

FAILURE TO LAUNCH: HOUSING, DEBT OVERHANG, AND THE INFLATION OPTION

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ONLINE APPENDIX

This appendix summarizes all of the parameters and gives a brief explanation of their role.

Preferences

- β : discount factor. This parameter simultaneously influences the amount of liquid assets (bonds) and mortgage debt households accumulate.
- σ : risk aversion.
- ν : intratemporal elasticity of substitution between consumption and housing services.
- ω : consumption weight parameter that affects spending on consumption vs. housing. It also influences how weighted household balance sheets are toward home equity.
- ξ : utility penalty in the event of a failure to sell. This parameter is very small in the calibration, but its main use is to stop homeowners nearly indifferent about selling from posting an excessively high list price that leads to extreme time on the market.

Housing Services: Renting vs. Owning

- \bar{a} : largest apartment space. This parameter primarily affects the extensive margin between owning and renting, i.e. the homeownership rate.
- \underline{h} (equivalently, h_1): minimum house size. This parameter affects extensive and intensive house buying choices, but the main reason for there being a distinction between \bar{a} and \underline{h} is that households prefer to make a discrete jump above the largest apartment when they become homeowners.
- r_a : price of apartment space each period. While technically a price and not a parameter, it is pinned down exactly by the technology parameter that describes the rate at which apartment space is produced from the numeraire good: $r_a = 1/A$.
- κ_s : entry cost for brokers to meet with sellers. This parameter determines the range of list prices that yield a sale with non-zero probability. In short, κ_s determines the maximum “hair cut” that sellers would need to take to guarantee an immediate sale.
- γ_s : matching function curvature between sellers and brokers. While κ_s determines the maximum hair cut, γ_s determines the *rate* at which selling probabilities decline as list prices increase from the bottom to the top of the positive-selling-probability range.

- κ_b, γ_b : same as above, except for buyers instead of sellers. In the model, κ_b is much smaller, indicating that buyers do not need to bid much above the house price index p (the price at which passive brokers can trade with each other within the period—see the main text for details) to purchase with high probability.
- δ : holding costs, i.e. maintenance, property taxes, etc. This parameter influences how much of the household budget goes to housing above and beyond mortgage payments, and it also plays a modest role in determining how patient sellers are (whether owner-occupiers or banks with REO houses) when listing their house on the market.

Banking Sector

- r : the risk-free rate which pins down bond prices $q_b = 1/(1+r)$ and determines the cost of external financing for banks when issuing mortgages.
- π : the inflation rate.
- $R_{m,t}$: the current market nominal mortgage rate. In steady state, R_m is constant.
- \bar{R}_m : a specific borrower’s mortgage rate, i.e. an individual state variable rather than a market-wide price. \bar{R}_m is set equal to the market rate $R_{m,t}$ at the time of origination. In steady state, there is no *substantive* distinction between \bar{R}_m and $R_{m,t}$ because $R_{m,t}$ never changes. Outside of steady state, if $R_{m,\tau}$ were to fall below \bar{R}_m in some future period $\tau > t$, that would create a motive to refinance separate from the already existing rationale to extract equity.
- ϑ : maximum loan-to-value at origination. This parameter directly impacts homeowner access to credit both at the stage of buying and in the event of refinancing.
- ζ : mortgage origination cost. This cost only occurs upon origination of a new loan, and therefore it primarily influences the *extensive* margin decision to remain in a current loan vs. refinance to a new loan (or to go from non-borrower to borrower status).
- ϕ : per-period loan servicing cost. This cost is what creates a wedge between mortgage rates and the risk-free rate, thereby influencing the *intensive* margin decision of how much to save in home equity (via paying down mortgage principal) vs. in liquid assets.
- χ : foreclosure loss that banks incur upon selling a repossessed (REO) house. In the model, the value of this parameter influences loan recovery ratios in the event of default which, in turn, affects the supply of credit.
- λ : stochastic duration of credit exclusion flag. Exclusion from borrowing after foreclosure is necessary to dissuade homeowners from always immediately defaulting whenever they become underwater on their mortgages (i.e. the house becomes worth less than outstanding debt). In the data, a substantial amount of negative equity, or else negative equity combined with financial distress, is necessary to induce foreclosure. In other words, borrowers would exhibit too much “ruthless” or strategic default if $\lambda = 0$.