

Discussion:

Understanding the Aggregate Effect of Credit Frictions and Uncertainty

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Paper in a Nutshell

- Question(s):
 - ▶ What are *sources* of business cycle fluctuations?
 - ▶ How do they *propagate* into the economy?
- What do they do: answer questions in NKM model with
 - (1) Time-varying cost of external finance
(=micro-uncertainty) (CarlstromFuerst97, BGG99, ChristianoMottoRostagno14)
 - (2) Time-varying innovation in two aggregate shocks
(=aggregate-uncertainty) (BornPfeider2014)
 - Productivity growth
 - Monetary shocks
- Main finding:
 - (1) is a main driver, and not (2)

Plan for the Discussion

① Model:

- Environment
- Interaction between agg. uncertainty and frictional financial markets

② Discussion of Results

Environment: Medium scale NK model

- Representative household with habit formation
- Taylor rule and sticky prices
- Aggregate shocks
 - Monetary shocks with stochastic volatility
 - Productivity with stochastic volatility
- Frictional financial frictions á la BGG1999 (more next)
 - Micro-uncertainty (more next)
- Use 3rd order perturbation (capture propagation of agg. uncertainty)

Model's main result

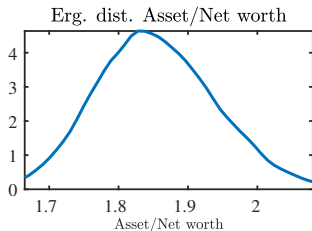
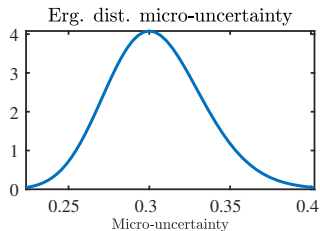
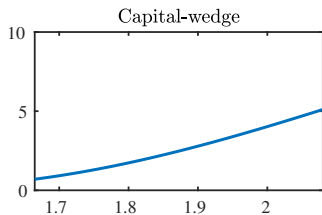
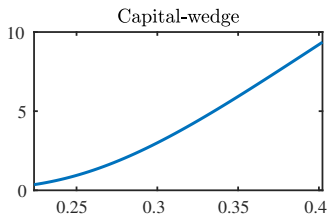
Does aggregate uncertainty interact with frictional financial market?

- Financial intermediation in capital: Townsend 1979
 - Entrepreneurs buy and rent capital subject to idio. shocks
 - Entrepreneurs borrow part of investment subject to a premium
 - Capital-wedge=difference between rental price/risk free interest rate
- Financial block main equation

$$Capital-wedge = s(\underbrace{\text{assets/net-worth}}_+ , \underbrace{\text{micro-uncertainty}}_+)$$

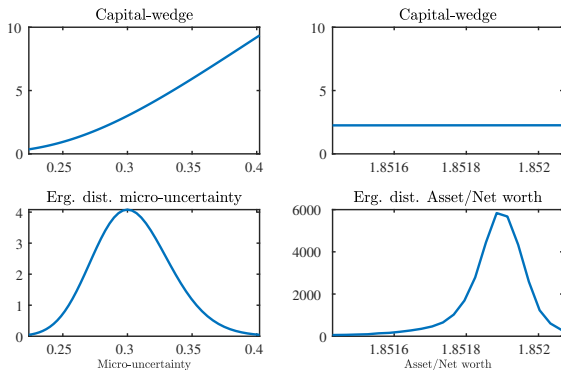
- \uparrow micro-uncertainty \Rightarrow \uparrow tail risk \Rightarrow \uparrow default risk (Capital-wedge)
 - \uparrow *capital-wedge* \Rightarrow \uparrow external finance \Rightarrow \uparrow assets-to-net-worth
- Aggregate uncertainty matters \iff Moves assets-to-net-worth

Model's main result cont'



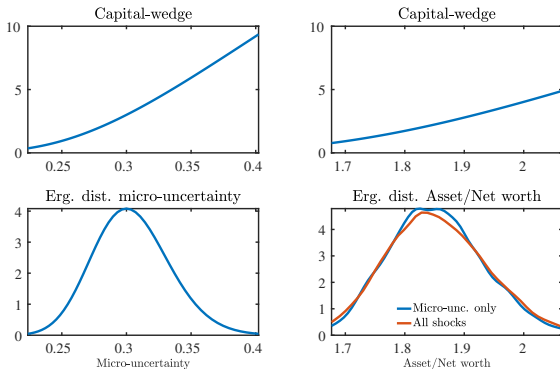
Micro uncertainty is the main driver even if variance asset-to-net-worth is 100% due to aggregate uncertainty (or other shocks)

Model's main result cont'



Almost 0% of asset-to-net-worth is due time-varying aggregate innovation

Model's main result cont'



At least 93% of asset-to-net-worth is due to micro-uncertainty

Model's property: triangularity

- Financial cond. depends *quantitatively* only on micro-uncertainty
- Quantitative property: triangularity
 - First, solve financial block and capital-wedge
 - Then, rest of the economy
- No meaningful interaction btw real and financial sector

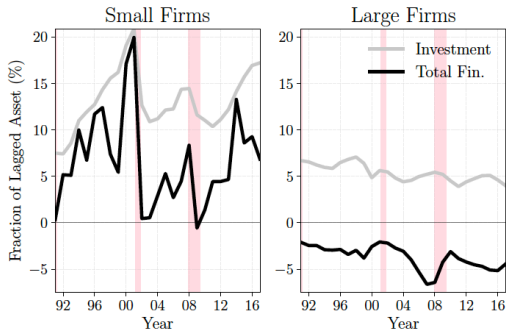
C1: break this property before trying to do next step (effect of aggregate uncertainty)

C2: Is debt as a source of external finance important?



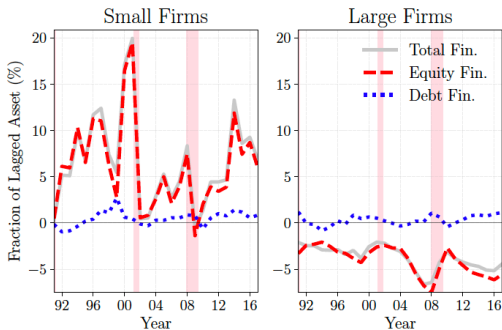
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- Small (large): $<$ ($>$) median book value asset

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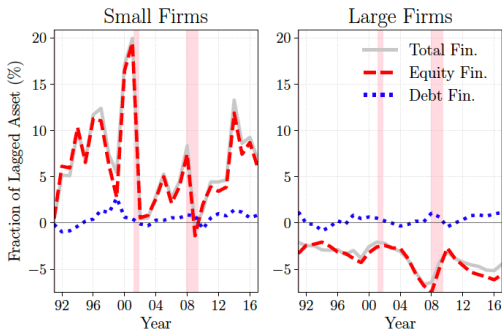
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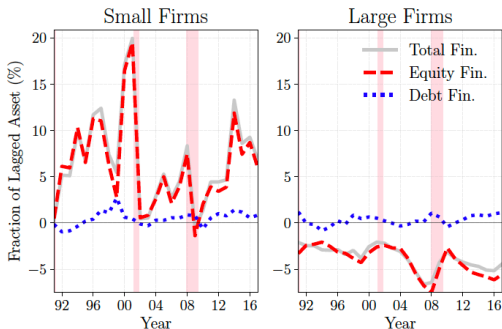
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C2: Is debt important? No



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C3a: Missing propagation mechanics

- This paper:
 - Curvature in preferences and adjustment cost of investment
- Other options:
 - Time to build (Hartman-Abel-effects): curvature in MPK

“That wine is not made in a day has long been recognized by economists. But, neither are ships nor factories built in a day.”

- Zero lower bound constraint
- Richer preferences consistent with asset prices
 - Separate risk-premium from default risk in credit spread
 - Gives information about curvature of preferences
 - SwansonWilliams2014, SwansonRudebusch2012

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(Kydland and Prescott-82)

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C3b: Estimation

- This paper:
 - Combine parameters estimates of BornPfeifer2014, BGG1999, SMM
- Problem with this methodology
 - Different model than BornPfeifer2014.
 - BGG1999 uses linear estimates
 - Problem: linear estimation goes as far as it can in trying to explain data, leaving no room to aggregate uncertainty
- Estimate model as BornPfeifer2014 and AndreasenEt.Al.2017

C4: Fit to aggregate data

- Key prerequisite: good fit to aggregate data
 - Pin down key parameters for sources/propagation of business cycle

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	Data	M1		Data	M1		Data	M1
$\sigma(z_t)$ (%)			$\rho(z_t, z_{t-1})$			$\rho(z_t, y_t)$		
y_t	4.62	4.45	y_t	0.91	0.63	y_t	1	1
$\sigma(z_t)/\sigma(y_t)$			c_t	0.9	0.9	c_t	0.9	0.7
c_t	0.64	0.38	x_t	0.93	0.58	x_t	0.93	0.94
x_t	4.23	4.2	h_t	0.96	0.56	h_t	0.88	0.79
h_t	1.66	1.61	$w_t - p_t$	0.73	0.56	$w_t - p_t$	0.04	0.94
$w_t - p_t$	0.96	1.54	π_t	0.39	0.52	π_t	0.35	0.83
π_t	0.14	0.42	i_t	0.94	0.75	i_t	0.65	-0.78
i_t	0.23	0.12	Leverage	0.96	0.99	Leverage	-0.02	0.06
Leverage	0.58	0.32	Spread	0.89	0.88	Spread	-0.51	-0.07
Spread	0.16	0.15						

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Example of missing mechanism: persistence of investment \Rightarrow adjustment cost of investment \Rightarrow higher impact of stochastic volatility

Effect of uncertainty investment depends of GE effect

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Key next step: improve fit with volatility of prices, persistence of (almost) all variables, correlation of prices with outputs (add price of investment).

Conclusion

- I learn (enjoy) a lot reading the paper
- Promising work in quantitative macro for higher order dynamics
- Keep up with the good work!