Beyond the Transaction: Depository Institutions and Reduced Mortgage Default for Low Income Homebuyers

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Motivation

- Low income homebuyers with (affordable) mortgages originated by depository institutions have a lower probability of default than borrowers with (affordable) mortgages originated by non-bank lenders.
  - Alexandar et al. 2002; Coulton et al. 2008; Ding et al. 2009; Laderman and Reid 2009; Moulton 2010
- Why?
  - Differences in loan products
  - Servicing effects (Stegman et al., 2007)
  - Portfolio vs. Securitization effect (Keys et al., 2009; Elul, 2009)
  - Institution effects (Regulation)
  - Information effects (Informational Advantages)

Institution Effects

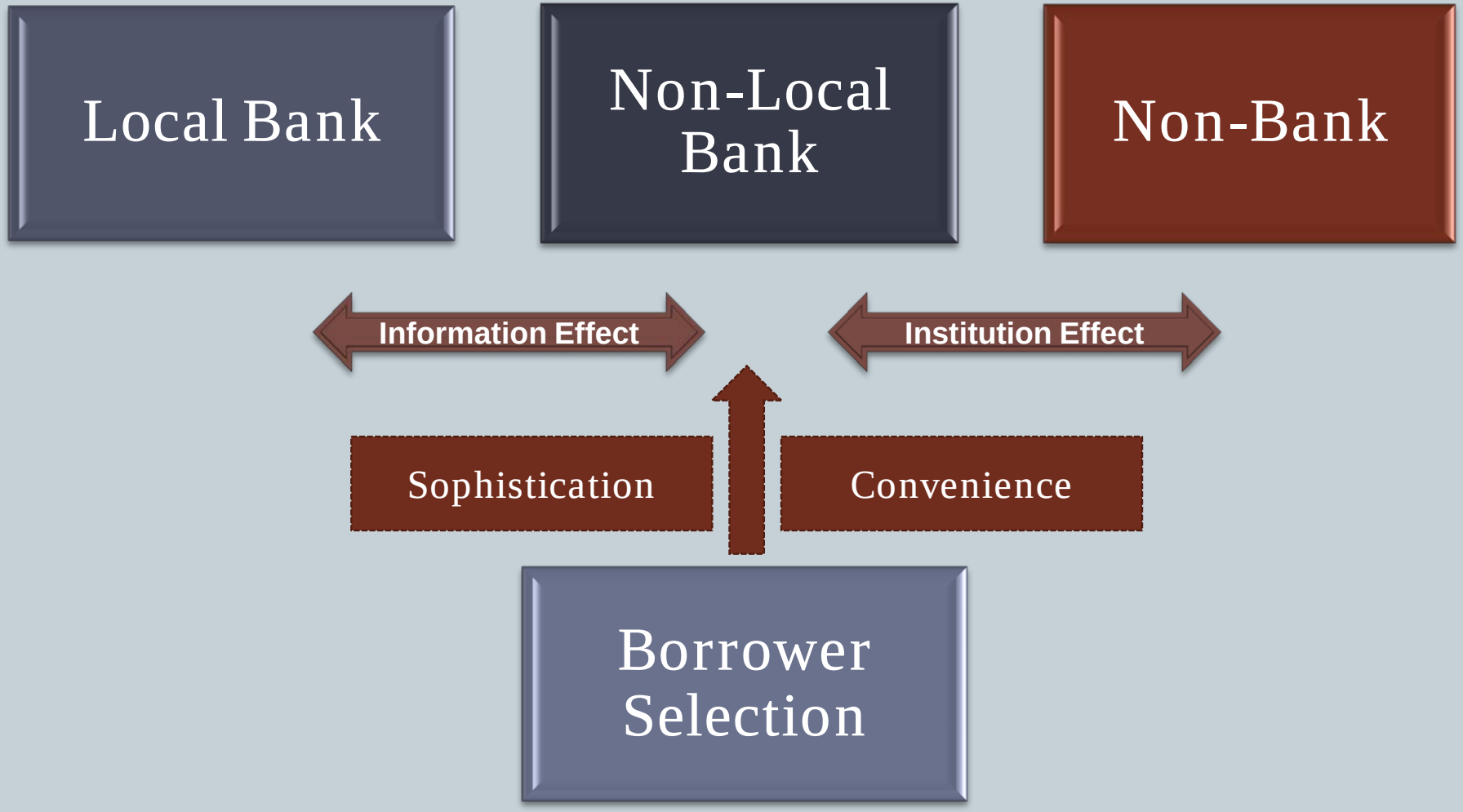
- Bank regulatory structure encourages more cautious lending
  - Banks are regulated entities with their loan quality subject to regulatory scrutiny.
  - Cautious in lending; longer term incentives
  - Use of less-regulated mortgage subsidiaries
- No presumption of soft information

- Implication:
  - Any bank loan (local or not) should have advantage over non-bank loans.
    - Even depository institutions making arm's-length loans are capable of separating creditworthy and uncreditworthy borrowers to some extent

Information Effects

- Bank branch presence in local markets => select less risky borrowers
- Importance of information for assessing credit risk
  - Hard Information
    - Credit score, debt ratios, automated underwriting standards, “transaction based lending”
  - Soft Information
    - Financial health of local employers, borrower participation in financial counseling, social attachments, “relationship lending”
      - Proximity: reduced transaction costs and repeated interactions
      - Local discretion: size may matter, smaller banks have more discretion
    - Example: Small business lending vs. large publicly traded companies
      - (Berger and Udell 2002; Berger et al. 2005; Uzzi 1999; 2003; Brevoort and Hanan 2006; Argawal and Hauswald 2007; Peterson and Rajan 2002)
- Implication:
  - Banks with a local presence should have an advantage over nonlocal banks in picking creditworthy borrowers.

How to Disentangle the Two Effects?

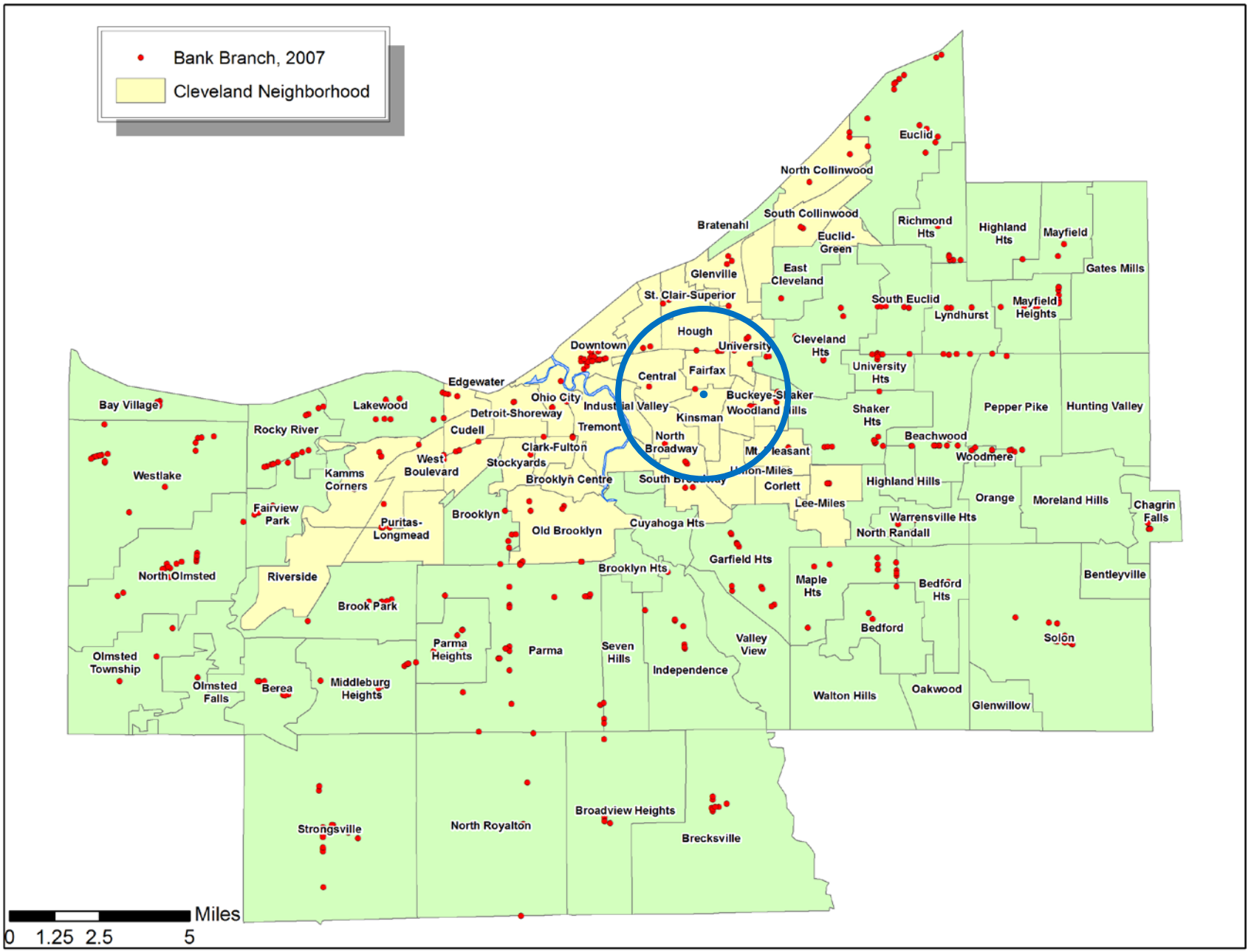


A Unique Dataset:

Mortgage Revenue Bond Program

- National Scope
  - Nearly 10 billion dollars generated per year
  - More than 100,000 home purchases per year
  - Reduced interest rate financing and/or downpayment assistance
- Targeted for Low Income Homebuyers
  - First time homebuyers with incomes <115% of Area Median Income
- In Ohio: Loans Originated by Depository Institutions and Mortgage Companies
  - Servicing held constant; sell to same “Master Servicer” within 60 days of closing
  - Loan product held constant; same interest rate at any given point in time
  - Data on previous renter and new purchase address

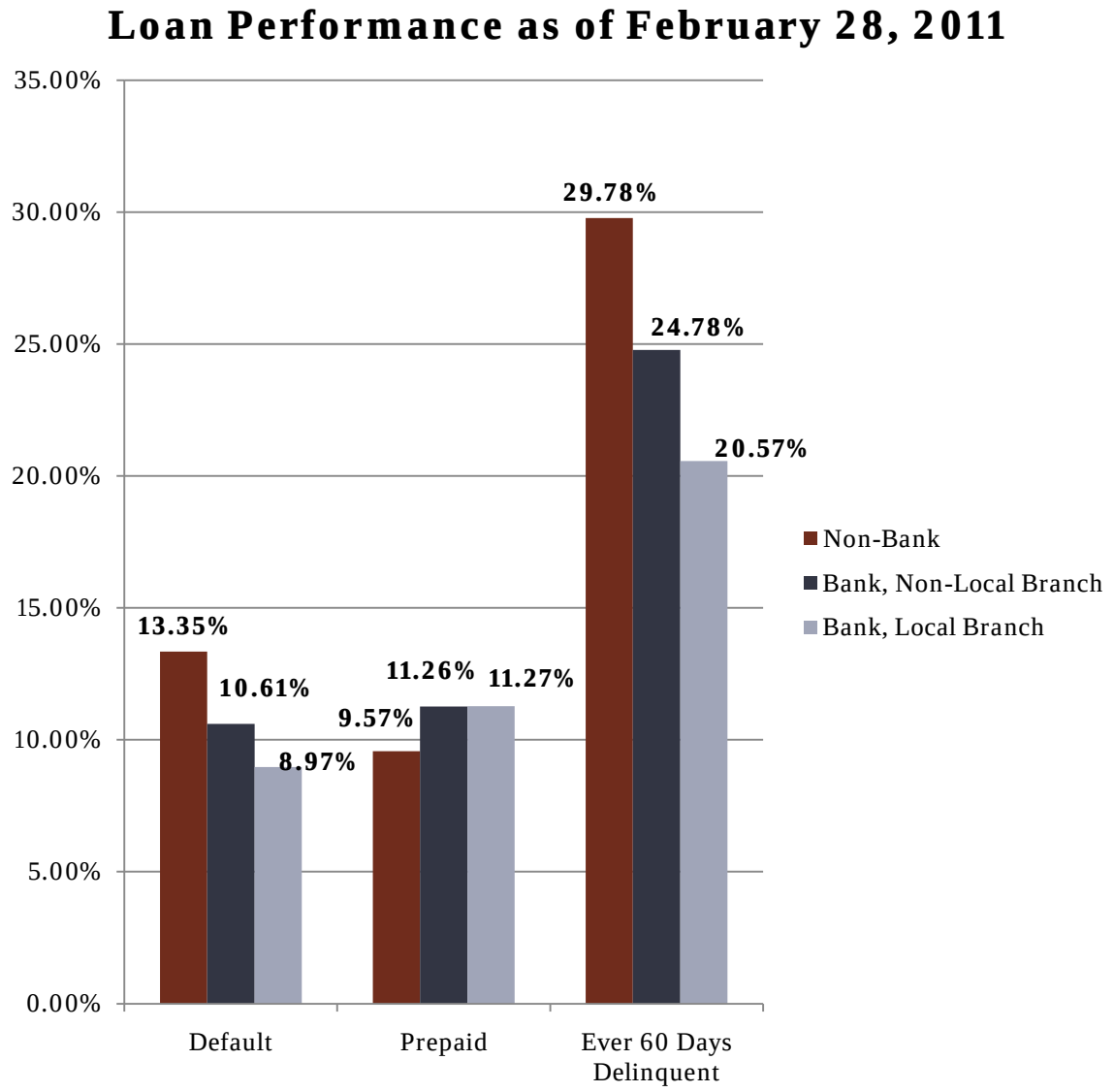
Bank Branches in Cuyahoga County: 2 Mile Radius



Ohio's Mortgage Revenue Bond Program, 2005-2008

Total N= 28,033
Sample N= 18,370 (MSA)

Non-Bank = 54%
Bank, Local Branch= 29%
Bank, Non Local Branch= 17%



Two Stages

Stage 1: Selection to Bank

- Dependent Variables:
  - Non-Bank, Local Bank Branch, Non-Local Bank Branch
  - Small & Large, Local & Non-Local Bank Branch
- Independent Variables:
  - Borrower Sophistication
    - Borrower & Loan Characteristics
  - Geographic Characteristics
    - Previous & and new address
  - Convenience (Orthogonal)
    - Access to **MRB** Banks
    - **Denial rates** of banks and nonbanks

Stage 2: Loan Performance

- Dependent Variables:
  - Current, Default, Prepayment
  - Current, Ever Delinquent, Prepayment
- Independent Variables:
  - Borrower Credit Risk
    - Borrower & Loan Characteristics
  - Geographic Characteristics
    - New address
    - Access to *All* Banks
  - Pr(Stage 1)
    - Pr(LocalBank), Pr(NonLocalBank)
  - LocalBank, NonLocalBank

Stage 1

	Local Bank branch ≤ 2 miles		Non-Local Bank branch > 2 miles	
	β	Δσ or *Δ1*	β	Δσ or *Δ1*
Credit Score (log)	2.512	4.42%**	1.344	0.61%**
Monthly Income (log)	-0.152	-1.09%	0.178	0.75%
Debt Ratio	-0.286	-0.59%	0.087	0.19%
Female	-0.065	-1.20%*	-0.027	-0.07%
Age (Years)	-0.005	-0.84%*	-0.003	-0.21%
LTV	-1.892	-1.78%**	-1.905	-0.83%**
Household Size	-0.063	-1.33%**	-0.036	-0.22%*
Prev Tract Urban	-0.030	0.20%	-0.215	-2.43%*
Prev Tract % Manufacturing	-1.185	-1.43%*	-0.825	-0.35%
Prev Tract Home Value (log)	-0.387	-2.76%**	0.046	0.64%
Prev Tract % County AMI	0.433	2.58%**	-0.030	-0.54%
Prev Access MRB banks (log)	0.126	2.82%**	-0.175	-2.15%**
Prev Count MRB banks	0.016	1.54%^	-0.008	-0.63%
Prev Herfandahl (Tract)	3.736	1.29%^	2.726	0.35%
Prev Tract Bank Denial Rate	-0.778	-1.45%**	0.118	0.36%
Prev Tract Non-Bank Denial Rate	0.272	0.53%	0.391	0.44%*
Pr(Y)		26.96%		12.48%

^p<.10; *p<.05; **p<.01

Stage 2

	Ever 60 Days Delinquent		Prepayment	
	β	Δσ or *Δ1*	β	Δσ or *Δ1*
Local Bank branch ≤ 2 miles	-0.181	-2.37%**	-0.012	0.15%
Bank Branch > 2 miles	-0.105	-1.38%*	-0.027	-0.06%
Selection Local Bank ≤ 2 miles	-1.983	-3.65%**	0.969	1.29%
Selection bank > 2 miles	-0.870	-1.30%	1.551	1.20%
Pr(Y)		16.86%		8.47%

	Foreclosure		Prepayment	
	β	Δσ or *Δ1*	β	Δσ or *Δ1*
Local Bank branch ≤ 2 miles	-0.144	-0.96%*	0.015	0.19%
Bank Branch > 2 miles	-0.101	-0.66%	-0.011	-0.03%
Selection Local Bank ≤ 2 miles	-2.278	-2.02%*	1.002	1.09%
Selection bank > 2 miles	-1.443	-0.97%^	1.518	1.09%
Pr(Y)		7.34%		8.03%

^p<.10; *p<.05; **p<.01

Stage 2, Small & Large Bank

	Delinquency		Prepayment		Foreclosure		Prepayment	
	β	Δσ or *Δ1*	β	Δσ or *Δ1*	β	Δσ or *Δ1*	β	Δσ or *Δ1*
Small Bank (Branch>2)	-0.16	-2.02%**	-0.06	-0.21%	-0.10	-0.66%^	-0.03	-0.14%
Large Bank (Branch>2)	0.10	1.43%	-0.03	-0.33%	-0.07	-0.43%	-0.06	-0.37%
Small Local (Branch<2)	-0.19	-2.59%**	0.11	1.10%	-0.13	-0.93%	0.14	1.13%
Large Local (Branch<2)	-0.21	-2.62%**	-0.07	-0.26%	-0.21	-1.33%**	-0.05	-0.20%
Selection Small Bank > 2	-0.75	-0.57%	-0.53	-0.17%	-1.72	-0.69%^	-0.53	-0.16%
Selection Large Bank > 2	-0.62	-0.70%	2.07	0.99%*	-1.17	-0.58%^	2.05	0.92%*
Selection Small Local < 2	-0.55	-0.60%	-0.37	-0.16%	-0.92	-0.52%	-0.39	-0.18%
Selection Large Local < 2	-1.87	-2.90%**	0.62	0.76%	-2.04	-1.58%*	0.70	0.65%
Pr(Y)		16.49%		7.93%		7.50%		7.50%

^p<.10; *p<.05; **p<.01

Stage 2, by Credit Score

Credit Score < 660 (N=7,140)

	Delinquency or Prepayment				Foreclosure or Prepayment			
	Delinquency		Prepayment		Foreclosure		Prepayment	
	β	Δσ or *Δ1*	β	Δσ or *Δ1*	β	Δσ or *Δ1*	β	Δσ or *Δ1*
Local Bank branch ≤ 2 miles	-0.18	-4.21%**	-0.07	0.03%	-0.20	-2.98%*	-0.03	0.07%
Bank Branch > 2 miles	-0.09	-2.09%	0.00	0.21%	-0.06	-0.99%	0.03	0.23%
Selection Local Bank ≤ 2 miles	-2.33	-6.14%*	-2.29	-0.82%^	-2.57	-4.68%*	-1.85	-0.82%
Selection bank > 2 miles	-1.82	-3.68%^	-1.19	-0.19%	-2.10	-2.89%**	-0.80	-0.16%
Pr(Y)		40.69%		5.63%		19.82%		5.51%

Credit Score > 660 (N= 11,230)

	Delinquency or Prepayment				Foreclosure or Prepayment			
	Delinquency		Prepayment		Foreclosure		Prepayment	
	β	Δσ or *Δ1*	β	Δσ or *Δ1*	β	Δσ or *Δ1*	β	Δσ or *Δ1*
Local Bank branch ≤ 2 miles	-0.18	-1.07%**	0.01	0.18%	-0.07	-0.20%	0.03	0.26%
Bank Branch > 2 miles	-0.11	-0.63%	-0.04	-0.28%	-0.14	-0.35%	-0.03	-0.25%
Selection Local Bank ≤ 2 miles	-1.56	-1.30%^	1.75	1.97%*	-0.81	-0.32%	1.86	1.97%*
Selection bank > 2 miles	-0.17	-0.25%	2.62	2.13%*	-0.02	-0.07%	2.61	2.10%*
Pr(Y)		6.52%		9.44%		2.70%		9.35%

^p<.10; *p<.05; **p<.01

Conclusions & Policy Implications

- Limits to credit scoring and "hard" information
  - For higher risk borrowers, this information is more opaque
    - Non-bank lenders relying on hard information may have higher default rates (among the higher risk borrowers) than those combining hard and soft information
  - Consider mechanisms to increase flow of soft information; role for homeownership counseling and coaching
    - Not just about education and information; also about screening

- Role of depository institutions
  - It's about more than a bank loan; Bank branch location may matter for high risk borrowers
    - Distance decreases the cost and increases the likelihood of soft information
  - Regulations that incentivize bank branch presence and activity in underserved areas may serve a purpose for mortgage outcomes
    - CRA and Large Banks

Thank You

QUESTIONS
& COMMENTS

Bank Access Variables

- The closer a bank branch is to a borrower:
  - The more likely it is for the bank to have relevant soft information.
  - The more likely it is for the borrower to deal with a local branch than a nonlocal bank branch or a non-bank institution.
- Caution:
  - Even in the absence of soft information, a borrower is more likely to choose a local bank if there are simply more of them.
    - Keeping the **number of bank branches** constant in near proximity to the borrower's old and new addresses constant, **proximity of bank branches** to the borrower's address still matters in the choice of a local bank over a nonlocal bank or a non-bank lender.
    - Count, Access & Herfandahl

$$PA_i = \ln\left(1 + \sum_{j=1}^{n_b} \frac{1}{D_{i,j}^{Y}}\right)$$

PA= branch (prev) access for borrower *i*,
n_b = # branches in 2 mile radius
$D^{y}_{i,j}$ = distance of borrower *i* to each bank branch *j* in year *Y* of origination, using the Haversine formula

Multinomial Logit Models

(1) $$\Pr(BANKLOAN_i = j) = \frac{\exp(X_{1,i}\beta_j)}{1 + \sum_{k=NONBANK} \exp(X_{1,i}\beta_k)} \text{ for } j \in \{LOCAL, NONLOCAL\} \text{ and}$$

$$\Pr(BANKLOAN_i = NONBANK) = \frac{1}{1 + \sum_{k=NONBANK} \exp(X_{1,i}\beta_k)}$$

(2) $$\Pr(PERFORM_i = j) = \frac{\exp(X_{2,i}\beta_j)}{1 + \sum_{k=CURRENT} \exp(X_{2,i}\beta_k)} \text{ for } j \in \{DELINQUENT, PREPAID\} \text{ and}$$

$$\Pr(PERFORM_i = CURRENT) = \frac{1}{1 + \sum_{k=CURRENT} \exp(X_{2,i}\beta_k)}$$

Alternate Specification Stage 2: Survival model, loglogistic distribution