

Housing Finance, Boom-Bust Episodes, and
Macroeconomic Fragility
by Carlos Garriga and Aaron Hedlund

Discussant

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Summary

- Develops a general equilibrium model that focuses on Housing with Endogenous Liquidity, strategic default, credit constraints and labour income risk.

Baseline

- Year 0: 5% productivity shock with credit boom - 2% reduction in mortgage rate from 5.6% to 3.6% and with possibility of 125% LTV.
- Year 5: Temporary Credit Bust
 - First part of calibration focuses on the fixed rate versus adjustable rate mortgages (FRM/ARM) in terms of responses to booms and busts.
 - Second part on short term debt versus FRM.
 - Third part of calibration focuses on macro-prudential policies in terms of loan to value and payment to income ratios.

Non-exhaustive list of calibration results

- Credit booms may even lead to lower home ownership in the short run.
 - House prices rise faster in the credit boom period.
- Credit boom leads to higher % increases in consumption for high and middle income households.
 - Contrary to the subprime narrative
- Consumption is more sensitive to housing busts relative to housing booms (almost double sensitivity)
 - Housing illiquidity channel.
- Bust results in a long-run reduction in consumption (6% after 5 years).

Non-exhaustive list of calibration results

ARM versus FRM for a bust

- Consumption reduction in a bust slightly higher for ARM versus FRM (20% versus 17%)
- More pronounced reduction of consumption for high LTV borrowers (30% versus 25%).
- Home Prices increase more in the bust (45%) versus the reduction crash in the bust (25%).

Short term debt versus FRM

- Short term debt leads to larger swings

Macro-prudential limits on Loan to Value and Payment to Income

- Both policies attenuate home price response and consumption response in booms and busts.

Model – Overview (Reduced Form)

Intermediaries

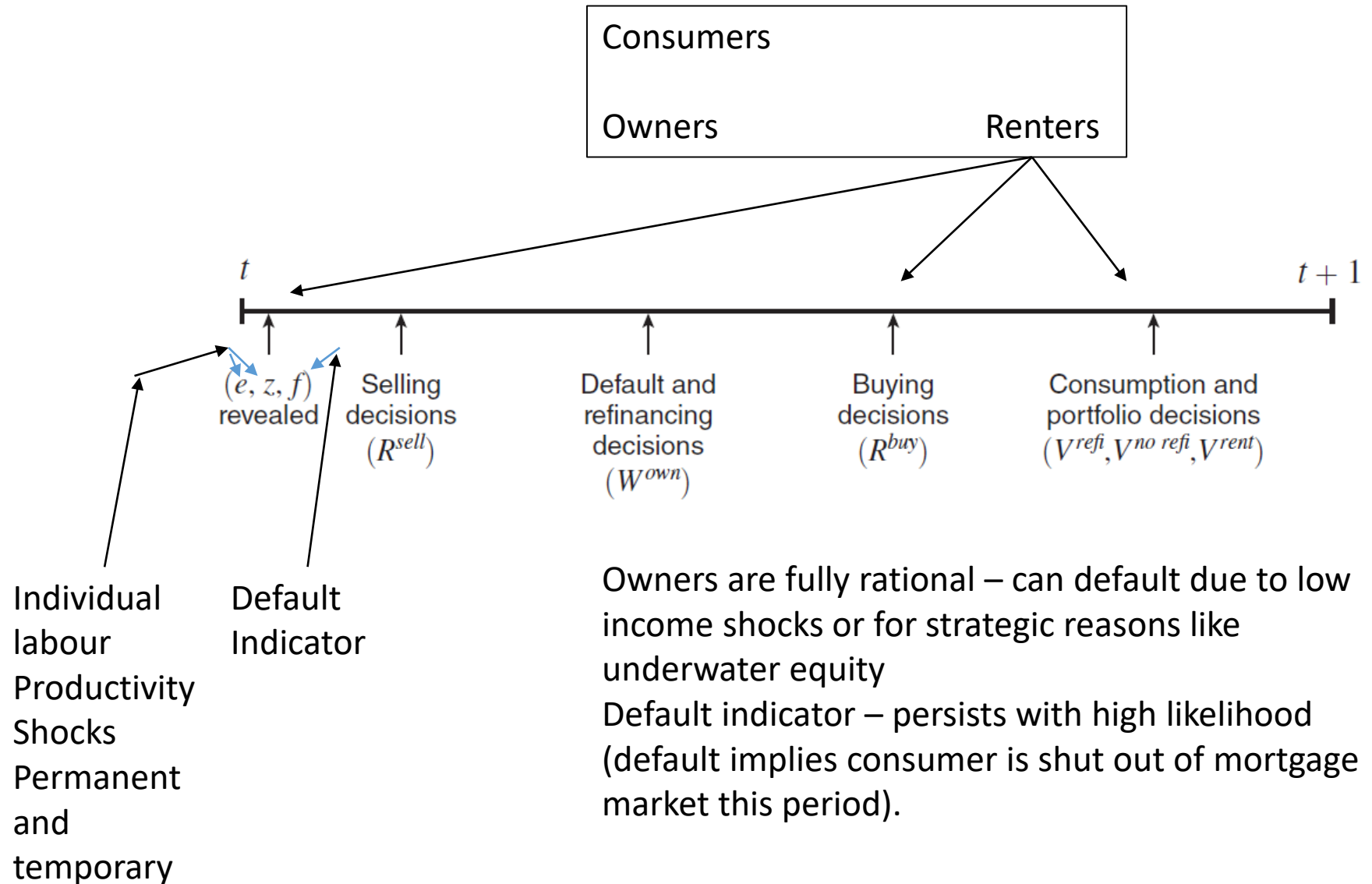
Banks
make mortgage
loans

Have infinite
funding at the risk
free rate.

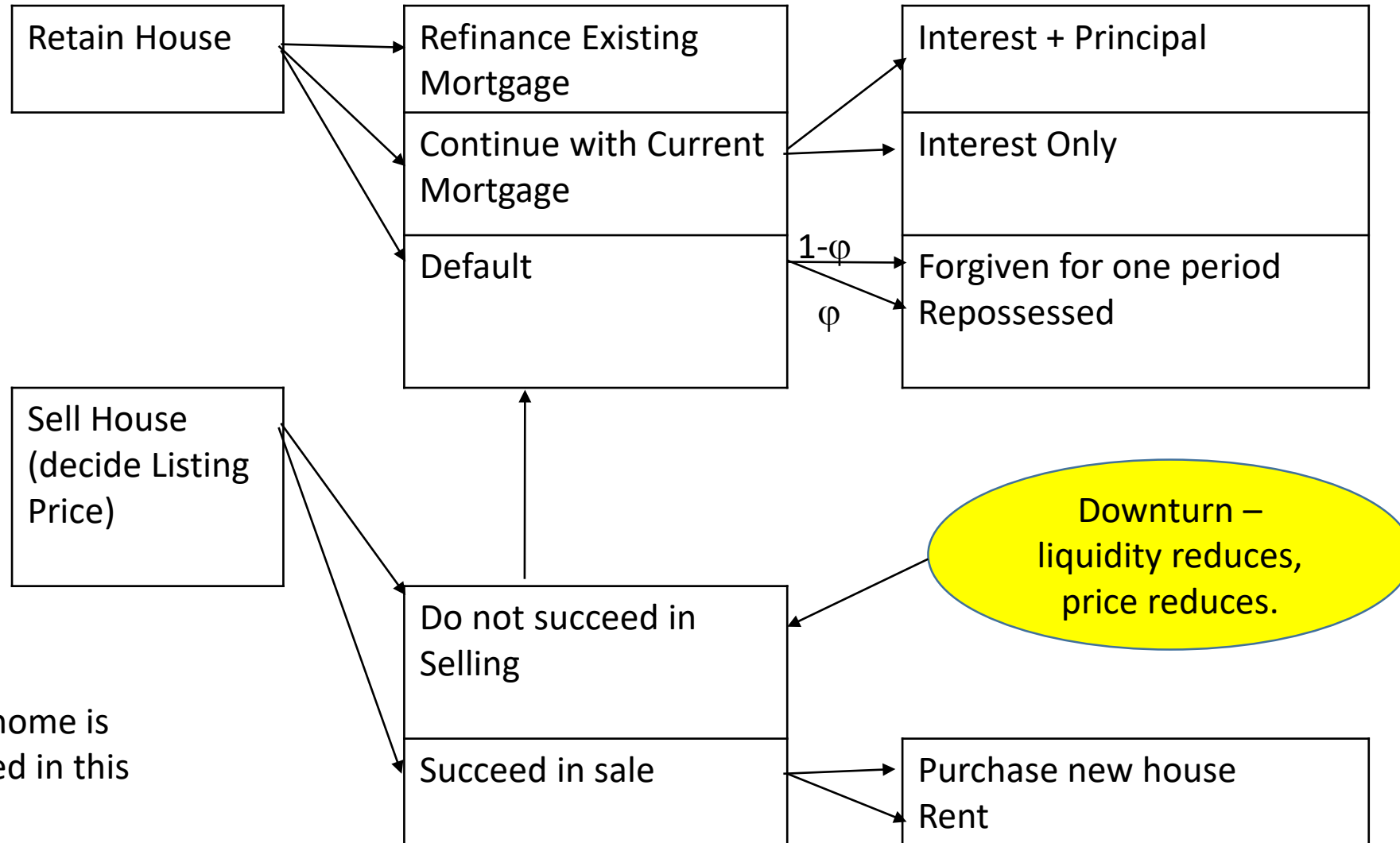
Price each loan
risk correctly

Brokers –
Intermediate Real
Estate sales and
Purchases

Zero cost for entry
and exit



Model – Owner’s problem (sub period 1) *



*Assuming home is not destroyed in this period.

Comments

- Depreciation
- Mortgage Price versus rate
- Default indicator consistency
- Strategic Default
- Other comments – Post Sale and labour income shock
- Calibration parameters
- Link to existing empirical literature

Depreciation

$$1 + r_m = \underbrace{\left(\frac{1 + \phi}{1 - \delta_h} \right)}_{\text{spread}} \underbrace{(1 + r^*)}_{\text{long term risk-free rate}}$$

Mortgage Rate Servicing Cost Home Depreciation

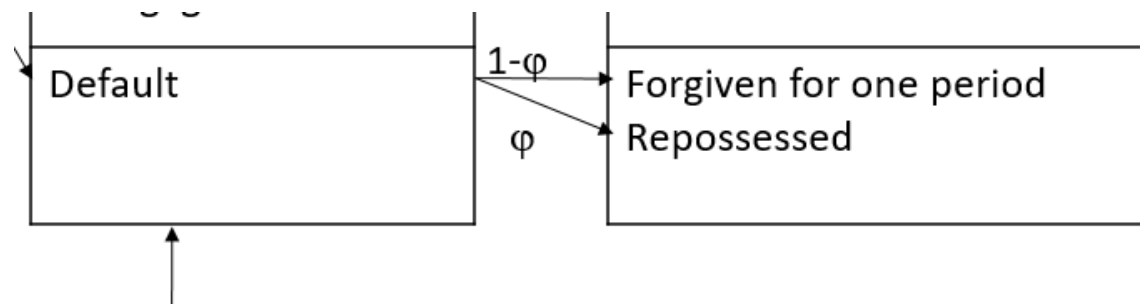
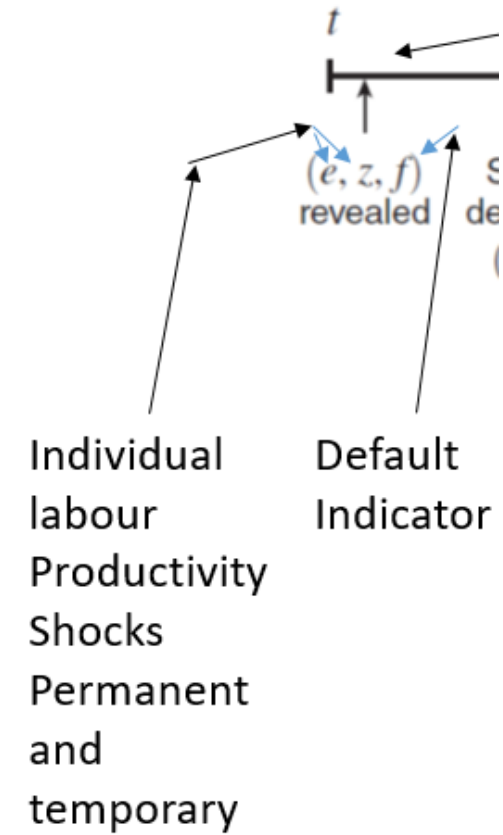
- Home depreciation treatment is non-standard. δ_h is probability of home destruction, i.e., δ_h is the fraction of homes completely destroyed every period.
- Not Equivalent to home depreciation as this would not force the borrowers to move.
- Allows borrowers to walk away from the mortgage if this happens. This hurts the borrowers with high home equity more than those who recently borrowed.
- If authors really need catastrophe risk, calibration needs to be done to risk of home destruction.
- Land does not depreciate, so the complete destruction is not compatible with this and the percentage of land values varies significantly across the US.

Mortgage Prices

- **Mortgage effects works in Prices**, not rates. q_0^m is the mortgage price per unit of principal repayment.
- Prepayment, default due to income shock, underwater equity or lack of ability to sell all are priced in q_0^m
- Likely to create high response to any shock as **entire present value of credit boom or bust is passed on the borrower in the first period of the loan.**

Consistency of default Indicator

- f is a default indicator that is 1 in the period of default and persists with a likelihood of approximately 0.95 in subsequent periods.
- However, given that the bank can observe e (temporary labour income shock) and z (permanent labour income shock), the bank knows if the default is due to a permanent or temporary shock. Thus, how is the assumed value of f consistent with a competitive equilibrium?
- Similarly, $1-\phi$, the probability of debt forgiveness should also depend on whether the shock comes from e or z .
- I assume $f_{t+n} = .95^n f_t$. This is inconsistent with practise where the default history is kept for 7 years, whereas the model implied probability after 7 years is close to 70%.



Strategic Default

- Every consumer in this model is a potential strategic defaulter.
 - Ganong and Noel (WP, 2020) finds that only 3% of defaults in mortgages are exclusively due to underwater equity.
- May try modification where negative income shock is necessary for default.
- Alternately, present results on number of strategic defaults to understand if this is a major factor in the calibrations.

Extension of model

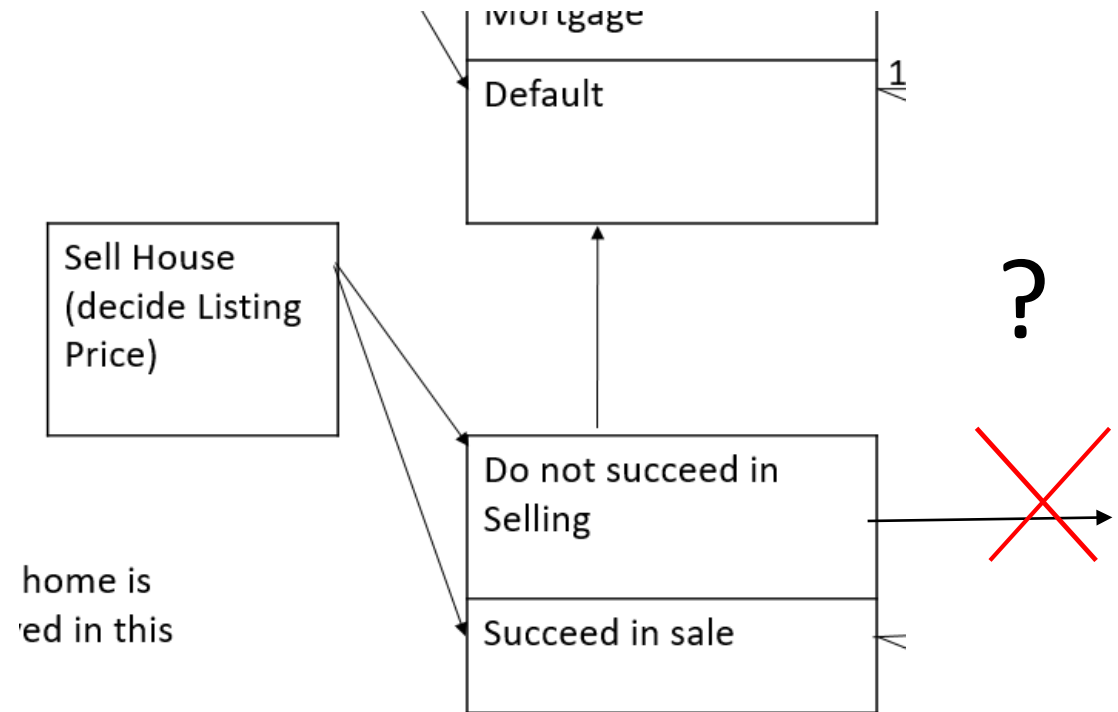
- Model is identical to the AER paper by the same authors. Calibration is done using parameters starting in 1990 versus 2006.
 - “the state of the economy (e.g. the leverage distribution) when the recession strikes is endogenous.”
 - “Intensive and Extensive margin of home ownership are considered”
 - “Home owners can choose to deleverage by repaying the loan or default”
- Would like to see more justification for how each of these adds to the paper.

Suggested Extension

- More motivation for ARM versus FRM question
 - Cross-country, government subsidies, history
- Allow choice of ARM versus FRM to consumers.
- Does this create endogenous credit booms and busts with small credit rate changes?

Others

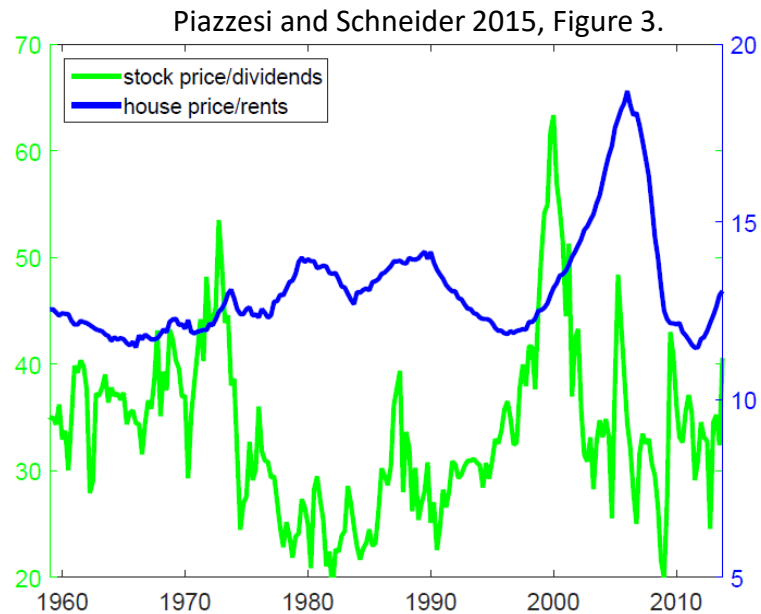
- If the consumer cannot sell the house, can he or she also possibly strategically make the payment for the mortgage in the current period?
- Can the consumer list the house in multiple periods?



Others

- Why are the temporary and permanent shocks multiplicative and not additive?
- Are the shocks and their volatilities correlated with the level of wealth or income?
- Role for segmented housing markets and brokers not clear. There is nothing in the calibration or results that makes use of this.
- Unclear what benefit partial amortization gives. A uniform payment mortgage with full prepayment would be better.
- Very little details on the negative 'temporary' credit shock.

Calibration



Servicing cost too high.
 Probability of repossession too low. Suggest cumulative repossession rate or shutting this off.

No details on distribution of home owner leverage in the economy or any other variable.

Description	Parameter	Value	Target	Model
Calibration: Independent Parameters				
Autocorrelation	ρ	0.952		
SD of Persistent Shock	σ_e	0.17		
SD of Transitory Shock	σ_e	0.49		
Intratemp. Elas. of Subst.	ν	0.13		
Risk Aversion	σ	2		
Structure Share	α_S	30%		
Land Share	α_L	33%		
Holding Costs	γ	0.7%		
Depreciation (Annual)	δ_h	1.4%		
Rent-Price Ratio (Annual)	r_h	5%	←	
Risk-Free Rate (Annual)	r	2.0%		
Servicing Cost (Annual)	ϕ	3.1%	←	
Mortgage Origination Cost	ζ	0.4%		
Maximum LTV	ϑ	125%	←	
Prob. of Repossession	φ	0.5	←	
Credit Flag Persistence	λ_f	0.9500		

Calibration: Jointly Determined Parameters

Link to existing results

- Several results (example: cash in market pricing, credit boom effects) etc observed without endogenous housing illiquidity.
- **Value addition will come from link to existing consumption papers.**
- Mortgage rates, household balance sheets and the real economy, Keys et al, 2015
 - Decline in mortgage payments lead to significantly lower default and increase in 10% in consumption.
- Mortgage Debt, Hand-to-Mouth Households, and Monetary Policy Transmission, Agarwal et al, 2020
 - Mortgagors increased their monthly credit card spending by 7.2% after the 230bps mortgage rate reduction
- How big is the wealth effect? Decomposing the response of consumption to house prices, Boragan Arouba et al, 2019.
 - Decompose the decline in consumption in the 2008 credit crisis due to wealth, financial constraints and bank health.
- Mortgage Choice and Expenditure over the Lifecycle: Evidence from Expiring Interest-Only Loans, Andersen et al 2020.
 - an average increase in mortgage instalments worth 9 per cent of annual income, consumption drops by 3 percent of income,

Summary

- Enjoyed reading the paper
- Few papers endogenize housing liquidity in a general equilibrium framework.
- Model could be simplified on some dimensions.
- More linkage to vast empirical literature on consumption.