

Credit Constraints and the Distributional Effects of the Refinancing Channel

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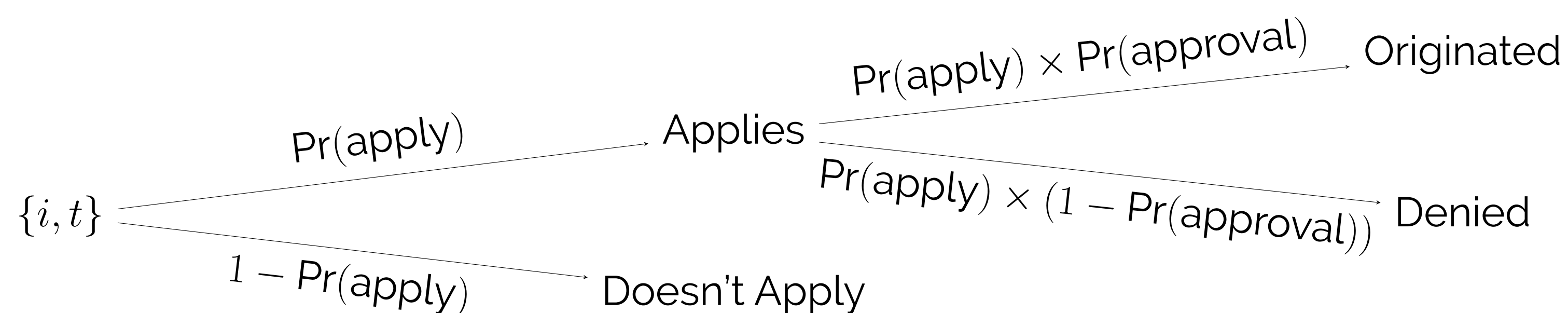
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Overview

- **Refinancing Channel:** Monetary Policy \Rightarrow Aggregate Refinancing Incentive (R_t) \Rightarrow Aggregate Mortgage Refinancing \Rightarrow Aggregate Consumption
- **Household-specific inhibiting factors:** *Behavioral Factors:* some households do not apply to refinance at different levels of R_t ; *Credit Constraints:* some households' refinancing applications are denied [1],[2]
- **This paper:** The household-level probability of refinancing approval is modelled separately from the application probability to investigate the distributional impact of credit constraints on the refinancing channel in the U.S. economy

A Household-Specific Model of Refinancing with Credit Constraints



Application and Approval Probabilities

- Household i in period t is defined by the vector of its characteristics $\mathbf{X}_{i,t}$
- Control for relative change in house prices (ΔHPI_t) and unemployment (U_t)

$$\Pr(\text{apply}) = \frac{\exp(\alpha_1 + \alpha_2' \mathbf{X}_{i,t} + \beta_1 R_t + \beta_2' \mathbf{X}_{i,t} R_t + \gamma_1 \Delta\text{HPI}_t R_t + \gamma_2 U_t R_t)}{1 + \exp(\alpha_1 + \alpha_2' \mathbf{X}_{i,t} + \beta_1 R_t + \beta_2' \mathbf{X}_{i,t} R_t + \gamma_1 \Delta\text{HPI}_t R_t + \gamma_2 U_t R_t)}$$

$$\Pr(\text{approval}) = \frac{\exp(\omega_i' \mathbf{D}_{i,t})}{1 + \exp(\omega_i' \mathbf{D}_{i,t})}, \text{ where } \mathbf{D}_{i,t} \subset \mathbf{X}_{i,t}$$

Aggregate Refinancing

- Households whose refinancing applications are originated are defined by the set of their characteristics:

$$A_t(R_t, \Delta\text{HPI}_t, U_t, \alpha_i, \beta_i, \gamma_1, \gamma_2, \omega_i) = \{(\mathbf{X}_{i,t}, \epsilon_{i,t}, \eta_{i,t}) | \text{apply}_{i,t} \geq 0, \text{approval}_{i,t} \geq 0\}$$

- To aggregate, integrate over the mass of refinancers (households in A_t):

$$\rho_t = \int_{A_t} \Pr(\text{apply}) \times \Pr(\text{approval}) dP(\mathbf{X})$$

Identification of Application and Approval Parameters

- Strong correlation exists between bank liquidity and its originated mortgages' LTI [3]
- As bank liquidity varies, households with different characteristics are approved to refinance, while the household decision to apply refinance will remain unaffected
- Liquidity is used as an instrument for the LTI of applicants in the probability of refinancing application approval

Variable	Means	R_t Interactions with Household Characteristics					White, Asian or Other	Female
		Loan Amount	Income	Income	Home Value	Home Value		
α_i	-3.783*** (0.278)	2.436*** (0.183)	-2.884*** (0.337)	-0.446*** (0.057)	-1.322*** (0.111)	0.169*** (0.056)	-0.271*** (0.042)	-0.380*** (0.043)
β_i	1.362*** (0.298)	-0.908*** (0.171)	1.747*** (0.300)	0.138** (0.064)	0.546*** (0.099)	-0.221*** (0.045)	0.778*** (0.051)	-0.182*** (0.042)
γ_1	-0.031*** (0.011)							
γ_2	-0.366*** (0.066)							
		LTI	LTI \times Income Dummy	LTV	White, Asian or Other		Female	
ω_i		-0.392** (0.191)	2.753** (1.451)	0.014 (0.030)	0.472*** (0.086)		-0.182*** (0.063)	

Table 1. Parameter Estimates. Asterisks denote significance levels (**=1%, ***=5%, *10%).

Result 1: Credit Constraint Effects on Monetary Policy Transmission

- Monetary policy transmission is studied by applying a -100bps shock to the mortgage market rate on 1/2014, keeping rates constant for 60 months and tracking the 'Baseline' model prediction
- A 'No Constraints' counterfactual scenario is also simulated, where all applications are approved
- Table 2 shows the effect of credit constraints as the percentage difference under no credit constraints versus under the baseline scenario of predicted cumulative refinancing rates, one year after the applied shock

Household Characteristic		Credit Constraint Effect (%)
Loan Amount	Decile 1	22.97
	Decile 5	31.66
	Decile 8	38.22
Income	Decile 1	44.29
	Decile 5	35.74
	Decile 8	31.33
Home Value	Decile 1	30.44
	Decile 5	36.54
	Decile 9	32.27
Race or Ethnicity	Black	46.29
	Hispanic	47.53
	White	35.14
Asian or Other		38.56
	Gender	
	Male	35.59
	Female	40.29

Table 2. Effect of Credit Constraints After Monetary Policy Shock

Result 2: Credit Constraint Tightening

- Financial institutions reportedly tightened their credit constraints in 2014 (source: Senior Loan Officer Opinion Survey on Bank Lending Practices)
- Interaction terms for the 'Tight Constraint Period' are added to quantify changes in the distributional effects of credit constraints on refinancing

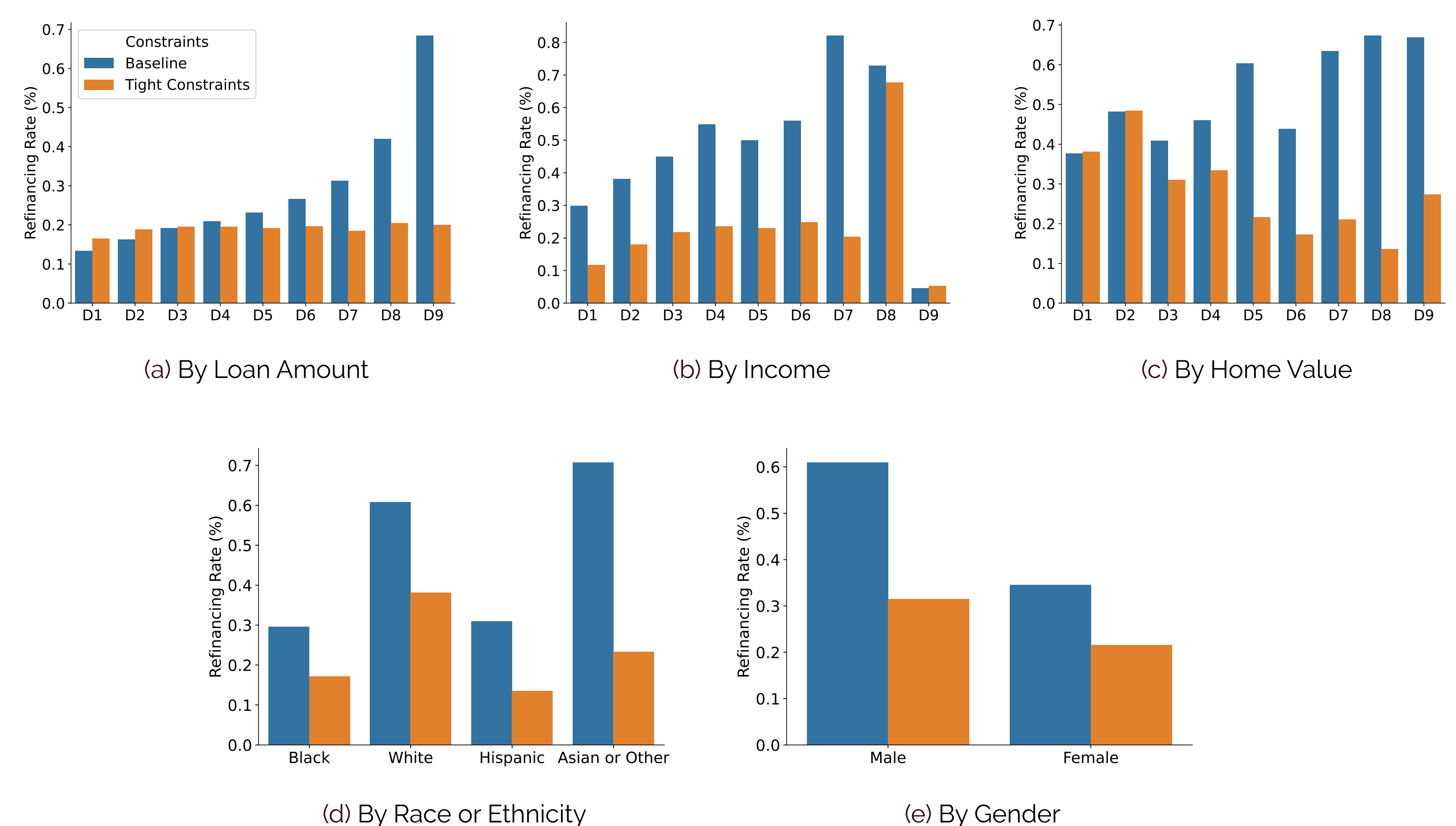


Figure 1. Distributional Effects of Credit Constraint Tightening

References

- [1] Gene Amromin and Caitlin Kearns. Access to Refinancing and Mortgage Interest Rates: HARPing on the Importance of Competition. Working Paper Series WP-2014-25, Federal Reserve Bank of Chicago, November 2014.
- [2] Francisco Gomes, Michael Haliassos, and Tarun Ramadorai. Household finance. *Journal of Economic Literature*, 59(3):919-1000, September 2021.
- [3] Elena Loutsikina. The role of securitization in bank liquidity and funding management. *Journal of Financial Economics*, 100(3):663-684, 2011. ISSN 0304-405X.