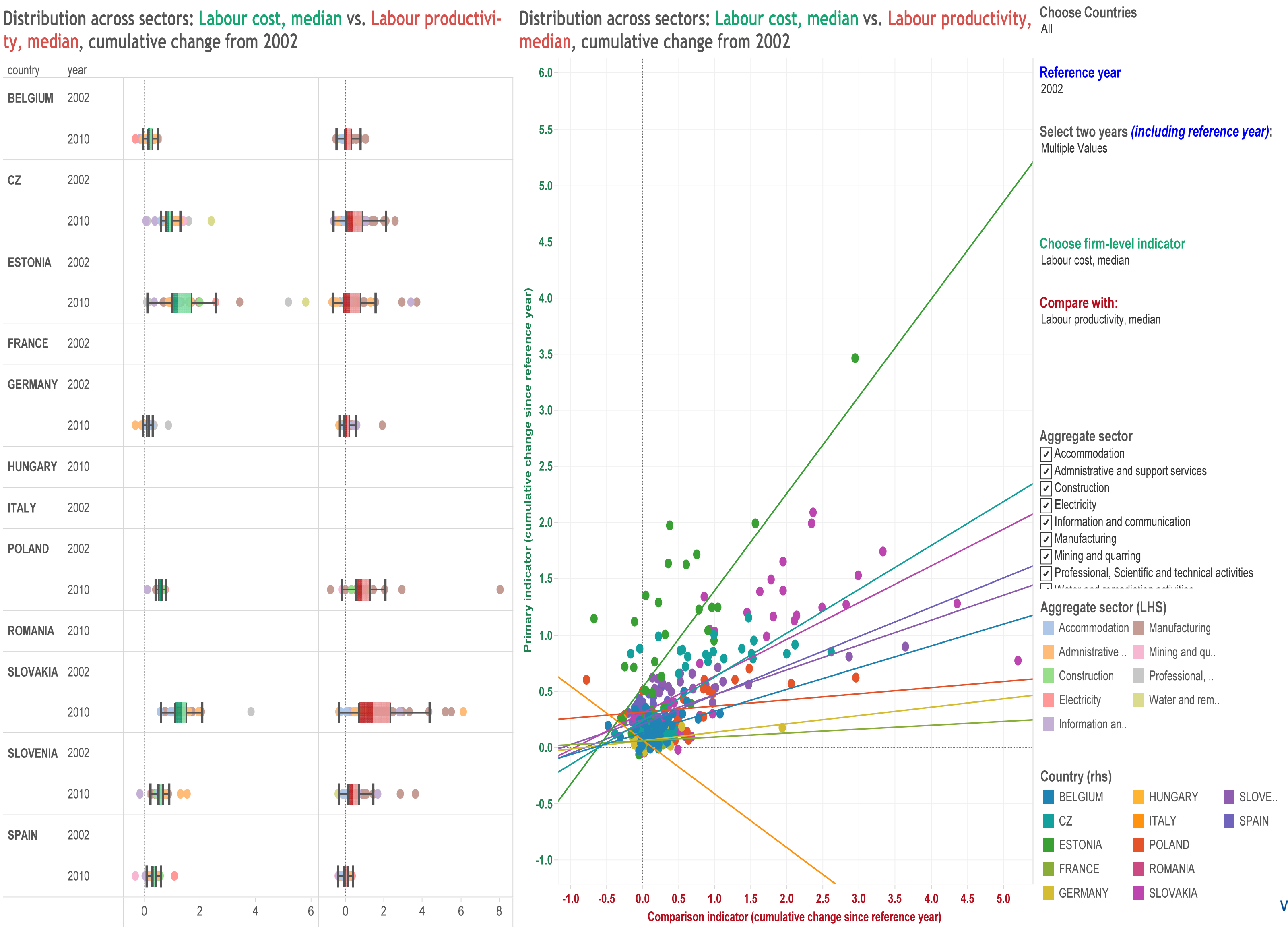
4) Firm-level labour cost and labour productivity: distributions in levels ...



...and cumulative growth



The end

THANKS FOR YOUR FEEDBACK

Please consult our website

http://www.ecb.europa.eu/home/html/researcher_compnet.en.html

NACE Sector classification

Aggregate sector	Sector	Sector_label
Accommodation	56	Food and beverage servi..
	55	Accommodation
Admnistrative and support services	82	Office and business supp..
	81	Services to buildings and..
	80	Security and investigation
	79	Travel agency, tour oper..
	78	Employment activities
	77	Rental and leasing
Construction	43	Specialised construction ..
	42	Civil engineering
	41	Building construction
Electricity	35	Electricity, gas, air conditi..
Information and communication	63	Information services
	62	Computer services
	61	Telecommunications
	60	Broadcasting
	59	TV, cinema, audio
	58	Publishing
Manufacturing	33	Repair and installation of ..
	32	Other manuf.
	31	Furniture
	30	Other transport
	29	Motor vehicles
	28	Machinery and equip.
	27	Electrical equip.
	26	Electronics and optical
	25	Fabricated metals
	24	Basic metals
	23	Non-metallic mineral pro..
	22	Plastic
	21	Pharmaceuticals
	20	Chemicals
	19	Refined petroleum
	18	Printing
	17	Paper
	16	Wood
	15	Leather
	14	Wearing
	13	Textiles
	12	Tobacco
	11	Beverages
	10	Food
Mining and quarring	9	Mining services
	8	Other mining and quarryi..
	7	Metal ores
	6	Oil and gas
	5	Coal and lignite
Professional, Scientific and technical activities	75	Veterinary
	74	Other professional, scient..
	73	Advertising
	72	R&D
	71	Architectural and enginee..
	70	Management consultancy
	69	Legal and accounting
Water and remediation activities	39	Remediation activities an..
	38	Garbage and recovery
	37	Sewerage
	36	Water

Aggregate sector

- Accommodation
- Water and rem..
- Admnistrative ..
- Construction
- Electricity
- Information an..
- Manufacturing
- Mining and qu..
- Professional, ..

Aggregate sector (color) broken down by Aggregate sector, Sector and Sector_label.