
Loan Product Steering in Mortgage Markets

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During the Housing Run-Up...

- Allegations of unscrupulous lending behavior
 - ▶ Predatory actions
 - ▶ Unjustifiably high fees/rates
 - ▶ Hidden terms (e.g. prepayment penalties)
 - ▶ Unaffordable mortgages
 - ▶ Falsified information
 - ▶ Lender compensation was tied to excesses

- Research Question:
 - ▶ **Did borrowers take the right mortgage contract for them, or did lenders steer them to more profitable contract types?**

What is steering in this context?

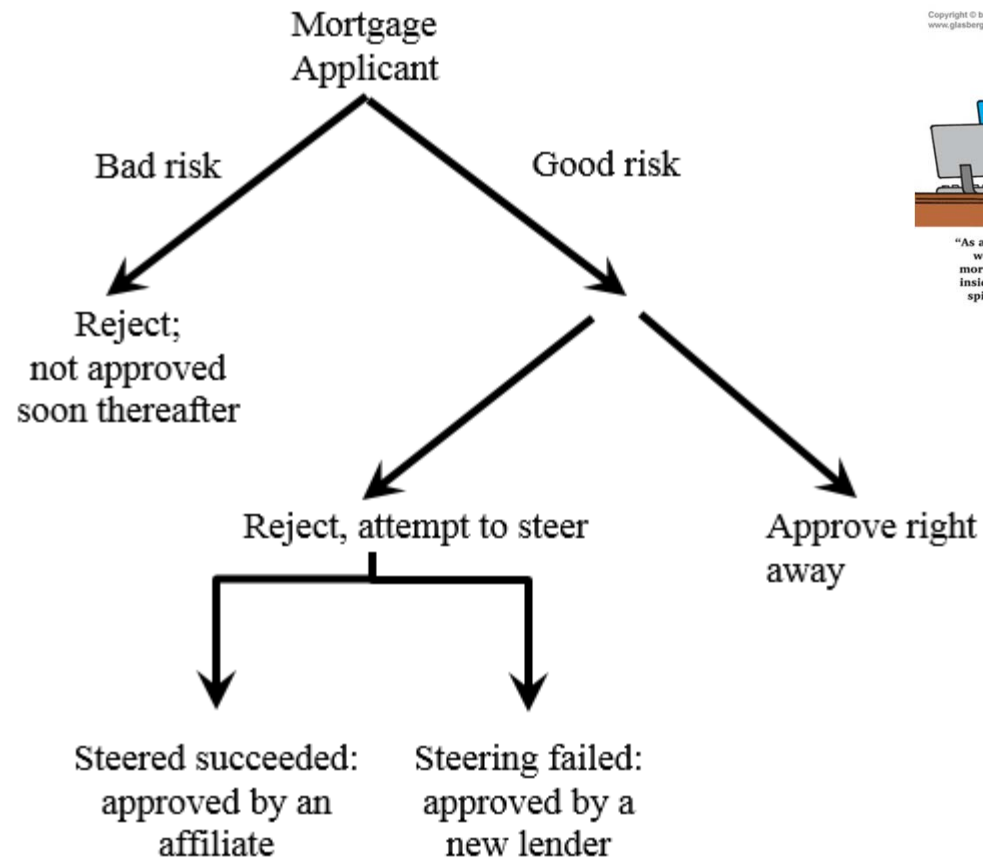
- Lender guiding a borrower towards mortgage contract with features that are highly compensated by the market but that may or may not be useful for the borrower
 - ▶ aside: “useful” takes no normative stand on a given contract feature
- Ideal experiment:
 - ▶ Steering is an observable treatment protocol
 - ▶ Borrowers are randomly assigned to different underwriting regimes
- Identification challenge:
 - ▶ How do you infer steering, which is inherently unobservable?
 - ▶ What is the control group?
 - ▶ What would have borrowers chosen in the absence of lender pressure?

Mortgage Steering



“As an alternative to the traditional 30-year mortgage, we also offer an interest-only mortgage, balloon mortgage, reverse mortgage, upside down mortgage, inside out mortgage, loop-de-loop mortgage, and the spinning double axel mortgage with a triple lutz.”

Flow Chart: Steering to an Affiliate



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Why Steer?

- Higher fees
- Better pricing in PLS pools
- Loan officer incentives (A&B 2013)
- More profitable servicing

Empirical Strategy

- Focus on a small group of borrowers whose application was (1) rejected and (2) then approved.

Propose:

- ▶ **“Steered”**: Denied and then approved with the original lender or an affiliate
- ▶ **“Non Steered”**: Denied and then approved elsewhere
 - Unobservable: steering within the lender unaccompanied by rejection
- Test: contrast the two groups along following dimensions
 - ▶ Mortgage contract: interest rate and contract features
 - ▶ Mortgage funding: securitization (public/private) or portfolio
 - ▶ Mortgage outcomes
 - ▶ Borrower characteristics: financially sophisticated or not

Null Hypothesis: The Good Lender

- “Oh, you are in the wrong department”
- Rejected and then approved by affiliate:
 - ▶ Competitive rate
 - ▶ Low fee products
 - ▶ Keeps mortgage on books
 - ▶ Good ex post credit outcomes



Summary of Hypotheses

- A borrower rejected but then quickly approved by a lender or its affiliate is characterized by:

	Steering	Good Lender
Interest rate	High	Low
Products	High-margin (exotic)	Low-margin (vanilla)
Allocation	Wall Street	Portfolio/FNMA
Borrower characteristics	Vulnerable	Similar
Default risk	Comparable	Comparable

- ... relative to a borrower rejected and quickly approved by an unaffiliated lender

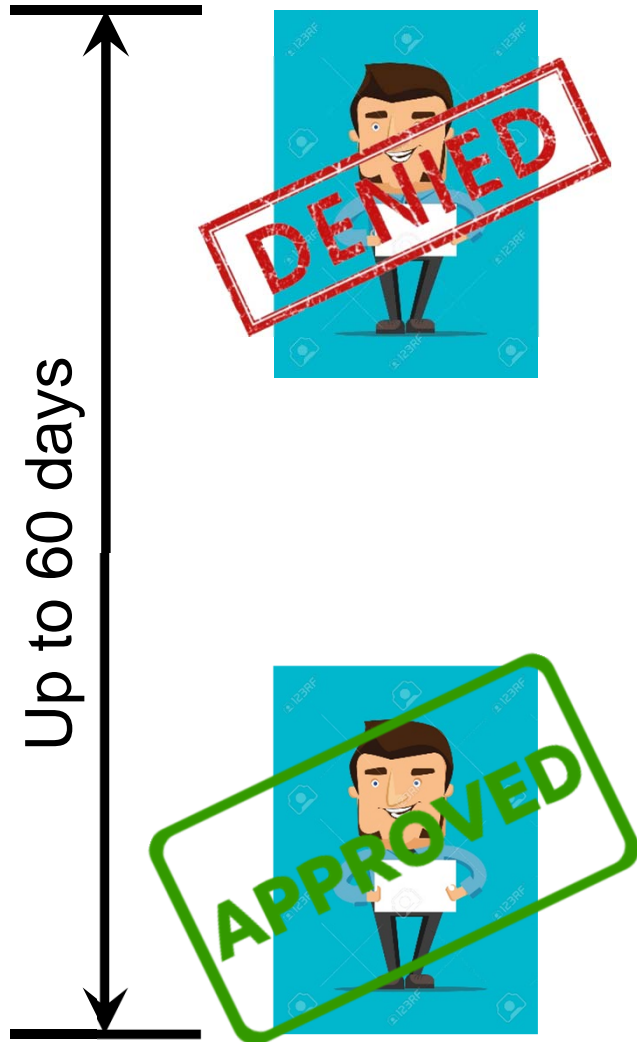
Data

- Home Mortgage Disclosure Act (HMDA)
 - ▶ 1998–2006
 - ▶ Non-public version: has application date
 - ▶ Includes all mortgage applications
 - ▶ Includes application amount, income, race, gender

- McDash Applied Analytics (LPS Applied Analytics)
 - ▶ 1998–2006 (better coverage in 2003–2006)
 - ▶ Collects loan characteristics at origination from servicers; tracks the performance over time
 - ▶ Includes: interest rate, fixed/ARM, mortgage type (IO, Option ARM, prepayment penalty, documentation), LTV
 - ▶ Performance over time

- Call Report Data
 - ▶ List of Bank Holding Companies and their subsidiaries

Generating Denied-Approved Sample



Exact match on:

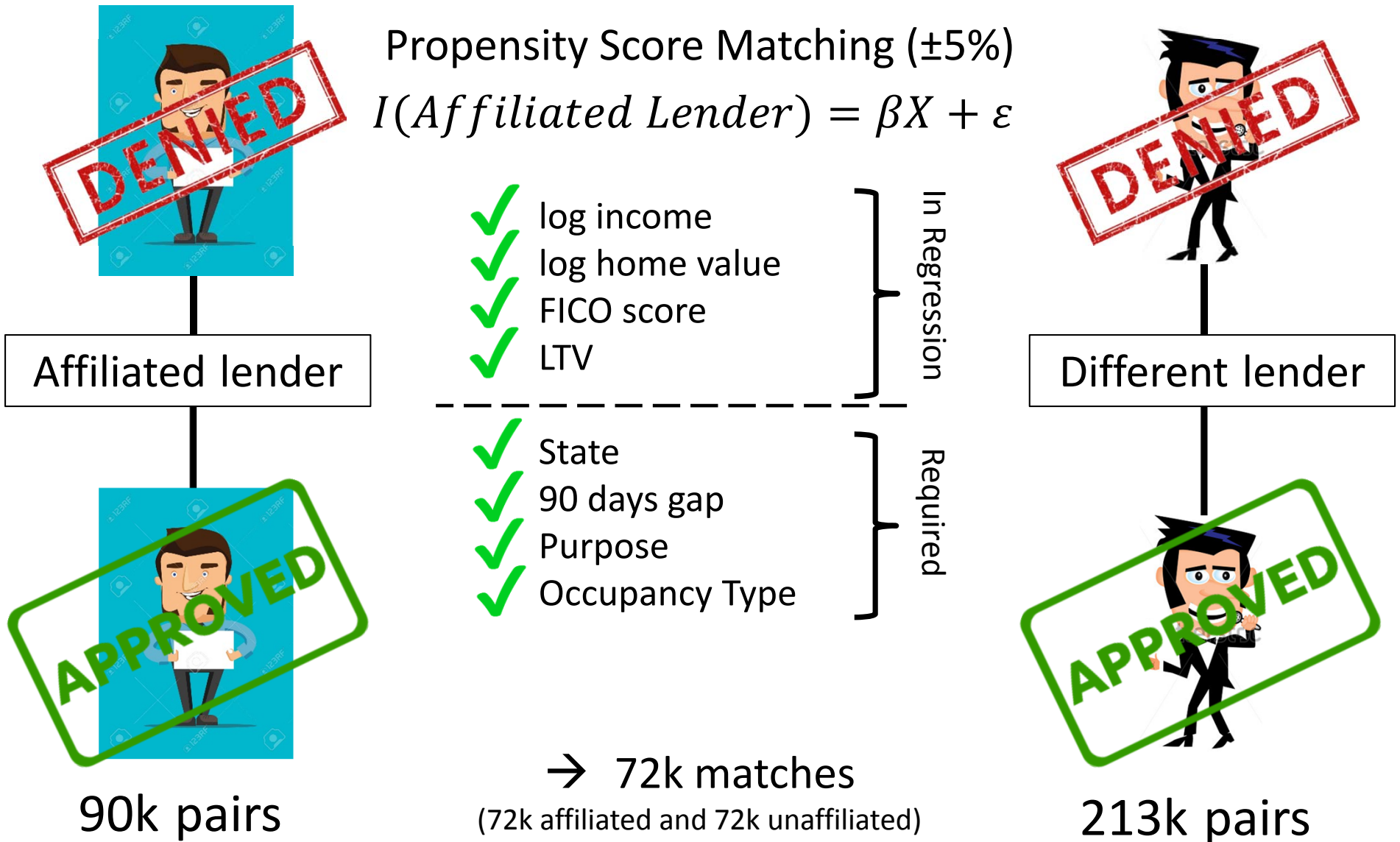
- Census tract
- Race and gender
- Loan type (conv/VA/FHA)
- Loan purpose
- Occupancy type

Close match (iterate up to \pm \$5k)

- Loan amount
- Income

- 3.40m pairs in 1998-2006 HMDA
- Match with BHC: 1.35m (250k in affiliates)
- Match with McDash: 303k (90k in affiliates); about 60% in 2005-06

Generating Matched Sample (Design 1)

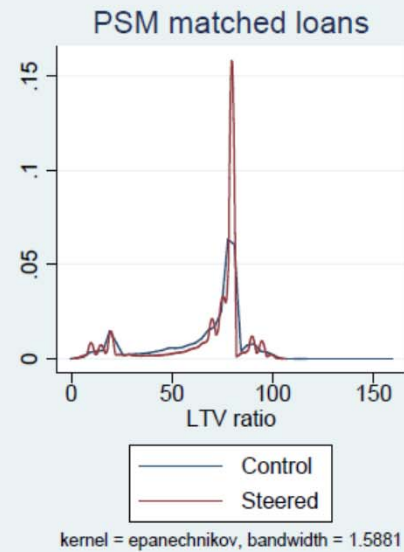
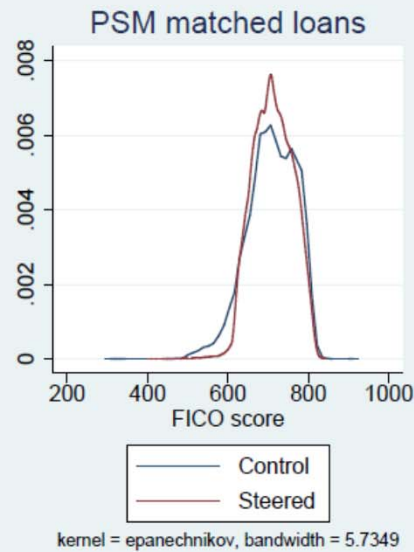
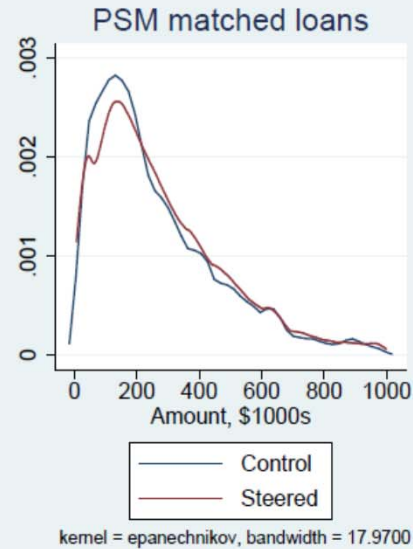
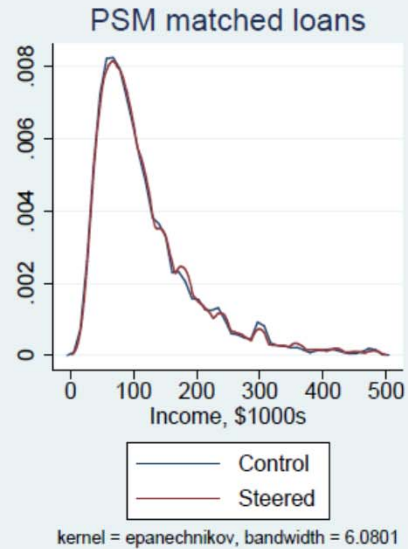


Prop Score Matching: Matched Variables

Variables	Design 1 (Propensity Score Matching)			
	Steered		Control	
N	71,682		71,682	
<u>Match quality</u>	<u>Mean</u>	<u>StDev</u>	<u>Mean</u>	<u>StDev</u>
FICO at origination	711.2	49.0	708.7	59.6
LTV Ratio	68.8	21.6	65.8	22.2
Income, \$1000s	124.5	97.2	124.8	100.7
Loan amount, \$1000s	277.2	205.1	262.7	199.9
Refi flag	0.41	0.49	0.41	0.49
Owner-occupied flag	0.81	0.39	0.81	0.39
Conventional flag	1.00	0.07	1.00	0.07

- Applicants in our sample have reasonably high credit scores and incomes, and low loan-to-value ratios

Kernel Densities



Prop Score Matching: Other Variables

Variables	Design 1 (Propensity Score Matching)			
	Steered		Control	
N	71,682		71,682	
<u>Other covariates</u>				
Change in HPI 12-mo prior to orig. (%)	0.140	0.104	0.139	0.106
Change in HPI 12-mo after to orig. (%)	0.045	0.112	0.045	0.113
Share African-American	0.06	0.23	0.06	0.23
Share Hispanic	0.17	0.38	0.15	0.36
Share Female	0.32	0.47	0.25	0.43
Share with no co-signer	0.68	0.47	0.57	0.50
Share in Low-Moderate Income tracts	0.30	0.46	0.27	0.44
Share with some college education	0.59	0.18	0.59	0.18

Interest Rates

Dependent variable:	Initial interest rate					
Mean of control sample:	6.59					
	(1)	(2)	(3)	(4)	(5)	(6)
Steered flag	0.387*** [2.60]	0.721*** [5.07]	-0.060 [-0.68]	0.348*** [8.43]	0.376* [1.84]	0.692*** [3.47]
Borrower characteristics	No	Yes	No	Yes	No	Yes
Mortgage characteristics	No	Yes	No	Yes	No	Yes
State*Qtr fixed effects	Yes	Yes	No	No	No	No
State*BHC*Qtr fixed effects	No	No	Yes	Yes	No	No
Matched pair fixed effects	No	No	No	No	Yes	Yes
Observations	143364	140072	143364	140072	143364	140072
Adjusted R ²	0.165	0.460	0.384	0.591	0.152	0.447

Economic Significance

- Industry multipliers for converting interest flows into capitalized dollar values: 4 to 7 (Fuster et al. 2013)
- $4 * 34.8\text{bp} * \$200,000 = \$2,800$ in extra profit
- $7 * 69.2\text{bp} * \$200,000 = \$10,100$ in extra profit

- Historical profitability of mortgage originations: \$2,000 to \$4,000 (2000-2010) (Goodman 2012)

Mortgage Products I

- Interest Only:
 - ▶ Baxi (2015, p. 98):

“Interest Only mortgages are the most profitable for a lender”

- Option ARMs (“pick-a-pay”):
 - ▶ Kennedy (2008): CEO of Washington Mutual (2004/Q3 conf. call):

“The company focuses on high margin mortgage products such as option ARM mortgages”

 - ▶ Similar message echoed in numerous press and industry articles starting in 2007 about mortgage market developments

Mortgage Products II

- Prepayment penalties:

- ▶ Mortgages with prepayment penalties were Countrywide's favorite product since:

"...investors who bought securities backed by the mortgages were willing to pay more for loans with prepayment penalties..."

(NYTimes 2007)

- Low documentation:

- ▶ Steven Krystofiak, President of the Mortgage Brokers Association for Responsible Lending testimony (Federal Reserve Board 2006):

"Banks allow such high volumes of [stated income] mortgages because days after the loans fund, they get pooled and sold to investors... After the loans get sold, which is very easy to do in the secondary market, the banks earn a nice profit and go out to find more loans to originate."

Mortgage Products I

Dependent variable:	Interest Only			Option ARM		
	0.165			0.161		
Mean of control sample:	(1)	(2)	(3)	(4)	(5)	(6)
Steered flag	0.266*** [5.60]	0.186*** [8.80]	0.262*** [4.03]	0.129*** [8.70]	0.046*** [2.98]	0.125*** [6.15]
State*Qtr fixed effects	Yes	No	No	Yes	No	No
State*BHC*Qtr fixed effects	No	Yes	No	No	Yes	No
Matched pair fixed effects	No	No	Yes	No	No	Yes
Borrower & mtg characteristics	----- Yes -----			----- Yes -----		
Observations	143364	143364	143364	143364	143364	143364
Adjusted R ²	0.158	0.254	0.144	0.241	0.404	0.204

- Steered borrowers are more likely to take out non-amortizing loans

Mortgage Products II

Dependent variable:	Prepayment Penalty			Low documentation		
	(1)	(2)	(3)	(4)	(5)	(6)
Mean of control sample:	0.198			0.671		
Steered flag	0.141*** [6.13]	0.102*** [2.92]	0.136*** [4.11]	0.219*** [5.30]	0.180*** [4.88]	0.221*** [3.99]
State*Qtr fixed effects	Yes	No	No	Yes	No	No
State*BHC*Qtr fixed effects	No	Yes	No	No	Yes	No
Matched pair fixed effects	No	No	Yes	No	No	Yes
Borrower & mtg characteristics	----- Yes -----			----- Yes -----		
Observations	143364	143364	143364	143364	143364	143364
Adjusted R ²	0.158	0.254	0.144	0.241	0.404	0.204

- Steered borrowers are more likely to take out “liar loans” or loans with prepayment penalties

Allocation

Dependent variable:	Portfolio			Private (PLS) securitization			Public (GSE) securitization		
Mean in the control sample:	0.17			0.44			0.38		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Steered flag	-0.231*** [-12.32]	-0.200*** [-4.25]	-0.230*** [-8.12]	0.207*** [6.13]	0.204*** [4.57]	0.203*** [4.16]	0.025 [0.91]	-0.005 [-0.22]	0.028 [0.76]
State*Qtr fixed effects	Yes	No	No	Yes	No	No	Yes	No	No
State*BHC*Qtr fixed effects	No	Yes	No	No	Yes	No	No	Yes	No
Matched pair fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Borrower & mtg characteristics	----- Yes -----			----- Yes -----			----- Yes -----		
Observations	134083	134083	134083	134083	134083	134083	134083	134083	134083
Adjusted R ²	0.172	0.418	0.139	0.314	0.439	0.300	0.372	0.471	0.376

- Steered borrowers' mortgages end up in private label mortgage-backed securities, instead of banks' own portfolios

Ex Post Default

Dependent variable:	90-day delinquency within 2 years					
Mean of control sample:	0.077					
	(1)	(2)	(3)	(4)	(5)	(6)
Steered flag	-0.012* [-1.89]	-0.028*** [-3.58]	-0.016** [-2.20]	-0.014 [-1.26]	-0.014 [-1.41]	-0.030** [-2.45]
HPI growth, lagged 12 mo		0.018 [0.55]		0.007 [0.21]		-0.027 [-0.79]
Fixed effects	State x Qtr		State x BHC X Qtr		Matched pair	
Borrower & mtg characteristics	No	Yes	No	Yes	No	Yes
Observations	143364	136484	143364	136484	143364	136484
Adjusted R ²	0.054	0.102	0.147	0.178	0.055	0.099

Controls: log income, FICO (621-660, 661-720, 721-760, >760), log loan amount, LTV (80%-89%, 90%-99%, ≥ 100%), contract types (indicators: amortizing ARM, option ARM, IO), indicators: refi, pre-payment penalty, owner-occupier, conventional mortgage, low documentation.

Double-cluster standard errors: state, calendar quarter

Who Gets Steered?

Dependent variable:	Borrower Steered (0/1)		
African-American	-0.013 [-0.77]	0.001 [0.12]	-0.020 [-0.43]
Hispanic	0.036*** [3.04]	0.001 [0.38]	0.073** [2.08]
Female	0.062*** [14.43]	0.019*** [3.43]	0.121*** [7.11]
No cosigner	0.101*** [9.33]	0.034*** [4.19]	0.205*** [6.38]
Low/Moderate Income	0.048*** [4.77]	0.027*** [3.56]	0.104*** [3.60]
Share with some college education or above	0.115*** [3.06]	0.060*** [2.80]	0.207* [1.80]
State*Qtr fixed effects	Yes	No	No
State*Rejecting BHC*Qtr fixed effects	No	Yes	No
Matched pair fixed effects	No	No	Yes
Observations	133011	133011	133011
Adjusted R ²	0.026	0.708	-0.928

- Female borrowers, single borrowers with no co-signers, and borrowers in low/moderate income areas are more likely to be steered

Summary

- Less-than-stellar lending practices are difficult to identify in publicly available data
- Propose comparing outcomes of ex ante similar borrowers rejected on their original application but quickly approved thereafter
 - ▶ Some approved by the original lender/affiliate, others shop elsewhere
- Evidence for specific form of credit steering, yielding \$3k-\$10k extra profit to lenders
- Steered borrowers tend to come from demographic groups associated with lower levels of financial literacy

Were there questionable lending practices?

