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Comptroller of the Currency
Administrator of National Banks

Determinants of the Incidence of Loan Modifications

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Modifications are a central tool to address crisis, but have been disappointing

- Key questions:
 - What determines whether the borrower and lender/servicer are able to agree to a modification?
 - What determines whether a modification is successful (allows the borrower to stay out of default and in the house)?

What determines whether the borrower and lender/servicer agree to modify?

- Is there any method to the madness?
 - Are servicers entering into modifications that are maximizing net present value for the investor/lenders?
- Are modifications race-neutral?

Prior research

- Severe data limitations
- Recent nationwide study based upon OCC file of LPS Applied Analytics data by Agarwal et al. 2011
 - Doesn't include many potentially important factors (junior liens, foreclosure counseling, neighborhood characteristics)
 - Treats each outcome as independent, rather than as one option among a set of choices

What determines which outcome results?

- The borrower cures the delinquency
 - becomes current or pays off the loan via refinance or normal sale
- The lender modifies the loan
 - change the terms of the mortgage through a formal underwriting process
- The borrower and lender agree on some other non-liquidation workout
 - forbearance, repayment plan, etc.
- The borrower suffers an involuntary liquidation
 - short-sale, deed-in-lieu, foreclosure sale, REO
- The loan remains delinquent

Data Sources

- Monthly loan performance data for New York City through OCC Mortgage Metrics
 - First lien loans originated from 2004 to 2008
 - Monthly loan performance information for 2008 and 2009
 - Both prime and subprime loans (national coverage is two thirds of the market)
 - But not as comprehensive as the Loan Performance database for subprime loans
 - Use all loans that were 60-day delinquent at some point during 2008 or 2009

Data Sources

- NYC Automated City Register Information System (ACRIS) for mortgage deeds
- HMDA for race of borrower
- NYC Real Property Assessment Database (RPAD) for property characteristics
- Center for NYC Neighborhoods (CNYCN) for foreclosure counseling records
- Furman Center quarterly neighborhood repeat sales price indices
- Public Data Corp. neighborhood level *lis pendens* rates
- NYC Police Department neighborhood level crime data
- 2000 Census

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Variables included in our model

Loan Characteristics

Credit Class
 Product Description
 ARM * Margin at Origination
 Interest Only at Origination
 Full Documentation
 Product Group
 Loan Purpose
 Relative interest rate at origination (fixed rate mortgages)
 Relative interest rate at origination (adjustable rate mortgages)
 Debt-to-income at origination
 Investor type
 Servicer Fixed Effects
 Percentage of loans in neighborhood originated by the servicer, 2004 – 2008
 Current Unpaid Balance
 Number of months post-adjustment (adjustable rate mortgages)
 Loan Age (months)
 Default Time (months)
 Current LTV
 Has a Junior Lien on the Property

Borrower and Property Characteristics

Owner Occupier
 Property Type
 Borrower Race/Ethnicity
 Current FICO Score
 Received Foreclosure Counseling

Neighborhood Characteristics

% Non-Hispanic Black
 % Hispanic
 % Non-Hispanic Asian
 % Foreign Born
 % >65 Years Old
 % of households with Children
 Median Household Income (1999)
 % of adults with a Bachelor's degree or higher
 Homeownership Rate
 Crime Rate

Local Market Conditions

Unemployment Rate
 Recent Foreclosure Rate
 Neighborhood Positive HP Appreciation
 Neighborhood Positive HP Appreciation * HP Appreciation
 Neighborhood Negative HP Appreciation * HP Appreciation

Other Controls

Origination Year
 Borough
 Quarter of Loan Performance

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Econometric Model

- Multinomial logit
 - models the outcomes of delinquent loans as a function of relevant factors
 - accounting for the competing risks of the various outcomes

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Descriptive Statistics: Outcomes

A. Outcomes of Seriously Delinquent Loans

<u>Outcome</u>	<u>% of all loans</u>
Cure	15.0
Modification	9.4
Other Workout	8.5
- Repayment Plan	1.3
- FHA Partial Claim	0.5
- Forbearance Plan	0.3
- Other	6.3
- Reaged/Deferred/Extended	0.2
Liquidation	5.6
<u>Delinquency Continues</u>	<u>61.5</u>

How do loan characteristics affect probability of outcomes?

- Non-prime more likely to be modified than prime
- But other risky loan types (junior liens, IO loans, undocumented loans), including ARMs
 - Make borrowers less likely to cure on their own
 - Make it less likely the loan will be modified
- As LTV rises (borrower has less, or negative, equity)
 - The likelihood of modifications rises
 - The likelihood of cures falls
- Interest Rate Adjustments
 - Loans are less likely to be modified as time since initial rate adjustment increases

Borrower characteristics?

- Borrowers with a greater decline in FICO scores between origination and default are less likely to receive modifications
- Borrowers with higher current FICO scores are less likely to receive modifications.

Race?

- Borrower's race is not a significant predictor of likelihood of getting a modification
- However, loans in majority black or Hispanic neighborhoods are more likely to be modified

Neighborhood characteristics?

- Neighborhood house price appreciation
 - In neighborhoods with negative appreciation, servicers are less likely to modify as depreciation increases
 - In neighborhoods with positive appreciation, servicers are more likely to foreclose
- Borrowers in neighborhoods with high foreclosure rates are less likely to receive modifications or to cure on their own

Foreclosure counseling?

- Foreclosure counseling does *not* increase the likelihood that a loan will be modified
- But it does have a significant and positive effect on the likelihood that the borrower and the servicer will agree on some other workout

Institutional arrangements?

- Loans held in portfolio are significantly more likely to be modified than securitized loans held by private investors
- Loans held by GSEs are less likely to be modified, but more likely to receive other workouts
- Differences among servicers
 - The identity of the servicer is not a strong predictor of modification
 - But the identity of the servicer does have a significant and substantial effect on the probability of other non-liquidation workouts

Conclusions and Policy Implications

- Servicers are acting to maximize the value of the mortgage to the lender/investor in their propensity to modify, come to another non-liquidation workout, or liquidate the property
 - No evidence of disparity in outcomes by race of borrower
 - Servicers seem to be acting to maximize value to investor/lender in selection of modifications (but we don't know whether level is efficient)
 - Servicers are doing what they can to prevent strategic default
- High risk loan characteristics have detrimental effects on borrower outcomes not only in making borrowers more likely to default, but also in limiting their options upon default
- Foreclosure counseling helps borrowers to stay in their homes, but not necessarily through modifications

Contributions of Neighborhood-Level Focus

- Modeling and analytical methods:
 - Confirms the basic findings of national-level analyses, even when controlling for individual race and presence of 2d lien – data which are difficult to incorporate into national models
 - Suggests the importance of incorporating neighborhood race, foreclosure rates and neighborhood level price trends, data which is or could be readily available, into national models

Targeting and design of modification programs

- Coordinate modification policies and counseling programs
- Revise eligibility determinations
 - E.g., add local housing price dynamics to criteria
- Devote additional attention to certain servicers