Discussion of

"Housing and Debt over the Life Cycle and over the Business Cycle"

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Motivation

- Micro (since 1970s)
  1. Rise in volatility of individual earnings
  2. Development in the mortgage loans market

- Macro (before and after 1983)
  1. Decline in volatility of Y, C, H, I (Great Moderation)
  2. Decline in σ_D and $corr(Y, D)$

- Can Micro account for Macro?

Main Elements of the Model

1. Life-cycle general equilibrium model

2. Uncertainty
   - Uninsured idiosyncratic productivity shock
   - Aggregate TFP shock

3. Labor-leisure decision

4. Housing for consumption and saving

5. Tenure decision
   - Own: Higher utility, Can be used as collateral
   - Rent: Lower moving cost, No minimum size restriction

6. Missing:
   - Land
   - House price
   - Mortgage loans choice
   - Location choice

Findings: 1/3 and 2/3

1. Cross-section
   1. Replicates asset distribution
   2. Life-cycle profile of tenure decision
   3. Lumpy and low frequency of housing adjustment

2. Business cycles
   1. Highly volatile ($\approx 4\sigma_Y$) and procyclical residential investment
      - Davis and Heathcote (2005)
   2. Volatile ($\approx \sigma_Y$) and procyclical mortgage debt balance.
      - Model replicates procyclicality.
      - But way too large volatility ($\times 4$).

Findings: 3/3: Effect of Micro Changes on Macro Dynamics

1. Higher individual earnings instability
   - Little effect on Y, C, IK
   - Reduce σ_D and σ_{IH}
   - Intuition: Agents become less responsive to aggregate shocks (really?)

2. Lower downpayment requirement of mortgage loans
   - Little effect on Y, C, IK
   - Reduce σ_D and σ_{IH}
   - Raise homeownership rate
   - Intuition: Less constrained debtors, more homeowners

Findings: Effect of Micro Level Changes on Macro Dynamics

	SD% 70s-80s	SD% 90s-00s	Ratio	SD% Only $\sigma_y \uparrow$	SD% Only $m \downarrow$
US economy					
Y	2.09	1.27	0.61		
C	1.20	0.61	0.51		
IK	5.03	4.14	0.82		
IH	8.24	3.78	0.46		
D	2.23	1.79	0.80		
Model economy					
Y	2.10	2.01	0.96	2.05	2.06
C	1.65	1.69	1.02	1.62	1.68
IK	3.84	3.63	0.95	3.46	3.83
IH	6.14	4.92	0.80	5.92	5.51
D	9.03	1.44	0.16	3.46	6.46

- Little effect on Y C, and IK (How about L?)
- Decline in volatility of IH but small fraction of the observed change.
- Too much decline in volatility of D

Comments on Findings 1/2

- Effect of a lower downpayment ratio on homeownership rate:
  - Chambers et al. (2008) say "Little"
  - The authors say "Huge"
  - Why the difference?

- Timing of events:
  - Great moderation: started around 1983
  - Rise in individual earnings instability: around late 1970s (OK)
  - Rise in homeownership rate: started around 1994 (NOT)
  - Why don't do the transition, with new events occur each year?

- Very very tough to solve → For the main results, could live without:
  - Life-cycle
  - Lumpiness of housing
  - Tenure decision
  - Labor leisure decision

- Do the sensitivity exercises for experiments as well!

Comments on Findings 2/2

- As for the decline in the volatility of macroeconomic aggregates (except for D), a decline in the volatility of TFP can account for most of it (Arias et al. (2006)).

- Why σ_D excessively high in the baseline?
  $\rightarrow$ Too many constrained debtors initially?
  $\rightarrow$ Too many marginal renters initially?

- Should match number of debtors, especially, number of borrowing-constrained debtors (for example, using β)

- Should investigate cyclical properties of homeownership rate, or the number of first-time buyers (consistent with data?)

- Borrowers' hours worked is countercyclical?

(Nitpicky) Comments about Calibration

- It's important to capture well the individual productivity shock, but...
  What are the (i) initial distribution of the persistent shock z and (ii)
  transitory shock t in the model?

	ρ_z	σ_z	σ_{z0}	σ_t
Storesletten et al. (2004)	0.952	0.168	0.378	0.255
Iacoviello and Pavan (2009) (70-80s)	0.900	0.131	?	?

- With housing, capital share of 0.33 seems high.

- Housing depreciation rate of 5% seems high.

(Nitpicky) Comments about Computation

- This model seems highly non-linear. Is it enough to...
  - Use only the first moment?
  - Use only the linear term in the forecasting function?

- Even with labor-leisure choice, only one forecasting function (for $\frac{K}{L}$).
  - Basically, prohibit agents to know K when making decision.
  - Potentially optimal decision changes with the use of K.
  - How about other information, like H?

- With Tauchen (1986) method, 3 abscissas is too small to replicate well the original AR(1) process, especially for a high persistence. It also depends on how to place abscissas.

- Number of size of housing is 15. A big chunk of lumpiness is generated by the small choice set of housing. Sensitivity?

Concluding Remarks

- Ambitious project.

- Compute a very tough model.

- Very rich model but authors do not fully exploit the richness:
  - Heterogeneous effect of recessions on homeowners (with and without debt) and renters?
  - Heterogeneous welfare implications of business cycles?

- Why focus on the changes in the cyclicality of debt, rather than...
  - Changes in the level of debt
  - House price

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