

Discussion of “Borrower and Lender Resilience”

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Big Picture

- Global Financial Crisis raises key debates about how to best regulate the financial sector to prevent another crisis.
 - Bank-focused regulatory rules: e.g. bank capital requirements, liquidity regulations, stress tests, ...
- How do borrower and lender fragility interact to amplify shocks?
- What are the optimal macroprudential policies to limit the effects of negative aggregate shocks to the economy?

Where does this fit into the literature?

Aggregate demand externalities:

e.g., Blanchard and Kiyotaki (1987), Jorda et al (2017), Mian and Sufi (2018), Korinek and Simsek (2016), Guerrieri and Lorenzoni (2017), ...

Financial frictions:

Studies of amplification of shocks because of credit supply disruption e.g., Greenwald, Stiglitz and Weiss (1984), Benmelech et al (2017), Chodorow-Reich (2014),

Macroprudential regulation:

e.g., Farhi and Werning (2016), Korinek and Simsek (2016), Greenwald (2018), Edge and Liang (2019),

This paper:

Simultaneous studies
aggregate demand externality
and potential credit supply
disruptions, with pecuniary
externalities

+

Considers optimal
macroprudential policies

Key features of the model

- Endowment economy $t = 0$ and $t = 2$. Production at $t = 1$, subject to aggregate shock θ .
- Consumers:
 - Heterogeneous income: $y_{i0} \sim F_0(y_{i0})$, $y_{i1} = w_{i1} \frac{Y_1}{Y^*}$, $y_{i2} \sim F_2(y_{i2}|\theta)$.
 - Assets trade: at $t = 0$ and $t = 1$, after observing y .
 - Default decision: at $t = 1$ only. $c_{i1} = \bar{c}_i = \tilde{a}_{i1} + y_{i1} + p_1 y_{i2}$ and $c_2 = 0$.
- Bankers:
 - Lending and obtain deposits. Prices determined in equilibrium.
 - Net worth dependent on loan repayment.
 - Moral hazard: shirk with probability π , makes loans with no repayment. IC constraint makes the intermediation spread and credit supply dependent on net worth.

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Amplification of shocks and sources of inefficiencies

- Income shocks amplified by:
 - **Financial accelerator**: Defaults affect banks' net worth falls. This reduces the supply of credit and increases loan rates on new loans.
 - **ZLB and wage rigidities**: If initial decline in aggregate demand is sufficient large to push the economy into ZLB, then effects on output is larger since interest rates cannot drop low enough.
- Inefficiencies arise because lenders and borrowers make decisions at date 0 without taking into account effects on prices and output.
- Incomplete market and nominal rigidities mean the pecuniary externalities have non-zero effects on efficiency of allocation at date 1.

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- Incomplete market and nominal rigidities mean the pecuniary externalities have non-zero effects on efficiency of allocation at date 1.
- Which policies alter the borrowing and lending choices in a way that maximizes welfare?

Implications for optimal financial regulation

- Constraints on banks' leverage at $t = 0$

$$q_0 D_1 \leq \psi N_0$$

is insufficient to achieve planners' allocation.

- Planners' allocation, which maximizes welfare, achieved via income-dependent policies at date 0:
 - a lump-sum transfer $T(y_i)$ from consumers to bankers
 - specifying asset position $A(y_{i0})$
 - specifying Pareto weights $\psi(y_{i0})$.

Comments

- ① Alternative policy tools aimed at individual loans:
 - e.g. Payment-to-income (PTI) constraints or debt-to-income (DTI) constraints.
- ② Heterogeneity in borrower types.
 - Variation in exposure to aggregate risks and asset positions.

Comment 1: Alternative macroprudential policies

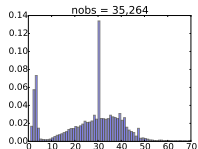
It would be interesting to consider in this model, [payment-to-income constraints](#).

E.g. Borrower with an annual income of \$50K. Takes out a \$160K loan with $r = 6\%$ to buy a \$200K house.

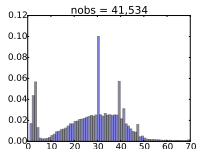
$$\text{monthly payment-to-income} = \$1.2K / (50/12) = 28\%.$$

- [How close to the planner's allocation do we get with individual loan constraints?](#)
- UK debt-to-income constraint; US loosening PTI in 2000s, and subsequent Dodd-Frank legislation in 2014.
- Greenwald (2018) studies the effect of changes in PTI constraints over time on asset positions, credit and prices. Does not study defaults, and pecuniary externalities affecting credit supply.

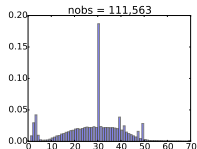
Loosening of payment-to-income constraints: pre-2007



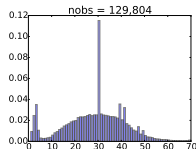
(e) PTI: 1996



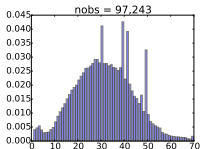
(f) PTI: 1997



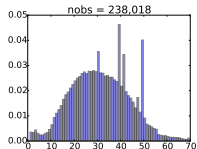
(g) PTI: 1998



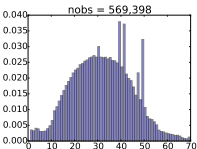
(h) PTI: 1999



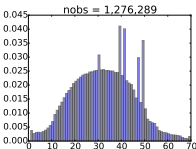
(i) PTI: 2000



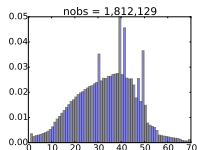
(j) PTI: 2001



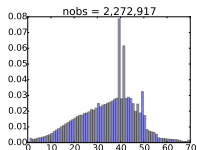
(k) PTI: 2002



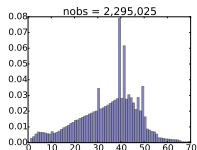
(l) PTI: 2003



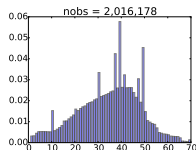
(m) PTI: 2004



(n) PTI: 2005

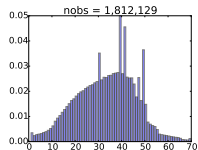


(o) PTI: 2006

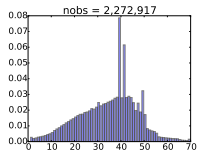


(p) PTI: 2007

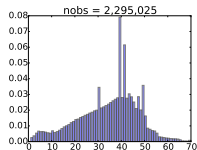
Enforcement of payment-to-income constraints: post-2007



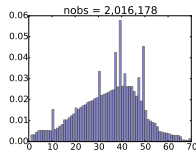
(m) PTI: 2004



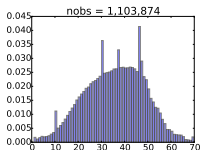
(n) PTI: 2005



(o) PTI: 2006



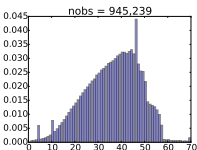
(p) PTI: 2007



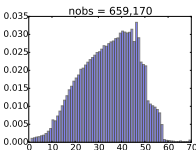
(q) PTI: 2008



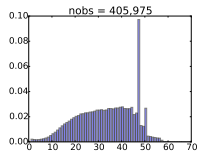
(r) PTI: 2009



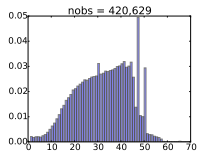
(s) PTI: 2010



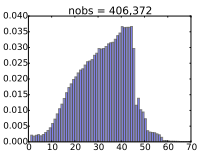
(t) PTI: 2011



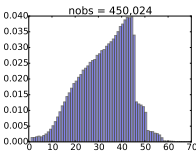
(u) PTI: 2012



(v) PTI: 2013



(w) PTI: 2014



(x) PTI: 2015

Role of payment-to-income constraints

Greenwald (2018):

- Studies the role of PTI constraints as a potential macro-prudential tool for limiting excess accumulation of debt:
 - Studies how loosening of PTI constraints contributed to the boom and bust of house prices and credit.
 - Studies how Dodd-Frank enforcement of PTI constraint (43%) potentially would have helped to limit the housing boom and bust if they had been implemented since the 1990s.
- Model set-up:
 - DSGE model with lenders and savers.
 - Housing, mortgages, and 1 period asset.
 - PTI constraint and LTV constraint on mortgages.
 - Nominal price rigidities, aggregate TFP and monetary shocks.
- Does not explore:
 - defaults; feedback effects on bankers' net worth and credit supply.
 - optimal macroprudential policies,

Role of payment-to-income constraints

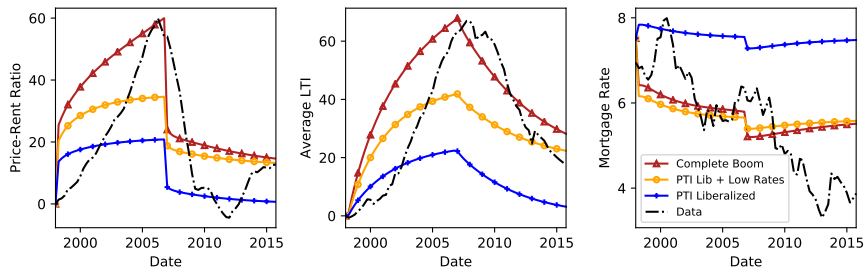


Figure 9: Decomposing the Boom

Source: Greenwald (2018)

- How much of the pecuniary externality can be mitigated by PTI constraints, if these are set by the social planner, in an environment with:
 - endogenous defaults, and
 - feedback effects on bankers' net worth and credit supply.

Comment 2: borrower heterogeneity

- Interesting to incorporate richer borrower heterogeneity: e.g. skill, or age.
- One reason why this may matter is it can change the covariance between the individual's endogenous asset position and the exposure of income to the aggregate shock θ .
 - E.g. Younger individuals are borrowers. Younger workers are more exposed to aggregate income shocks. This covariance increases their default probability, sensitivity of bankers' net worth to aggregate shocks and hence, the feedback effects to credit supply.
 - Suggests the pareto weights that maximize the social welfare function depend also on these characteristics of the household.

Conclusion

- Really elegant and intuitive paper.
- Tackles an important topic of optimal macroprudential policy.
- I look forward to seeing it evolve!