Discussion
Shocks, Frictions, and Inequality in the U.S. Business Cycles

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November 21, 2019

Bank of Canada Conference
Frontiers of Monetary Policy and Financial Studies

Summary of the Paper (1)

★ Based on Bayer et al (ECMA2019).

- NK-DSGE model + market incompleteness (Aiyagari).
- Three key features:

① Shock to variance of AR(1) individual productivity shock.

- Evidence: Storesletten, et al (2004), Guvenen et al (2014)

② Liquid and Illiquid assets.

- With i.i.d. prob λ, a household can adjust illiquid asset holding.
- Expected return of illiquid asset is higher ($4\% > 1.6\%$).
- Illiquid assets are not suitable for consumption smoothing.
  $\rightarrow$ Held by wealthy households.

③ Entrepreneurs.

- Small number of super-high-income HHs (Castañeda et al (2003)).
- "Jeff Bezos" shock: Receive all profiles of firms.

Summary of the Paper (2)

Novel features relative to Bayer et.al. (ECMA2019)

- ★ Add variety of shocks common in the medium-scale DSGE model.
  - TFP, Inv-specific, Price mark-up, Wage mark-up, Risk premium, Monetary policy, Govt spending.
  - New: Uncertainty, Liquidity.

- ★ Estimating the model using standard Bayesian method.
  - One of the frontier papers: Auclert et al (2019), Hagedorn et al (2018)
  - Use extended 1st-order perturbation method (Bayer and Luetticke (2018)).

Summary of the Paper (3)

Main findings

① Main drivers of business cycles are mostly the same as in RA model.

- Not surprising (Krusell and Smith (1998))
- Risk-premium shock is more important for output volatility. Intuition?
- Uncertainty shock is not very important, except for C volatility (20%).
  - High MPC of (wealthy) hand-to-mouth.
- Liquidity shock is not important.

② Business cycle shocks can replicate inequality dynamics.

- Top 10% income share went up by 35pp between 1980-2015.
  - 19pp: Higher price mark-up $\rightarrow$ Higher income of entrepreneurs (top 1%).
  - 10pp: Higher income uncertainty (Heathcote, Perri, and Violante (2010)).
- Top 10% wealth share went up by 13pp.
  - Various drivers: 5pp from TFP. 4pp from price mark-up.

Comment 1: Income Uncertainty

★ Individual income = individual productivity × hours × wage
- By assumption, wage and hours are the same across all households.
  → Income shock ≃ productivity shock.

★ Meanwhile, in (micro) data...
- Unemployment shock affects small fraction of workers severely.
- Unemployment risk is larger for lower-income workers.

★ Unemployment risk is strongly countercyclical.
- Endogenous to other shocks.
- Search-and-matching framework.

★ Part of the identified income uncertainty shocks come from endogenous response of unemployment to other shocks.

Comment 2: Income Composition of Top 1%

SCF 2004 (21-65)	Overall	0-40%	40-60%	60-80%	80-100%	Top 1%
Avg income	76,801	21,253	48,634	76,050	216,814	1,281,791
Composition (%)						
Wage	77.9	81.6	89.0	88.9	70.8	48.9
Business income	11.1	3.8	3.0	5.1	16.5	28.0
Financial income	2.5	0.8	0.8	0.9	3.8	6.9
Capital gain	3.0	-0.0	0.1	0.2	5.2	13.1
Govt transfers	5.7	17.3	8.6	5.4	2.9	1.8

- ★ Model: entrepreneurs (top 1%) earn a lot, by receiving firms' profits.
  - Does the model match the top 1% share, or the entire Lorenz curve?
- ★ Data: top 1% earn from various sources.
  - Half of their income is wage.
- ★ (At least part of) higher mark-up probably shows up as higher return of illiquid assets (dividends, capital gains).
  - Heterogeneous returns?

Comment 3: Progressivity of Income Taxation

★ Paper finds two main driving forces for rising income inequality:

① Rising profits of firms (for top 1%)

② Rising income uncertainty (for the bottom 99%)

- How about decline in income tax progressivity?
  - Paper assumes proportional tax.
  - Important driving force for rising wealth inequality.
    Hubmer, Krusell, and Smith (2019)

★ How about other hypotheses?
  - Tax treatment of proprietors' income.
  - Changes in technology (e.g. rising skill premium).
  - Decline in union.

★ Is dynamics of inequality really affected by *business cycle* shocks?
  - Or structural changes interpreted as business cycle shocks by construction.

Comment 4: Liquid vs. Illiquid Assets

SCF 2004 (21-65)	Overall	0-20%	20-40%	40-60%	60-80%	80-100%	Top 1%
Avg wealth (000)	402	-3	26	70	218	1,714	14,054
Composition (%)							
Liquid	6.5	–	4.3	5.1	6.1	6.7	7.1
Illiquid	93.5	–	95.7	94.9	93.9	93.3	92.9

★ I compute households' allocation between liquid and illiquid assets.
- I follow the definition of (il)liquid assets in Bayer et.al.
- Liquid: checking and saving accounts, MMA, call accounts, bond holdings, minus credit card debt.
- Illiquid: total wealth - net vehicle value - liquid assets.

★ Allocation is stable for all wealth groups.
- Model: Share of illiquid assets rises with wealth. $\rightarrow$ Rich get richer.
- Data: All (except for 0-20%) benefit from high returns of illiquid assets.

- Liquid asset / GDP $= 0.69$ » liquid assets in HH portfolio.
  - (Directly) Held by: Pension fund. Foreign governments. Firms. Banks.

Comment 5: What are Illiquid Assets?

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Illiquid	93.5	–	95.7	94.9	93.9	93.3	92.9
Housing	24.5	–	61.3	60.1	48.6	19.5	9.4
IRA	14.1	–	22.5	15.8	19.2	13.1	5.8
Other illiquid	54.9	–	11.9	19.0	26.1	60.7	77.7

★ Why illiquid assets are held widely?

- Illiquid asset is a mashed object made of housing and other illiquid assets (illiquid financial assets, business, etc).

★ Illiquid assets of bottom 80%: housing (durable), IRA (life-cycle).

★ Illiquid assets of top 1%: business, stocks, etc.

★ Would be nice to see how different illiquid assets contribute to inequality dynamics differently.

- Kuhn et al. (forthcoming)

Conclusion

- ★ First paper estimating NK-DSGE model with market-incompleteness, variable income uncertainty, and liquid and illiquid assets.
- ★ Ask an important question about sources of income and wealth inequality dynamics, while being consistent with business cycle data.
- ★ Would be great if the model can encompass other promising hypotheses on rising inequality, such as changes in tax progressivity.
- ★ The model would be even more useful (for policymakers) if housing, retirement accounts, and other illiquid financial assets are distinguished.
  - Various illiquid assets are distributed differently.
  - Different distributional consequences of shocks/policies.
- ★ Promising first step!