

# **Is There a Puzzle in Underwater Mortgage Default?**

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# Summary

- **Question:** What role do utility costs and economic fundamentals play in driving strategic default decisions?
- **Approach:** Sophisticated structural model of mortgage default with several innovations.
- **Main findings:**
  - Matching default patterns requires small utility penalty  $\psi$  (0.7% of lifetime consumption, vs. 25% to 70% in existing work).
  - Important role for fundamentals (rent) in driving default → “triple trigger.”
- **This discussion:** trying to unpack what allows the small utility penalty.
  - Does not seem to be driven by novel model features, which **incentivize** default.
  - Instead, likely related to wedges between e.g., house prices and PV of rents.

## A simple benchmark

- Let's consider the simplest possible static problem of whether to default on debt.
  - Value of not defaulting:  $P - M$ , where  $P$  is house price and  $M$  is mortgage balance.
  - Value of defaulting:  $-\psi$ , where  $\psi$  is utility cost.
- Borrower defaults if and only if

$$P - M \leq -\psi \iff \psi \leq (LTV - 1)P$$

where  $LTV = M/P$ .

- Literature has shown that households begin strategically defaulting at  $LTV \simeq 150\%$ .
  - Implies  $\psi \simeq 0.5 \times P$ .
- Assuming  $P \simeq 4 \times C$  and PV lifetime consumption  $W \simeq 15 \times C$ , we get  $\psi \simeq 0.3 \times W$ .

# Model innovations

- In contrast the authors find that strategic default behavior can be explained using  $\psi = 0.007 \times W$ , around  $40\times$  smaller.
- The model includes several realistic innovations.
  - Households can downsize into a smaller home when they default.
  - Households are not permanently excluded from the mortgage market after default.
  - No added utility from ownership.
- However, these changes mostly make default **more** appealing, not less.
  - Should require **larger** utility penalty  $\psi$  compared to models without these features.
  - So the resolution to the puzzle must be elsewhere.
  - One exception is ability to “cure” mortgage – depends on whether default or foreclosure drives disutility.

## Back to the simple model

- Now let's replace the simple static model with a dynamic one including rents.
- Borrower will default if

$$\underbrace{\sum_{t=1}^{\infty} (1+r)^{-t} \text{rent}}_{\text{PV of rent}} - \underbrace{\sum_{t=1}^{\infty} (1+r)^{-t} r_m M}_{\text{PV of mortgage payments}} < -\psi.$$

- In frictionless model where  $r = r_m$  and  $P = PV(\text{rent})$ , this is just  $P - M < -\psi$  as before.
- Instead, it seems like we must have

$$PV(\text{rent} \times H) - PV(r_m \times M) \gg P - M$$

at least for typical borrowers at risk of default.

## GE vs. PE

- Specific equalities  $PV(\text{rent}) = P$  and  $PV(r_m \times M) = M$  require frictionless model.
- But all general equilibrium models will have connections between these variables.
  - For example, a borrower constrained by loan to value can buy  $dH$  of housing and borrow  $dM = \theta dH$  of mortgage, netting  $PV(\text{rent})dH - PV(r_m)dM - (dP - dM)$ .
  - This expression should be zero if the marginal borrower is LTV-constrained.
- Instead, this model sets prices, rents, and mortgage rates in **partial equilibrium**.
  - Real rents and mortgage rates are constant.
  - House prices follow a stochastic process.
  - No endogenous links between these objects.

## GE vs. PE

- This partial equilibrium approach has substantial advantages.
  - Much more tractable in a very sophisticated quantitative model.
  - Confront households with dynamics of house prices close to those in the data.
- However, there are also some disadvantages.
  - In the model, movements in house prices create a pure wedge relative to PV of rents, affecting default motives.
  - In reality, changes in prices could reflect changes in PV of rents, attenuating this effect.
- More generally, I think the paper should do more to explain and document these wedges.
  - These need to be large for the marginal **defaulting borrower** for small  $\psi$ .
  - But seems more plausible if the marginal **home buyer** has smaller total wedges.

# The role of rents

- The paper focuses on the role of rents.
  - Hold rents fixed, matching large fall in price-rent ratio during housing bust.
  - This corresponds to a large increase in the wedge between  $P$  and  $PV(\text{rent})$ .
  - Reduces strategic default because households value stream of housing services from keeping their homes highly relative to the price.
- Seems to be the main factor resolving the puzzle
  - Shows that Campbell and Cocco (2015) requires a small penalty when rents held fixed.
- The pattern in the price-rent pattern is empirically correct.
  - But can we rule out that households were not discounting the rental stream more?

## Aside: the role of the mortgage wedge

- While the paper emphasizes the rental wedge, the mortgage wedge could also play a role.
- One particularly important feature relates to refinancing
  - Technically, a refinance originates a new loan to replace the old one.
  - But for underwater households, a new loan of the same size violates LTV limit.
  - Locked underwater households out of receiving interest rate relief.
  - Eventually led to the HARP program designed to allow these households to refi.
- This is a very clear wedge that is unlikely to be undone by equilibrium considerations
  - Households are mechanically locked into above-market mortgage rates.
  - Double trigger models predict HARP is ineffective for preventing defaults.
  - Triple trigger (+ fundamentals) might imply larger effects!

# Conclusion

- Impressive quantitative structural model studying the drivers of strategic default.
- Model innovations seem like advances relative to existing work.
  - But mostly make strategic default **more attractive** relative to past models.
  - Deepen the puzzle, rather than resolving it.
- Instead, lack of strategic default without a large utility penalty depends on wedges between household valuation of housing and mortgages and their market prices.
  - These wedges are very important for the results, but currently opaque.
  - Partial equilibrium approach may mask parallel movements in prices and present values with limited effects on default.
  - Suggestion: compare wedges for marginal defaulter and marginal home buyer.