

Tailoring Loan Modifications: When Is Principal Reduction Desirable?

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Research and analysis on the
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Motivation

- Home Affordable Modification Program
 - Encourage servicers to modify the loan to 31% DTI
 - Monthly payment reduction cost share
 - Standard waterfall of process for payment reduction: beginning with rate reduction, followed by term extension, and principal forbearance
 - Incentives for servicers and borrowers
 - Home price decline protection incentive
 - Second-lien modifications
 - Foreclosure alternative programs (incentive for short sales and deeds-in-lieu)
- There is an absence of specific guidelines for principal reduction.

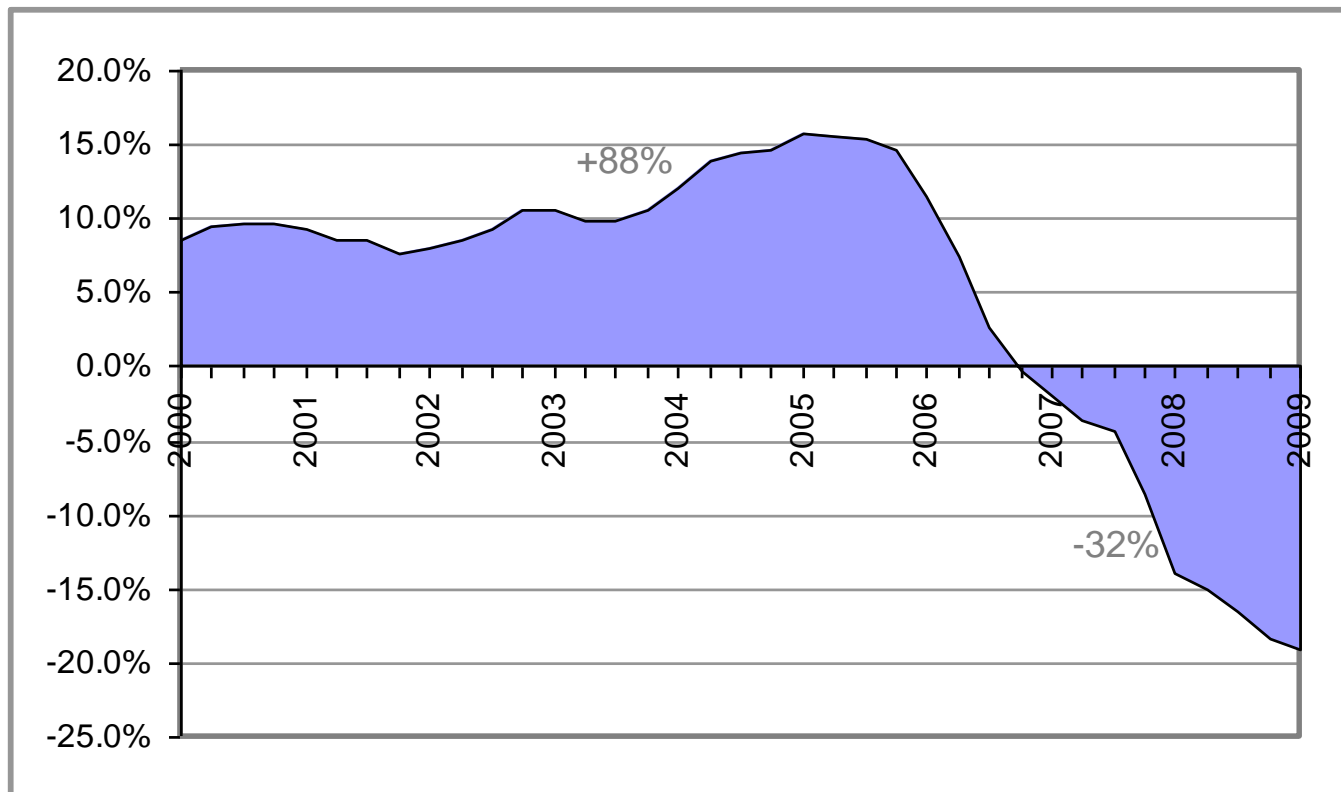
Motivation

Refault of loan modifications

- Option theory: borrower has the incentive to default when he has negative equity in the property (Foster and Van Order 1984).
- Trigger event theory: trigger events affect the homeowner's ability to make mortgage payments (Vandell 1995).
- The current program may solve the short-term payment problem but does not solve negative equity problem.



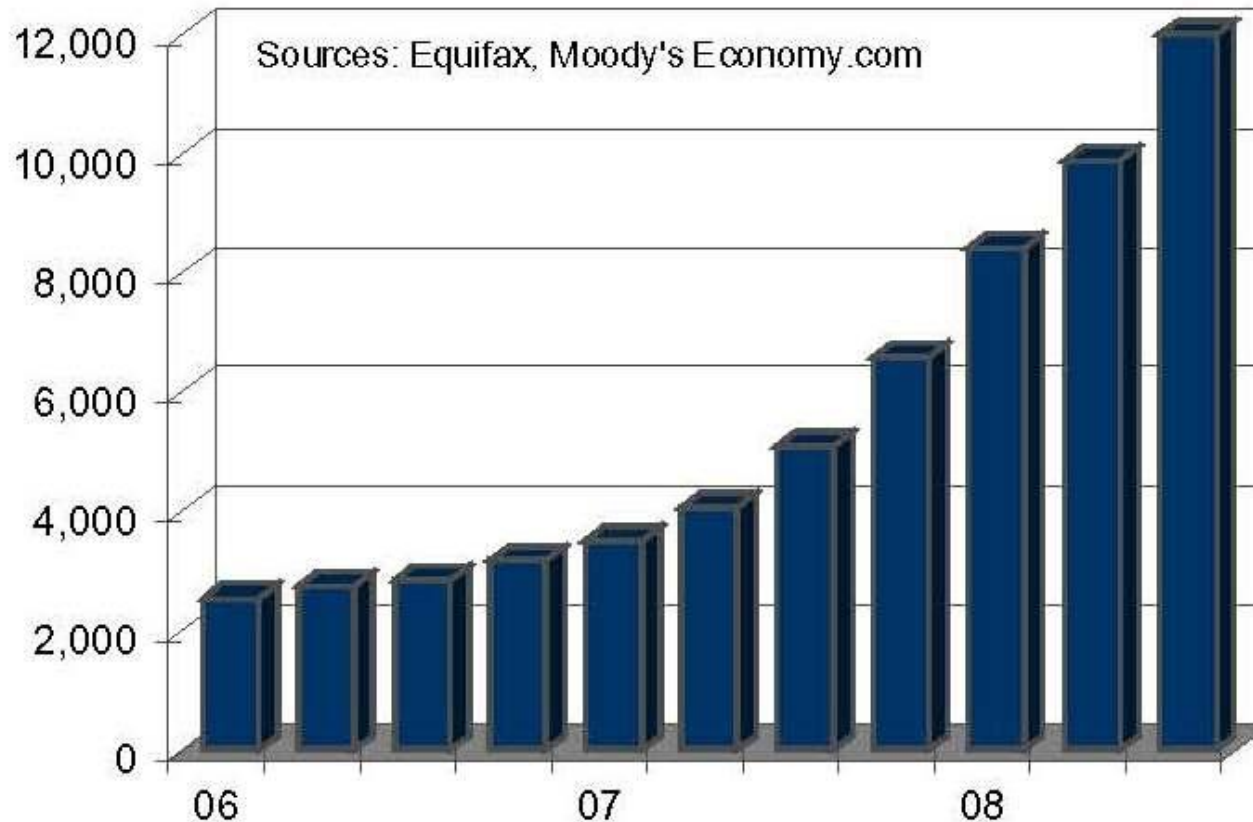
Annual Change in U.S. Housing Prices (Inflation not Adjusted, with Cyclical Totals)



Source: Standard&Poor's S&P Case-Shiller Housing Price Indices.



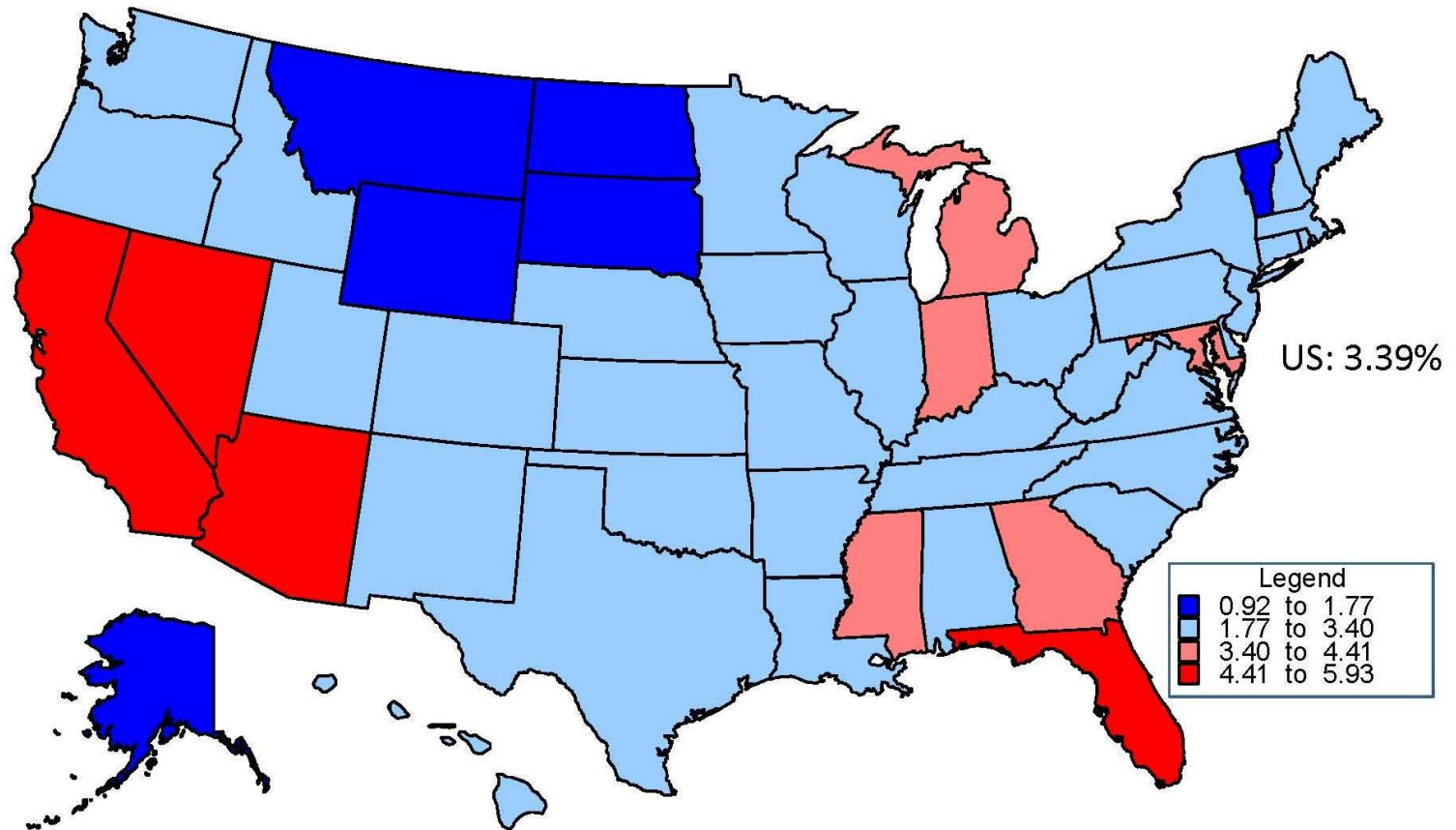
Properties with Negative Equity Increased Sharply



Source: Moody's Economy.com. Unite: 1,000.



State Distribution of 90+day Delinquency Rate, 2009Q1



Motivation: Obstacles for Principal Reduction

Investors

- NPV
- Market uncertainty and changing policy environment

Servicers

- Friction from securitization (Piskorski et al. 2008, Adelino et al. 2009)
- Lack of incentive to prefer principal reduction

Moral hazard

- Providing a less costly option, like principal reduction, may result in more defaults than otherwise would have occurred (Ambrose and Capone, 1996).

Motivation

- 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.
- Whether a loan should be modified is not the focus of this study.



A Preview of Results

- Not surprising, payment reduction mods generally lower the redefault rate.
- Loan mods that increases 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 large

Methodology

- Standard and mixed logit model

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

- Controlling variables include loan and borrower characteristics, servicer dummies, market dummies, time dummies.
- The mixed logit allows us to capture the unobserved heterogeneity by allowing coefficients to be random parameters or treat unobserved heterogeneity as a separate component.

Data

- Loan-level data from remittance reports produced by the trustee on several mortgage pools (more than 4 million private-label securitizations)
- Rich data on loan characteristics and loan performance but no income or debt ratio information
- 2005-2006 originations securitized during 2005-2007
- 51,674 loan modifications reported during the period from January 2008 to November 2008
- Performance observed from mod to February 2009

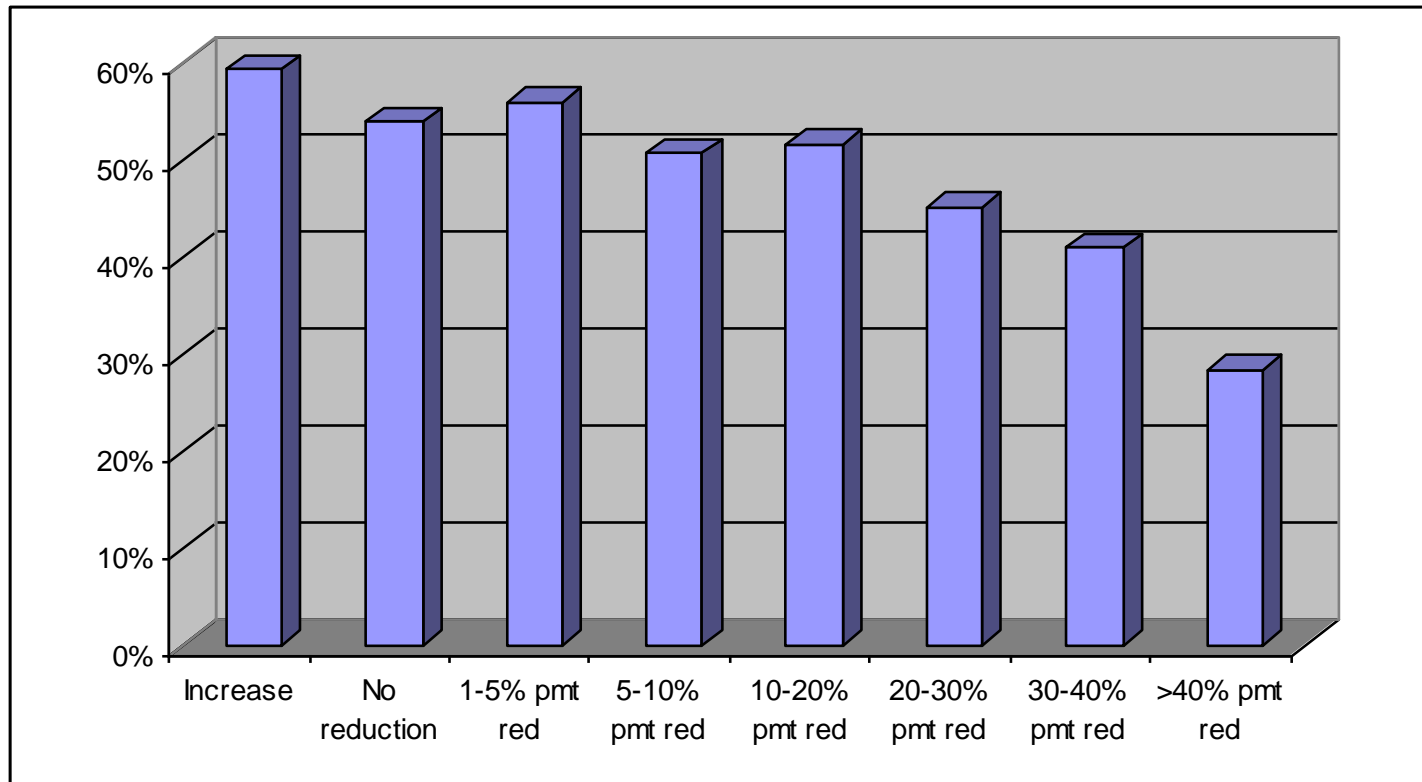


Characteristics of Modified Loans

Characteristics	Value (mean or percent)
Origination FICO	614
Appraisal Value	\$267,662
Combined LTV at origination	84.94%
Home purchase	45.40%
ARM	87.57%
Interest Only	24.42%
Negative Amortization	4.47%
Full-doc/Alt-doc	61.29%
30- or 60-day delinquent when mod	18.50%
90-day delinquent when mod	42.30%
Loan Modification	
Unpaid balance before mod	\$235,673
Unpaid balance after mod	\$240,659
Interest rate before mod	8.88%
Interest rate after mod	6.82%
P&I payment before mod	\$1,746.0
P&I payment after mod	\$1,498.6



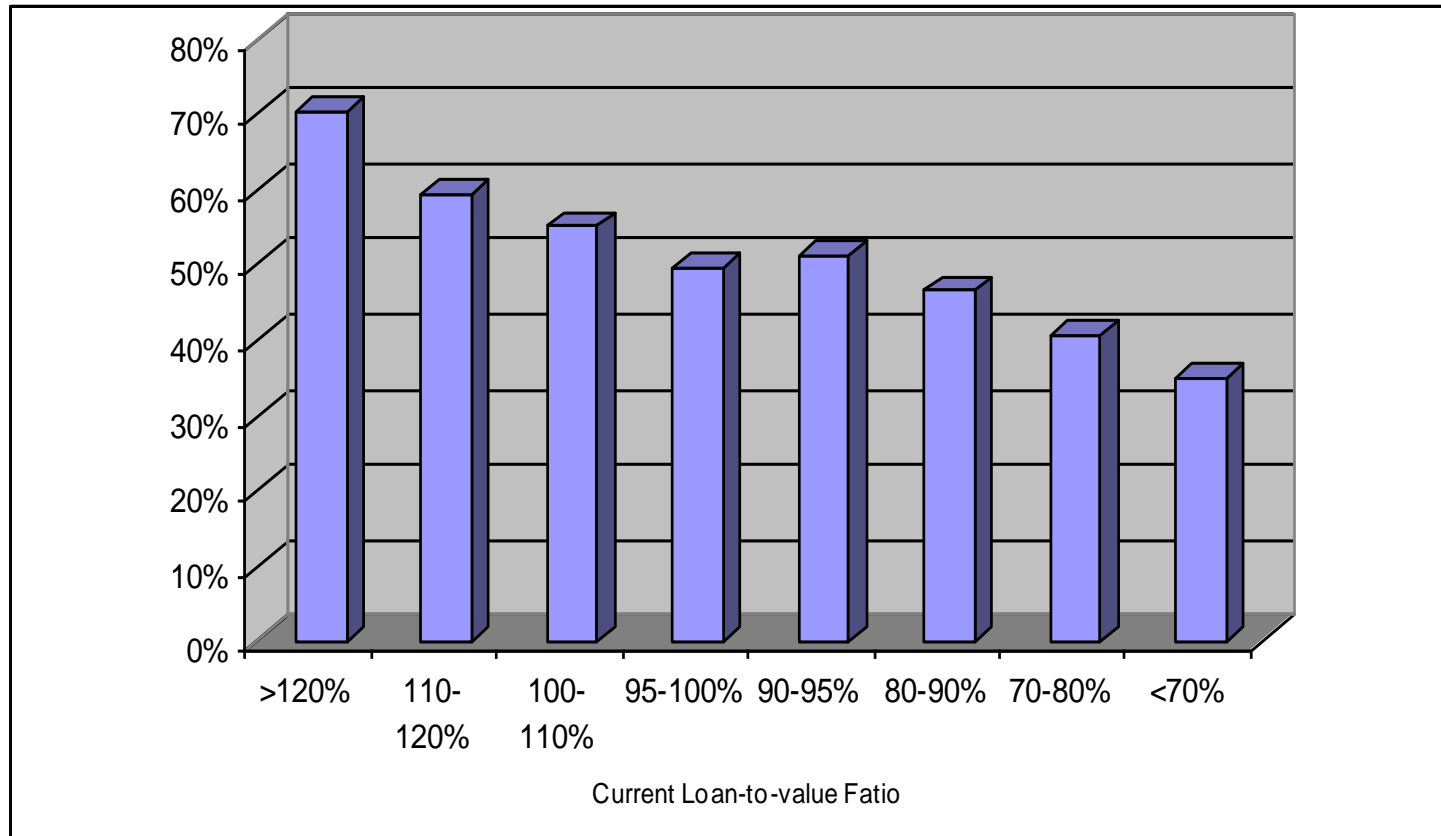
Payment Red Only on average Lowers the Redefault Rate (Estimated 9-month FC Rates)



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)



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.



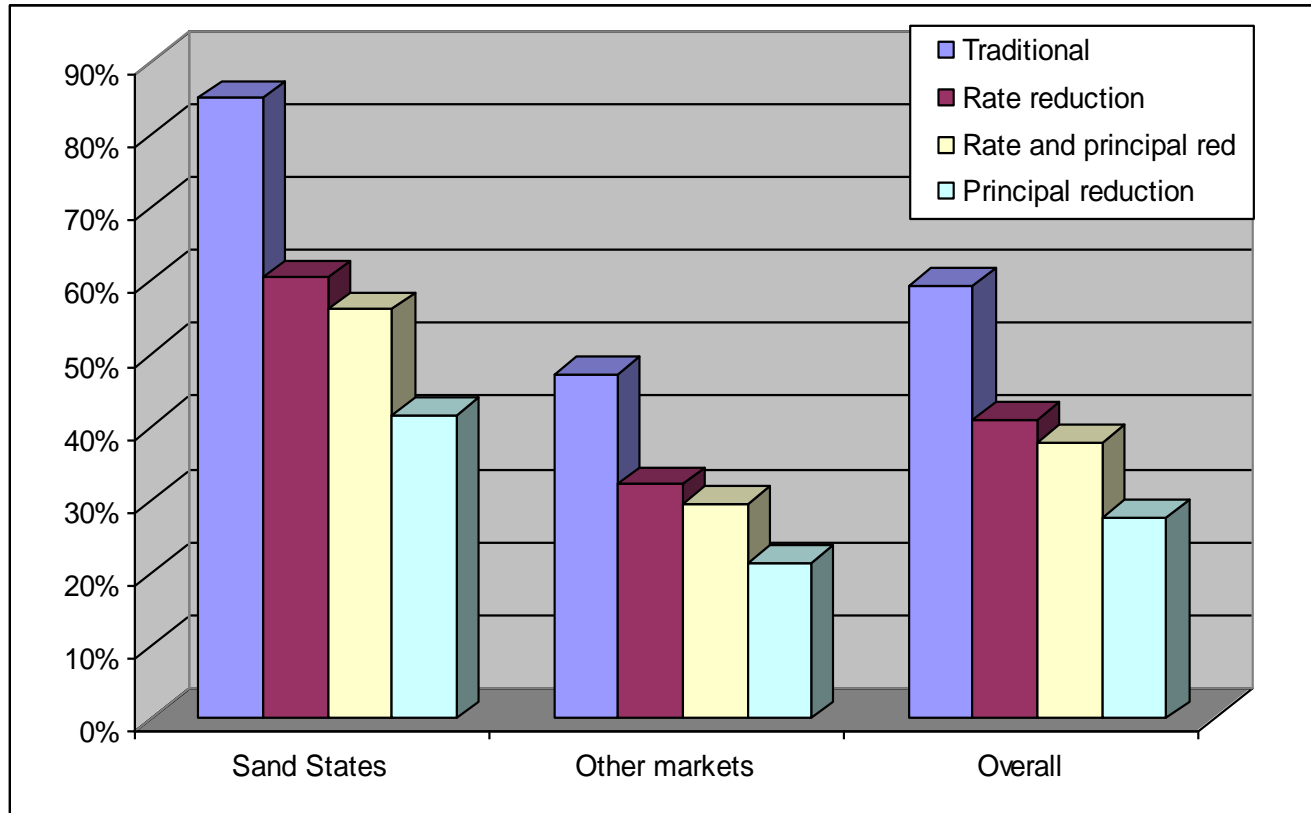
Payment Red Only Mods Do Not Have Consistent Impact

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.



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.



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	Market1	Market2-4
DTI50toDTI31	Rate reduction	60.49%	54.45%	63.24%
	Principal reduction	59.58%	56.22%	61.07%
	Rate and principal red	60.59%	55.19%	63.03%
	Foreclosure	42.20%	42.20%	42.20%
DTI40 toDTI31	Rate reduction	67.44%	57.78%	71.89%
	Principal reduction	68.57%	61.62%	71.70%
	Rate and principal red	-	-	-
	Foreclosure	42.20%	42.20%	42.20%
DTI55 toDTI31	Rate reduction	60.36%	56.71%	61.98%
	Principal reduction	57.31%	55.76%	57.97%
	Rate and principal red	60.22%	57.59%	61.36%
	Foreclosure	42.20%	42.20%	42.20%
With subsidy * DTI50toDTI31	Rate reduction	62.07%	55.51%	65.06%
	Principal reduction	61.53%	57.79%	63.18%
	Rate and principal red	62.26%	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 do not have very consistent impacts
- Principal reduction has consistent impact in reducing redefault risk.
- 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.