Industry Concentration in Europe and North America

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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

Large increase in mega-deals
Increasing industry concentration in US\(^1\)
... but evidence for other regions limited
... so far little evidence of increasing concentration in Europe\(^2\).

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
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:*
  - \( P_{10} \) = 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 / \( P_{10} \) 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
(2.8 million firms 2000-2014)

Manual Checks of 300 global largest groups

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

Many Semi-Automated Cleaning Steps

Business Group-Level Regional Concentration Metrics
(21 Countries, 2000-2014)
Apportion business-group sales to industries & countries

Business Group
Sales €100m

GROUP

telecom
Spain

FIRM_A  FIRM_B  FIRM_C

parent  subsidiary  subsidiary

telecom  telecom  broadcasting
Spain    Spain    Germany

Sales = €40m  Sales €20m  Sales €40m
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

Increase in 3 out of 4 industries (2-digit) in each region

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
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...
We welcome your feedback and suggestions

Matej Bajgar, Giuseppe Berlingieri, Sara Calligaris, Chiara Criscuolo and Jonathan Timmis
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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...

Proportion 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*

![Graph showing change in the share of sales due to 8 largest groups in Europe and North America.](chart.png)

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: \( \hat{\beta}_m + 2\hat{\beta}_m m_{it} + \hat{\beta}_{lm} l_{it} + \hat{\beta}_{mk} k_{it} \). **Firm specific.**
- Intermediates as flexible input \( \Rightarrow \) Output-based production function \( \Rightarrow \) additional parameters \( \Rightarrow \) **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

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<th><strong>Supply-side</strong></th>
<th><strong>Demand-side</strong></th>
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| **Advantages**       | (1) Less micro data requirements AND relatively less demanding to estimate.  
                        (2) No need for information on product features.  
                        (3) No need to assume form of market conduct (FOC always valid).  
                        (3) controls for measurement error and endogeneity of inputs.  
                        ...                                                                                                                                                                                               | (1) No need to assume cost minimisation for all firms.  
                        (2) Estimation of demand systems, yielding direct estimate of market conduct / competition.  
                        ...                                                                                                                                                                                               |
| **Disadvantages**    | (1) Still requires data to obtain TFP (and assumptions thereof if estimated).  
                        (2) Assume cost minimisation in all firms.  
                        (3) Assume at least one input is free to adjust.  
                        ...                                                                                                                                                                                               | (1) Need detailed product-level and consumer data.  
                        (2) Assume shape of utility function.  
                        (3) Assume way firms compete and set prices (e.g. Nash Bertrand).  
                        (4) IV needed to retrieve demand elasticities.  
                        ...                                                                                                                                                                                               |
| **Literature**       | Hall (1988); Roeger (1995); Ellis and Halvorsen (2002); DeSouza (2009); De Loecker (2011); De Loecker and Warzynski (2012).                                                                                                                                               | 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).                                                |

De Loecker and Scott (2016): compare the approaches for one industry. “The results indicate fairly broad agreement between the two approaches”
COMPNET COMPARED WITH STAN
Correlation between industry sales in CompNet and STAN

Correlations in GO over time by country

Distribution over A38

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