



FURMAN CENTER
FOR REAL ESTATE & URBAN POLICY
NEW YORK UNIVERSITY
SCHOOL OF LAW • WAGNER SCHOOL OF PUBLIC SERVICE



The Role of Neighborhood Characteristics in Mortgage Default Risk: Evidence from New York City

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2010 Policy Summit

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The larger research project

1. Who enters mortgage distress?
2. What happens to distressed mortgage borrowers?

New data from New York City

- LoanPerformance mortgage data

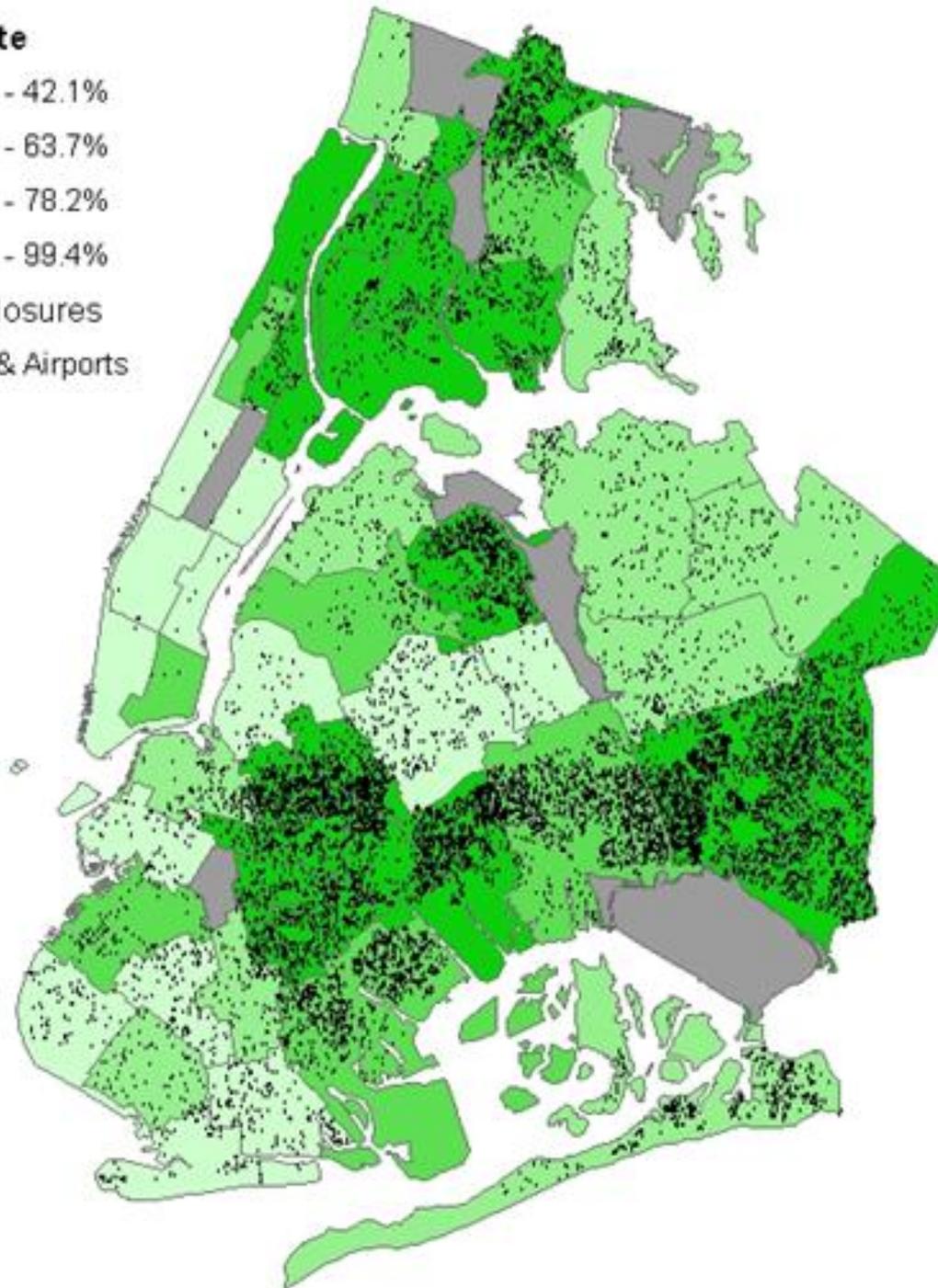
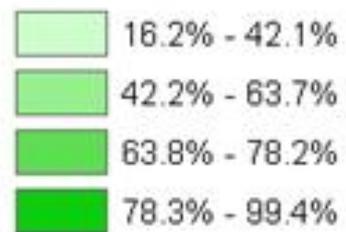
Merged with:

- Deeds records from NYC Dept. of Finance
- Property characteristics from tax assessment records
- Neighborhood characteristics from the Census
- Neighborhood foreclosure data
- 56 local repeat-sales house price indices
- HMDA

Contributions of the study

- Jointly explore role of:
 - Borrower characteristics (credit score, race of borrower)
 - Loan characteristics (current LTV)
 - Neighborhood characteristics
- Incorporate very local measures of:
 - House price dynamics
 - Neighborhood demographics
 - Neighborhoods foreclosure rates
- Control for time-variant macro trends
- Flexible specification (non-linear relationships)

% Non-white



Analysis sample

- First lien mortgages originated 2004-2007 in NYC, observed until December 2009
- All securitized mortgages in NYC – $\frac{3}{4}$ of all non-prime mortgages originated in NYC
- Loan types
 - 30 year FRM
 - Hybrid ARMs (2/28 and 3/27)
- Sample size
 - 59,721 mortgages
 - 1,449,414 monthly observations

Loan and borrower characteristics

	FRMs	ARMs
Default rate	20%	28%
Averages at origination:		
FICO credit score	665	621
Combined LTV	69%	74%
Original loan amount	\$360,600	\$352,500
ARM margin		5.9%
Fraction >20% payment shock:		2.5%

Borrower race and gender

	FRMs	ARMs
<u>Primary borrower</u>		
Female	39%	43%
White	31%	22%
Black	37%	46%
Hispanic	19%	20%

Empirical specification

- Cox proportional hazard model
- Dependent variable:
hazard of becoming 90 days delinquent
- Explanatory variables:
 - Borrower, loan, neighborhood characteristics
 - Calendar time fixed effects

Hazard model results: loan and borrower characteristics

- Increased probability of default for:
 - Home purchase loans
 - Higher current combined LTV
 - Lower credit scores
 - Higher DTI
 - Higher interest rate at origination
 - Higher loan amount
 - Higher ARM margin
 - Large ARM payment shocks
 - No coborrower
 - Black borrowers

Hazard model results: neighborhood characteristics

- The probability of default increases with:
 - Lower neighborhood median income
 - Lower % of high school graduates
 - Lower % of immigrants
 - Higher share of non-prime loans (ARMs)
- Recent foreclosure and REO rates matter
 - Higher concentration of foreclosures and REOs increases the probability of default
- For home purchase loans, race of the neighborhood matters
 - Even after controlling for race of the borrower, a higher percentage of black residents in the neighborhood increases probability of default

Interaction effects: borrower race and neighborhood race

- Majority black neighborhoods
 - No effect of being black vs. non-black
- Non-black neighborhoods
 - Black borrowers have significantly higher default rates than non-black borrowers
- Neighborhood race is a more powerful predictor of default than is borrower's race

Higher risk of default in black neighborhoods: possible explanations

- Something different about people living in black neighborhoods for which we can't control
 - More likely to experience adverse shocks (unemployment)
 - Lower capacity to weather shocks (lower financial reserves)
- Unobservable variation in underwriting
 - Less stringent or improper standards in black neighborhoods
- Unobservable loan characteristics
 - Higher up-front fees in black neighborhoods?
 - More likely to get brokered loans in black neighborhoods?
- Measurement error
 - Inadequate controls for local house prices
 - HMDA race information is inaccurate

Conclusions and policy implications

- Main findings
 - Neighborhood foreclosure and REO rates significantly affect default
 - For home purchase loans, neighborhood race affects default rates
- Public policies to address foreclosure crisis may need to be tailored for different types of neighborhoods
 - Foreclosure prevention efforts should consider neighborhood foreclosure rates and possible contagion effects
 - Regulatory framework should acknowledge differential treatment of black neighborhoods by mortgage industry

Next steps

- Explore effect of loan, borrower, and neighborhood characteristics on how mortgage distress plays out



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Semi-parametric Cox proportional hazard

$$h_i(t) = h_0(t) \exp \left(\beta \text{ borrower characteristics}_i + \gamma \text{ loan characteristics}_i + \delta \text{ neighborhood characteristics}_i + \alpha \text{ calendar time fixed effects} \right),$$

$h_i(t)$ = default hazard of mortgage i at time t

Neighborhood characteristics

	FRMs	ARMs
<u>Census tract averages</u>		
Median income	\$42,000	\$40,500
Recent foreclosure rate	0.9%	1.0%
HMDA denials in past 6 months	55%	54%
Hispanic residents	8%	6%
Black residents	40%	50%
Non-native born	37%	37%

Neighborhood characteristics

	FRMs	ARMs
Foreclosure rate of >2%	20%	18%
>60% Black	40%	50%

Variables we include: loan-level measures

- Loan type (FRM vs. 2/28 ARM vs. 3/27 ARM)
 - Loan purpose (home purchase vs. refinance)
 - Loan amount
 - Interest rate & relative interest rate
 - ARM margin and ARM payment shock
 - Debt-to-income ratio (DTI) at origination
 - Full documentation
 - Presence of coborrower
 - Combined loan-to-value ratio (LTV) at origination
 - Origination year
- Borrower credit score
 - Borrower race/ethnicity & gender
 - Current loan-to-value ratio (LTV)

Variables we include: neighborhood (census tract) measures

- Neighborhood demographics
 - Median income
 - Percent high school graduates
 - Percent non-native born
 - Percent Hispanic/black/white/Asian
- Neighborhood non-prime loan share
- Neighborhood foreclosure, REO and crime rates