Motivation

R. E. Hall, 2004, Quarterly Journal of Economics

(...) rents arising from adjustment costs are relatively small and are not an important part of the explanation of the large movements of the values of corporations in relation to the reproduction costs of their capital.
Motivation

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Growing literature

- Fama and French (1997), Hou and Robinson (2006)
- Bustamante and Donangelo (2014), van Binsbergen (2007)
Plan

1. Summary

2. Markup Volatility

3. Predictability, Markups and the Labor Share

4. Industrial Organization and Asset Pricing
This Paper

Markups predict returns
Markups predict returns

Asset Pricing with Markups
- Monopoly power: firms rent
- Variation in asset prices from varying monopoly rents
- Focus on the extensive margin of investment rather than classic capital investment at the intensive margin
This Paper

Markups predict returns

Asset Pricing with Markups

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Markups amplify booms and busts

- RBC model: economy goes through good and bad times
  - Bad times: low productivity, low investment, low firm entry
  - Good times: high productivity, high investment, high firm entry

How do markups amplify business cycles?
The Role of Markups for Business Cycles

Good times
- High productivity
- More production
- More new firms enter the economy
- More competition

Bad times
- Low productivity
- Low production
- Low level of firm entry
- Low competition
## The Role of Markups for Business Cycles

<table>
<thead>
<tr>
<th>Good times</th>
<th>Bad times</th>
</tr>
</thead>
<tbody>
<tr>
<td>High productivity</td>
<td>Low productivity</td>
</tr>
<tr>
<td>More production</td>
<td>Low production</td>
</tr>
<tr>
<td>More new firms enter the economy</td>
<td>Low level of firm entry</td>
</tr>
<tr>
<td>More competition</td>
<td>Low competition</td>
</tr>
<tr>
<td><strong>Markups fall</strong></td>
<td><strong>Markups rise</strong></td>
</tr>
<tr>
<td>▶ low price distortions</td>
<td>▶ high price distortions</td>
</tr>
</tbody>
</table>
The Role of Markups for Business Cycles

Good times

\[ p(q) \]

\[ MC \]

\[ q_c \]
The Role of Markups for Business Cycles

Good times

Bad times

$p$ $q$

$p$ $q$

$p$ $q$

$p$ $q$

$P(q)$

$MC$

$MC$

$q_c$

$q_m$

$q_c$
The Role of Markups for Business Cycles

Good times
- High productivity
- More production
- More new firms enter the economy
- More competition
- Markups fall
  - low price distortions
- Low profits

Bad times
- Low productivity
- Low production
- Low level of firm entry
- Low competition
- Markups rise
  - high price distortions
- High profits

Countercyclical Profits: what about firms risk premium?
Final Good Producer $Y_t$

Intermediate Producers

Producing $X_{i,j}$ at markup $\phi_{i,j}$

Additional R&D factor $Z_{i,j}$

Capital

Labor

R&D

New Firm Entry

Consumption $C_t$
Final Good Producer $Y_t$

- Sector 2
- Sector 1

Intermediate Producers producing $X_{i,j}$ at markup $\phi_{i,j}$

Additional R&D factor $Z_{ij}$

Capital Labor New Firm Entry Consumption $C_t$
Final Good Producer $Y_t$

- Sector 2
- Sector 1
- Sector 3
Final Good Producer $Y_t$

Sector 4

Sector 2

Sector 1

Sector 3

Intermediate Producers Producing $X_{i,j}$ at markup $\phi_{i,j}$

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Capital Labor R&D New Firm Entry Consumption $C_t$
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Sector 4

Sector 2

Sector 1

Sector 3

Sector 5

Intermediate Producers Producing $X_{i,j}$ at markup $\phi_{i,j}$

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Capital Labor R&D New Firm Entry Consumption $C_t$
Final Good Producer $Y_t$

- Sector $j$
- Sector 2
- Sector 1
- Sector 3
- Sector 5

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$N_j$ Intermediate Producers
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$\text{Final Good Producer } Y_t$
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Consumption $C_t$

Sector $j$

Capital

R&D

Labor

New Firm Entry
Final Good Producer $Y_t$

$N$ Intermediate Producers Producing $X(i)$ at markup $\mu(N)$
Only Capital

New Firm Entry

Capital
Final Good Producer $Y_t$

$N$ Intermediate Producers Producing $X(i)$ at **markup** $\mu(N)$
Only Capital

Capital

New Firm Entry

Countercyclical Profits

Pro-cyclical Demand

Countercyclical Profits

Countercyclical Profit Volatility

Fixed Valuation (free entry condition)

Counter-cyclical Demand Volatility

Riskier Firms
Final Good Producer $Y_t$

$N$ Intermediate Producers
Producing $X(i)$ at markup $\mu(N)$
Only Capital

New Firm Entry

$\Rightarrow$ Riskier Firms

Countercyclical Profits

Pro-cyclical Demand

Capital
Final Good Producer $Y_t$

$N$ Intermediate Producers Producing $X(i)$ at markup $\mu(N)$ Only Capital

Capital

New Firm Entry

Countercyclical Profit Volatility
$N$ Intermediate Producers Producing $X(i)$ at markup $\mu(N)$ Only Capital

Final Good Producer $Y_t$

Capital

New Firm Entry

Countercyclical Profit Volatility

Fixed Valuation (free entry condition)
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Fixed Valuation (free entry condition)

Counter-cyclical Demand Volatility
$\Rightarrow$ Riskier Firms
Model Summary

Firms’ cash-flow dynamics

- Monopolistic firms:
  - free entry conditions: perfectly elastic supply
  - valuation driven by risk-free rate ($q = 1$)

- Capital good producers
  - demand for capital falls
  - low cash-flows from rents to adjustment costs
Model Summary

Firms’ cash-flow dynamics

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- Capital good producers
  - demand for capital falls
  - low cash-flows from rents to adjustment costs

Expected returns

- Aggregate risk only comes from capital good producers
- Markups **amplify** cash-flow volatility

Predictability

- Markup volatility higher in bad times
- Demand (for capital goods) volatility higher in bad times
- Countercyclical risk premium
Plan

1 Summary

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Markups and the Business Cycles
Markups and returns

- Predictability regression in the model
- Markups specified exogenously
- Classic predictability regression

\[ r_{t,t+n} - y^{(n)}_t = a + b \cdot pd_t + \varepsilon_{t+1} \]

<table>
<thead>
<tr>
<th>Horizon (in years)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Countercyclical Markups</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>( b^{(n)} )</td>
<td>0.002</td>
<td>0.004</td>
<td>0.005</td>
<td>0.007</td>
<td>0.009</td>
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<tr>
<td>( R^2 )</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
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<tr>
<td>B. Countercyclical and heteroskedastic markups</td>
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<tr>
<td>( b^{(n)} )</td>
<td>-0.022</td>
<td>-0.044</td>
<td>-0.066</td>
<td>-0.087</td>
<td>-0.109</td>
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<tr>
<td>( R^2 )</td>
<td>0.015</td>
<td>0.029</td>
<td>0.043</td>
<td>0.057</td>
<td>0.070</td>
</tr>
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</table>
Conditional Volatility of Markups: Evidence

Markup elasticity

- This paper: elasticity of markups to new firms is higher in bad times
- What is the evidence from industrial organization?
Conditional Volatility of Markups: Evidence

Markup elasticity
- This paper: elasticity of markups to new firms is higher in bad times
- What is the evidence from industrial organization?
  - Large evidence on the link between number of competitors and markups
    - Negative
  - Evidence on convexity?
    - Markup elasticity greater when number of firms is smaller
Conditional Volatility of Markups: Evidence

Markup elasticity

- This paper: elasticity of markups to new firms is higher in bad times
- What is the evidence from industrial organization?

- Campbell and Hopenhayn (2005)
Conditional Volatility of Markups: Evidence

High Markups

Low Markups

Markup Changes
Conditional Volatility of Markups: Evidence
Conditional Volatility of Markups: Evidence

<table>
<thead>
<tr>
<th></th>
<th>Volatility</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Bad Times</td>
</tr>
<tr>
<td>Labor Share</td>
<td></td>
</tr>
<tr>
<td>First difference</td>
<td>0.95%</td>
</tr>
<tr>
<td>AR(1)</td>
<td>0.87%</td>
</tr>
<tr>
<td>Compustat</td>
<td></td>
</tr>
<tr>
<td>profit margins</td>
<td>1.03%</td>
</tr>
<tr>
<td>profitability</td>
<td>0.71%</td>
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</tbody>
</table>
### What About Entry Rates?

<table>
<thead>
<tr>
<th>Volatility</th>
<th>Bad Times</th>
<th>Good Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markups</td>
<td></td>
<td></td>
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<tr>
<td>First difference</td>
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<td>profitability</td>
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<td>0.81%</td>
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<tr>
<td>Entry Rates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aggregate</td>
<td>3.2%</td>
<td>3.4%</td>
</tr>
<tr>
<td>industry</td>
<td>9.8%</td>
<td>11.1%</td>
</tr>
</tbody>
</table>
Plan

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What About the Predictability Results?

What do they do

- Predictability regression: future returns on markups

\[ r_{t+1} = a + b \cdot (\text{markups})_t + \varepsilon_{t+1} \]
What About the Predictability Results?

What do they do

- Predictability regression: future returns on markups

\[ r_{t+1} = a + b \cdot (\text{markups})_t + \varepsilon_{t+1} \]

How can we measure aggregate markups?

- Large macroeconomics literature on markups (for models of sticky prices)
- Rotemberg and Woodford (1991); Rotemberg and Woodford (1999): countercyclicical
- Nekarda and Ramey (2010): a- or pro-cyclicical

This paper: Hall (1986) method

From firms’ optimization: markups are the inverse of marginal costs

Cobb-Douglas: markup \( \propto \frac{1}{\text{labor share}} \)

This paper’s regression:

\[ r_{t+1} = a + b \cdot \left(\frac{1}{\text{labor share}}\right)_t + \varepsilon_{t+1} \]
What About the Predictability Results?

The labor share and predictability

- Large finance literature on the labor share and asset returns
- Lettau and Ludvigson (2001), Santos and Veronesi (2006) (see also Belo et al. (2014))

An example: Santos and Veronesi (2006)

- Large labor share predicts low risk premium
- Low covariance of consumption and asset returns

Identification

- What is the mechanism?
- Should we truly care about markup variations as sources of risk?
Plan

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Competition risk and prices – Loualiche (2014)

Heterogeneity across product markets
- Risk of displacement of monopoly rents for incumbent firms
- Heterogeneity in industries exposure to the risk of new entry
- Some industries become more risky than others

Explaining the cross-section of industry returns
- Is I.O. the answer to Fama and French (1997)?
- Summary statistics approach at the industry level
  - I measure the elasticity of industry entry to aggregate shocks
  - I measure the elasticity of industry cash-flow to entry
- Two elasticities at the industry level (cash-flow and industry entry)
  → predict CS of industry returns
Conclusion

New Direction for Production Based Asset Pricing:

- Important topic: where do firms cash-flow come from?

Future work:

- Inspect the mechanism precisely: if markups matter how exactly?
- Move to the cross-section?