SUPERSTARS OR SUPERVILLAINS?
LARGE FIRMS IN THE SOUTH KOREAN GROWTH MIRACLE

Jaedo Choi   Andrei A. Levchenko   Dimitrije Ruzic   Younghun Shim

Discussed by Seula Kim

SNU-UC San Diego Joint Webinar

Oct 21, 2024

Summary

This Paper

Q: What is the role of top sales firms and market concentration in Korean economy?

THIS PAPER

Q: What is the role of top sales firms and market concentration in Korean economy?

- Develop a quantitative macroeconomic model featuring:
    - Heterogeneous firm productivity and export demand (Melitz 2003)
    - Heterogeneous distortions (Hsieh and Klenow 2009)
    - Oligopolistic and oligopsonistic competition (Atkeson and Burstein 2008; Berger et al. 2022)

This Paper

Q: What is the role of top sales firms and market concentration in Korean economy?

- Develop a quantitative macroeconomic model featuring:
  - Heterogeneous firm productivity and export demand (Melitz 2003)
  - Heterogeneous distortions (Hsieh and Klenow 2009)
  - Oligopolistic and oligopsonistic competition (Atkeson and Burstein 2008; Berger et al. 2022)

- Use firm-level data from South Korea to extract key primitives:
  - Productivity, distortions, export demand

- Decompose sectoral concentration into:
  - Top-3 firms' productivity, foreign market access, top firm turnover (entry/exit), sectoral reallocation

- Quantify the contribution of top-3 firms to real GDP and welfare

MAIN FINDINGS

MAIN FINDINGS

1. Top-3 firms have different primitives:

    i) higher TFP level and growth

    ii) faster increase in foreign demand

    iii) no long-run trend in distortions

Main Findings

1. Top-3 firms have different primitives:
    - i) higher TFP level and growth
    - ii) faster increase in foreign demand
    - iii) no long-run trend in distortions

2. Sectoral concentration has been rising
    - · 57% accounted for by sectoral reallocation
    - · 43% driven by within-sector increase in the top-3 firm shares (half coming from churning)

Main Findings

1. Top-3 firms have different primitives:
    i) higher TFP level and growth
    ii) faster increase in foreign demand
    iii) no long-run trend in distortions

2. Sectoral concentration has been rising
    - 57% accounted for by sectoral reallocation
    - 43% driven by within-sector increase in the top-3 firm shares (half coming from churning)

3. Counterfactual of having the top-3 firms w/average shock process
    - Market concentration is reduced
    - Real GDP in 2011: 15% ↓
    - NPV of Welfare over 1972-2011: 4% ↓
    - Mostly from productivity shocks
    - Samsung Electronics: real GDP 6.4%, welfare 1.04% ↓; Hyundai Motors: real GDP 1.1%, weflare 0.5% ↓

Comments

OVERVIEW

Super interesting & well-written paper!

- Model + data: carefully estimating firm primitives and effectively identifying the main sources of market concentration

- Quantify the implications of top-3 firms and market concentration in the macroeconomy

OVERVIEW

Super interesting & well-written paper!

- Model + data: carefully estimating firm primitives and effectively identifying the main sources of market concentration
- Quantify the implications of top-3 firms and market concentration in the macroeconomy

Some comments:

1. Validation of the Model & Estimates
2. Revisiting the Counterfactual Analysis
3. The Role of Firm Entry and Turnover
4. Further Investigation of the Top Firms

VALIDATION OF THE MODEL & ESTIMATES

$$\max_{y_{fj}^H, y_{fj}^F, l_{fj}, k_{fj}, m_{fj}} \quad p_{fj}^H y_{fj}^H + p_{fj}^F y_{fj}^F - (1 + \tau_{fj}^L) w_{fj} l_{fj} - (1 + \tau_{fj}^K) \rho k_{fj} - P_j^M m_{fj}$$

subject to

$$\underbrace{y_{fj} = a_{fj} l_{fj}^{\gamma_j^L} k_{fj}^{\gamma_j^K} m_{fj}^{\gamma_j^M}}_{\text{production}}, \quad \underbrace{y_{fj}^H = \frac{1}{F_j}(p_{fj}^H)^{-\sigma}(p_j^H)^{\sigma - \rho} P_j^{\rho - 1} E_j}_{\text{domestic demand}}, \quad \underbrace{y_{fj}^F = (p_{fj}^F)^{-\sigma} D_{fj}}_{\text{foreign demand}}, \quad \underbrace{l_{fj} = \frac{1}{F_j} w_{fj}^{-\eta} W_j^{\theta - \eta} W^{-\theta} L}_{\text{labor supply}}$$

VALIDATION OF THE MODEL & ESTIMATES

$$\max_{y_{fj}^H, y_{fj}^F, l_{fj}, k_{fj}, m_{fj}} \quad p_{fj}^H y_{fj}^H + p_{fj}^F y_{fj}^F - (1 + \tau_{fj}^L) w_{fj} l_{fj} - (1 + \tau_{fj}^K) \varphi k_{fj} - P_j^M m_{fj}$$

subject to

$$\underbrace{y_{fj} = a_{fj} l_{fj}^{\gamma_j^L} k_{fj}^{\gamma_j^K} m_{fj}^{\gamma_j^M}}_{\text{production}}, \quad \underbrace{y_{fj}^H = \frac{1}{F_j}(p_{fj}^H)^{-\sigma}(p_j^H)^{\sigma-\rho} P_j^{\rho-1} E_j}_{\text{domestic demand}}, \quad \underbrace{y_{fj}^F = (p_{fj}^F)^{-\sigma} D_{fj}}_{\text{foreign demand}}, \quad \underbrace{l_{fj} = \frac{1}{F_j} w_{fj}^{-\eta} W_j^{\theta-\eta} W^{-\theta} L}_{\text{labor supply}}$$

- Heterogeneous firm productivity a_{fj}

- Heterogeneous foreign demand D_{fj}

- Labor, capital distortions τ_{fj}^L, τ_{fj}^K

VALIDATION OF THE MODEL & ESTIMATES

$$\max_{y_{fj}^H, y_{fj}^F, l_{fj}, k_{fj}, m_{fj}} \quad p_{fj}^H y_{fj}^H + p_{fj}^F y_{fj}^F - (1 + \tau_{fj}^L) w_{fj} l_{fj} - (1 + \tau_{fj}^K) \varphi k_{fj} - P_j^M m_{fj}$$

subject to

$$\underbrace{y_{fj} = a_{fj} l_{fj}^{\gamma_j^L} k_{fj}^{\gamma_j^K} m_{fj}^{\gamma_j^M}}_{\text{production}}, \quad \underbrace{y_{fj}^H = \frac{1}{F_j}(p_{fj}^H)^{-\sigma}(p_j^H)^{\sigma-\rho} P_j^{\rho-1} E_j}_{\text{domestic demand}}, \quad \underbrace{y_{fj}^F = (p_{fj}^F)^{-\sigma} D_{fj}}_{\text{foreign demand}}, \quad \underbrace{l_{fj} = \frac{1}{F_j} w_{fj}^{-\eta} W_j^{\theta-\eta} W^{-\theta} L}_{\text{labor supply}}$$

- Heterogeneous firm productivity a_{fj}

- Heterogeneous foreign demand D_{fj}

- Labor, capital distortions τ_{fj}^L, τ_{fj}^K

$\Rightarrow$ $\{a_{fj} \ D_{fj}, \tau_{fj}^L, \tau_{fj}^K\}$ are recovered w/ the model solutions+data

Validation of the Model & Estimates

A. a_{fjt}

B. D_{fjt}

C. $1 + \tau^L_{fjt}$

D. $1 + \tau^K_{fjt}$
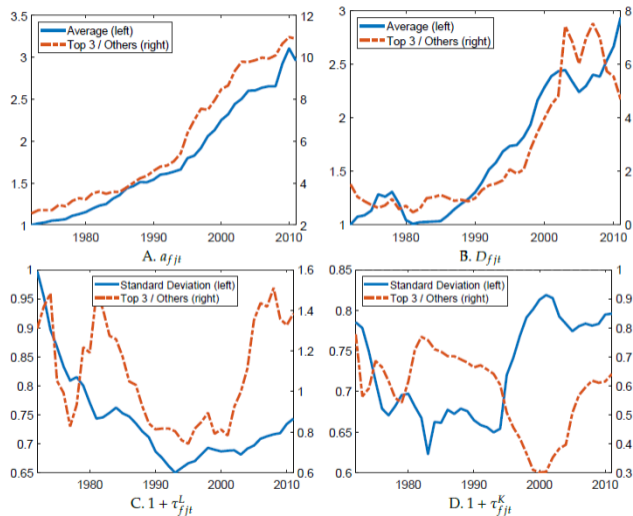
Validation of the Model & Estimates

- How can we validate the model and the estimates?

VALIDATION OF THE MODEL & ESTIMATES

- How can we validate the model and the estimates?

- "The Distortion that Ate the Residual" (Haltiwanger et al. 2019)

  : any unmodeled demand or cost conditions would be misinterpreted as distortions

  - Demand shifters, factor quality, adjustment costs
 - Heterogeneity in factor demand and elasticities

VALIDATION OF THE MODEL & ESTIMATES

- How can we validate the model and the estimates?

- "The Distortion that Ate the Residual" (Haltiwanger et al. 2019)

  : any unmodeled demand or cost conditions would be misinterpreted as distortions

  - Demand shifters, factor quality, adjustment costs
  - Heterogeneity in factor demand and elasticities

- Any relationships b/w measured a_{fj}, D_{fj}, τ_{fj}^{L}, τ_{fj}^{K}?

  - Can look into their corr. w/ firm age, size, growth, exit, etc. (by time, industry, cohort)
  - Any corr. b/w distortions & fundamentals?

    (e.g., size-dependent subsidy or regulation, subsidies to exporters, etc.)

VALIDATION OF THE MODEL & ESTIMATES

- What are τ_{fj}^L, τ_{fj}^K? How to think about them?

  · What happened in 1980s, 2000s?

  · Any candidates to fix our ideas?

    (e.g., government interventions favoring certain firms or sectors)

- Investigate historical policy changes and their corr. w/ τ_{fj}^L, τ_{fj}^K

REVISITING THE COUNTERFACTUAL ANALYSIS

A. Top 3 Mfg. Concentration Ratio (%) B. Real GDP Relative to Data (%)
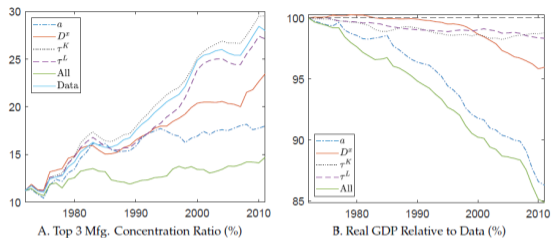
Shocks	All shocks	Productivity a_{fjt}	Foreign demand D^f_{fjt}	Labor distortions $1 + \tau^L_{fjt}$	Capital distortions $1 + \tau^K_{fjt}$
	(1)	(2)	(3)	(4)	(5)
Panel A. Top 3 firms within sectors					
△ Welfare (%)	−4.10	−2.79	−0.68	−0.69	−0.54
Panel B. Samsung Electronics					
△ Welfare (%)	−1.04	−0.96	−0.38	−0.01	−0.12
Panel C. Hyundai Motors					
△ Welfare (%)	−0.49	−0.44	−0.08	−0.04	−0.02

$\Longrightarrow$ a_{fj} D_{fj} are effective, but not so much for τ^L_{fj}, τ^K_{fj} (despite a large variation seen before)

REVISITING THE COUNTERFACTUAL ANALYSIS

- Construct counterfactual growth for top-3 firms

$$X_{fjt} = (1 + \hat{X}^a_{jt})X^c_{fj,t-1} \text{ for } x_{fjt} \in \{a_{fjt}, D_{fjt}, 1 + \tau^L_{fjt}, 1 + \tau^K_{fjt}\}$$

where $\hat{X}^a_{jt} = \sum_{f \in F^a_{jt} \cap F^{cont,nz}_{jt}} \dfrac{X_{fjt} - X_{fj,t-1}}{2(X_{fjt} + X_{fj,t-1})}$: unweighted avg. growth amongst continuers by age bin

REVISITING THE COUNTERFACTUAL ANALYSIS

- What are the growth diffs. b/w top vs non-top firms?

  - Previous figures compared the levels over time

  - Systematically "increasing" dispersion in levels of a_{fjt}, D_{fjt}, but not so much for τ^L_{fjt}, τ^K_{fjt}?

Revisiting the Counterfactual Analysis

- What are the growth diffs. b/w top vs non-top firms?

  - Previous figures compared the levels over time

  - Systematically "increasing" dispersion in levels of a_{fjt}, D_{fjt}, but not so much for τ^L_{fjt}, τ^K_{fjt}?

- Does the growth vary and matter for τ^L_{fjt}, τ^K_{fjt}? Why not using levels?

REVISITING THE COUNTERFACTUAL ANALYSIS

- What are the growth diffs. b/w top vs non-top firms?
  - Previous figures compared the levels over time
  - Systematically "increasing" dispersion in levels of a_{fjt}, D_{fjt}, but not so much for τ^L_{fjt}, τ^K_{fjt}?

- Does the growth vary and matter for τ^L_{fjt}, τ^K_{fjt}? Why not using levels?

- Any systematic diffs. in τ^L_{fjt}, τ^K_{fjt} by age?
  - Depending on how we interpret them, the comparison group should be different
  - Average across all vs. by age bins?

Revisiting the Counterfactual Analysis

- What are the growth diffs. b/w top vs non-top firms?
  - Previous figures compared the levels over time
  - Systematically "increasing" dispersion in levels of a_{fjt}, D_{fjt}, but not so much for τ^L_{fjt}, τ^K_{fjt}?

- Does the growth vary and matter for τ^L_{fjt}, τ^K_{fjt}? Why not using levels?

- Any systematic diffs. in τ^L_{fjt}, τ^K_{fjt} by age?
  - Depending on how we interpret them, the comparison group should be different
  - Average across all vs. by age bins?

- How would the sample coverage affect the imputed series and implications?
  - KIS-VALUE firms are restricted to asset>2.3 mil. USD
  - Missing firms (mostly small) may affect the imputed growth and implication
  - What if we consider small but productive firms?

The Role of Firm Entry and Turnover

- Current model and analysis abstracts from firm entry or turnover
  - The number of oligopolistic firms is fixed (N)
  - No effective firm entry or exit
 - Current exercise is only through fringe firm adjustment

The Role of Firm Entry and Turnover

- Current model and analysis abstracts from firm entry or turnover

  · The number of oligopolistic firms is fixed (N)

  · No effective firm entry or exit

  · Current exercise is only through fringe firm adjustment

- How does firm entry and dynamics interact with top firm activities and market concentration?

- How would the implications be affected with endogenous firm entry and turnover?

  ⇒ The model can extend firm entry and exit

  ⇒ Counterfactual analysis on firm entry, exit, reallocation, and welfare through them?

Further Investigation of the Top Firms

- Who are those top-3 firms? Basic statistics?

  - Age, size, revenue, TFPR, etc.

  - By continuers, entrants, exiters

  - Specific cohorts of firms? (e.g., HCI policy in 1970s)

  - In specific industries?

  - Dealing with multi-industry firms?

- Any anecdotal examples about their growth or relevant policy?

FURTHER INVESTIGATION OF THE TOP FIRMS
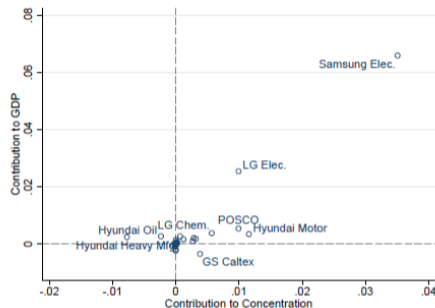
- Heterogeneity in top firms: what drives superstars vs. supervillains vs. others?

  · What is the distribution of $\{a_{fj}\ D_{fj}, \tau^L_{fj}, \tau^K_{fj}\}$ across them over time?

  · What is the source of their heterogeneity and distortions?

  · Any role of industrial policy?

Conclusion

CONCLUSION

This paper:

- Documents a novel fact about rising concentration in South Korea

- Recover firm primitives & disentangle the part attributing to the rise in concentration

- Quantify the role of top firms in real GDP and welfare

- Conclude the rise of large firms as a positive phenomenon!

CONCLUSION

This paper:

- Documents a novel fact about rising concentration in South Korea

- Recover firm primitives & disentangle the part attributing to the rise in concentration

- Quantify the role of top firms in real GDP and welfare

- Conclude the rise of large firms as a positive phenomenon!

Review:

- Promising paper: important question, tractable modeling, insightful results and implications

- Model and estimates validation need to be discussed

- Quantification analysis can be explored in depth

- Extension w/ firm entry, turnover

- Further details about top firms and summary statistics may help