"Why Do Larger Firms have Lower Labor Shares?" by de Frahan, Lamadon, Meling and Mogstad, FLMM

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March 2022

Outline

Motivation

- In cross section, wage bill share of sales (and costs) decreases in firm size
- Autor, Dorn, Katz, Patterson & Van Reenen (2020, ADKPV) on US Census data: US Example
  - Growing importance of large "superstar" firms are a force pushing down aggregate labor share (regardless of precise reason for low labor share-firm size relationship); e.g. higher industrial concentration allocates more output to these low labor share firms
- ADKPV suggest firm product market power a reason that large firms have lower labor shares (larger/more productive firms have higher markups)
- FLMM consider this and also other mechanisms:
  - Labor market monopsony power: do bigger firms have larger markdowns (wage under marginal product of labor)?
  - Heterogeneous production technologies

Key Findings

- **Findings on labor supply curves by firm size**
  - Both employment *and* wages (average change in incumbents' individual pay) respond positively to sales shock
  - The wage response *declines* with firm size, whereas the employment response is more stable
    - ★ Large firms act like they face very elastic labor supply curve
    - ★ So cannot explain lower labor share with higher markdowns

Set - Up

- Imperfect competition in labor & product markets (wage and price posting, no strategic effects). Allow for non-constant returns to scale (CRTS) in technology
- Firm j chooses factor inputs (L and V) to maximize profits:

$$\Pi_j(A_j) = A_j F[\omega_j H(L_j) + (1 - \omega_j) G(V_j)] - \delta_j C(L_j) - V_j$$

- A_j = TFP
- L_j = Labor
- V_j = Non-labor input (treated as expenditure)
- $\delta_j C(L_j)$ = cost of labor, $C(L_j)$ upward sloping supply curve reflecting monopsony power
- $Y_j = A_j F[.]$ = Revenue function allows for product market power & non-CRTS
- ω_j Governs substitutability between factors

Aims

- Estimate labor supply curve $C(.)$
  - ΔW and ΔL from ΔA shocks (actually, sales shocks)
- Estimate factor "substitutability"
  - ΔL and ΔV
- Estimate revenue function elasticities
  - ΔY and $\Delta \Pi$
  - product market power (consumer demand elasticity)
  - Returns To Scale
- All of these subjects of vast literatures
  - Like authors, I will focus mainly on labor supply (less clear on identification of product market power & technology)

Data Context

- Extremely rich Norwegian data
- Universe of firm accounts 1999-2018 (43k firms)
- Worker data -wages, hours (4.5m workers)
- Procurement Data (5k first time winners)

Identification of labor supply elasticity

- Convexify methods their earlier papers on US data:
- **Internal Instruments** (follows Lamadon, Mogstad & Setzler, AER 2022; "LMS")
  - "Short run" sales shocks to instrument "long run" employment.
    - ★ IV is a dummy = 1 if firm sales growth > median sales growth in market-year (how is "market defined"?); $lnY_1 - lnY_0$
  - Compare $t = -2$ to $t = 2, 3$ for the effect of the shock on wages & jobs
    - ★ Compare $t = -3$ vs. $t = -2$ to check for pre-trend
- **External instruments** (follows Kroft, Lamadon, Mogstad & Setzler, 2021, "KLMS")
  - Winning a government procurement auction as a shock to revenue
- Allow elasticities to vary depending on firm size: Different from earlier papers - very ambitious!

Outline

(1) Big Picture Questions

- **What is the reason for lower labor shares in large firms?**
  - If smaller labor share in large firms is not monopsony, what is it?
  - Employer market power (ADKPV) and/or fixed costs/intangible capital?
- **Is it really wage posting? What about wage bargaining?**
  - Bargaining over surplus implies rents *per* worker
    - ★ Unions much stronger in Norway than US
    - ★ Do wages depend on (e.g.) sales per employee, not numbers of employees
- **What were the changes in Norway?:**
  - Do we see fall in aggregate labor share?
  - Do we see any of the seismic changes to business landscape we have seen in US & other OECD countries (e.g. UK - see de Loecker, Obermeier and Van Reenen, 2022)?
    - ★ Rise of superstar firms, increasing differences between firms, slowdown in productivity growth, etc.

(2) Identifying labor supply curve I

- **Methods**
  - Tracing out response of wages to employment shocks is attractive as a quite direct approach
  - Alternative methods to estimate monopsony :
    - ★ Hiring/Firing responses to wages (issue that flows are not stocks)
    - ★ Relating wages to labor market structure (e.g. local concentration, market shares face market definition issue)
    - ★ Employment response to wage shocks (minimum wage lit. - where is firm-level variation?)
- **Comment:** Please report average degree of monopsony power so we then compare to other papers including authors' earlier work on US
- **Note:** Estimating effect of employment on wages for firms of different employment levels very challenging task in face of multiple nonlinearities and measurement error.

(2) Identifying labor supply curve II

- Internal IV approach relies a lot on assumed dynamic processes
  - I like the visualization via event study (a la LMS). But:
  - Changes in stochastic assumptions can lead to instrument invalidity (e.g. AR(1) vs. random walk for TFP). Power of tests for such violation usually weak
  - Why discretize shock? Magnitude of shock could be quite different intensity small vs. large firms, makes LATE hard to assess
  - Method requires observing firms (& workers) for multiple periods (t-3 to t+3?).
    - ⋆ A main empirical point of Olley-Pakes was how this causes large selection bias on production function coefficients

(2) Identifying labor supply curve III

- Internal IV approach relies a lot on assumed dynamic processes
- So external IV preferable. But:
  - Procurement winners not really comparable to losers (they won for a reason)
  - "Just winners" vs. "just losers" design is more credible as in KLMS (ideally use discontinuity around bidding). But what do you use here?
  - **Suggestion:**Try technological innovations/patents as shocks (as in Van Reenen, 1996, or Kline et al, 2019)?
- **Idea**: Complementary design using Norway's institutions: e.g. min. wage & union contract changes generate pay shocks (heterogeneous across firms with different internal wage distributions)?

(3) Data Questions I: Wages

- Why not use hourly wages throughout instead of earnings? Usual worry is that earnings increase following size shock on hours margin. Cannot do much with US employer-employee data (LEHD, IRS), but Norway data excellent for this exercise
- You use wages of incumbents to avoid composition changes. But should also expect to see wage rises for entrant workers (in exactly same way if wage posting is really correct)

(3) Data Questions II: What is a "market?"

- Unclear on market definition of labor (and product) market
  - This is a key issue and difficult to do well
  - For a fixed market size, eventually a growing firm becomes a "company town", so it will have monopsony power
  - Market shares assumed irrelevant under your monopsonistic competition set up (unlike oligopsony models where market share matters)
- Different markets for different skill groups? (e.g. national for graduates, local for less skilled workers)
  - Maybe large firms are in national labor markets because more skilled workers (or have national wage policies - see Hazell, Patterson, Sarsons & Taska, 2022), so this is why their wages do not respond to local shocks

(3) Data Questions III: Intangibles/Fixed costs

- Large firms may use more inputs with high fixed costs like intangible capital (Bessen, 2019; Lashkari, Bauer & Boussard, 2020; Crouzet and Eberley, 2020; de Loecker et al, 2020; de Ridder, 2021), so labor share falls with size
  - Example of Walmart - high fixed costs of enterprise software
- Other Inputs
  - What about service intermediates (many fixed costs/intangible capital here like marketing, IP, consultancy, etc.)?
  - V seems to be scalar expenditure. Is it materials?
  - What are you doing with capital?
- Given richness of Norwegian data, you could do a lot more here

Outline

Summary

- Impressive program of research from a great team pushing boundaries on imperfect competition in labor & product markets
- Perhaps unsurprisingly, monopsony power cannot (easily) account for lower lab share of large firms
- Other forces still on the table - product market power; technology.What's the conclusion?
- Look forward to seeing the next stage!

Outline

Production Function Estimation

- A lot of pioneering work on estimating production functions in face of problems you have here by Tor Klette on Norwegian data (who died tragically early)
  - Klette and Griliches (1996) PF with monopolist competition & endogeneity
  - Klette and Johanson (1998)
  - Klette (1996)
- Would be good to link what you do with production function literature (Olley Pakes style to Blundell & Bond)

Responsiveness to shocks

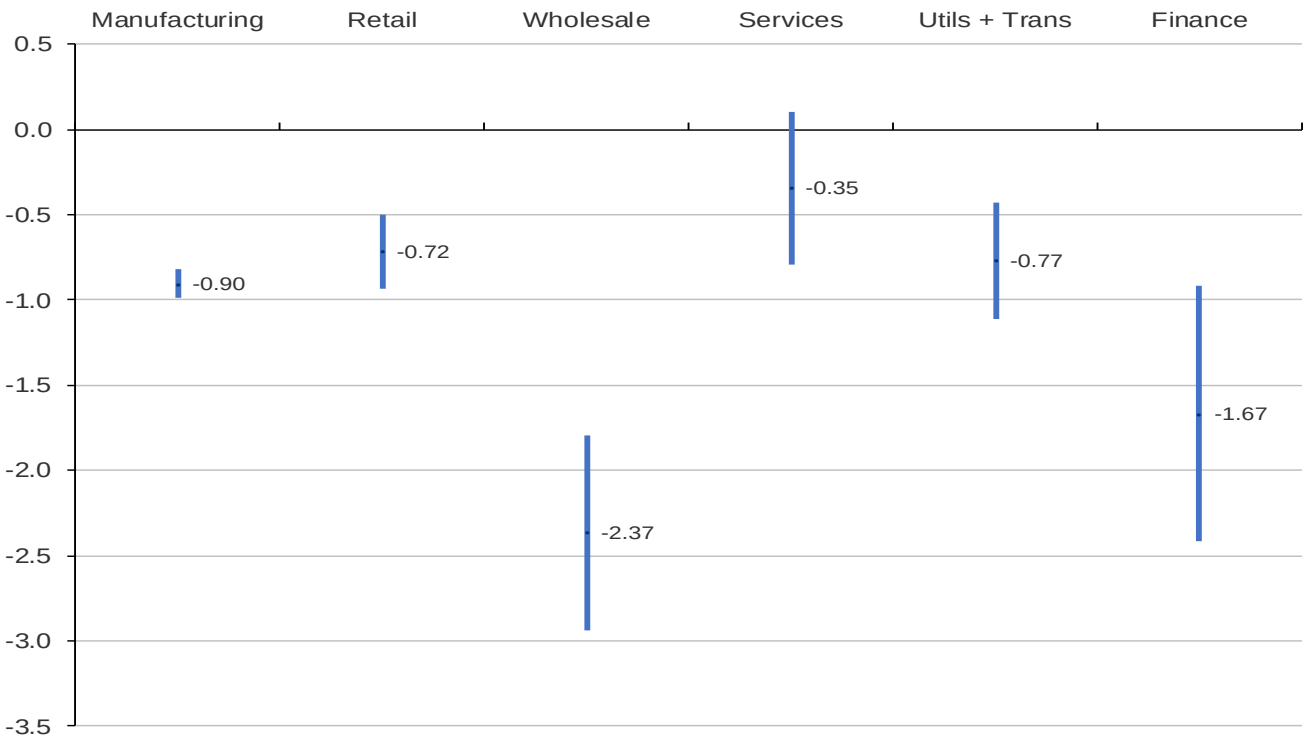
- The wage response *declines* with firm size (from ~5% to ~2%), whereas the employment response is "stable" (actually seems to rise from 15 log points to 20 log points)

EXAMPLE FROM US ECNOMIC CENSUS

Back

Larger Firms Have Lower Labor Shares (within SIC4 industry)

$$LSHARE_{ijt} = \gamma_t + \beta SIZE_{ijt} + \varepsilon_{ijt}$$



Source: US Economic Census 1982-2012; Autor, Dorn, Katz, Patterson & Van Reenen (2020,, Figure V). Establishments group into firm *i* by SIC4 *j* in year *t*