



Payment changes and default risk: The impact of refinancing on expected credit losses[☆]



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ABSTRACT

This paper analyzes how access to credit and the path of mortgage rates can affect borrower credit risk. This is a crucial issue for evaluating refinance programs as a form of loss mitigation, and it became prominent in the debates around the Treasury Department's Home Affordable Refinance Program (HARP). These debates exposed gaps in the literature on the relationship between credit performance and changes in borrowers' monthly mortgage payments. Since then, several new studies have attempted to fill these holes, each pursuing a different methodology. In this paper, we review the relevant debates and look at what downward adjustments in prime adjustable-rate mortgages can tell us about modifications of prime fixed-rate mortgages. We argue that this method better addresses the various sampling biases that plague all attempts to predict HARP's impact. Our analysis indicates that typical monthly payment reductions under HARP would reduce credit losses by 56 basis points.

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In February 2009, the Secretary of the Treasury, Timothy Geithner, announced a multi-pronged Financial Stability Plan that included measures to help pull banks, markets and homeowners out of the financial crisis and deepening economic recession. Each aspect of the plan proved highly controversial, but the more centralized programs for banks and the markets have tended to receive more public attention. Two years later, when the housing market continued to languish even as banks and markets were undergoing recoveries, policy makers set out to strengthen the existing housing programs. Central to this initiative was the revision of the Home Affordable Refinance Program (HARP), which had seen far lower participation than originally projected. This revision came to be known as "HARP 2.0."

As originally conceived, HARP sought to reduce obstacles to mortgage refinancing, such that borrowers with high loan-to-value (LTV) ratios on prime conforming fixed-rate mortgages (FRM) could take advantage of declines in mortgage rates following the extraordinary monetary stimulus provided by the Federal Reserve.¹

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¹ Absent the HARP program, a high LTV FRM borrower would have to put in additional equity in order to refinance.

HARP relaxed the LTV requirements imposed by Fannie Mae and Freddie Mac (the GSEs) based on two premises: that individual homeowners should not be penalized for market-wide declines in house prices (which of course drive up LTV ratios), and that the GSEs were already exposed to the credit risk of the eligible borrowers. As the revisions for HARP 2.0 were debated in 2011, it became clear that the decentralized nature of the HARP program was a challenge – HARP was administered by Fannie Mae and Freddie Mac, and each company had its own idiosyncratic approach to implementing it. The focus of the public debate, though, was on the fairness and macroeconomic efficacy of revising HARP.

Some commentators argued that it would be unfair to change the "rules of the game" for investors who stood to lose revenues from enhancing the HARP program.² Others argued that investors had been given sufficient advance warning of potential changes to HARP, and that many of the barriers to refinancing were artificial ones anyway (such as the differences between the Fannie and Freddie implementations). Still others noted the potential for increased refinancing to lower overall mortgage default rates and to accelerate recovery in the housing market. As for the question of macroeconomic efficacy, refinancing is one of the normal channels through which declining interest rates support economic activity: it reduces the amount of income households that have to spend on

² When a borrower refinances, the investor must reinvest the principal at the lower prevailing interest rate.

servicing their mortgages, and thereby frees up cash flow to spend on other goods and services. For homeowners with adjustable-rate mortgages (ARMs), the required monthly mortgage payment declines automatically as the interest rate resets on the mortgage. For homeowners with fixed-rate mortgages—the vast majority of U.S. mortgage borrowers—the reduction in monthly payments takes place when the homeowner refinances the existing mortgage into a new mortgage at the lower prevailing mortgage rate. However, declining home prices create a friction to this refinancing if borrowers do not have enough equity to pay off the current mortgage and fund the required downpayment on the new mortgage.

These big-picture questions dominated the public debate, and were central for the Treasury and the White House in overseeing HARP. Another important policy maker, though, had a different mandate. As both the regulator and conservator of the GSEs—and an independent organ of government—the Federal Housing Finance Agency (FHFA) had the responsibility of evaluating any proposed changes to HARP in terms of the likely impact on the capital of the GSEs. This includes implications for the fee income generated from the refinancing, for the interest income from the GSEs' holdings of MBS securities, for the expected revenues from put-backs of guaranteed mortgages that default and finally for the impact of refinancing on expected credit losses to the GSEs. However, analysis of leading refinance or modification proposals tended to provide estimates of only the first three of these impacts on the GSEs' capital. To some extent, this is because there simply was not a rich literature to draw on to estimate the impact on credit losses.

Since that time, several studies have attempted to fill this gap. In this paper, we implement a novel empirical strategy to estimate the expected reduction in credit losses to the GSEs that would result from the HARP program. To be clear: the question is how the mortgage payment reduction from a HARP refinance will affect the likelihood that the borrower defaults after having refinanced.

Some background information on the HARP program is necessary to understand both the methodological issues in this paper and the broader debates about HARP. For a prime conforming FRM to qualify for a HARP refinance, it had to be originated prior to June 2009. In addition, at the refinance date the borrower must have a clean payment history as well as a current LTV between 80 and 125. Over the first two and a half years, HARP refinancing activity remained subdued relative to model-based extrapolations from historical experience. From its inception to the end of 2011, 1.1 million mortgages refinanced through HARP, compared to the initial announced goal of three to four million mortgages. These lackluster results provoked much discussion by market participants and policymakers over the low take-up rate under HARP. Prominent factors included the credit risk fees, the LTV cap of 125, limited lender capacity, costly and time-consuming appraisal processes, restrictions on marketing refinancing programs and legal risks for lenders. In December 2011, HARP 2.0 was introduced to better address these issues. HARP refinance volume picked up under the revised program, with total HARP refinances reaching 3.3 million by February 2015.

The most intuitive approach to assessing the relationship between HARP and credit risk is to look at data on HARP participants. However, the nature of the HARP program entails selection biases that are difficult to address. This makes it difficult to determine the impact on borrower performance that is due solely to the payment reduction. We take a different approach and identify the monthly payment effect on subsequent default by analyzing payment changes and borrower performance from a sample of prime ARM borrowers.

We use a competing risk model to estimate the sensitivity of default risk to downward adjustments to borrowers' monthly mortgage payments, but the crux of our contribution to the literature is our approach to dealing with selection bias. The prime ARM bor-

rowers have similar observed credit characteristics as prime FRM borrowers. As we discuss later, by seasoning our ARMs sample by at least two years, we eliminate those borrowers who are riskier than FRM borrowers based on unobserved characteristics. We argue that it is easier to control for selection bias arising from the choice of ARM versus FRM than the selection biases inherent in any sample of HARP borrowers (i.e., dynamic program eligibility and the decision to participate). In effect, our approach substitutes the borrower's decision at origination to select an ARM over a FRM for the borrower's eligibility and decision to participate in HARP. Ultimately, we estimate that HARP refinancings would be expected to lower credit losses on average by 56 basis points. Our estimate of the HARP impact on default losses is lower than those produced using data on HARP refinanced mortgages.

1. Literature review

As noted, above, the debates around revising HARP exposed gaps in the literature on the relationship between changes in borrowers' monthly mortgage payments and future credit performance. Advocates for a broad-based refinance program cited as one of the advantages the reduction in future defaults by borrowers that participate in the program.³ However, the literature provides only a few estimates of the potential magnitude of the reduction in defaults and associated default costs. Recent studies have pursued various approaches, each with its own set of advantages and disadvantages. Some analyze only refinanced fixed-rate mortgages, some focus on modifications and still others look at adjustable-rate mortgages of various types.

On first reflection, it may appear that studies of prime agency FRMs and whether borrowers participated in the HARP program. However, there are two confounding selection biases that complicate identifying the payment reduction effect from data on HARP refinances, and they arise directly from the nature of HARP itself. The first is that to be eligible to refinance through the HARP program a borrower must have a clean payment history at the time of the refinance. Such borrowers are less likely to default over the near term than borrowers with similar observed underwriting risk factors who lack the same clean payment history.

The second complication is that only a subset of eligible borrowers actually decides to refinance under the HARP program. This is partly because any refinance, including one under HARP, incurs up-front costs to the borrower. Holding constant the percent reduction in the monthly payment, a borrower is more likely to refinance the longer the expected stay in the house. Borrowers who perceive that they are either more likely to prepay the mortgage, or who are more at risk of a default, are less likely to invest in a refinance. In addition, behavioral frictions may prevent borrowers from optimally exercising their prepayment options. The decision to refinance, therefore, may be correlated with unobserved factors that affect future loan performance. The degree of the selection effect also likely depends on the size of the monthly payment reduction, which further complicates the estimation of how the size of the monthly payment reduction impacts the degree of reduction in the default risk.

Zhu (2012) confronts this challenge head on, using internal Freddie Mac data to estimate an overall impact of a HARP refinance on borrower default.⁴ Zhu uses a static logistic model which includes as an explanatory variable an indicator for whether a loan is a HARP refinance. To control for selection effects, Zhu estimates

³ See for example Boyce, Hubbard Mayer and Witkin (2012). http://www4.gsb.columbia.edu/null/download?&exclusive=filemgr.download&file_id=739308. Also, Greenlaw (2010).

⁴ This data identifies if a borrower participated in the HARP program, the monthly payment reduction for participants and whether the borrower defaults.

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