

## Reducing Foreclosures

Chris Foote, Kris Gerardi, Lorenz Goette, and Paul Willen

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## Disclaimer

- I am speaking today as a researcher and as a concerned citizen
- ... not as a representative of:
  - The Boston Fed
  - or the Federal Reserve System



- When I say “we”, I don’t mean Ben and me.

## Some leading claims about the foreclosure crisis

- 1 High monthly payments have led to “unaffordable” mortgages
- 2 Loan modifications that lower payments are “win-win” for borrowers and lenders
  - Borrowers keep their homes
  - Lenders get more money than they would from a foreclosure.
- 3 Contract frictions related to securitization are blocking win-win modifications

## Unaffordable payments?

- “Unaffordable” payments are not the most important reason people are defaulting
  - Theory: What is affordable for a borrower today may not be affordable tomorrow
  - Data: An empirical model of default gives only a small role to DTI at origination

## Loan Modifications

- Loan modifications are
  - Safe
  - Legal
  - and RARE!
- We look at loans after they became 60 days delinquent:
  - Over the next year, only about 7 percent of the loans received modifications
  - Servicers made no changes for 93 percent of the loans.
- Even after foreclosure proceedings start, we find the same thing
  - Over the next year, only about 6 percent of the loans received modifications
  - For 94 percent of the loans, no renegotiation.

## The role of securitization

- Contrary to popular belief, this has *nothing* to do with the fact that many loans are securitized.
- Probability of a modification of a loan that becomes 60 days delinquent

	Securitized	Portfolio	Total
In next 3 months	1.7%	1.8%	1.8%
In next 6 months	3.9%	4.1%	3.9%
In next 12 months	7.4%	6.7%	7.3%

- The contracts state that servicers should treat securitized mortgages if they own them.
  - They appear to be doing that.
- Our results are quite robust.
  - The likelihood that a delinquent borrower “cures” does not depend on securitization either.

## Understanding Modification

- Concessions to borrowers – Reduction in principal balance?
- Basic logic: If reduced principal balance exceeds loss from foreclosure...
- It would be an *error* not to take advantage of this
- But no one ever does. According to one *banker* (quoted in *ABA Banking Journal*):

*We have not to date forgiven any principal.*

- Reason:

*We are wary of the consequences of being known as a bank that forgives principal.*

## Type I and Type II Error

- Two errors:
  - 1 Type I error: Not assisting a borrower who can't repay.
  - 2 Type II error: Providing costly assistance to a borrower who will repay.

## Could we be wrong?

- Absolutely.
- However, if we are right, the government could waste a lot of money on ineffective programs.

## Affordability and Sustainability of Mortgages

*The flood of foreclosures we see today goes beyond the typical foreclosures of years past, which were precipitated by catastrophic and unforeseen events such as job loss, divorce, illness or death. The current crisis originated in losses triggered by the unsustainability of the mortgage itself, even without any changes in the families' situation, and even where the family qualified for, but was not offered, a loan that would have been sustainable.*

Ellen Harnick  
Senior Policy Counsel  
Center for Responsible Lending  
March 19, 2009

## Unaffordable?



- Penthouse Apartment at Time-Warner Center in New York.
- Price: \$65 Million.
- Outside my budget set.

## When do borrowers default?

- If they have positive equity: Never.
  - Selling dominates
  - There were more foreclosures in 2008Q2 in MA than in 2000-2005 combined!
- If they have negative equity, potential influences include
  - ① **Size of monthly payment** — is it high relative to alternative rent? Has the interest rate recently “reset”?
  - ② **Employment and income** — is the borrower unemployed and likely to be liquidity constrained?
  - ③ **Other life events** — is the borrower suffering illness or divorce, which also affect shadow cost of funds?
  - ④ **Expectations of future price appreciation** — is there a chance that house prices will recover?
- What influences are most important empirically?

## The LPS (“McDash”) Data

- Loan-level dataset covering about 60 percent of mortgages in the U.S.
- Comes from large loan-servicing organizations (“servicers”)
- Advantages
  - Includes both portfolio, securitized, and agency loans
  - Includes prime conforming and subprime (“B & C”) mortgages
- Disadvantages
  - Does not allow us to link first and second mortgages on the same house
  - Does not allow us to link mortgages sequentially within the same ownership experience

## The Endogeneity of Prices

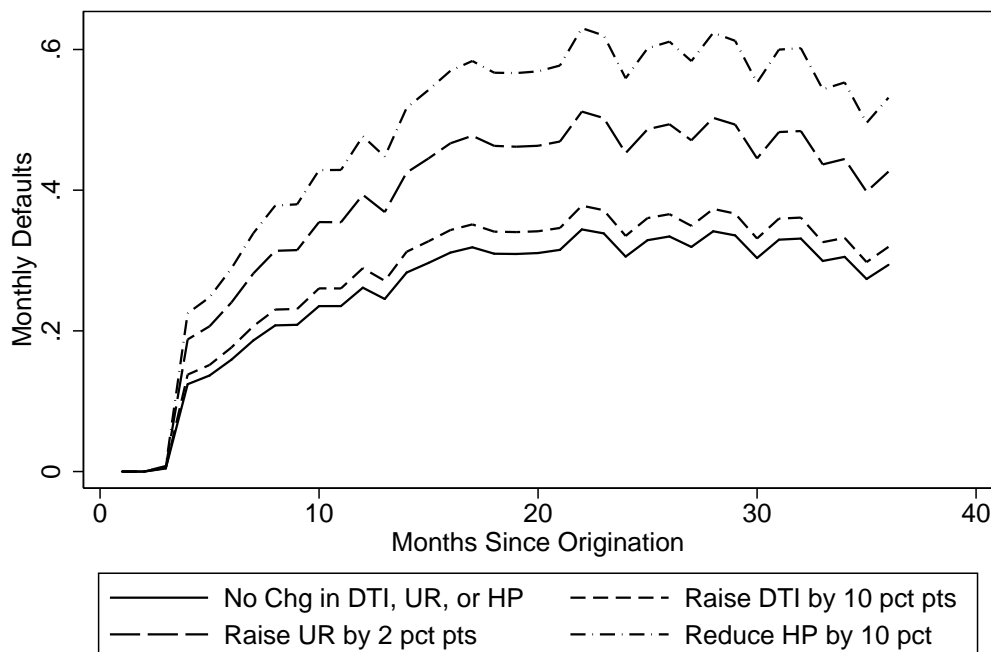
- Could foreclosures cause falling prices? Yes.
- But RHS variable is not prices – it is the cumulative appreciation by individual homeowner
- So we have within-state, within-time variation
- See Gerardi, Shapiro, Willen (2008) for extensive discussion of this point
- While prices and UR enter strongly in the regressions, the results on DTI are not sensitive to their inclusion

## Summary Statistics

	Prime		Subprime	
	Mean	Std Dev	Mean	Std Dev
DTI Ratio	35.1	13.8	40.0	11.1
FICO Score	714.1	61.6	609.0	54.9
LTV Ratio	73.4	18.2	79.2	12.5
Adjustable Rate Dummy	.21	.40	.56	.50
Number of Loans	501,317		41,132	

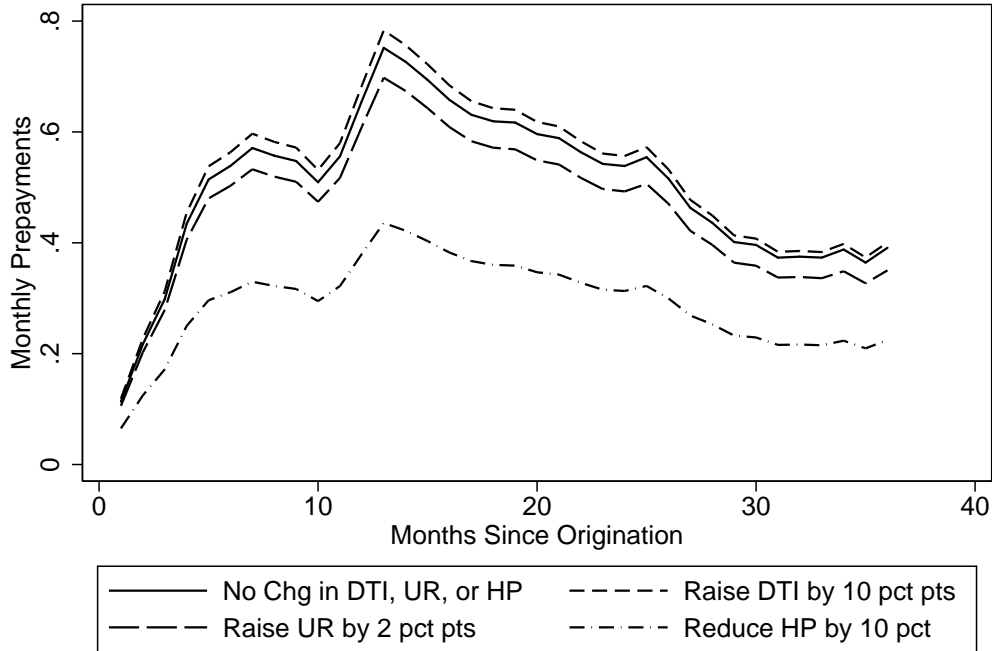
## Model-Generated Defaults and Prepayments

Panel A: Prime Defaults



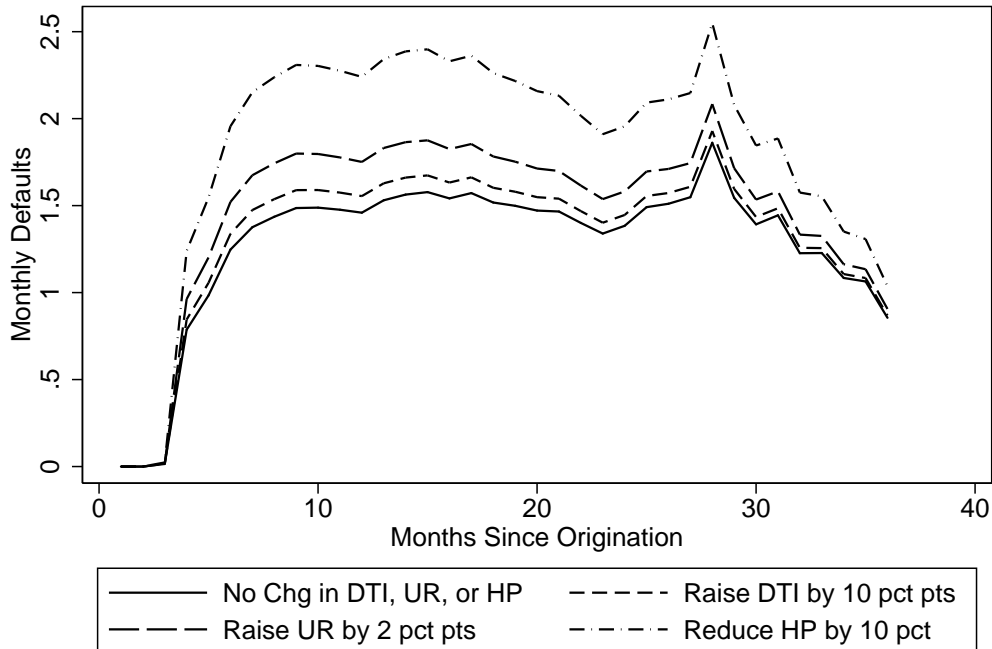
## Model-Generated Defaults and Prepayments (con't)

Panel B: Prime Prepayments

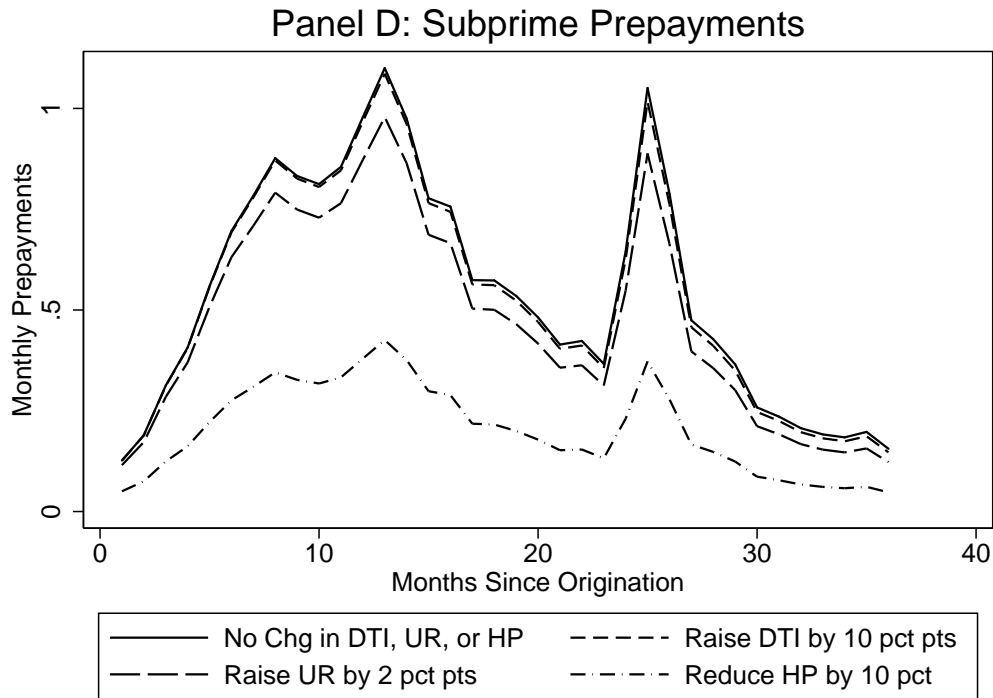


## Model-Generated Defaults and Prepayments (con't)

Panel C: Subprime Defaults

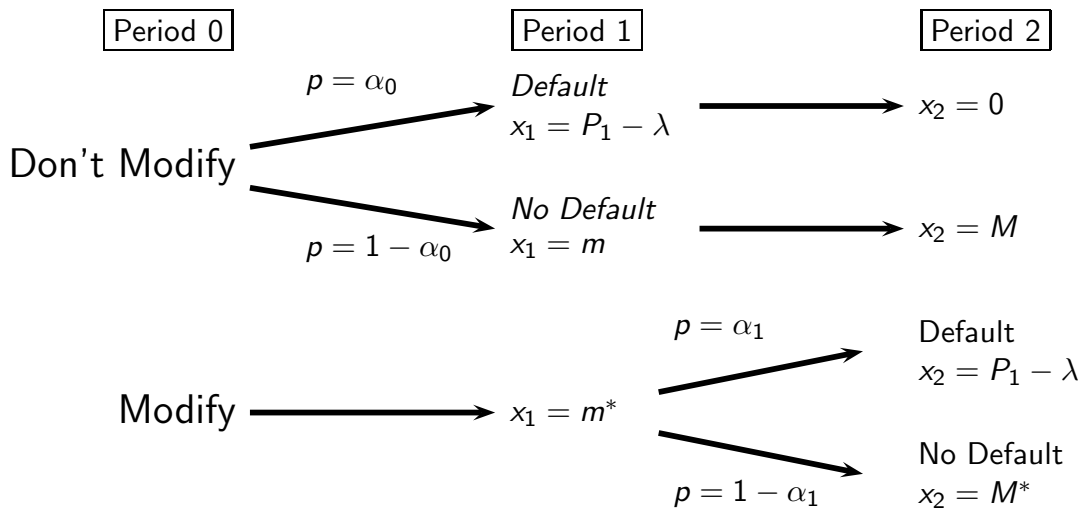


# Model-Generated Defaults and Prepayments (con't)



## A model

- Three periods:  $t = 0, 1, 2$
- Mortgage is a stream of payments  $x_1, x_2$



# The gains to modification

t	Mortgage	House Price	Foreclosure	Modification
1	$m$	$P_1$	$P_1 - \lambda$	$m^*$
2	$M$	$P_2$	$P_2 - \lambda$	$M^*$

- Value of loan without modification:

$$V_{\text{no mod}} = \alpha_0(P_1 - \lambda) + (1 - \alpha_0)[m + (1/R)M].$$

- Value of loan with modification:

$$V_{\text{mod}} = m^* + (1/R)\alpha_1(P_2 - \lambda) + (1/R)(1 - \alpha_1)M^*.$$

- NPV Test: Modify if  $V_{\text{mod}} > V_{\text{no mod}}$

$$\begin{aligned}
 V_{\text{mod}} - V_{\text{no mod}} = & (\alpha_0 - \alpha_1)[m^* + \frac{1}{R}M^* - (P_1 - \lambda)] \\
 & - (1 - \alpha_0)[m + \frac{1}{R}M - (m^* + \frac{1}{R}M^*)] \\
 & + \alpha_1[m^* + \frac{1}{R}(P_2 - \lambda) - (P_1 - \lambda)] > 0 \quad (1)
 \end{aligned}$$

$$1 - \alpha_0$$

Borrower always repays  
 Lender loses because  
 borrower would have paid  
 in full

$$m + \frac{1}{R}M - (m^* + \frac{1}{R}M^*)$$

"Type II error"  
 Costly assistance to  
 borrowers who can pay

$$\alpha_0 - \alpha_1$$

Modification effective  
 Lender gains because  
 modified payments worth  
 more than foreclosure

$$m^* + \frac{1}{R}M^* - (P_1 - \lambda)$$

"Type I error"  
 Don't help borrowers who  
 would have defaulted

$$\alpha_1$$

Borrower never repays  
 Foreclosure is delayed  
 May or may not help lender

$$m^* + \frac{1}{R}(P_2 - \lambda) - (P_1 - \lambda)$$

"Type III error"  
 Lender loses if  $R$  is large  
 or if  $P_2 - P_1$  is big

## The NPV Test in practice

- OCC/OTS data released April 3, 2009:

	Delinquent after		
	3 Mos.	6 Mos.	9 Mos.
(1) Payment reduction	13.8%	22.7%	26.2%
(2) Payment increase	29.2%	45.8%	49.1%

- Let's say that:
  - Payment reduction is 20%, recovers 80¢ on the dollar
  - In foreclosure, lender loses 50% so recovers 50¢ on the dollar
- Does reducing payments increase NPV of loan?
  - NPV of increased payment loan:

$$NPV = \underbrace{49.1\% \times 50¢}_{\text{Recovery from Defaults}} + \underbrace{50.9 \times 100¢}_{\text{Recovery from Repayment}} = 75.45¢$$

- NPV of reduced payment loan:

$$NPV = \underbrace{26.2\% \times 50¢}_{\text{Recovery from Defaults}} + \underbrace{73.8 \times 80¢}_{\text{Recovery from Repayment}} = 72.14¢$$

## The Complexity of Securitization

*The complex webs that securitization weaves can be a trap and leave no one, not even those who own the loans, able effectively to save borrowers from foreclosure. With the loan sliced and tranced into so many separate interests, the different claimants with their antagonistic rights may find it difficult to provide borrowers with the necessary loan modifications, whether they want to or not. In the tranche warfare of securitization, unnecessary foreclosures are the collateral damage.*

Kurt Eggert  
 in *Housing Policy Debate*  
 (2007)

## Identifying the Effect of Modifications

- Are the differences in OCC/OTS's  $\alpha$ 's treatment effects? No.
- To estimate effects of modifications accurately we need to correct for selection:
  - Randomized trials
  - An instrument
  - A good structural model
- Has anyone done this?
  - No. FDIC could have with Indymac, but didn't.

## Mod Example #1: Fixed-rate loan originated Jan 2007

Date	MBA Delinq. Stat.	Interest Rate	Monthly Payment	Outstanding Balance	Remaining Term in Months
2008m10	9	6.5	907	141,323	340
2008m11	9	6.5	907	141,323	339
2008m12	9	6.5	907	141,323	338
2009m1	C	4.5	660	146,686	479

- This borrower was 90 days delinquent, but then became current
- He then received an interest rate reduction (on a supposedly fixed-rate loan)
- His monthly payment *declined* while his outstanding balance *rose* (to make up for past arrears)
- The borrower also received a term extension to a 40-year loan

## 60DQ to Modification

	All Loans				
GNMA	0.877	0.712	0.816	0.908	0.671
	-4.54	-8.34	-4.66	-1.79	-5.38
FNMA	0.437	0.522	0.556	0.777	0.701
	-26.64	-17.51	-15.39	-5.60	-6.00
FHLMC	1.110	1.382	1.391	1.335	1.273
	3.37	8.76	8.48	5.69	3.54
Privately Securitized	1.072	1.015	0.944	0.996	1.040
	2.99	0.56	-2.10	-0.12	0.82
Controls	No	Yes	Yes	Yes	Yes
Refinance	.	.	1.099	1.138	1.102
	.	.	5.65	6.31	3.19
Subprime/Alt-A	.	.	1.563	1.610	1.605
	.	.	21.06	18.69	10.29
Equity	.	.	.	0.997	0.995
	.	.	.	-0.65	-0.52
Negative Equity Dummy	.	.	.	1.010	1.010
	.	.	.	4.07	2.77
Equity Interaction	.	.	.	0.981	0.971
	.	.	.	-0.76	-0.82
Cumulative Unemployment Change	.	.	.	1.023	1.021
	.	.	.	9.60	5.88
DTI ratio	.	.	.	.	1.002
	.	.	.	.	1.85
Low/No Document	.	.	.	.	0.842
	.	.	.	.	-5.05
# Mortgages	244,929	181,564	170,220	132,528	60,546

## Differences with Previous Research

- Using the same data, Piskorski, Seru, and Vig (2008) argue that securitized lenders modify less often
- We find the opposite. What explains the difference?
- They don't try to identify modifications
  - They look at the performance of delinquent loans
  - They assume that, controlling for everything in McDash, the *only* explanation for a difference in performance is modification
- Alternative interpretation: They look at “outcomes” whereas we look at inputs.
- They're wrong. We're right.

## Why we are right

- 1 If there is a difference it's not due to differences in modification:
  - The sheer number of modification is too low to explain significant differences in performance
- 2 And the difference is “successful outcomes” – loan not in REO – is not robust:
  - If we define success as loan not in foreclosure, results go away
    - Most “successes” are > 90 days delinquent or in some stage of foreclosure.
    - Difference between REO and Foreclosure could reflect greater willingness to do “deed-in-lieu” or accounting issues with portfolio lenders.
  - If successful renegotiation is going on, we would expect to see transitions to current or prepayment.
    - In fact, the likelihood of a transition to a better condition is no higher for portfolio loans.

## The slide you've all been waiting for...

- The end.