



# Tailoring Loan Modifications: When Is Principal Reduction Desirable?

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## Background: The Case of Loan Modification

- Previously, loan modifications have been used on a case-by-case basis to deal with temporary hardship experienced by the borrower.
- Most early loan modifications increased mortgage debt and mortgage payment (White, 2008, 2009).



## Background: The Case of Loan Modification

Loan modifications accepted as the centerpiece of the anti-foreclosure policy by this Administration

- 10/07, voluntary loan mod efforts by HOPE NOW Alliance
- 06/08, IndyMac loan mod plan operated by the FDIC
- 12/08, Streamlined modification plan by GSEs
- 03/09, Home Affordable Modification Program by Treasury



## Background: The Case of Loan Modification

- The goal of the current loan mod program:
  - Lower the monthly payment
  - Implemented at a large scale to stabilize the housing market
- HAMP: beginning with rate reduction, followed by term extension, and principal forbearance.



## Background: The Case of Principal Reduction

- An absence of specific guidelines for principal reduction in HAMP
- Failure of the “cramdown” bankruptcy reform legislation
- Fannie and Freddie were authorized to refinance loans with LTVs up to 125 %
- Starting August 15, 2009, servicers can reduce the principal of a troubled FHA mortgage by up to 30% under the FHA HAMP program.



## Background: The Case of Principal Reduction

- Theory of mortgage default
  - Trigger event theory: income/expense shocks
  - Option theory: home equity
- Widespread of negative equity, especially in distressed markets like the “Sand States”
- Can house prices reach the pre-bust levels in the near future?

## Obstacles for Principal Reduction

- How many can/should be saved (high redefault rates and high self-cure rates)
- Securitization: potential conflicts of interest between servicers and investors (Piskorski, Seru, and Vig, 2009)
- Moral hazard: the incentive to default to qualify (Ambrose and Capone, 1996)
- Lack of incentive to prefer principal reduction over other options



## Literature

- Early studies on the effectiveness of loss mitigation efforts, including loan modifications (Capone and Metz, 2003; Cutts and Green, 2005; Cutts and Merrill, 2008)
- Reduced mortgage payment leads to a lower short-term redefault rate (Quercia and Ding, 2009)
- Foote, Gerardi, Goette, and Willen (2009)
  - Origination DTI not a strong predictor of default
  - Self-cure risk makes loan mod unattractive to investors



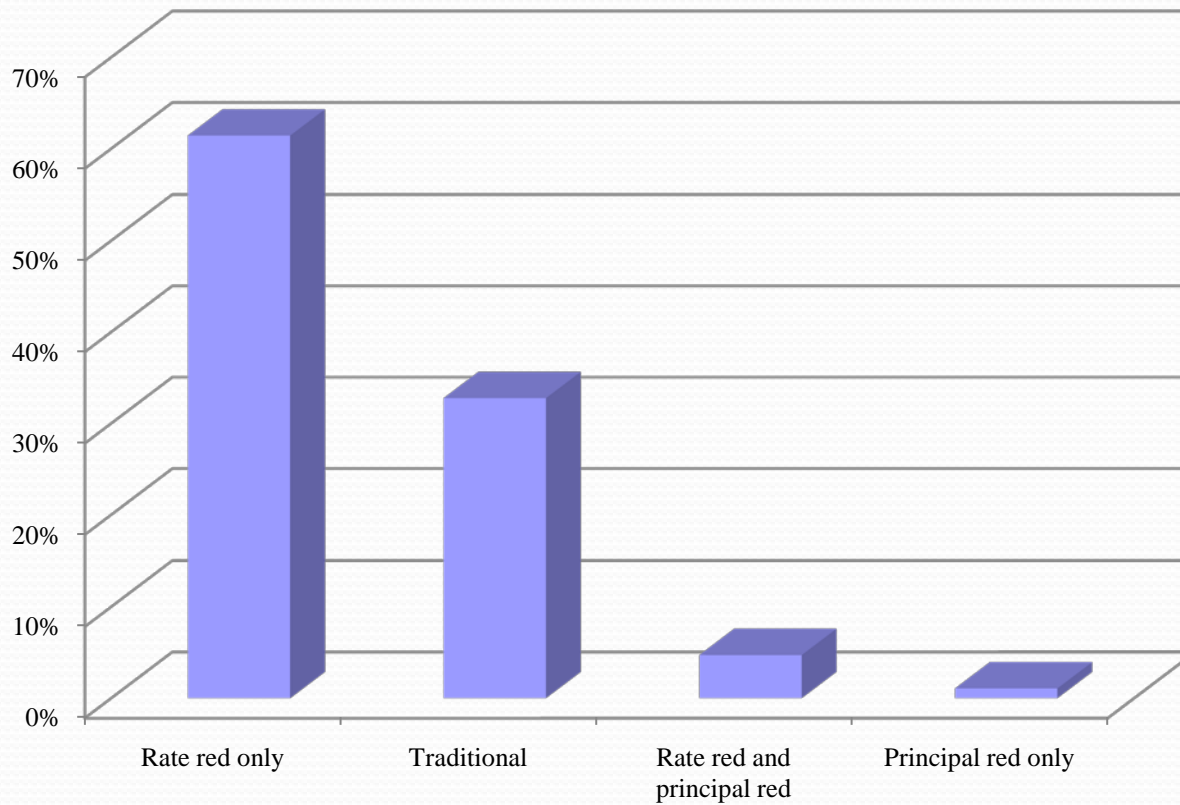
# Motivation

- There is an urgent need for an evaluation of different types of modification.
- Our goal is to examine the way the current efforts in the nonprime market could be made more effective by looking at the full range of modification options, including the principal reduction.
- Two success measures are: redefault risks and a net present value calculation.

## Loan Modification Data

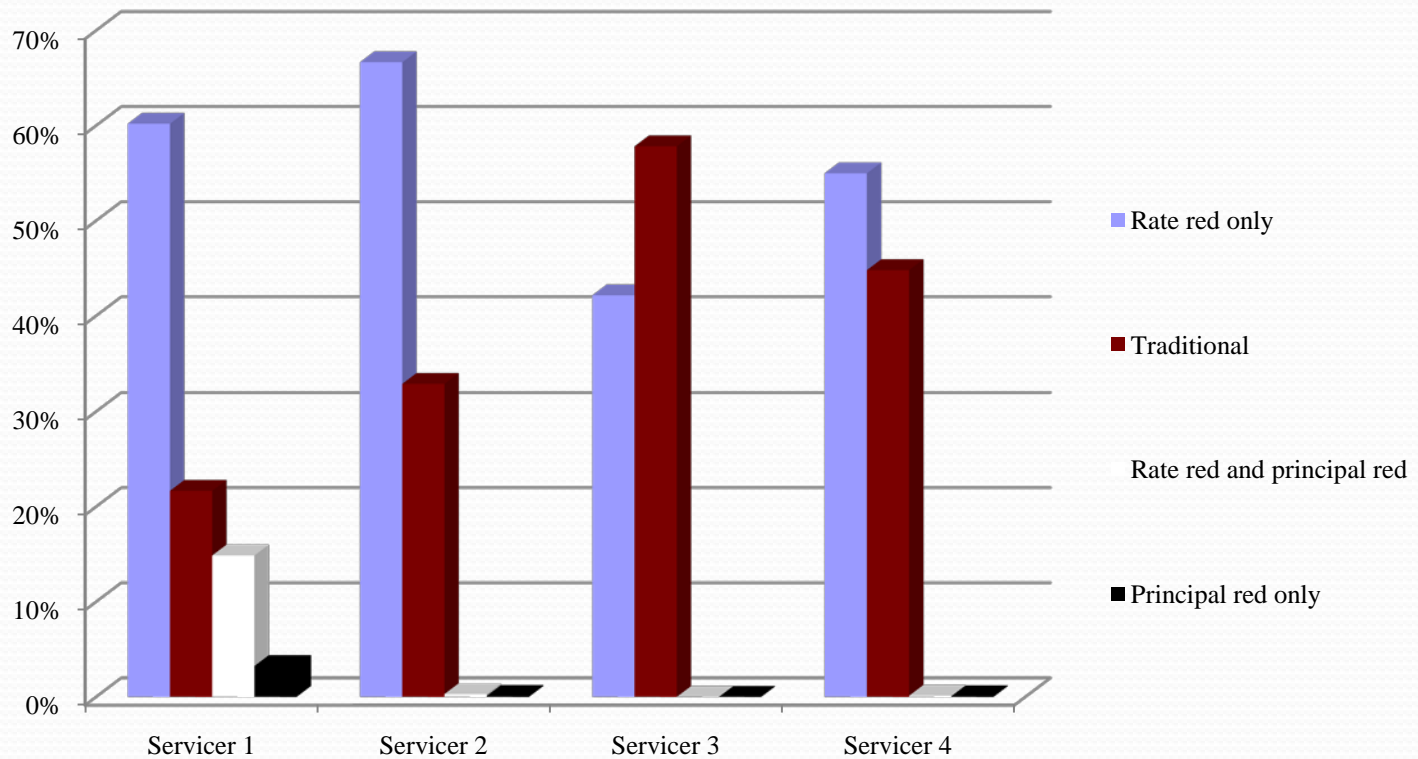
- Loan-level data from remittance reports produced by the trustee on several mortgage pools (more than 4 million private-label securitizations)
- 51,674 loan modifications reported during 01/08 to 11/08; performance observed from mod to February 2009. 2005-2006 originations securitized during 2005-2007
- Rich data on loan characteristics and loan performance but no income or debt ratio information

# Loan Modification Data: Types of Mods



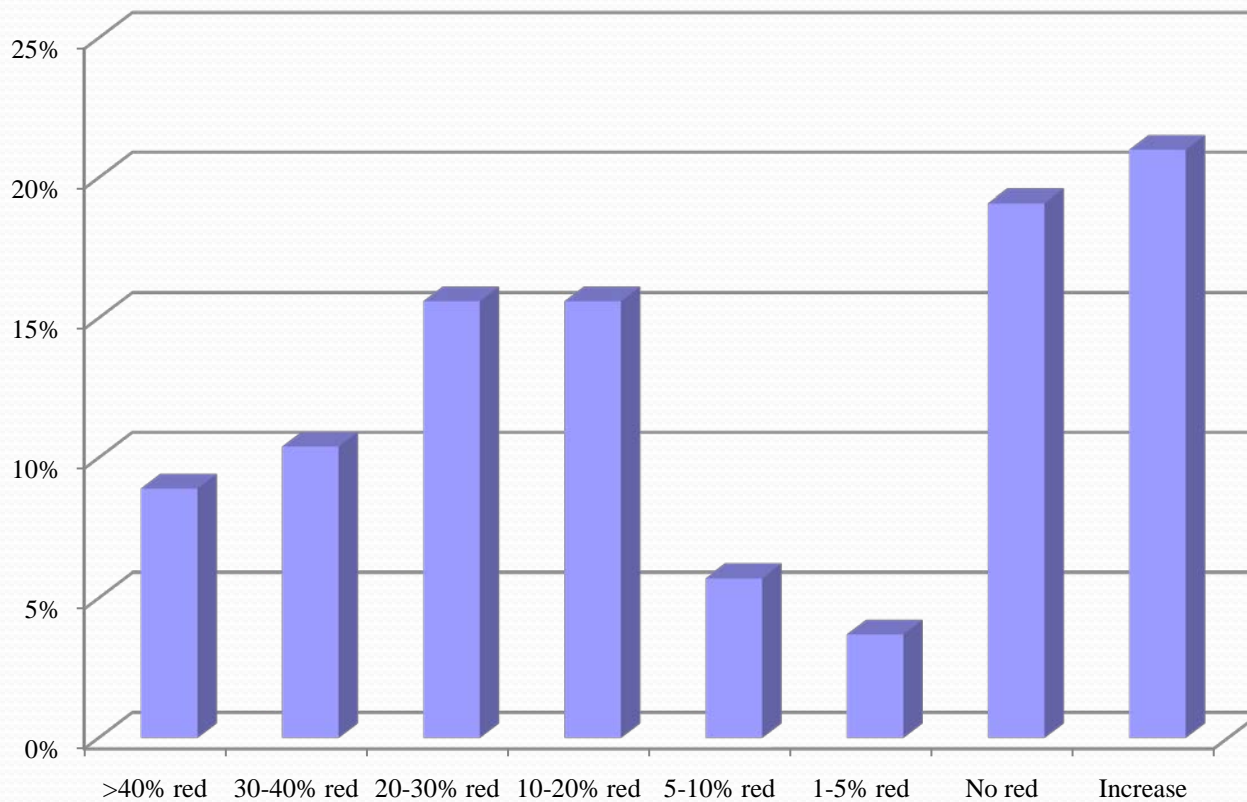
N=51,674

# Loan Modification Data: Different Servicers' Strategy



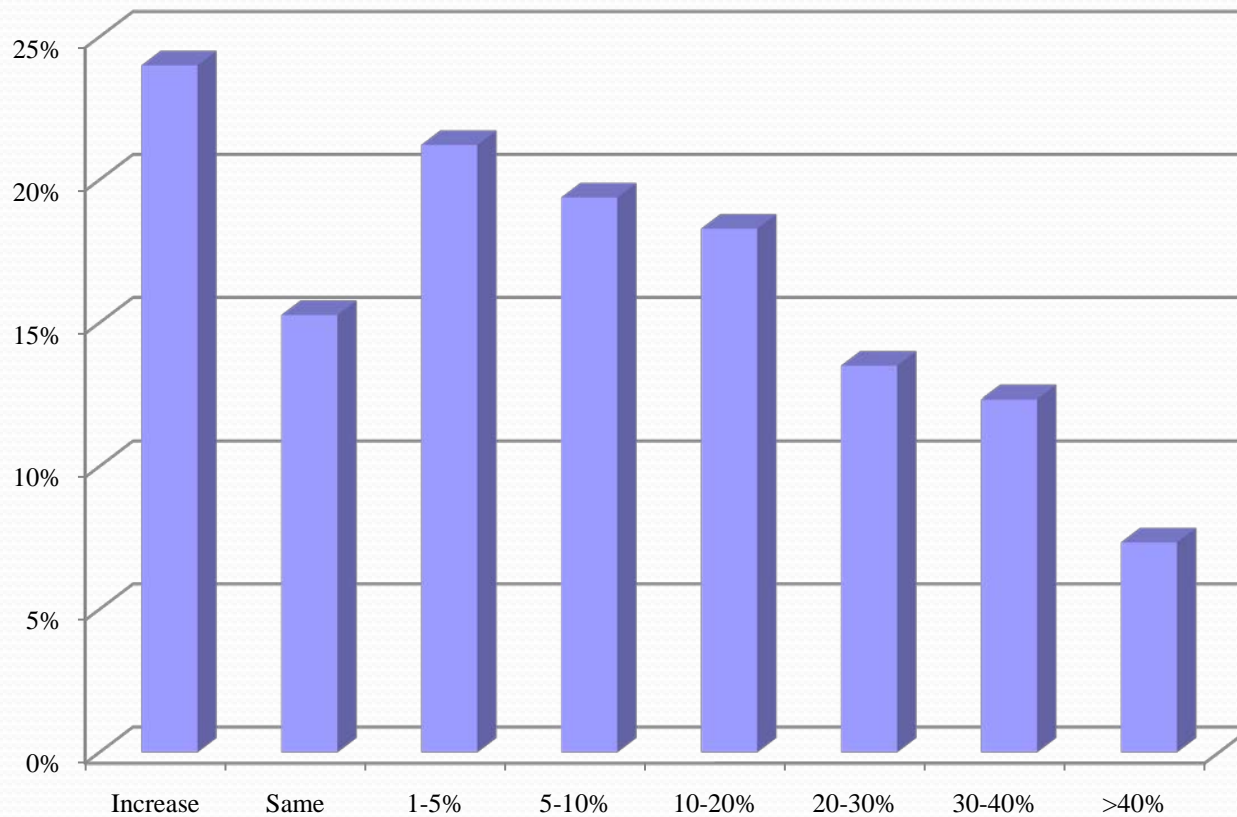
Note: servicer 1 to 4 are the four major servicers of the modified loans

# Loan Modification Data: Payment Reduction



N= 51,674

# Loan Modification Data: Redefault and Payment Red



N= 51,674

## Methodology

- Mixed logit model

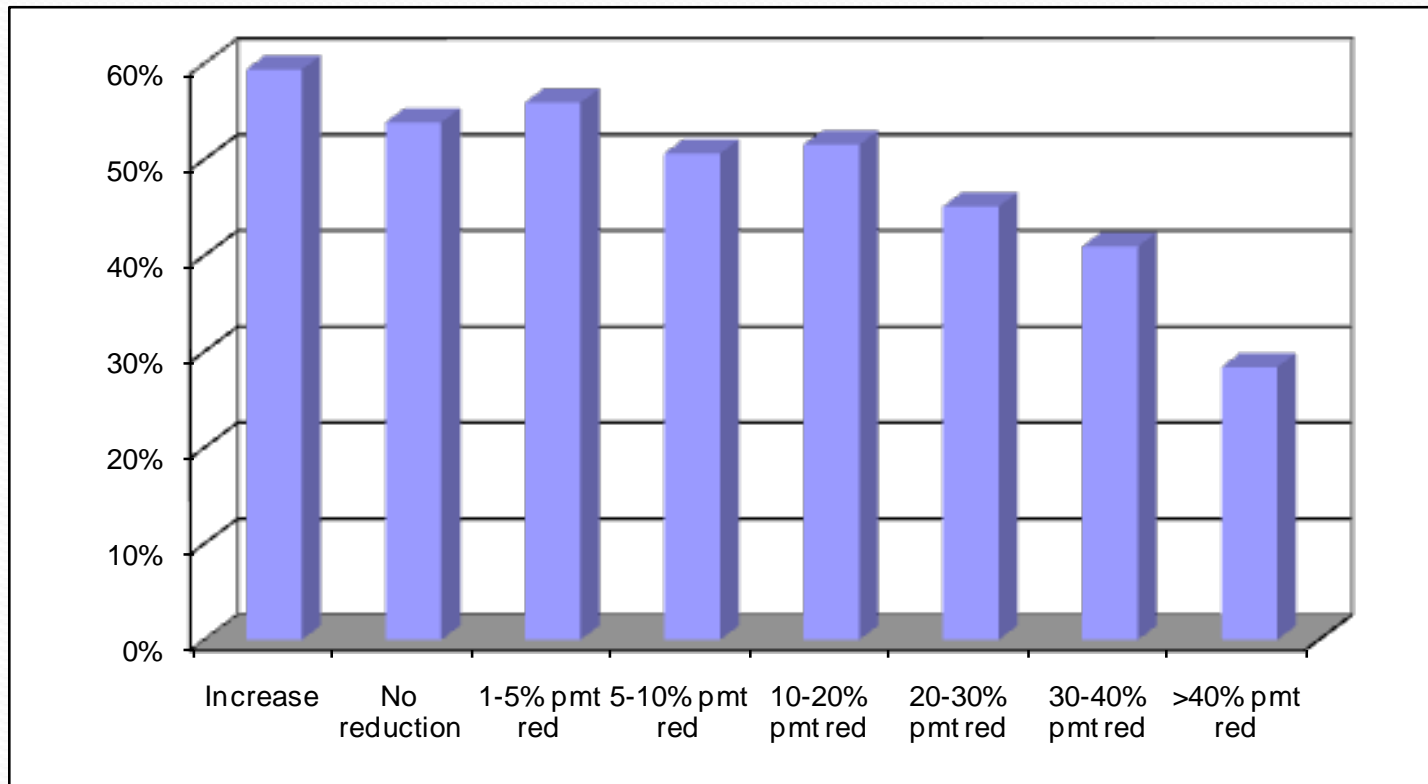
$$\Pr(Y_{it} = 1 | Modify) = f(\alpha + \beta * Mod\_type_i + \gamma * X_{it} + \eta * S_i + \kappa * M_i + \lambda * T_i + \varepsilon_{it})$$

- Controlling variables include loan and borrower characteristics, servicer dummies, market dummies, time dummies.
- The mixed logit allows us to capture the unobserved heterogeneity.

## A Preview of Results

- Payment reduction mods generally lower the redefault rate.
- Loan mods that increase the level of home equity has more consistent impacts.
  - Principal red has the lowest redefault rate.
  - Principal red has the highest NPV in some circumstances:
    - In markets with highest rate of subprime and a concentration of foreclosures; and/or
    - When principal write-down is significant but not very big

# Payment Red only on average Lowers the Redefault Rate (Estimated 9-month FC Rates)

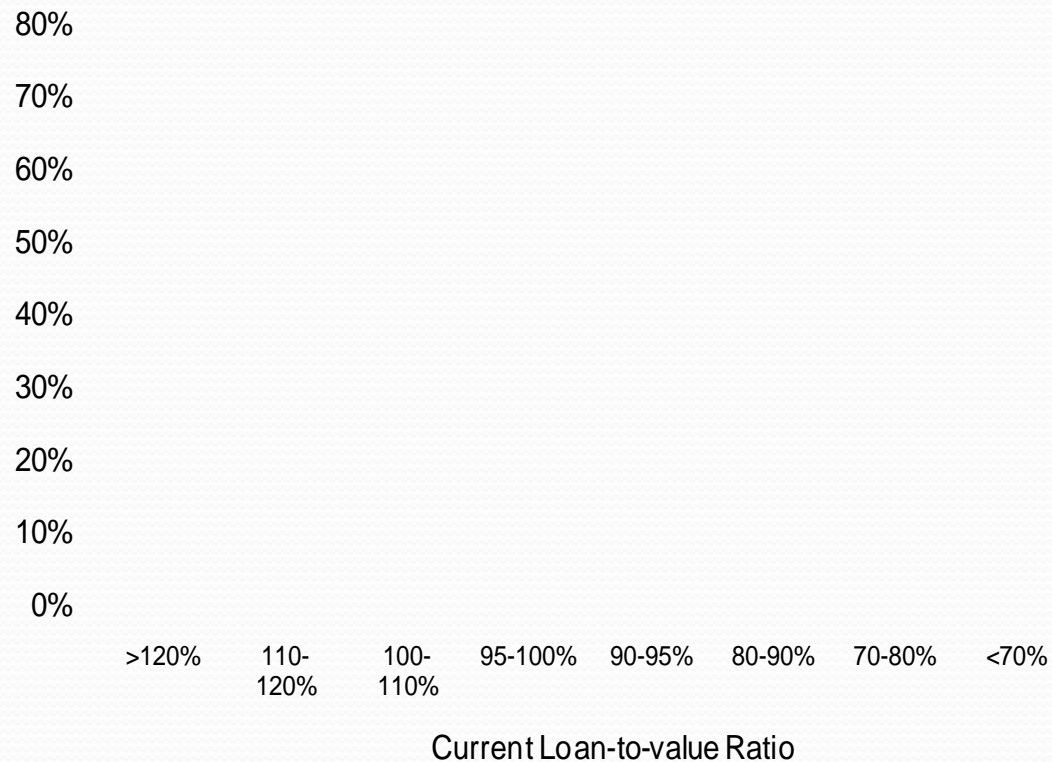


Note: estimation is for a typical subprime borrower who was 90+day delinquent when modified, with 114% LTV when modified, and with average value of other regressors.

# Redefault Rate Is Sensitive to Home Equity Level

(Estimated 9-month FC Rates)

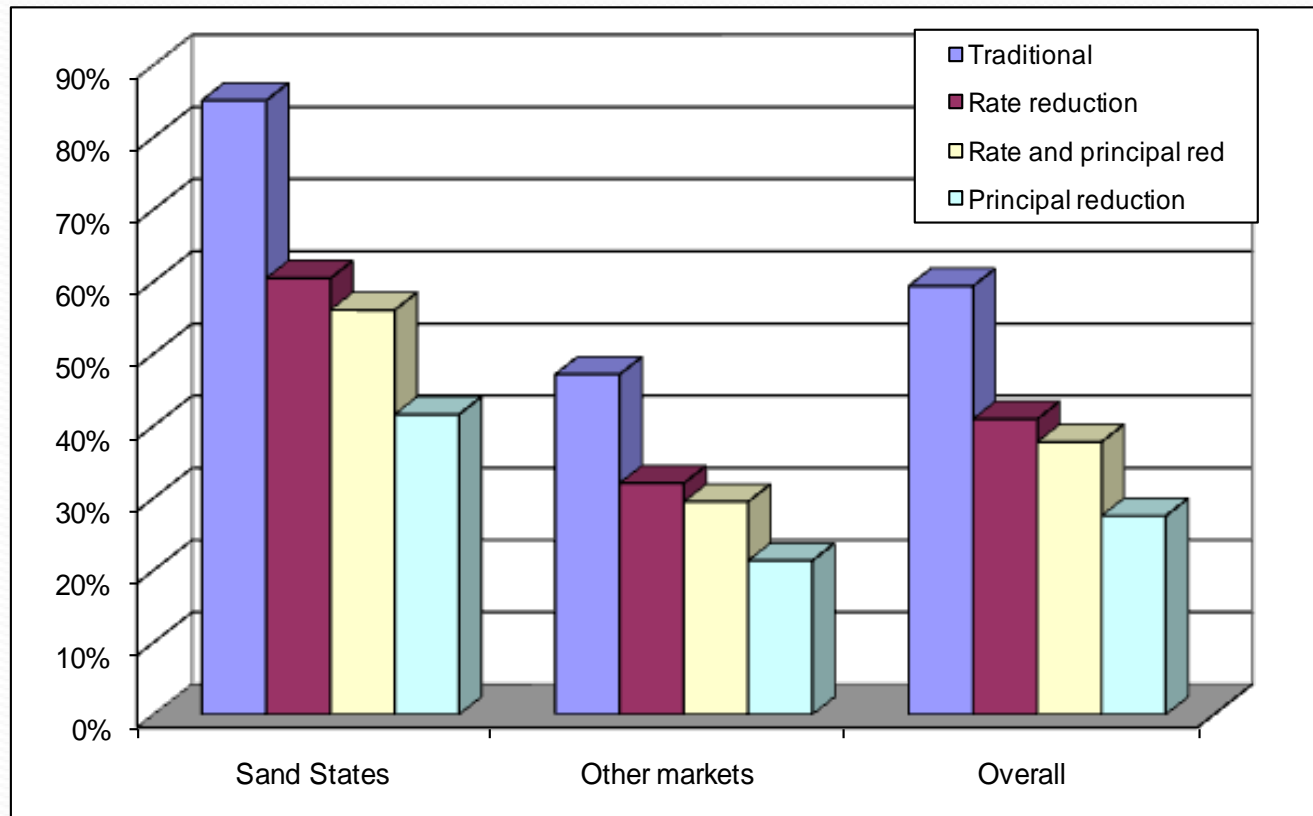
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Note: estimation is for a typical subprime borrower who was 90+day delinquent when modified, with 114% LTV when modified, and with average value of other regressors.

# Principal Reduction Has the Lowest Redefault Rate

(Estimated 9-months FC Rates in Different Markets)



Note: \* Sand states include CA, FL, NV, AZ. All loan mods result in a payment reduction from 50% DTI to 31% DTI.

# Payment Red Only Mods Do Not Have Consistent Impact

Variable	Mean Coefficient	Standard Deviation	Share of Effective Cases
>40% pmt red	-0.852 ***	0.252	-
30-40% pmt red	-0.441 ***	0.164	-
20-30% pmt red	-0.329 ***	-0.359 **	82.0%
10-20% pmt red	-0.171 ***	0.478 ***	64.0%
5-10% pmt red	-0.193 ***	0.681 ***	61.1%
1-5% pmt red	-0.073	-0.532 ***	55.5%
No pmt red	-0.118 ***	-0.044	-
CLTV <70%	-0.831 ***	0.016	-
CLTV 70-80%	-0.654 ***	0.131*	99.9%
CLTV 80-90%	-0.501 ***	0.006	-
CLTV 90-95%	-0.391 ***	-0.079	-
CLTV 95-100%	-0.426 ***	0.102	-
CLTV 100-110%	-0.301 ***	0.05	-
CLTV 110-120%	-0.208 ***	0.08	-

Note: results of other control variables are not shown here.

## Assumptions of Default and NPV Analysis

Assumptions	DTI50toDTI31	DTI40 toDTI31	DTI55 toDTI31
initial house price	300,000	300,000	300,000
upb	240,000	240,000	240,000
interest rate	8.50%	8.50%	8.50%
DTI before mod	50	40	55
new DTI	31	31	31
FC cost(%)	0.25	0.25	0.25
duration of FC	1yr	1yr	1yr
price decline after origination	30%	30%	30%
future price decline	10%	10%	10%
delinquency status	90+day	90+day	90+day
# of existing advances	6	6	6
market rate	5.0%	5.0%	5.0%
discount rate	7.5%	7.5%	7.5%
Prepay (principal mod)	8 yr	8 yr	8 yr
Prepay (rate mod)	15 yr	15 yr	15 yr
Previous pmt	1,845	1,845	1,845
New pmt	1,144	1,430	1,040
Term	30 yr	30 yr	30 yr

Note: Built upon Credit Suisse, 2009

## Summary: NPVs of Loan Mods in Different Markets

	Loan mod type	Overall	Sand States	Other States
DTI50toDTI31	Rate reduction	60.49%	54.45%	<b>63.24%</b>
	Principal reduction	59.58%	<b>56.22%</b>	61.07%
	Rate and principal red	<b>60.59%</b>	55.19%	63.03%
	Foreclosure	42.20%	42.20%	42.20%
DTI40 toDTI31	Rate reduction	67.44%	57.78%	<b>71.89%</b>
	Principal reduction	<b>68.57%</b>	<b>61.62%</b>	71.70%
	Rate and principal red	-	-	-
	Foreclosure	42.20%	42.20%	42.20%
DTI55 toDTI31	Rate reduction	<b>60.36%</b>	56.71%	<b>61.98%</b>
	Principal reduction	57.31%	55.76%	57.97%
	Rate and principal red	60.22%	<b>57.59%</b>	61.36%
	Foreclosure	42.20%	42.20%	42.20%
With subsidy * DTI50toDTI31	Rate reduction	62.07%	55.51%	<b>65.06%</b>
	Principal reduction	61.53%	<b>57.79%</b>	63.18%
	Rate and principal red	<b>62.26%</b>	56.37%	64.92%
	Foreclosure	42.20%	42.20%	42.20%

Note: the highlighted numbers represent the highest NPVs among different loan mod types in a market.



## Conclusions and Discussion

- Payment relief mods generally reduce the redefault risk but payment relief based on principal reduction has consistent impact.
- Principal reduction can create even better cash flow for investors in some markets and when the write-down is significant but not too large.
- More structured guidelines are needed with regard to the use of principal reduction.