The Fall of the Labor Share and the Rise of Superstar Firms

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Granularity and Networks in the Global Economy, Master in Economics
Introduction

Motivation: a fall in the labor share in many countries

Notes: Each panel plots the ratio of aggregate compensation over value-added for all industries in a country based on KLEMS data.
Introduction
Motivation: a fall in the labor share in many countries

What are the causes?
- Decrease in the cost of capital relative to labor (ICTs)
- Trade and international outsourcing
- Labor market institutions

This paper:
Is the increase in concentration a reason for the decrease in the labor share?

Main idea:
- If globalization or technological changes advantage the most productive firms, product market concentration will rise
- Does it affect the labor shares?
Introduction

Contributions

- Micro evidence on the evolution of the labor shares in the US
- New "Superstar Firms" model of the labor share change
- Empirical evidence consistent with the model:
  - Rise in sales concentration over time
  - Industries with largest increase in concentration have experienced the largest declines in the labor shares
  - Fall of the labor share is a between firm reallocation
  - Reallocation more pronounced in concentrated industries
  - Same patterns in other OECD countries
Outline

1. Introduction
2. An illustrative model of superstar firms
3. Data
4. Results
5. Conclusion
An illustrative model of superstar firms

Environment

- Production function: \( Y_i = A_i V_i^{1-\alpha} K_i^\alpha \)
  - \( Y_i \): value added
  - \( V_i \): variable labor
  - \( K_i \): capital
  - \( A_i \): efficiency parameter

- Assume there is a fixed amount of overhead labor needed for production \( F \)
  - Total labor: \( L = V + F \)

- Perfect competition of factors market: \( w \) and \( r \)
- Imperfect competition of product market
  - \( P_i \) price of good produced by firm \( i \)
An illustrative model of superstar firms

Main mechanisms

Share of labor costs \((wL_i)\) in nominal value-added \((P_iY_i)\):

\[
\frac{wL_i}{P_iY_i} = \frac{1 - \alpha}{\mu_i} + \frac{wF}{P_iY_i}, \quad \mu_i = \frac{P_i}{c_i}
\]

Decrease in the labor share if:

- Higher markup
- Lower fixed labor share in value added

⇒ A shock that increases the markup or favors the most productive firms will decrease the labor shares because of a reallocation effect between firms.
An illustrative model of superstar firms
Monopolistically competitive setting

Appendix → model taking into account both the intensive and extensive margins

- Entrepreneurs pay a fixed cost to draw $A_i$;
- Fixed cost to produce ⇒ low productivity firms choose to exit;
- High productivity firms will have a higher marker share and a higher share of profits in value added;
- These firms have lower labor shares.

The degree of concentration depends on the degree of competition:

- If consumers become more sensitive to prices / quality, more output is allocated to the most productive firms;
- When competition increases, the labor share decreases.
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Data

- **US Economic Census**
  - Every five years (1982-2012)
  - 6 large sectors: manufacturing, retail trade, whole trade, services, finance, utilities and transportation

- **KLEMS**
  - Industry-level data, OECD

- **Comtrade**
  - Industry exports

- **Compnet**
  - Firm-level balance sheet in 14 EU countries

- **BVD Orbis**
  - Firms-level labor shares in the manufacturing sector of 6 EU countries
Data

Descriptive evidence

For the US:

- Downward trend for the labor share except for finance
- Stronger concentration in sales than in employment
- Negative correlation between firm size and labor share
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Results

Concentration and the fall of the labor share

\[ \Delta S_{jt} = \alpha \Delta Conc_{jt} + \tau_t + u_{jt} \]

- \( \hat{\alpha} \) negative and significant in most cases

Magnitudes? Comparison of conditional and unconditional time dummies to obtain the contribution of concentration to the fall of the labor share

Contributions: 1/3 in services, 10% in manufacturing, 25% utilities and transportation, 100% in retail trade

Labor share would have risen more in finance and wholesale trade without the increase in concentration
Results
Decomposing changes in the labor share within and between firms

- Model prediction: the decrease in the labor share should have an important between-firm component since firms with low labor shares capture a rising fraction of value-added.

- Melitz and Polanec (2015) decomposition:

\[
S = \sum \omega_i S_i = \bar{S} + \sum (\omega_i - \bar{\omega})(S_i - \bar{S}) , \quad \omega_i = \frac{P_i Y_i}{\sum P_i Y_i}
\]

- Change between period 1 and 2 can be rewritten:

\[
\Delta S = \Delta \bar{S}_S + \Delta \left[ \sum (\omega_i - \bar{\omega})(S_i - \bar{S}) \right] + \omega_{X,1}(S_{S,1} - S_{X,1}) + \omega_{E,2}(S_{E,2} - S_{S,2})
\]

- Main component of labor fall: between component

\[\text{Fig}\]
Results
Between firm component and rising concentration

- Model prediction: the industries where concentration rose the most were those that experienced the largest fall in the between component of labor share.
- Regression of the between firm component on concentration.
- Results consistent with the model. 

Fig
Results
International evidence

Summary of results:

- Correlation of the labor share of each country with the others: from 0.7 to 0.9
- Decline in labor share in similar industries
- Countries with the greatest increase in concentration exhibited the sharpest falls in the labor share
- The fall in the labor share is primarily a between firm reallocation
Results
What explains the rise in concentration?

Technology

- Is rising concentration more prevalent in industries with rapid technological advances?
- 2 measures of technological change:
  - Patent-intensity
  - TFP
- Regression of these measures on concentration: positive correlation

→ Slowdown of technological diffusion?
  - Measure of technological diffusion: speed of patent citations
  - In industries where the speed of diffusion has slowed, concentration had risen by more
Results

What explains the rise in concentration?

Trade

- Relationship between changes in labor share and changes in Chinese import intensity?
- OLS + 2SLS using Autor, Dorn and Hanson (2013)
- Find a positive correlation between the rise of Chinese import and the increase in concentration
- Effect not precise

Other factors?

- Business dynamism, computer investment, routine task-replacing technical change,
- No robust correlation found
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Conclusion

- This paper provides a Superstar Firms model
- Empirical evidence consistent with the predictions of the model:
  - Increase in sales concentration over time
  - Negative correlation between concentration changes and changes in labor share
  - Main component of the fall in labor share is a between firm reallocation
  - Negative correlation between the reallocation component and concentration
  - Similar patterns in other OECD countries
- Further research: better understanding of the shocks that lead to superstar firms (what about inputs? outsourcing?)
Appendix
Decrease in labor share by industries

Panel A: Manufacturing
Panel B: Finance
Panel C: Services
Panel D: Utilities and Transportation
Panel E: Retail Trade
Panel F: Wholesale Trade

Notes: Each panel plots the overall payroll-to-sales ratio in one of the six major sectors covered by the U.S. Economic Census.
Appendix

Concentration in manufacturing

Panel A: Manufacturing

[Graph showing concentration in manufacturing from 1980 to 2010, with lines for Top 4 Concentration and Top 20 Concentration, measured for Sales and Employment]
Appendix

Size and labor share

Figure 5: The Relationship Between Firm Size and Labor Share

Notes: The dots indicate the coefficient estimates of a regression of a firm’s labor share on its share of overall sales in its four-digit industry. The regressions include all years available for that sector, and year fixed effects. The labor share is defined as the payroll-to-sales ratio in each sector. The blue lines represent the 95% confidence intervals.
Appendix
Size and labor share

Figure 2. Distribution of Labor Shares Across French Firms

Notes: This figure plots the cumulative distribution of firm-level labor shares ($\alpha_{n,j}(f)$), in tradable and in non-tradable sectors. The solid (red) lines correspond to the unweighted distribution and the (blue) circles to the weighted distribution, where firms’ weights are defined according to their share in aggregate value added. Calculated from French balance-sheet data together with the WIOD information on sectoral labor shares, for 2005.

From di Giovanni, Levchenko and Mejean (2017)
## Appendix

Concentration and labor share

### Table 3: Industry Regressions of the Change in the Payroll-to-Sales Ratio on the Change in Concentration, Different Sectors

<table>
<thead>
<tr>
<th>Sector</th>
<th>Stacked Five-Year Changes</th>
<th>Stacked Ten-Year Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CR4</td>
<td>CR20</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>-0.064**</td>
<td>-0.087**</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.024)</td>
</tr>
<tr>
<td>Retail</td>
<td>-0.036~</td>
<td>-0.085*</td>
</tr>
<tr>
<td></td>
<td>(0.021)</td>
<td>(0.037)</td>
</tr>
<tr>
<td>Services</td>
<td>-0.090</td>
<td>-0.127**</td>
</tr>
<tr>
<td></td>
<td>(0.057)</td>
<td>(0.037)</td>
</tr>
<tr>
<td>Wholesale</td>
<td>-0.035**</td>
<td>-0.039*</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>Finance</td>
<td>-0.230**</td>
<td>-0.265**</td>
</tr>
<tr>
<td></td>
<td>(0.083)</td>
<td>(0.080)</td>
</tr>
<tr>
<td>Utilities + Transport</td>
<td>-0.118**</td>
<td>-0.116**</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.044)</td>
</tr>
<tr>
<td>All combined</td>
<td>-0.076**</td>
<td>-0.093**</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.022)</td>
</tr>
</tbody>
</table>
Appendix

Melitz and Polanec decomposition

Figure 10: Melitz-Polanec Decomposition of the Change in Labor Share in Six Sectors

Notes: Each bar represents the cumulated sum of the Melitz-Polanec decomposition components calculated over adjacent five-year intervals. Table 5 reports the underlying year-by-year estimates.
Appendix

Between component and concentration

Figure 11: Regressions of the Components of the Change in Labor Share on the Change in Concentration