Kaldor and Piketty’s Facts:
The Rise of Monopoly Power in the United States

Eggertsson, Robbins, Wold
Discussion by Maarten De Ridder

15 October 2020
Five puzzling trends

1. Financial wealth (% of income) has increased, capital stock has stagnated
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2. Tobin’s Q has increased, now permanently above 1
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4. Both the capital and the labor share in income have decreased

5. Investment-to-output has decreased
Explaination: market power

Markups for U.S. listed firms (Compustat data, estimates from De Loecker, Eeckhout, Unger 2020)
Explanation: interest rates

Natural real interest rate for the U.S. (estimates from Holston, Laubach, Williams 2017)
This Paper

- Build a DSGE model, minimal changes from the standard Neoclassical model
  - Dixit-Stiglitz monopolistic competition with exogenous entry and exit
  - Profits are traded on financial markets (asset pricing)
  - Epstein - Zin preferences for realistic equity premium i.c.w. long-term risk
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- Calibrate the model to match initial moments for U.S. economy (1970)

- Assess effect of a jump in markups and interest rates on model's predictions
  - Compare ergodic mean of variables before and after shock
Intuition

Increase in markups:

- Increase in pure profits ⇒ increase in stock prices ⇒ financial wealth up ✓
- Increase in pure profits ⇒ capital and labor income in (% of GDP) declines ✓
- Increase in pure profits ⇒ Wealth > Capital ⇒ \( Q_t = W_t - K_t \) above 1 ✓
- Monopolist chooses lower \( I \) such that marginal product of capital > \( r \) ✓

Decline in interest rates:
- MPK has been constant ⇒ rise of \( \mu \) raises MPK; fall of \( r \) offsets ✓
- Contributes quantitatively to increase in financial wealth, Tobin’s \( Q \) ✓
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## Results

<table>
<thead>
<tr>
<th>Moment</th>
<th>Δ Model</th>
<th>Δ Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wealth-to-output</td>
<td>0.77</td>
<td>1.10</td>
</tr>
<tr>
<td>Capital-to-output</td>
<td>0.24</td>
<td>0.31</td>
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<tr>
<td>Tobin’s Q</td>
<td>0.20</td>
<td>0.26</td>
</tr>
<tr>
<td>Real interest rate (pp)</td>
<td>-2.16</td>
<td>-2.00</td>
</tr>
<tr>
<td>Average return to capital</td>
<td>-0.19</td>
<td>-0.14</td>
</tr>
<tr>
<td>Profit share (pp)</td>
<td>7.45</td>
<td>7.66</td>
</tr>
<tr>
<td>Labor share (pp)</td>
<td>-5.45</td>
<td>-5.51</td>
</tr>
<tr>
<td>Capital share (pp)</td>
<td>-2.00</td>
<td>-2.15</td>
</tr>
<tr>
<td>Investment-to-output (pp)</td>
<td>-0.57</td>
<td>-4.09</td>
</tr>
<tr>
<td>Equity premium (pp)</td>
<td>2.24</td>
<td>0 to 2</td>
</tr>
</tbody>
</table>

Change in ergodic mean of moments relating the 5 economic puzzles versus change in data

Eggertsson et al. (2020) Table 6. Targets: interest rates, markups (profit share)
Discussion

- Inequality versus representative agent
- Note: model versus data predictions on concentration
- Markups: diagnosis or symptom?
Inequality versus representative agent

The effect of markups is analyzed in a representative agent framework.
Inequality versus representative agent

The effect of markups is analyzed in a representative agent framework.

Important feature of markup rise: unequal across firms:

- Markup dispersion has increased: rise is concentrated in top deciles.
- Reallocation: markups increased because high-markup firms became larger.
- Raises questions about welfare effects and mechanisms.
Markup dispersion

Markups for U.S. listed firms (Compustat data, estimates from De Loecker, Eeckhout, Unger 2020)
Dispersion matters for quantification:
Markup dispersion

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- Heterogeneous markups: affects *allocative efficiency*
- Loss from misallocation reduces $Y \Rightarrow$ affects profitability, asset prices, etc.
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- Heterogeneous markups: affects allocative efficiency
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.. but it also tells something about mechanisms
Markups and growth

Key mechanism:

- In the model: $\frac{\partial y_i}{\partial \mu_i} < 0$ hence lower investment, capital
Markups and growth

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In the model:

$$\frac{\partial y_i}{\partial \mu_i} < 0$$

In the data:

$$\frac{\partial y_i}{\partial \mu_i} > 0$$

Markups from replication of De Loecker, Eeckhout, Unger (2020)

Maarten De Ridder (discussant)
Markups and growth

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$$\frac{l_{it}}{Y_{it}} = \phi_i + \psi_t + \beta \ln \mu_{it} + \varepsilon_{it}$$

<table>
<thead>
<tr>
<th>In $\mu_{it}$</th>
<th>0.059***</th>
<th>0.032***</th>
<th>0.037***</th>
<th>0.035***</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.006)</td>
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</table>

<table>
<thead>
<tr>
<th>Fixed effects</th>
<th>No</th>
<th>Firm</th>
<th>Firm &amp; Year</th>
<th>Firm &amp; Ind-year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td>123,915</td>
<td>123,915</td>
<td>123,915</td>
<td>123,915</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.015</td>
<td>0.002</td>
<td>0.022</td>
<td>0.052</td>
</tr>
</tbody>
</table>

Firm-clustered standard errors in parentheses. 1% winsorization. Compustat data.

Markups from replication of De Loecker, Eeckhout, Unger (2020)
Markups and growth

Key mechanism:

- In the model: \( \frac{\partial y_i}{\partial \mu_i} < 0 \) hence lower investment, capital

- In the data: \( \frac{\partial y_i}{\partial \mu_i} > 0 \Rightarrow \) high markup firms are expanding

\[
\Delta \left( \frac{I_{it}}{Y_{it}} \right) = \phi_i + \psi_t + \beta \Delta \ln \mu_{it} + \epsilon_{it}
\]

<table>
<thead>
<tr>
<th>( \Delta \ln \mu_{it} )</th>
<th>-0.004***</th>
<th>-0.004***</th>
<th>-0.004*</th>
<th>-0.001</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.002)</td>
<td>(0.002)</td>
</tr>
</tbody>
</table>

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Markups from replication of De Loecker, Eeckhout, Unger (2020)
Reallocation

Markups for U.S. listed firms (Compustat data, estimates from De Loecker, Eeckhout, Unger 2020)
Reallocation

Productivity: Efficiency of Allocation versus Technology (estimates from Baqae and Farhi 2020)
Discussion

- Inequality versus representative agent

- **Note:** model versus data predictions on concentration

- Markups: diagnosis or symptom?
Predictions for concentration

Introduce simple form of heterogeneity: low $a_l$ and high productivity $a_h$ firms
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- Relative output of high productivity firms:

\[
\frac{y_h}{y_l} = \left( \frac{a_h}{a_l} \right)^{\Lambda_t}
\]
Predictions for concentration

Introduce simple form of heterogeneity: low $a_l$ and high productivity $a_h$ firms

- Relative output of high productivity firms:
  \[
  \frac{y_h}{y_l} = \left( \frac{a_h}{a_l} \right)^{\Lambda_t}
  \]

- Relative output productive firms increases in elasticity of substitution $\Lambda_t$
  $\Rightarrow$ negative correlation between markups and concentration
Concentration

Fraction of sales and employment by top 4 or 20 firms.

Source: Autor et al (2017) based on U.S. Census
Markups and concentration

<table>
<thead>
<tr>
<th>Inverse markup</th>
<th>$\mu_{s,t}^{-1}$</th>
<th>$\mu_{s,t}^{-1}$</th>
<th>$\mu_{s,t}^{-1}$</th>
<th>$\mu_{s,t}^{-1}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$HHI_{s,t}$</td>
<td>-.73***</td>
<td>-.73***</td>
<td>-0.43***</td>
<td>-0.44***</td>
</tr>
<tr>
<td></td>
<td>(0.23)</td>
<td>(0.23)</td>
<td>(0.11)</td>
<td>(0.11)</td>
</tr>
<tr>
<td>Year F.E.</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Sector F.E.</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Sectors</td>
<td>504</td>
<td>504</td>
<td>504</td>
<td>504</td>
</tr>
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</table>

Sector-level relationship between concentration and average markups.

Discussion

- Inequality versus representative agent

- Note: model versus data predictions on concentration

- Markups: diagnosis or symptom?
Diagnosis or symptom?

Two shocks: increase in **markups** and fall in **interest rates**
Diagnosis or symptom?

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Could these be joint symptoms rather than a diagnosis?

- Recent literature: Jointly explains trends in market power, labor share, capital share, business dynamism, productivity growth
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- Recent literature: Jointly explains trends in market power, labor share, capital share, business dynamism, productivity growth
  - Software/intangibles: Aghion Bergeaud Boppart Klenow Li (’19); De Ridder
  - Anti-competitive behavior: Akcigit and Ates (2019)
  - Low interest rates: Liu Mian and Sufi (2019),
Diagnosis or symptom?

Market Power and Innovation in the Intangible Economy (2019):

- Shock is the rise of **intangible inputs** in production
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Fixed costs across sectors

(a) France
Sales-weighted average of fixed costs as a percentage of total costs

(b) United States

Maarten De Ridder (discussant)
Fixed costs and markups

\[ \mu_{it} = \alpha_i + \psi_t + \gamma \cdot \frac{f_{it}}{tC_{it}} + \beta' g(p_{it} \cdot y_{it}) + \epsilon_{ijt}, \]

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Fixed-Cost Share</td>
<td>1.66*** (0.031)</td>
<td>1.28*** (0.002)</td>
<td>0.67*** (0.224)</td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.62</td>
<td>0.52</td>
<td>140,861</td>
</tr>
<tr>
<td>Observations</td>
<td>125,231</td>
<td>9,457,679</td>
<td></td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Firm fixed effects</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Size polynomial</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Firm-clustered errors in brackets. Data: Compustat, FARE-FICUS merged with EAE. 2SLS IV: third-degree polynomial in the ratio of software to sales (F-stat 16.6).
Markups and technology

Trends in markups at high and low-IT U.S. listed firms.

Source: Van 't Klooster (2020) based on replication of De Loecker, Eeckhout, Unger (2020)
Fixed costs and sales growth

\[ \Delta(p_{it} \cdot y_{it}) = \alpha_i + \psi_t + \gamma \cdot \frac{f_{it-1}}{tc_{it-1}} + \beta' g(p_{it-1} \cdot y_{it-1}) + \varepsilon_{ijt}, \]

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lagged Fixed-Cost Share</td>
<td>.125*** (.009)</td>
<td>.514*** (.002)</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.02</td>
<td>0.05</td>
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<tr>
<td>Observations</td>
<td>111,397</td>
<td>8,670,007</td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Firm fixed effects</td>
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<td>✓</td>
</tr>
<tr>
<td>Size polynomial</td>
<td>✓</td>
<td>✓</td>
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## Balanced Growth Path

<table>
<thead>
<tr>
<th></th>
<th>Δ Model</th>
<th>Δ Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Growth and Innovation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productivity growth rate</td>
<td>-0.4 pp</td>
<td>-0.9 pp</td>
</tr>
<tr>
<td>Aggregate R&amp;D over value added</td>
<td>41.9%</td>
<td>64.5%</td>
</tr>
<tr>
<td><strong>Dynamism</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entry rate (target)</td>
<td>-5.8 pp</td>
<td>-5.8 pp</td>
</tr>
<tr>
<td>Reallocation rate</td>
<td>-42.0%</td>
<td>-23%</td>
</tr>
<tr>
<td><strong>Market Power</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Markup</td>
<td>21.8 pt</td>
<td>30 pt</td>
</tr>
<tr>
<td><strong>Cost Structure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intangibles over value added (target)</td>
<td>1.5 pp</td>
<td>2.1 pp</td>
</tr>
<tr>
<td>Average fixed-cost Share</td>
<td>3.8 pp</td>
<td>10.6 pp</td>
</tr>
</tbody>
</table>

↑ denotes increase, ↓ denotes decrease

Δ data: change in U.S. data for 2016 vs 1980.
Diagnosis or symptom?

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**Productivity growth fell > 1 percentage point**
  - Explains around half the real rate decline (log utility)

Note: this is not a measurement story ⇒ see Crouzet and Eberly (later!)
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Summary

- Clear analysis of the powerful effect that rise of markups can have

- Diverse trends both qualitatively and quantitatively explained
  - Model explains puzzles, but maintains tractability
  - Combines real factors with asset pricing; model for Tobin’s Q

- Representative agent approach
  - Model does not analyse effect of heterogeneity in markup trends
  - Are markups endogenous?