



Strategic loan modification: An options-based response to strategic default

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ABSTRACT

This paper presents a parsimonious barrier model for the optimal principal reset in a loan modification, thereby maximizing the loan value to the lender bank and minimizing the likelihood of strategic foreclosure by the homeowner. Writing down the loan-to-value (LTV) ratio will reduce the present value of future payments on the loan, but will also reduce the probability of default, thereby saving foreclosure losses. The optimal trade-off of these two countervailing effects will pinpoint the optimal LTV at which the loan must be reset. We present a simple barrier option decomposition of the loan value that makes the optimization of LTV easy to implement. An extension of the model is shown to account for varying growth rate assumptions about house prices. The model in this paper specifically accounts for the homeowner's willingness to pay, and uses the framework to model shared-appreciation mortgages (SAMs).

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1. Introduction

The housing crisis of 2008–2009 in the US is unprecedented. By the end of 2009, there was a glut of 3.2 million unsold new and existing single-family homes, amounting to seven months inventory.¹ Home prices have fallen during and after the 2008–2009 crisis, and as of July 2012, there were 1.5 million inventoried foreclosure homes,² driving prices down further. The average national decline in home values based on the composite Case-Shiller 20-city index from January 2006 to March 2012 was 32%, resulting in a household wealth loss of \$7 trillion.³ About 31.4% of homeowners are estimated to have negative equity in their homes as of Q1 2012.⁴ In September 2010, 1 in 371 homes received a foreclosure filing, but this improved to 1 in 686 homes by July 2012.⁵ Fig. 1 shows the foreclosure landscape across the nation. The highest foreclosure rates are in areas with the greatest run up in prices before the crisis, i.e., the sun belt states, where negative equity is much in evidence.

Efforts to stem the tide of foreclosures appear to have had mixed results. Whether loan modification is an antidote is debated—see Foote et al. (2009). As of May 2012, of the roughly 3.2 million loans eligible for a modification, the Treasury reported 810,443 active permanent modifications, i.e., about 27% conversion, but a large number of homes nevertheless.⁶ Loan modification activity has picked up in the past year—see Fig. 2—and it is important to evaluate loans with modifications, which is the goal of this paper. There were 385,000 permanent loan modifications in the first half of 2012.⁷ About 98% of modifications have a rate reduction, and 31% entail a principal reduction.⁸ As of May 2012, the median principal reduction in modifications is 25.6%.⁹

When modification is appropriate, it is important to determine the optimal modification scheme and this paper presents a model in which optimal principal modification may be determined. In a recent paper, Das (2009) developed a model to show that the current approach taken by lenders and regulators, i.e., to reduce monthly payments by writing down interest rates, extending maturity, or forbearing principal, often increases the propensity for homeowners

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¹ New York Times, January 4, 2010—“This Year's Housing Crisis”.

² www.realtytrac.com, Down from 1.6 million in July 2011.

³ See “The US Housing Market: Current Conditions and Policy Considerations,” White paper, Federal Reserve Board of Governors (January 2012).

⁴ www.zillow.com, Versus 28.4% of single-family homeowners estimated to have negative equity in their homes as of May 2011.

⁵ www.realtytrac.com, Versus 1 in 611 homes by July 2011.

⁶ HAMP Making Homes Affordable (MHA) Report, May 2012. As of July 2010, of the roughly 4.5 million loans eligible for a modification, the Treasury reported 421,804 active permanent modifications, i.e., under 10% conversion, and therefore, in two years, the modification success rate has sharply increased.

⁷ www.hopenow.com; Reported in www.dsnews.com/articles/hope-now-reports-385k-loan-mods-in-first-half-of-2012-2012-08-14.

⁸ See “The US Housing Market: Current Conditions and Policy Considerations,” White paper, Federal Reserve Board of Governors (January 2012).

⁹ HAMP MHA Report, May 2012.

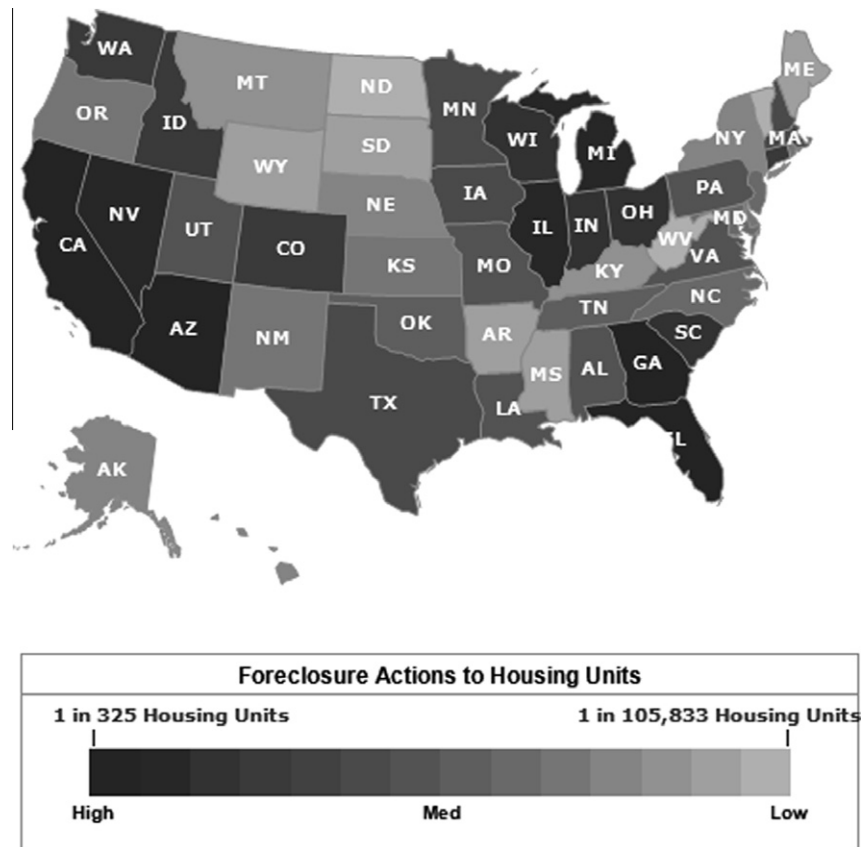


Fig. 1. Foreclosure distribution across the nation as of July 2012. Source: www.realtytrac.com.

to default. This leads to heavy societal costs—foreclosure discounts are estimated to be greater than 20% of home value on average—see Pennington–Cross (2004) for an estimate in good economic times of 22%; Campbell et al. (2011) report this figure as 27%. An alternate solution is to write down principal, resulting in lower foreclosure rates, mitigation of lender losses in foreclosure,¹⁰ and an overall higher economic value of the loan to the lender, after accounting for the borrower’s option to default—see Goodman (2010) for an excellent analysis of why the negative equity problem must be tackled head on with principal modifications. The recent introduction of the HAMP-PRA (Principal Reduction Alternative) scheme as of October 1, 2010 by the Federal government adds the principal modification quiver to the arsenal aimed at stemming foreclosure.

The intuition behind principal forgiveness is based on analyzing the option to default held by the homeowner. This option is an American (Bermudan-style) put, allowing the borrower to put the home back to the lender. It is in-the-money when the value of the home (the underlying) is less than the loan balance (the option strike), i.e., when there is negative equity in the home. To keep the monthly payment fixed at some reduced level, it is usually preferable to write down principal because it makes this option less in-the-money (unless the rate is above market, when it makes sense to also reduce the rate). Other approaches, such as reducing the loan rate below market, require higher principal balances given that the monthly payment is held fixed, taking the option further in-the-money. Likewise, extending maturity also makes the option more valuable, as options tend to increase in value when their maturities increase, especially when the option to default is

in-the-money. Given the huge lender costs of foreclosure, minimizing the homeowner’s propensity to default increases the economic value of the loan (the default-adjusted expected present value of the modified loan’s payments), even after writing down principal.

That writing down principal is an important approach is becoming self-evident. The New York Times editorial page (01/04/2010) expressed the essence of this most effectively:

The best way to modify an underwater loan is to reduce the principal balance, lowering the monthly payment and restoring equity. But for the most part, lenders have refused to reduce principal because it would force them to take an immediate loss on the loan. Lenders also have vehemently and successfully resisted Congressional efforts to change the law so that bankruptcy courts could reduce the mortgage balances for bankrupt borrowers.

The administration decided not to press lenders to grant principal reductions in the flawed belief that simply making payments more affordable would be enough to forestall foreclosures. It hasn’t. The administration also didn’t fight for the bankruptcy fix when it was before Congress last year despite President Obama’s campaign promise to do so.

The economy is hard pressed to function, let alone thrive, when house prices are falling. As home equity erodes, consumer spending falls and foreclosures increase. Lenders lose the ability and willingness to extend credit and employers are disinclined to hire. True economic recovery is all but impossible.

To avert the worst, the White House should alter its loan-modification effort to emphasize principal reduction. Job creation should also be a priority so that rising unemployment does not cause more defaults.

If we accept that principal write-downs are the optimal way to modify distressed loans, then lenders’ reluctance to take write-offs appears to be more of an accounting issue than an economic one.

¹⁰ This cost, also known as the “foreclosure discount” comprises damage repairs to restore the house to a sale-able condition, a distress sale discount, brokerage commissions and direct selling costs, taxes, insurance, and property management, and interest on capital for the holding period.

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