The Cost of Consumer Collateral: Evidence from Bunching

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- Lending contracts rely on collateral to align incentives of lender and borrower
 - Increases borrowers' skin in the game; may reduce default rates
 - U.S. household debt comprises \$15 trillion; 80% is collateralized (NY Fed 2020)
- With houses, consumers don't respond always to collateral in ways we expect
 - e.g., Continue to repay mortgage when underwater

Identifying the Effect of Collateral is Challenging

Collateral is typically part of a bundle of contract terms determined in equilibrium

- Consumer credit markets are highly segmented
 - Mortgages and auto loans collateralized
 - Credit cards and student loans uncollateralized

We study a unique setting – consumers can choose collateral – to quantify collateral's role in aligning incentives:

- O How much are consumers willing to give up to avoid pledging collateral?
 - Use U.S. Federal Disaster Loan Program thresholds to estimate consumer responsiveness to collateral requirements
 - ullet \longrightarrow Consumers give up 40% of subsidized credit to avoid posting their houses
- ② Does collateral causally reduce defaults (moral hazard)?
 - Use time variation in thresholds to estimate the effect of collateral on loan default
 - \longrightarrow Collateral reduces default risk by 35%

- Provides low-interest loans to HHs affected by natural disasters
- Loan amounts capped at uninsured portion of documented loss (up to \$240k)
- Data: 1.2 million applicants, 960 distinct disasters, \$11.2B disbursed from Jan 2005 to April 2018

Collateral Rules

- Approval decisions do not depend on availability of collateral
- But, if available, collateral is required if loan amount exceeds
 - \$10,000 from 2005 2007
 - \$14,000 from 2008 2013
 - \$25,000 from 2014 2018
- Program holds junior lien and accepts over-subscribed collateral
- Setting preserves <u>core trade-off</u>: collateral expands credit access, but at risk of losing one's home

Loss Distributions for Three Collateral Rules



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Final Loan Distributions for Three Collateral Rules



- Counterfactual: HH's "ideal" loan amount amount it would borrow absent the collateral requirement
- Three approaches to estimating the counterfactual
 - Traditional bunching estimator: Project using density prior to the bunch point
 - Difference-in-bunching: Use changes in bunching threshold over time
 - Original Request: Use borrower's initially requested loan amounts

Traditional Bunching Approach to the Counterfactual

Method

- Bin the data to get a discrete density
- Fit the density parametrically using data to the bunch point (e.g. <\$10k)
- The difference between the cf and actual density shows the amounts borrowers gave up to bunch



Traditional Model: \$10k Bunch Point

Results

- Median reduction: 44% of ideal loan (\$7,900)
- 73% in bunching area move to the uncollateralized threshold
- Similar percentage reductions for other thresholds



Traditional Model Limitations

Difficulties

- Binned data no individual covariates
- Challenge to determine where "bunching region" ends
 - Counterfactual less accurate further from bunch point
 - Extensive margin impacts assumed away



Difference-in-Bunching, Individual Borrower Regressions

- Absent collateral requirements, loss amounts strongly predict loan amounts
- For loans \in (\$10K, \$25K]
 - Control group: Borrowers during \$25K threshold
 - Treatment group: Borrowers during \$10K threshold



Difference-in-Bunching Results

- Left half = parallel trends
- Right half = impact of collateral
- Average HH with \$25K in losses borrows \$5K less due to collateral requirement
- Median collateral aversion of 47%



Takeaways from the Three Approaches: Ex Ante Collateral Aversion

- Across methods and thresholds, consumers will give up around 40% of their "ideal" loan to avoid collateral
 - The "shadow tax" of posting collateral is approximately \$8,000-\$10,000 in foregone subsidized borrowing
 - Similar overall demand response from doubling of interest rate
 - Total amount forgone > \$1.1 billion

- Financial incentives yes, HHs bunch more when interest rates are higher
- Adverse/advantageous selection*
- Behavioral considerations*

We Find Advantageous Selection

Panel A: Credit Score



Panel B: Income



17/23

Existing LTV on Home Loans

- LTV matters (somewhat)
 - Low LTV 5pp more likely to bunch
 - BUT(!) 30% of HHs with LTV > 1 bunch



Does Collateral Reduce Defaults?

- Use variation in posting collateral across different threshold rules
- Instrument for posting collateral: Distance to threshold
- Loss size fixed effects make this a "within" estimator



First Stage Results: Distance Predicts Collateral Use

Instrument is strong

 And in the correct direction: Farther from collateral threshold → More likely to post collateral

	Dependent variable:
	Collateral
In(Loan Amount)	1.036***
	(0.031)
Distance IV	1.535***
	(0.149)
Dependent Var. Mean:	0.38
Instrument F-Stat:	1,086
Disaster Fixed Effects?	Yes
Time Since Origination Fixed Effects?	Yes
Loss Size Fixed Effects?	Yes
Data Level?	Household - Loan Year
Observations	592,214
Residual Std. Error	0.213

Second Stage Results: Collateral Causally Reduces Default

- Large causal impact of collateral on default: 34% decline
- Similar in magnitude to 100 point increase in credit scores
- Adding controls doesn't impact estimate

	Dependent variable:		
	Default Hazard		Default Rate
	(1)	(2)	(3)
Collateral (fit)	-0.031* (0.017)	-0.030**	-0.058**
In(Loan Amount)	0.070***	0.060*** (0.016)	0.132***
Credit Score (00s)	(0.0.0)	-0.034*** (0.002)	(0.020)
In(Monthly Debt)		-0.022*** (0.003)	
In(Monthly Income)		-0.000*** (0.000)	
Implied Percentage Change:	-0.34	-0.37	-0.39
Time Since Origination Fixed Effects?	Yes	Yes	No
Loss Size Fixed Effects?	Yes	Yes	Yes
Data Level?	Household - Loan Year	Household - Loan Year	Household
Observations	592,214	592,214	54,123
Residual Sta. Error	0.263	0.260	19.223

- First evidence of collateral's effect on household decision-making
 - Prior research examines commercial borrowers (e.g. Jimenez et al. 2006, Benmelech and Bergman 2009, Chaney et al. 2012, Luck and Santos 2019)
- New evidence on borrowing against one's home and default (e.g. Bhutta et al. 2017, Nakajima and Telyukova 2017, Ganong and Noel 2020)
- Extend the growing methodological literature on using thresholds and bunching to recover elasticities (e.g. Kleven 2016)

Conclusion - Please send comments: collier@temple.edu

- We use a unique setting to estimate the costs of collateral requirements
- Findings: collateral is a key factor in the actions of consumers, both *ex ante* (loan amounts) and *ex post* (repayment)
- Findings point to attachment to one's home we isolate the non-financial / non-moral costs of default and they are large
- Helps to explain behaviors like high default costs in mortgage market and reluctance to borrow against home equity