

# **Systematic Mistakes of Borrowers in the Mortgage Market**

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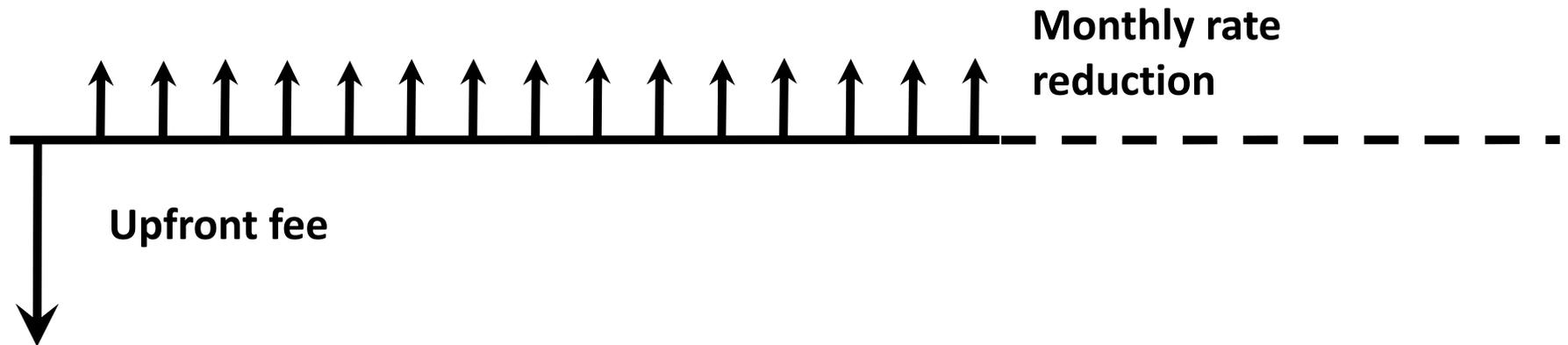
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# Motivation

- There is mounting evidence that households make mistakes in their financial decisions
  - Campbell, 2006; Campbell, Jackson, Madrian, and Tufano, 2011; and Agarwal, Driscoll, Gabaix, and Liabson, 2009.
- Yet, there is little evidence about the optimality of mortgage decision.
  - Campbell and Cocco, 2003; Agarwal, Rosen, and Yao, 2012; Campbell et al 2014; and Keys , Pope and Pope, 2014.
- This paper studies the “Points” decision by borrowers.

# What are “Points”?



- Viability of points depend on:
  - Tenure with mortgage (unknown to borrower at origination)
  - Opportunity cost of capital (known to borrower at origination)

# Our Approach to Evaluate “Points” Decision

- Opportunity cost of capital = Mortgage rate
- For each borrower:
  - Estimate time needed in the house to achieve  $IRR = \text{Opportunity cost of capital}$
  - Estimate expected tenure in the house given borrower characteristics (proportional hazard model)
- Estimate whether borrower make mistake

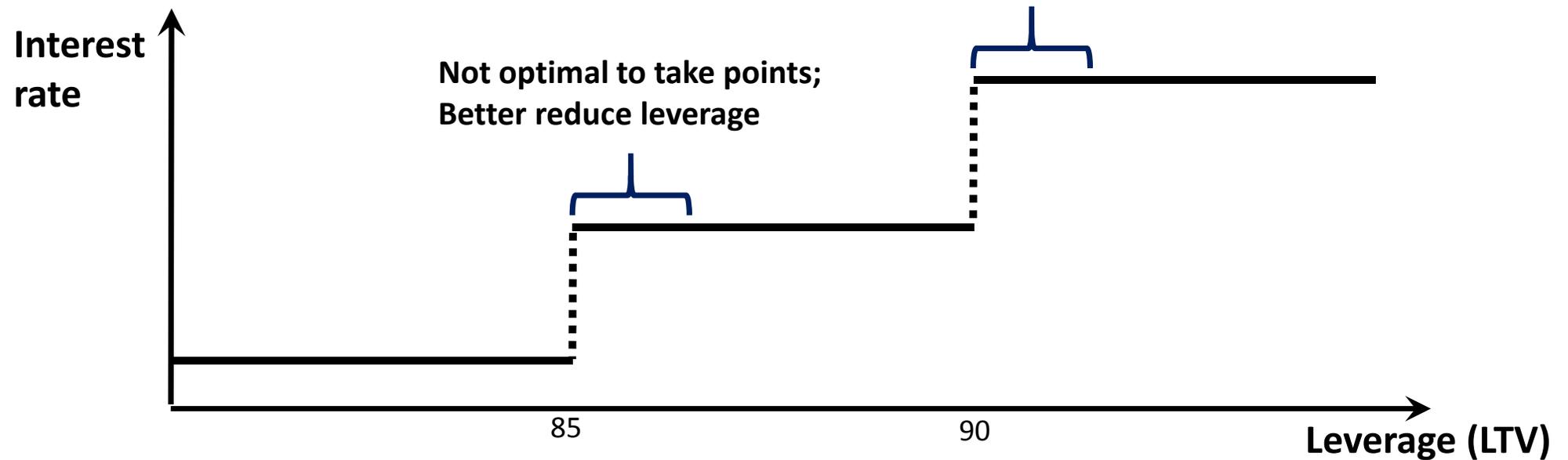
# Data

- Prime, Conventional and Conforming mortgages originated
  - 2001 – 2011 in top 20 MSAs
  - Standard mortgage attributes
  - Payment history: move, refinance and default
  - Marked to market LTV
  - Interest rate savings
- Federal laws mandate points and closing costs to be recorded in HUD-1.
  - We collect points and multiples banks pay to GSEs or issuers
  - We can calculate rate reduction from paying the points
- Final sample contains 309,439 loans and 4,816,444 loan-quarter panel.

# Ex Ante Analysis of “Points” Decision

- Based on whether “Points” decision is optimal ex ante, **29-36%** borrowers should buy “Points”, but in reality only **12%**.
- We can identify two types of mistakes:
  - Type I Mistake: optimal to buy “Points”, but borrower did NOT (28-36%)
  - Type II Mistake: NOT optimal to buy “Points”, but borrower did (60-67%)

# Using Leverage Step to Identify



- 3% of borrowers who take points, take them when it is strictly suboptimal
  - Result independent from opportunity cost and expected tenure

# Ex Post Analysis of “Points” Decision

- Sunk Cost Fallacy: Refinance decision should depend on rate saving but NOT on past investment in points
- Evidence that borrowers are less likely to refinance after investing points
- After controlling for interest rate savings, we estimate the impact of points on refinance hazard.
  - 1% rate savings increases refinance hazard by 63%.
  - Borrower paying points has 47% lower hazard.

# Conclusion

- Our estimates show that between 29% and 36% of borrowers should take points, much higher than 12% in the data.
- We find a mismatch between borrowers who should take points and those that actually takes points.
  - 28-36% commit Type I mistake and 60-67% commit Type II mistake
- Borrowers that take points suffer sunk cost fallacy in their future move and refinance decisions.