



Industry Concentration in Europe and North America

Chiara Criscuolo
Head of Productivity and Business Dynamics Division
OECD Directorate for Science, Technology and Innovation

chiara.criscuolo@oecd.org



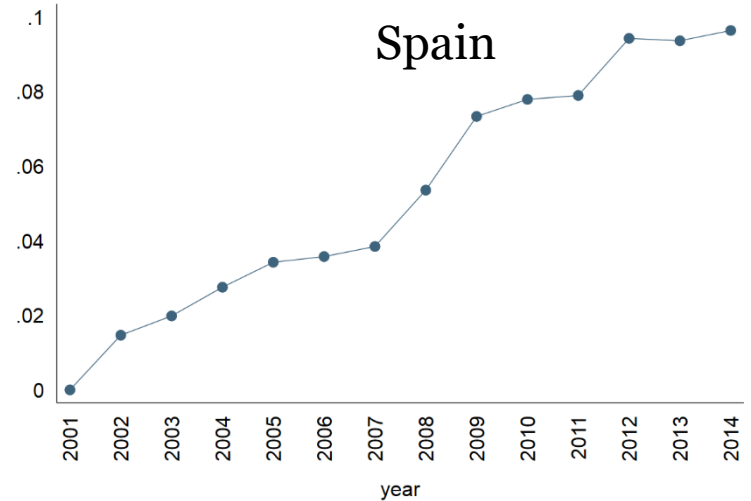
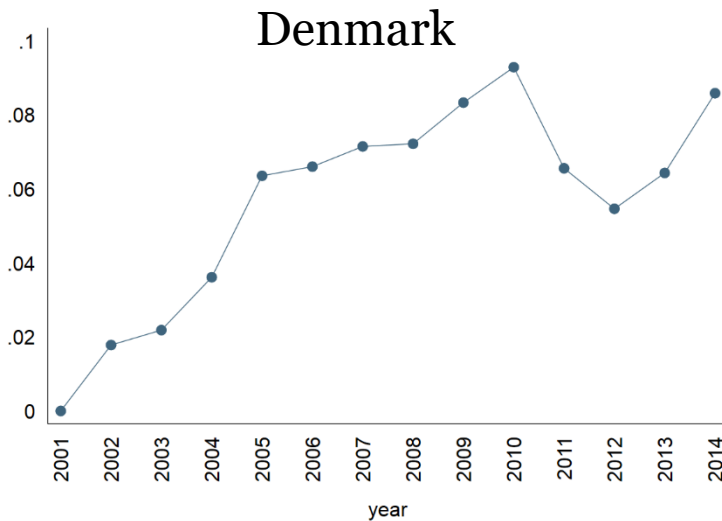
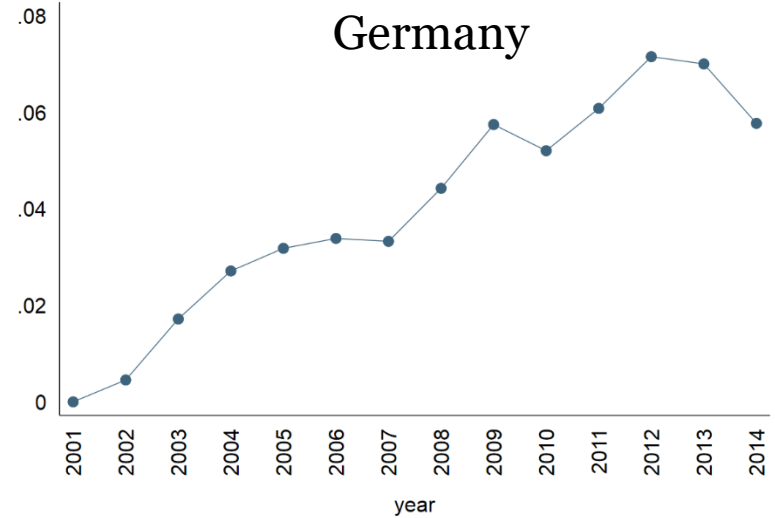
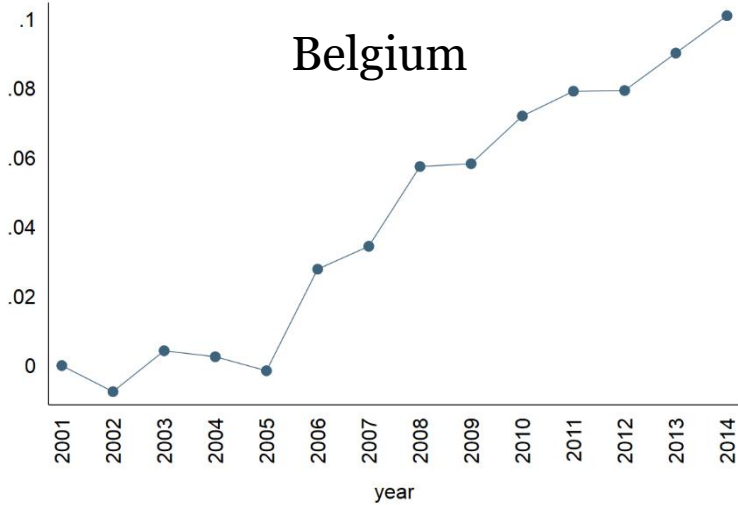


Macro trends

- Increase in **concentration** , evidence mainly for US (Autor et al., 2017; Bessen, 2017; Gutierrez and Philippon 2016, 2017a,b; Grullon et al., 2017; But: Shapiro, 2017, Valletti et al., 2017);
- Increase in **mark-ups** (Calligaris et al, 2018; De Loecker and Eeckhout, 2017; Traina, 2018; Andrews et al., 2018);
- Declining **business dynamism** (e.g. Haltiwanger et al., 2017);
- Decline in both **labour** (Autor et al., 2017); and **capital share** (Barkai, 2016);
- Decline in **investment intensities** (Gutierrez and Philippon, 2016, 2017b).
- Increase in **profit dispersion** (MGI, 2015; Bessen, 2017; Eggertsson et al., 2018);
- Productivity slowdown and **productivity** divergence (Andrews, et al., 2017, Berlingieri et al., 2017);



Increasing markup trends

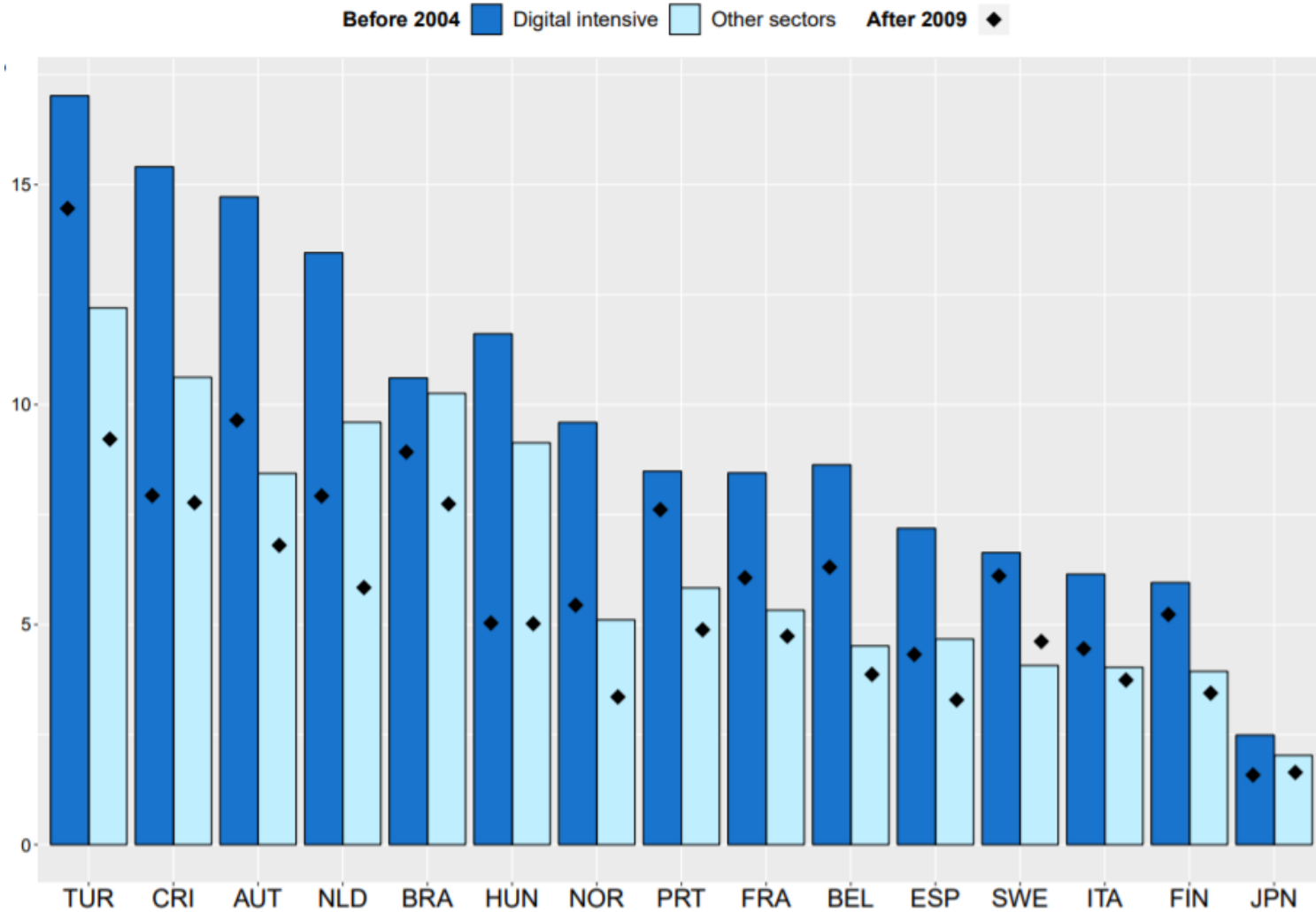


Note: Unconditional averages of firm-level log mark-ups - indexes the 2001 level to 0.

Source: Calligaris, Criscuolo and Marcolin (2018)



Declining dynamism trends – entry rates

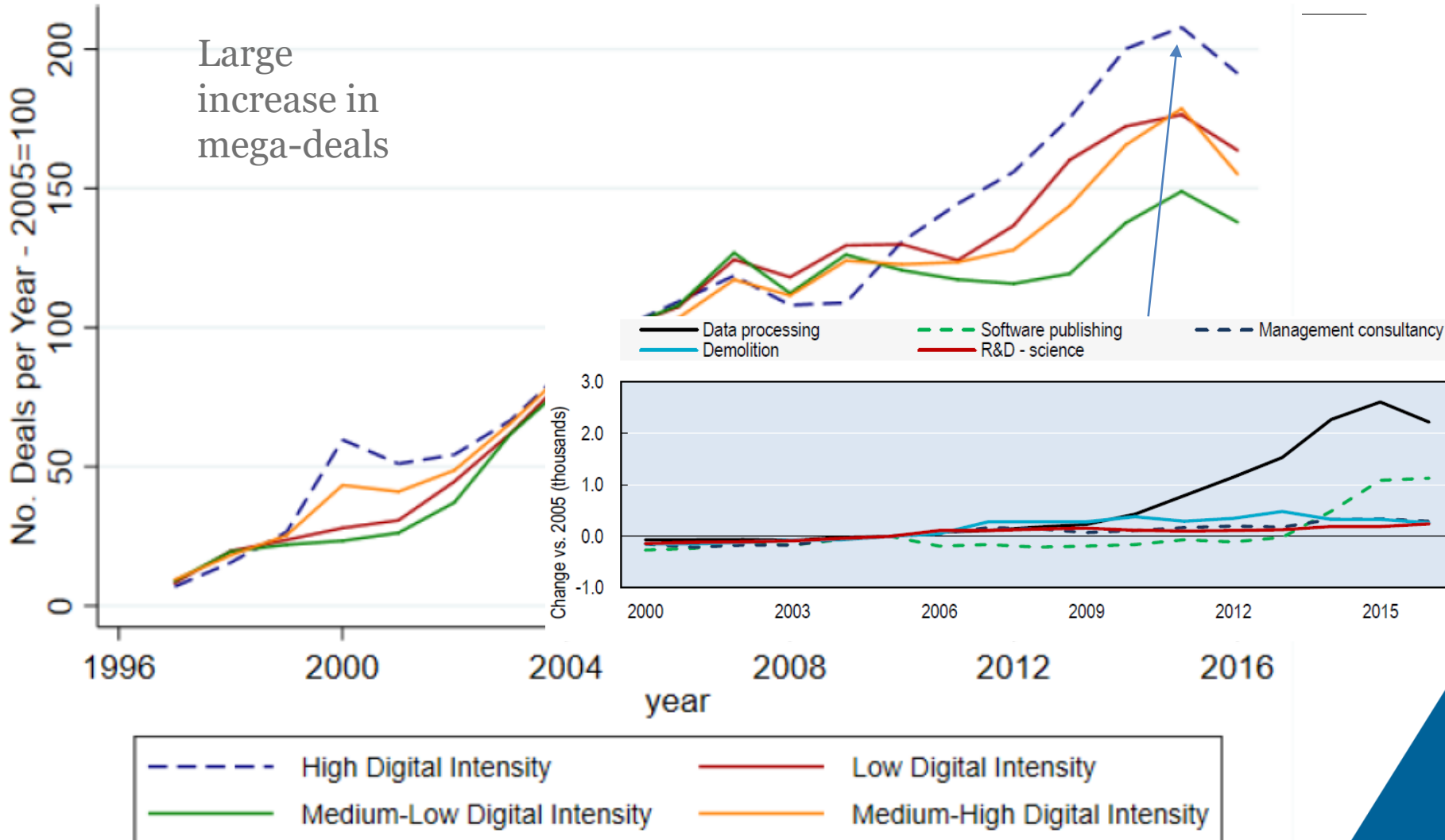


Source: Calvino and Criscuolo (2019)



Increase in M&As

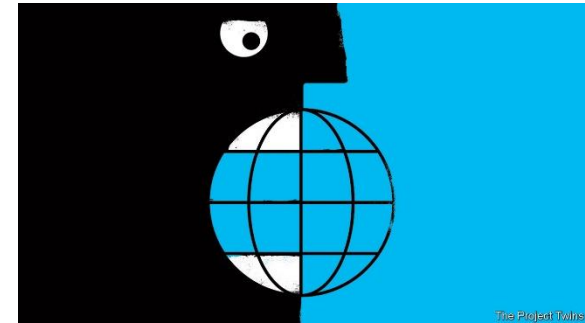
Number of M&As per Year by Digital Intensity of the Target Firm Industry





What we do

Increasing industry concentration in US¹
... but evidence for other regions limited
... so far little evidence of increasing concentration
in Europe².



We present two new pieces of descriptive evidence for Europe & N. America since early 2000s:

1. Representative firm-level concentration for Europe from OECD Multiprod
2. Business group-level concentration for Europe and N. America using Orbis-Worldscope-Zephyr data

¹ Autor et al., 2017; Bessen, 2017; Furman and Orszag, 2015; Grullon et al., 2017

² Valletti et al., 2017; Gutiérrez and Philippon, 2018



Preview of results

1. Concentration has increased in 3 out of 4 industries in **both** Europe and North-America.

Using Multiprod firm-level data:

- a) 2001-2012 the average industry saw a **2 - 3 p.p. increase** the share of the 10% largest companies in industry sales in Europe

Using Orbis-Worldscope-Zephyr business group-level data:

- b) 2000-2014 the average industry saw a **4 - 8 p.p increase** in the share of the largest 8 companies in industry sales in both Europe and North America
2. Concentration has increased in **digital intensive and less-intensive sectors**



METHODOLOGY & DATA



How do we measure concentration?

1) Level

Firms or business groups?

2) Measure

Using Multiprod firm-level data:

- P10 = share of industry sales of large 10% of firms

Using Orbis-Worldscope-Zephyr business group-level data:

- CR_{4/8/20} = share of industry sales of the largest 4/8/20 groups
- (NB dangers of Herfindahl / P10 with coverage changes)

3) Industry definition

2-digit NACE/ISIC -> differs from *product markets*

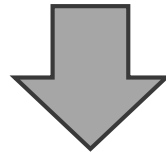
4) Industry sales (denominator)

OECD STAN (NB dangers of other choices with coverage changes)



Firm-Level Data

- OECD MultiProd distributed microdata project
- 10 European countries for which data is fully representative
- Period: 2001-2012;
- Whole economy, detailed at 2-digit level;



Firm-Level Concentration Metrics
(10 Countries, 2001-2012)



Business Group-Level Data

**Group-Subsidiary
Ownership Data**
(2.8million firms
2000-2014)



**Sales Data for
Subsidiaries, Parent
& Group**
(100 Countries)

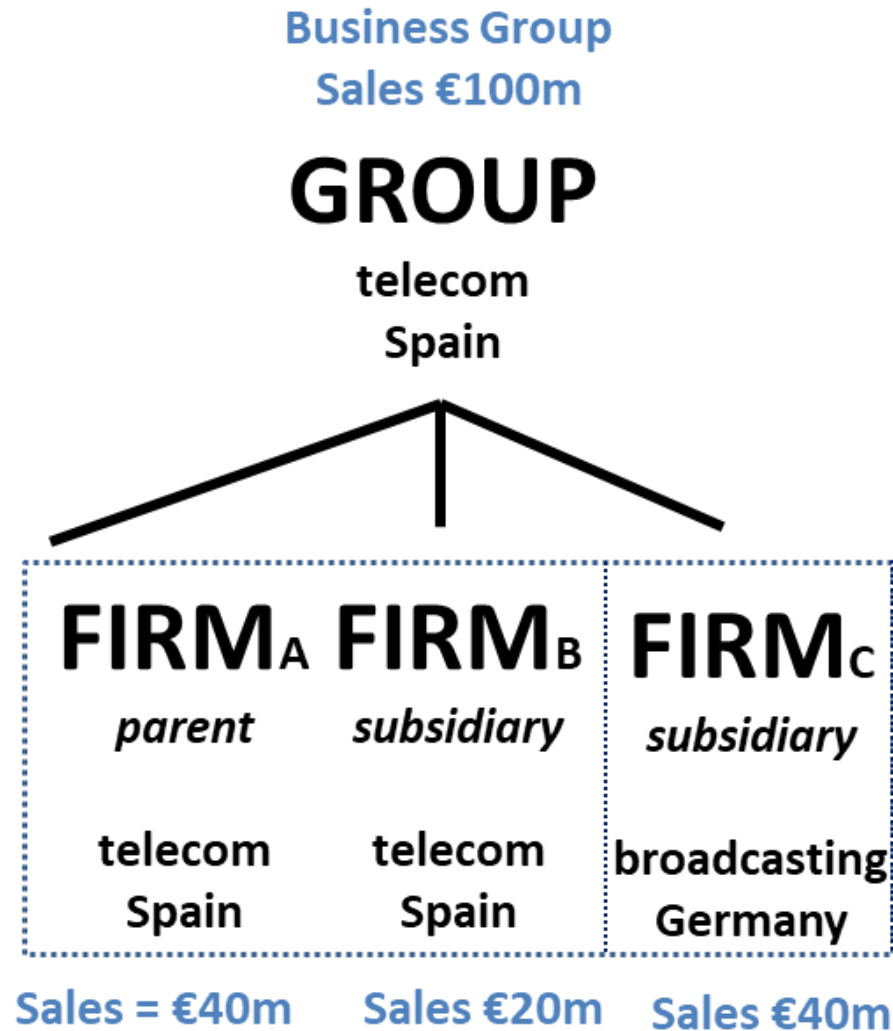


Business Group-Level Regional Concentration Metrics
(21 Countries, 2000-2014)





Apportion business-group sales to industries & countries



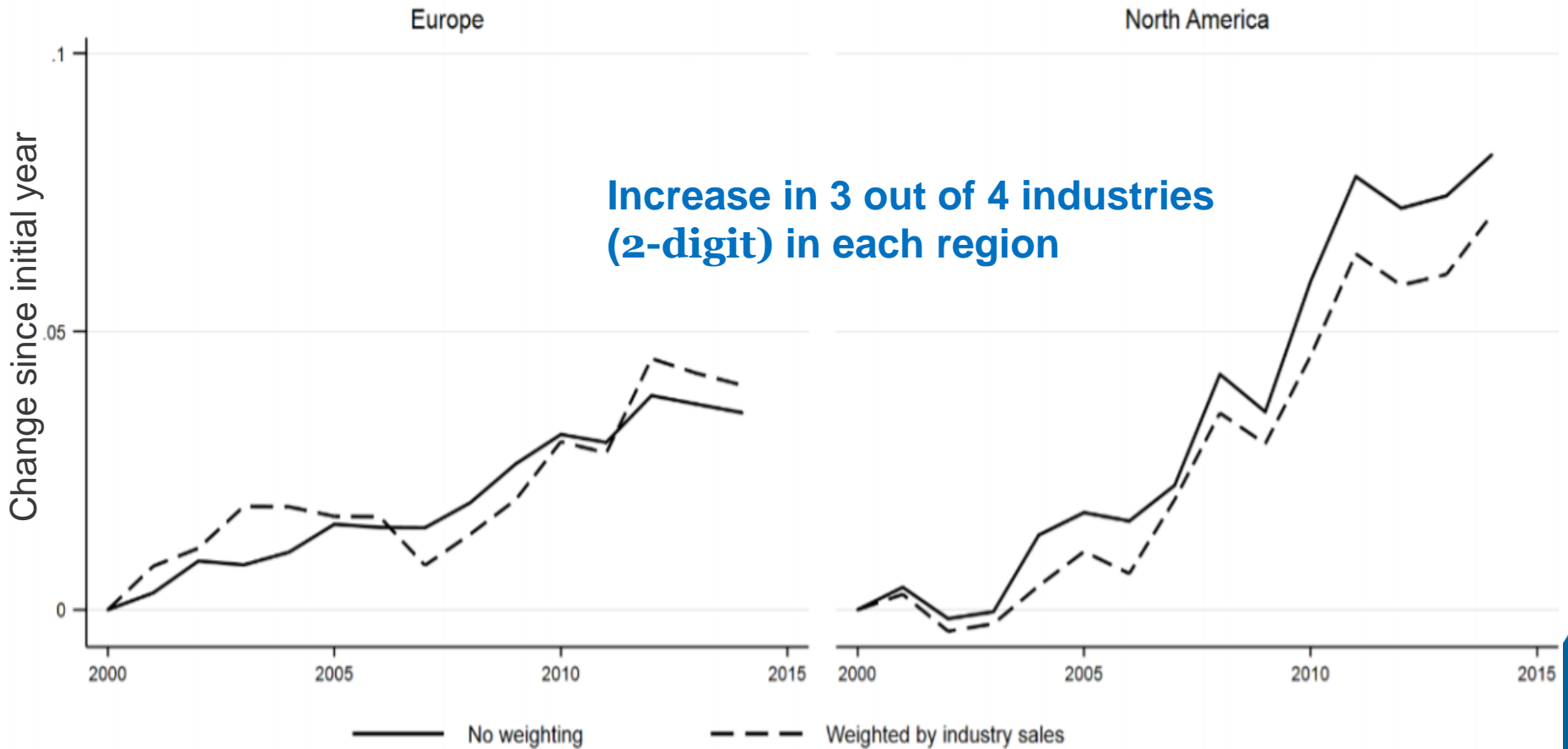


FINDINGS



Fact 1: Concentration increased in both Europe and US...

Change in the share of sales due to 8 largest groups (rel. to 2000)
Orbis-Worldscope-Zephyr data, average across industries

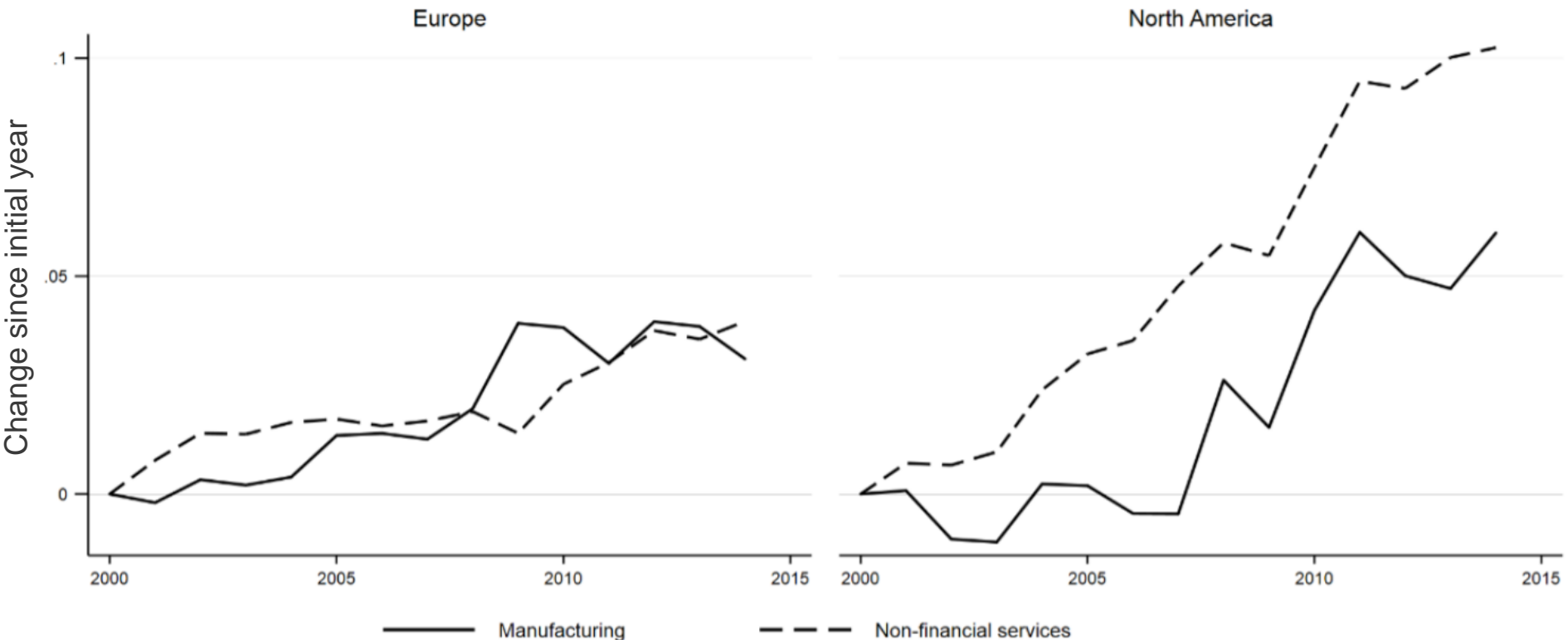


Europe: BE, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LV, NL, NO, PL, PT, SI, SE
North America: CA, US



Fact 2: Concentration Increased in both Manufacturing & Services

Change in the share of sales due to 8 largest groups (rel. to 2000)
Orbis-Worldscope-Zephyr data, average across industries

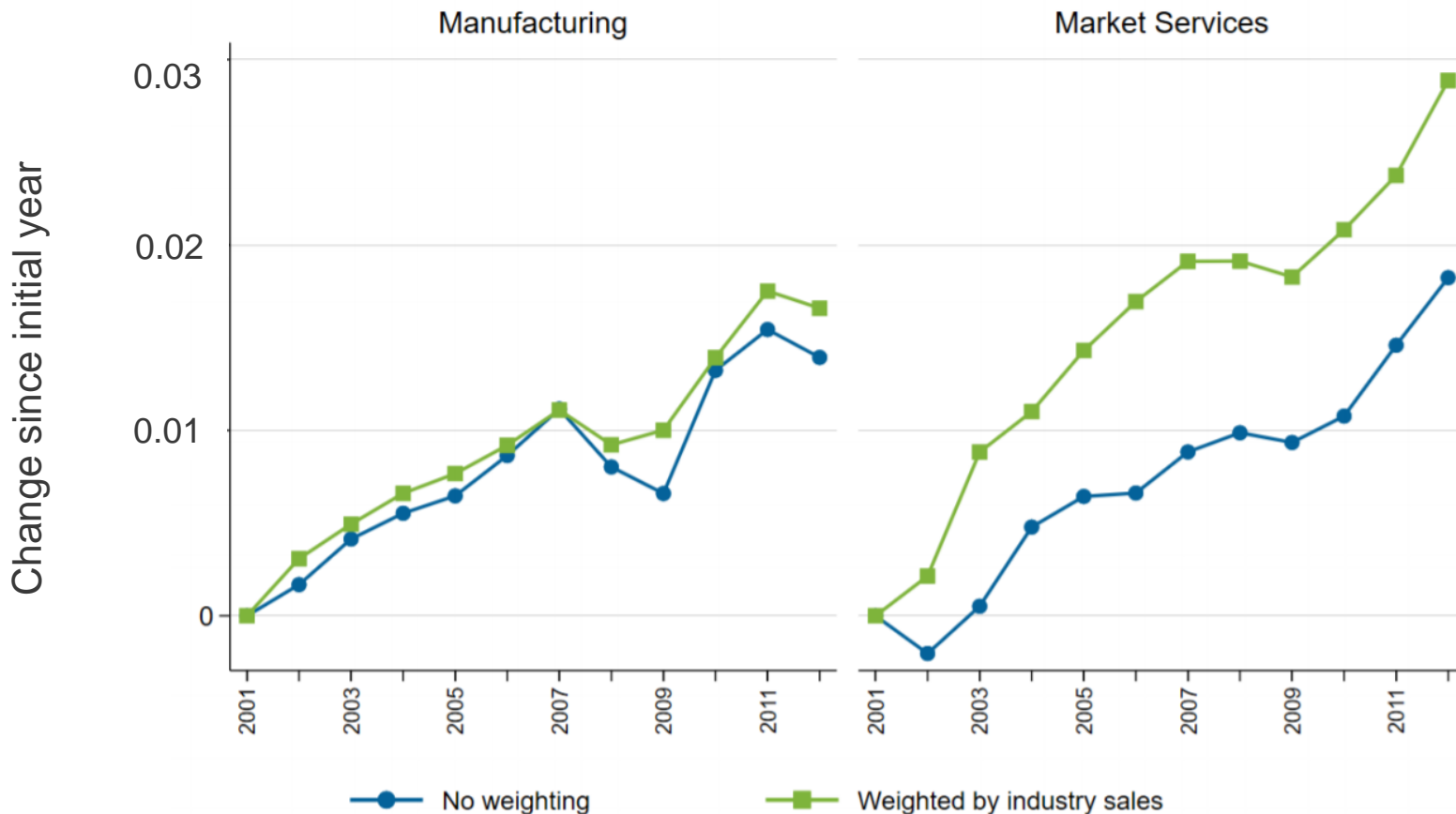


Europe: BE, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LV, NL, NO, PL, PT, SI, SE
North America: CA, US



Fact 2a: Similar trends for firm-level, within-country concentration

Change in the share of sales due to 10% largest firms (rel. to 2001)
Multiprod data, average across countries and industries

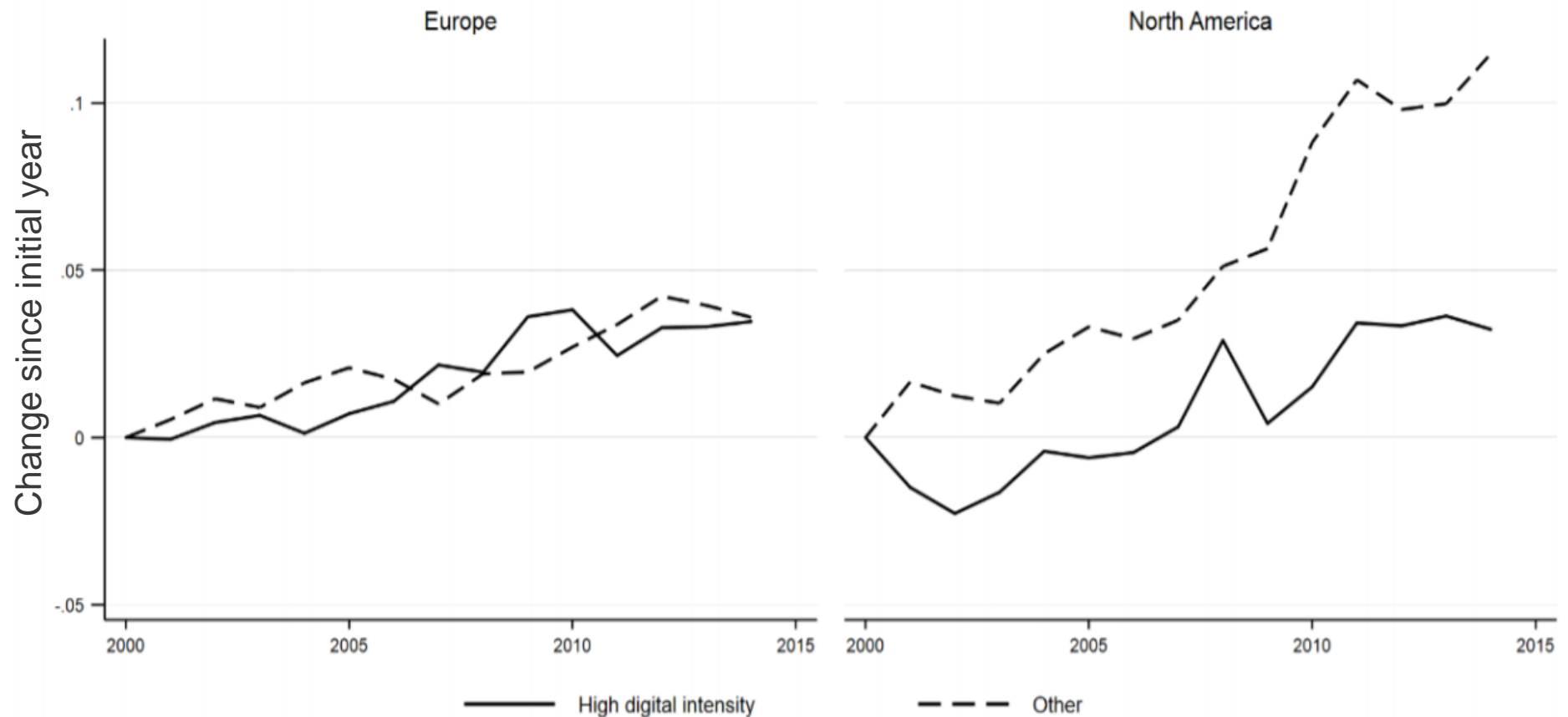


Calculated as year effects from regressions of concentration on country-industry and year dummies.
Countries: AUT, BEL, DEU, DNK, FIN, FRA, HUN, NOR, PRT, SWE



Fact 3: Concentration Increased in both Digital and Non-Digital Sectors

Change in the share of sales due to 8 largest groups (rel. to 2000)
Orbis-Worldscope-Zephyr data, average across industries



Europe: BE, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LV, NL, NO, PL, PT, SI, SE
North America: CA, US



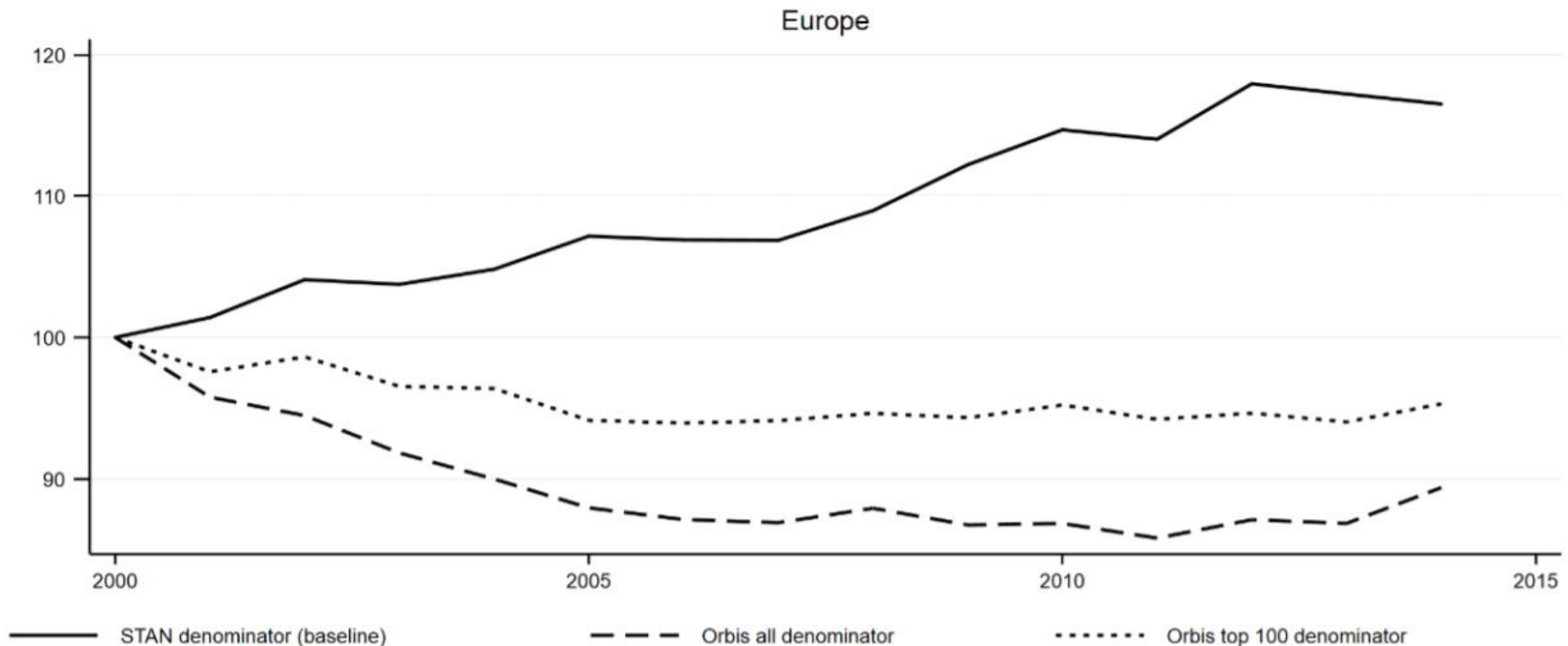
IMPORTANCE OF GETTING METHODOLOGY RIGHT



Rising concentration in Europe? The importance of the “right” denominator

Dangers of other choices of industry sales denominator with coverage changes

Change in the share of sales due to 8 largest groups (rel. to 2000)
Orbis-Worldscope-Zephyr data, average across industries





SUMMARY & NEXT STEPS



Implications?

Implications depend on drivers

- Technological change or globalization allowing most efficient firms to expand?
- A competition problem?

And could lead to:

- More/less innovation and changes in “type of innovation”;
- More or less diffusion?
- Increased inequality
- Firms becoming “too big to fail“
- Monopsony power in some industries
- Stronger incentives for lobbying



Summary & Next steps

(your input is very welcome)

Descriptive evidence

- Correlations - need not imply causality or need for a particular policy action
- Since increasing concentration is broad-based, it is less likely to be due to a particular policy environment

Proposed next steps

- Link changes in concentration to possible mechanisms...
- New digital technologies? Management & other intangibles? Global Value Chains? Low interest rate environment? M&As?



We welcome your feedback and suggestions

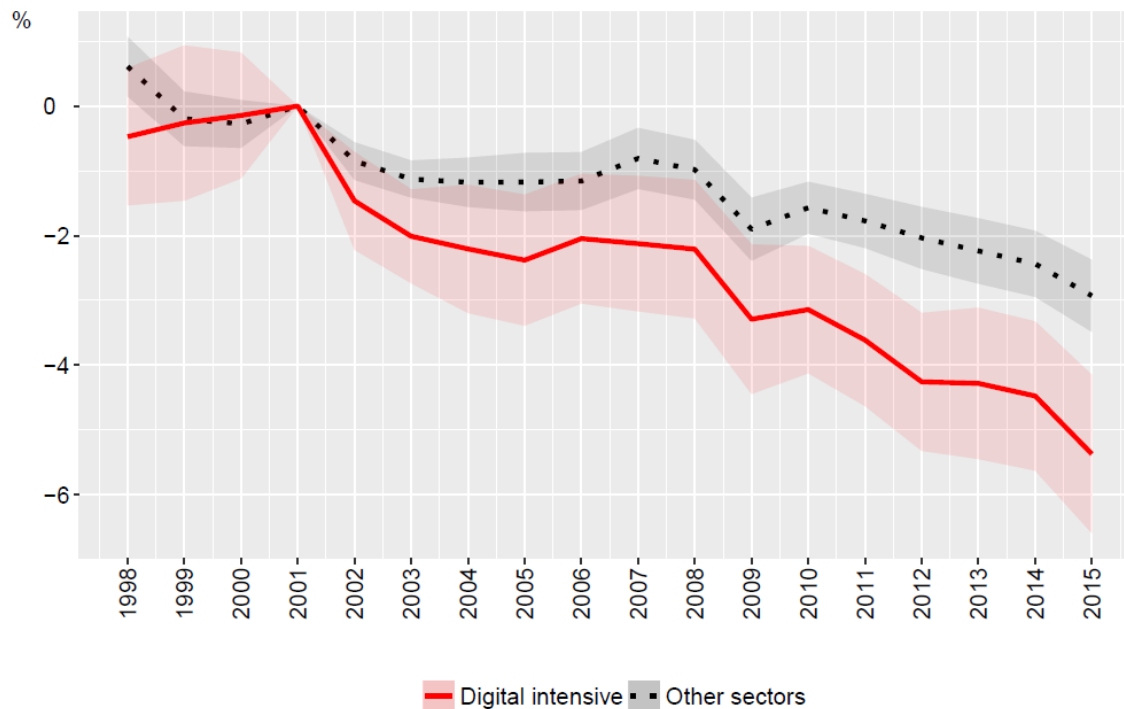
Matej Bajgar, Giuseppe Berlingieri, Sara Calligaris, Chiara Criscuolo and Jonathan Timmis
OECD Directorate for Science, Technology and Innovation

giuseppe.berlingieri@oecd.org
matej.bajgar@oecd.org
sara.calligaris@oecd.org
chiara.criscuolo@oecd.org
jonathan.timmis@oecd.org





Decline in entry rates...especially in digital sectors



Source: Calvino and Criscuolo, 2018 based on OECD DynEmp3 database, August 2018.

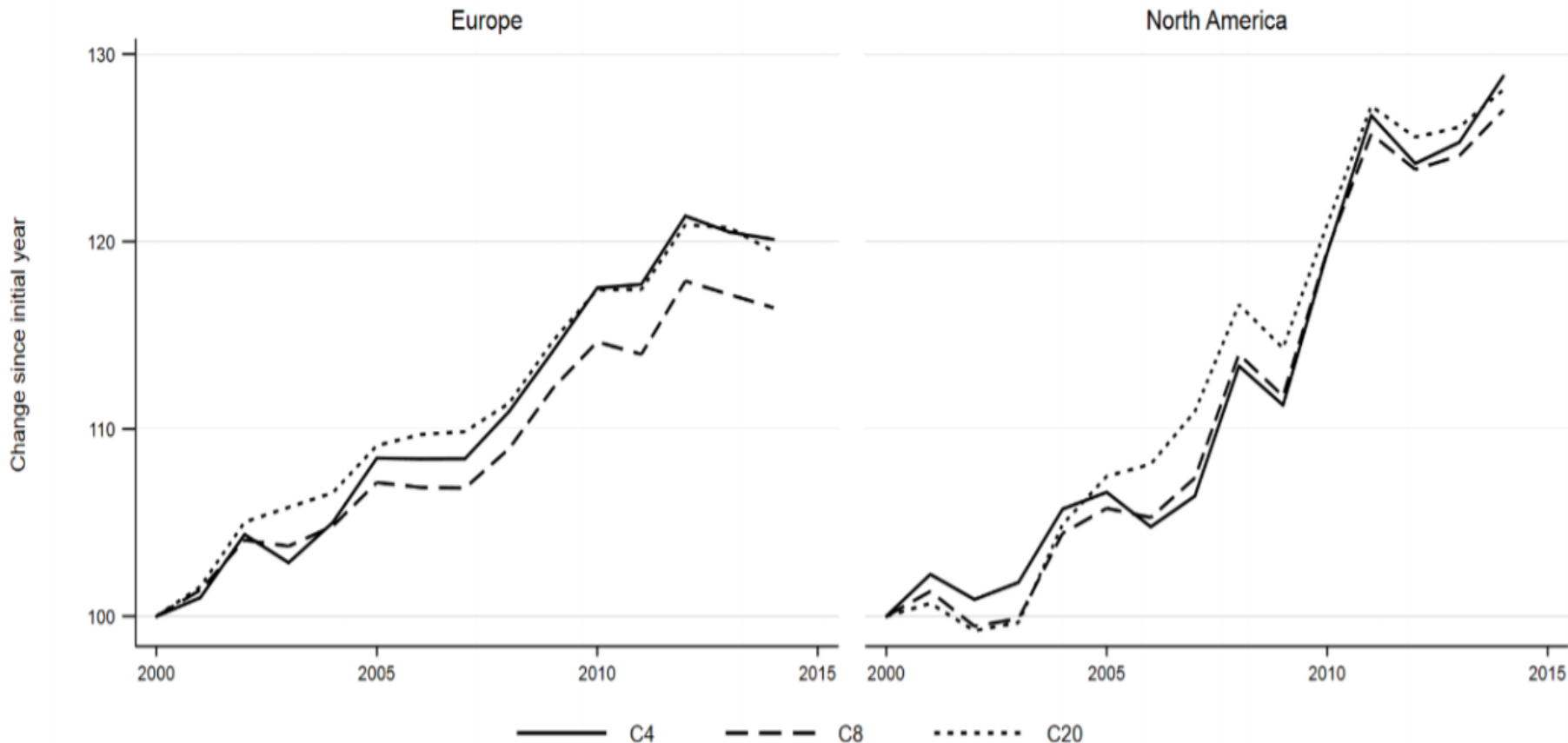
job reallocation rates also declining while exit rates rather flat



Fact 1a: Increasing concentration across different metrics...

Propor. change in share of sales due to 4/8/20 largest groups (rel. to 2000)

Orbis-Worldscope-Zephyr data, average across industries



Europe: BE, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LV, NL, NO, PL, PT, SI, SE
North America: CA, US



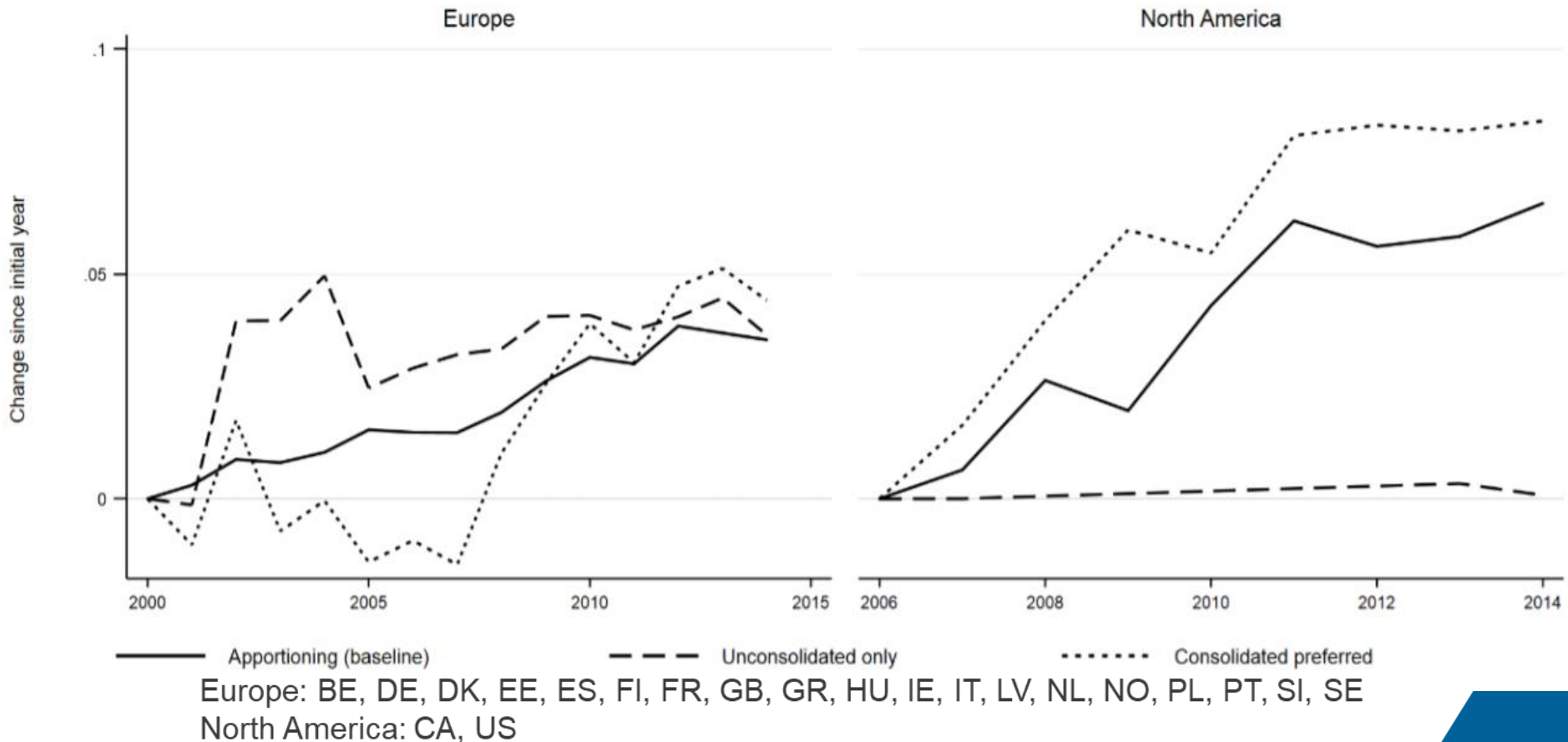
Rising concentration in Europe & N. America?

The importance of apportioning group activity

Looking only at HQ or only subsidiaries or apportioning?

Change in the share of sales due to 8 largest groups (rel. to 2000)

Orbis-Worldscope-Zephyr data, average across industries





Rising concentration in Europe & N. America?

The importance of data cleaning

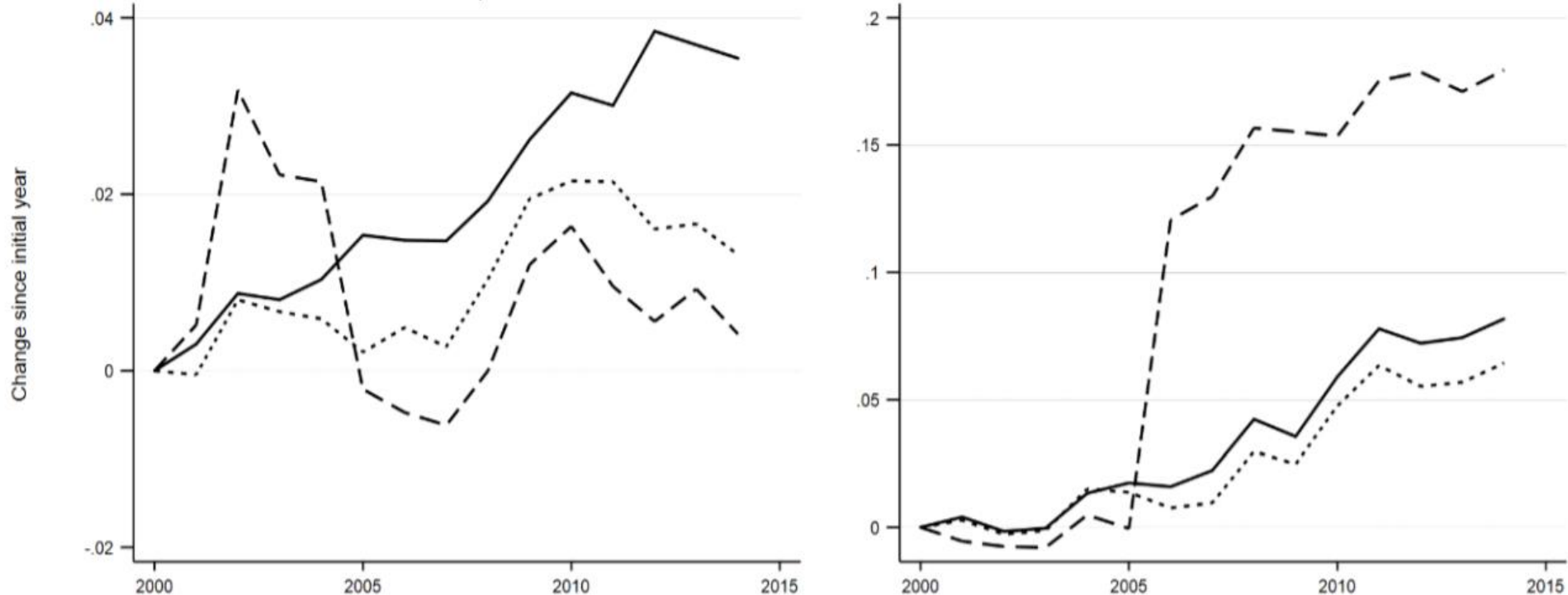
Cleaning of financial or ownership data or both?

Change in the share of sales due to 8 largest groups (rel. to 2000)

Orbis-Worldscope-Zephyr data, average across industries

Europe

North America



— Corrected (baseline) - - - Uncorrected ownership and financials ····· Uncorrected ownership

Europe: BE, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LV, NL, NO, PL, PT, SI, SE

North America: CA, US



THE METHODOLOGY:

MARK-UPS



Supply-side approach to mark-ups

Hall (1988) and De Loecker & Warzynski (2012):

$$\mu_{it} = \frac{p_{it}}{mc_{it}} = \frac{OE_{it}}{IS_{it}},$$

Mark-up corresponds to the ratio between:

- the elasticity of output with respect to intermediates (obtained by estimating a production function);
- and the cost of intermediates as a share of the firms revenue (observed in the data).

Intuition: in perfect competition input shares = output elasticities



Supply-side approach to mark-ups

$$\mu_{it} = \frac{p_{it}}{mc_{it}} = \frac{OE_{it}}{IS_{it}},$$

We need to assume:

- Each firm is cost-minimising.
- One fully flexible input \rightarrow we use *intermediates*.
- Specification of the production function \rightarrow we use:
 - industry-specific Cobb Douglas with 3 inputs (K, L, M).
 - industry-specific Translog with 3 inputs (K, L, M).



Estimating Output Elasticities (OEs)

OE_{it} = first derivative of the log-production function w.r.t. intermediates.

- Here industry (3-digit) production function with 3 inputs.
- If **Cobb-Douglas** (CD):

$$y_{it} = \beta_l l_{it} + \beta_m m_{it} + \beta_k k_{it} + \omega_{it} + \varepsilon_{it}$$

– Derivative: $\hat{\beta}_m$. Industry specific.

- If **Translog** (TL):

$$y_{it} = \beta_l l_{it} + \beta_m m_{it} + \beta_k k_{it} + \beta_{ll} l_{it}^2 + \beta_{mm} m_{it}^2 + \beta_{kk} k_{it}^2 + \beta_{lm} l_{it} m_{it} + \beta_{lk} l_{it} k_{it} + \beta_{mk} m_{it} k_{it} + \omega_{it} + \varepsilon_{it}$$

– Derivative: $\hat{\beta}_m + 2\hat{\beta}_{mm} m_{it} + \hat{\beta}_{lm} l_{it} + \hat{\beta}_{mk} k_{it}$. Firm specific.

- Intermediates as flexible input => Output-based production function => additional parameters => **CD as baseline**.
- Several other choices for estimation: ACF algorithm; use of 3-order polynomial and GMM to control for endogeneity, etc.



Mark-ups: demand- vs supply-side

	Supply-side	Demand-side
<i>Advantages</i>	<p>(1) Less micro data requirements AND relatively less demanding to estimate.</p> <p>(2) No need for information on product features.</p> <p>(3) No need to assume form of market conduct (FOC always valid).</p> <p>(3) controls for measurement error and endogeneity of inputs.</p> <p>...</p>	<p>(1) No need to assume cost minimisation for all firms.</p> <p>(2) Estimation of demand systems, yielding direct estimate of market conduct / competition.</p> <p>...</p>
<i>Disadvantages</i>	<p>(1) Still requires data to obtain TFP (and assumptions thereof if estimated).</p> <p>(2) Assume cost minimisation in all firms.</p> <p>(3) Assume at least one input is free to adjust.</p> <p>...</p>	<p>(1) Need detailed product-level and consumer data.</p> <p>(2) Assume shape of utility function.</p> <p>(3) Assume way firms compete and set prices (e.g. Nash Bertrand).</p> <p>(4) IV needed to retrieve demand elasticities.</p> <p>...</p>
<i>Literature</i>	<p>Hall (1988); Roeger (1995); Ellis and Halvorsen (2002); DeSouza (2009); De Loecker (2011); De Loecker and Warzynski (2012).</p>	<p>Klette Berry (1994); BLP (1995); Goldberg (1995); Nevo (2000, 2001); Capps et al. (2003); Davis (2006); Zhelobodko et al. (2012); Berry and Haile (2015); Pakes (2015).</p>
	<p>De Loecker and Scott (2016): compare the approaches for one industry. “The results indicate fairly broad agreement between the two approaches”</p>	

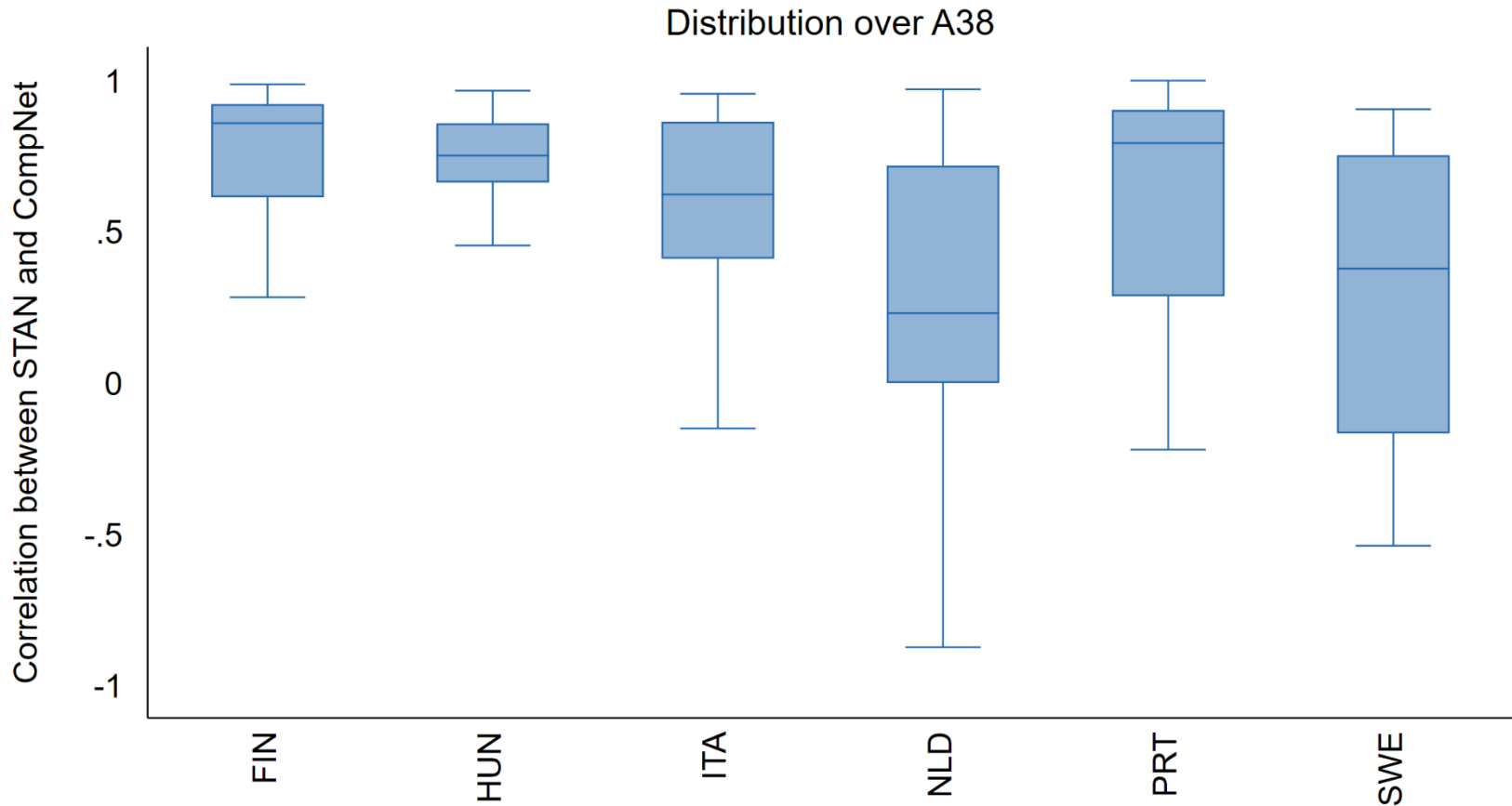


COMPNET COMPARED WITH STAN



Correlation between industry sales in CompNet and STAN

Correlations in GO over time by country



Distribution of correlation coefficients calculated separately for each country-industry combination over time. Based on Compnet and STAN data.