Sustaining Homeownership after Delinquency: The Effectiveness of Loan Modifications by Race and Ethnicity

Paper submitted for review to Cityscape
April 28, 2014

Abstract

Since the start of the foreclosure crisis in 2007, federal policy-makers have focused on loan modifications as a primary tool for preventing foreclosure, and have initiated a number of programs to increase the number and effectiveness of loan renegotiations. Yet, even with these programs, modifications are largely undertaken at the discretion of private loan servicers, and are not as systematically transparent as loan application approvals and denials. This raises concerns that there may be systematic differences in the types of loan modifications that borrowers are offered, and specifically, that borrowers of color may be receiving worse modification terms than comparably situated white borrowers. Since the terms of a loan modification influence the likelihood that a borrower will be able to retain their home, it is important to understand who gets what kind of modification, and whether that modification succeeds in preventing foreclosure. This paper uses data on a national sample of approximately 15,000 privately securitized subprime loans made in 2005 to examine modification types and outcomes by race and ethnicity. We find no evidence of systematic differences in modification types across borrowers. However, we do find that the type of modification matters, with HAMP-eligible modifications and principal reductions significantly reducing the likelihood of re-default one year after modification. The research shows that federal efforts to incentivize and streamline the modification process have helped to keep borrowers in their homes, and suggests that servicing and loss mitigation practices are an important component of ensuring the sustainability of homeownership.

1. Introduction

The recent foreclosure crisis, and the resulting erosion of family wealth and neighborhood destabilization, has raised important questions about the policies and programs that are needed to promote sustainable homeownership, particularly for communities of color. While a significant lesson has been the need to focus on better consumer protection in the mortgage lending market and the terms by which borrowers *access* credit, equally important has been the recognition that what happens *after* loan origination also matters. Specifically, the role of mortgage servicing and loan modification practices have emerged as central to the debate about how to keep borrowers in their homes and prevent foreclosure and their negative impacts on borrowers, communities, and the overall U.S. economy. Indeed, the mortgage servicing industry has been identified as a central factor in the failure of the various government foreclosure prevention programs, including the $75 billion Home Affordable Modification Program (HAMP) (Levitin and Twomey, 2011).

Yet compared to the vast literature on mortgage originations and access to credit, mortgage servicing practices have received fairly little research attention, and there is much to be learned about the role of loan modifications in foreclosure prevention. Part of the problem is that modifications are largely at the discretion of private loan servicers, and modification terms and outcomes are not as systematically transparent as loan application approvals and denials. In addition, the process of modifying a loan is highly individualized, time consuming, and, in the words of one large servicer, "as much an art as a science." As a result, advocates and housing counselors have raised the concern that the loan modification process presents challenges for historically underserved borrowers who may lack experience and knowledge of dealing with a lending institution. For example, borrowers who do not speak English or who may distrust banking institutions may fail to pursue a loan modification, or may not be able to negotiate the best modification terms. Race or perceived race could also serve as a proxy that servicers use for decision-making on modifications, especially if these borrowers are deemed less sophisticated, more time consuming and therefore more costly to serve.

However, we know surprisingly little about modification outcomes across different demographic groups. This study helps to fill this gap by examining whether or not there are systematic differences in the types of modifications that are given to borrowers of color,

and whether those modifications are effective in preventing foreclosure. Some research has shown that there is little evidence for racial disparities in the incidence of loan modifications (Collins and Reid, 2010; Vicki Been and Murff, 2013), but are there racial or ethnic differences in the types of loan modifications received? And which modifications are the most effective at preventing subsequent foreclosure? These questions are important if the goal is to help sustain homeownership among borrowers of color. The foreclosure crisis has had a disparate impact on African American and Latino households; indeed, these households have had nearly double the rate of foreclosures and serious delinquencies of white borrowers (Bocian et al., 2011). As a result, the foreclosure crisis is likely to have longstanding implications for the racial wealth gap. Understanding whether loan modifications are helping these borrowers keep their homes is therefore of critical public policy concern, yet lack of data on modifications by race and ethnicity have prevented scholars from assessing the effectiveness of loan modifications for borrowers of color. In this paper, we use a unique dataset that merges data on the loan performance of subprime home mortgages that are managed by Corporate Trust Services (CTS) of Wells Fargo Bank with data on borrowers demographics reported as part of the Home Mortgage Disclosure Act (HMDA). With these data, we are able to examine national trends in loan modification types by borrower race and ethnicity, as well as assess the subsequent outcomes of those modified loans.

Our findings suggest that, conditional on being modified, there are no significant racial and/or ethnic differences in the types of modifications that borrowers receive. In fact, we find that controlling for a range of borrower, loan, and housing market characteristics, minorities are equally likely to receive a loan modification with a rate or principal reduction, and that the amount of relief given does not vary by borrower race or ethnicity. The only effect we find is that Latino borrowers are slightly more likely to receive principal forgiveness, as well as see a slightly larger decrease in their interest rates than white borrowers, controlling for other characteristics. These findings stand in stark contrast to the literature on mortgage originations, which has revealed persistent differences in loan outcomes by race and ethnicity in terms of loan pricing and terms. In terms of loan performance after modification, we find that Latinos are slightly more likely to re-default at 12 months after modification, perhaps due to the concentration of these borrowers in states that experienced significant price de-

clines as well as a dramatic and prolonged contraction in their labor markets (e.g. Arizona, California, Florida and Nevada). Importantly, borrowers eligible for HAMP modifications and those who received principal reductions were much less likely to re-default a year after modification, suggesting that modifications that focus on affordability and equity position are the most likely to save households from foreclosure.

2. Evolution of Loan Modification Efforts

Mortgage loan servicers[1] have a number of options open to them in response to a borrower in default: approve a loan modification, offer an alternative such as a short sale, or pursue a foreclosure. Servicers may pursue these options simultaneously, or even encourage borrowers to submit modification applications and then fail to act on the application, request extensions and more data, or require that the borrower initiate the whole process again sometime down the road.

In addition to significant variation in the loan modification process, loans can be modified in multiple ways, and not always in ways that are favorable to the borrower. One of the most common forms of loan modification occurs when a servicer adds payment arrears to the total loan balance, and then calculates a new monthly payment that will amortize the increased balance over the life of the loan. This type of modification generally increases both the monthly payment amount as well as the overall amount of debt (White, 2009a,b). A second type of modification - generally used on adjustable rate mortgages - is to freeze the interest rate and not allow it to reset at a higher rate. Third, a servicer can permanently reduce the interest rate on a loan in order to reduce the monthly payment, while leaving the balance of the mortgage the same. Finally, servicers can choose to reduce principal debt, which reduces the overall amount of the loan. A principal reduction is particularly beneficial to homeowners whose house values are significantly lower than the amount of their mortgage,

[1] Although a mortgage loan may be serviced by a third party or by a lender directly, this paper will use the term "servicer" to indicate the party responsible for reporting to lenders and investors in a security about the status of each loan each month. Not all servicers have the discretion to decide loan outcomes and decisions may be made in collaboration with lenders and investors; for simplicity the term servicer will be used regardless.

commonly referred to as being "underwater."

Early loan modification efforts were solely proprietary and voluntary in nature, and did little to help delinquent borrowers. As the foreclosure crisis extended into 2008, prompting a large-scale recession and high rates of unemployment, pressure mounted on the federal government to scale up efforts to modify loans and prevent foreclosures. In February 2009, the Treasury Department rolled out the federal government's landmark foreclosure prevention initiative, the "Making Home Affordable" (MHA) program. As part of MHA, the "Home Affordable Modification Program" or HAMP, sought to overcome barriers to loan modification by encouraging servicers to bring loan payments in line with borrower incomes, with a goal of reaching 3 to 4 million distressed borrowers (GAO, 2014). Under the program, eligible borrowers work with the servicer to reduce their monthly payment to 38 percent of their income, and then HAMP provides a government subsidy to further reduce the payment to 31 percent. Servicers also receive an up-front fee of $1,000 for each modification, plus "pay for success" fees on performing modified loans of $1,000 per year for up to 5 years, thus providing servicers a financial incentive to initiate modifications that help keep borrowers in their homes.[2] Borrowers are eligible for a HAMP modification on first-lien loans for owner-occupied properties with an unpaid principal balance of less than $729,750, originated on or before January 1, 2009.

Since its launch, HAMP's achievements have fallen significantly short of expectations, and the program has been revised several times to extend its reach and effectiveness. For example, as high unemployment persisted and housing prices nationally continued to fall, HAMP added features to try to address the situation of unemployed homeowners and underwater borrowers. As of November 2013, 1.3 million borrowers had received modifications under the HAMP program, well below Treasurys initial estimate of 3 million to 4 million (GAO, 2014). In addition, after peaking in early 2010, the monthly volume of new modi-

[2]HAMP also provides a bonus incentive of $1,500 to lender/investors and $500 to servicers for modifications made while a borrower is still current on mortgage payments but at imminent risk of default. To help servicers make a determination if a modification would help to protect the investors' interests in the loan, HAMP uses a standardized net present value (NPV) model to compare expected cash flows from a modified loan to the same loan with no modification, using certain assumptions.

fications made under the program has largely trailed off. However, the program has led to significant reductions in payments–an average of $544 each month, or approximately 40 percent of their pre-modification payment–for borrowers who obtained relief (US Department of the Treasury, 2014). In addition to HAMP modifications, the Office of the Comptroller of the Currency (OCC) estimates that an additional 2 million homeowners have received proprietary modifications (Office of the Comptroller of the Currency, 2014). While both OCC and Treasury release regular reports on loan modification activity and redefaults, there are still only a few studies that have examined the factors that influence the effectiveness of modifications in a multivariate framework, and even fewer that consider differences across demographic groups. This study helps to fill this gap. In the next section, we review the existing literature on loan modifications, focusing specifically on studies that seek to understand loan modification trends by borrower race and ethnicity.

3. Literature Review

Although in theory, both borrower and investor are better off if a foreclosure is avoided, in practice it has proven to be much more difficult to modify loans. Significant barriers exist to increasing the scale of loan modifications, including servicer incentives and capacity, mortgage securitization and the associated "pooling and servicing agreements", information asymmetries, and lack of borrower contact (Adelino et al., 2009; Cordell et al., 2010; Eggert, 2007; Gelpern and Levitin, 2009; Levitin and Twomey, 2011; Pikorski et al., 2009). One of the biggest barriers has been the lack of incentives for servicers to modify loans. Loan modifications are costly: they are both labor and time intensive and cannot be easily automated. And unlike the costs associated with foreclosure, neither the labor nor the overhead costs associated with modifications are billable back to investors. As a result, until the HAMP program was put into place, most servicers had very little financial incentive to undertake loan modifications. Moreover, very few servicers invested in either the staff or the technological capacity to respond to the volume of distressed borrowers at the height of the crisis. In addition to these constraints, there has been an active debate in the literature about whether the frequency of loan modifications varies across investor type. Adelino, Gerardi, and Willen (2009) found no differences in loan modifications between loans held in portfolio

and loans in private label securities, while Piskorski, Seru, and Vig (2009) found just the opposite. Agarwal and coauthors (2011) and Been, Weselcouch, Voicu and Murff (2013) have subsequently confirmed Pikorski et al.'s findings that loans in private-label securities were the least likely to be securitized, though differences in data and methodology across the studies suggest that the debate over the role of securitization in loan renegotiations is likely to be ongoing.

In this paper, we build more directly on studies that have explored the effectiveness of different modification types, and explicitly examine outcomes for different racial and ethnic groups. The lack of public data on individual loan modifications, coupled with the fact that most loan performance datasets do not include any information about the borrower with the exception of a FICO score, means that we still have a limited understanding of whether loan modifications help to prevent foreclosures, and for whom. [3] This gap in our knowledge is of significant public policy concern, especially given the important role that homeownership plays in asset building and community development, and has prompted research to better understand what constitutes an effective modification and inform policies to improve the efficiency of the default resolution process.

Importantly this research has shown that not all loan modifications are created equal. Not surprisingly, early studies analyzing the impacts of loan modifications found high rates of recidivism and re-default (Office of the Comptroller of the Currency, 2008). However, these high re-default rates were in part due to modifications that did not actually increase the affordability of the loan. White, for example, showed that the majority of pre-HAMP modifications typically increased a borrower's monthly payment, as well as the principal owed on the loan (White, 2009a,b). Subsequent studies have shown that the most successful loan modifications are those that result in a significant decrease in either the monthly payments and/or the principal of the loan (Cordell et al., 2009; Cutts and Merrill, 2008; Haughwout et al., 2010; Quercia and Ding, 2009). Quercia and Ding (2009), for example, find that loans

[3] In early 2011, Treasury released the first loan level data on the HAMP program. However, 79 percent of active permanent modification records and 82 percent of trial modification records in the data file lack information identifying the race or ethnicity of the borrower. A study by the Urban Institute, cited below, has nevertheless used these data to identify racial differences in modification outcomes.

with greater payment reductions have lower re-default risks, and that there is an even lower level of re-default when payment reduction is accompanied by principal reduction. The authors suggest that among the different types of modifications, the principal forgiveness modification has the lowest re-default rate. Cutts and Merrill (2008) similarly show that the success rate of modified loans varies by the amount of arrearage capitalized into the loan modification; they find a direct relationship between a lower arrearage and a lower re-default rate. In a more recent study of borrowers in New York City, Voicu and his colleagues (Voicu et al., 2012) find that HAMP loans are much more effective at preventing default than proprietary loan modifications, after controlling for a wide range of variables. While they found that borrowers who received HAMP modifications were less likely to redefault compared to those that received proprietary modifications, the borrowers race or ethnicity was not significantly correlated with the odds of re-default.

What is missing from these studies, however, is an analysis of how these factors might differ for different types of borrowers. Three studies post-crisis have used loan performance datasets merged with HMDA and other data sources to examine outcomes by borrower race and ethnicity in the loan modification process.[4] Two of these studies focus on borrower outcomes in New York City, which allow the authors to build comprehensive datasets with a large number of control variables. Importantly, with a wide range of controls, both studies fail to find poorer outcomes for borrowers of color. In the first study, Been and her colleagues (2013), using a sample of first lien mortgages in New York originated between 2004 and 2008, find that the race or ethnicity of the borrower had no significant impact on the likelihood that a loan was modified. Using a different dataset for loans originated in New York between

[4]A couple of studies prior to the foreclosure crisis examined the influence of borrower race on post-delinquency outcomes. For example, using a large sample of Federal Housing Administration (FHA) loans, Ambrose and Capone (1996) investigate whether there are racial differences in the resolution of loans that enter default. They find that minority borrowers remain in default longer than white borrowers, suggesting that lenders may actually have been more lenient toward minority borrowers. They also find that the foreclosure rate is consistent for both minority and white borrowers, conditional on being delinquent. However, these prior studies rely almost exclusively on FHA data, and do not include other factors (e.g. credit score or equity position) that might influence borrower outcomes post-delinquency.

2003 and 2008, Chan et al. (2014) actually find a higher loan modification propensity for African-Americans and Hispanics. In the first study using national data to observe loan modification differences by race, Collins and Reid (2010) similarly find no differences in the number or nature of modifications by race or ethnicity.

However, as Collins and Reid (2010) point out, it is hard to use datasets on loan performance to determine whether or not there are racial or ethnic differences in the incidence of loan modifications, since the data don't allow researchers to see the number of borrowers filing applications to have their loan modified. Ultimately, without application data, determining differences in incidence of modifications is impossible. A recent study by Mayer and Piven (2012) use the publicly released HAMP data to assess racial disparities in loan modification incidence and find that overall, fair lending groups did not experience differential outcomes compared to their comparison populations. They conclude that race, ethnicity, gender, and income have "very little" impact on borrowers' successful participation in HAMP. A subsequent study conducted by the U.S. General Accounting Office using non-public HAMP data on four servicers found some differences in the incidence of HAMP modifications across fair lending populations, but these differences were in large part due to differences in servicers' determination of borrower eligibility related to their debt-to-income ratio and the completeness of their modification request (GAO, 2014). While both of these studies add valuable information about the fair lending implications of loan modifications, each is limited by the scope of their data. In addition, the GAO study only focuses on four large servicers, however, and did not examine the extent to which borrowers may have gotten different modification terms based on race or ethnicity, or whether there are differences in outcomes for borrowers of color who received a modification.

In this paper, we seek not to understand the incidence of loan modifications, but rather whether borrowers receive equivalent modifications, or whether there are differences in modification terms by race and ethnicity. As noted above, borrowers who have less knowledge of the mortgage market and existing government foreclosure prevention programs may systematically fail to renegotiate the best terms for their modification. Second, we examine whether or not there are differences in borrower outcomes after modification. This question is crucial, because if modifications merely delay foreclosure, they may actually make lenders

and borrowers (who are making payments under the modification) worse off. Some studies have suggested that re-default rates on modified loans are high; the OCC reported that re-default rates on modified loans were at 41 percent in the second quarter of 2011 (with redefault defined as 60 or more days delinquent one year after the modification), though other studies have reported even higher rates (e.g. 40 to 50 percent in Adelino et al. (2009)). If re-default rates are systematically higher for borrowers of color who have received modifications, it would suggest that additional policies are needed to help these borrowers resolve their delinquency and sustain homeownership.

4. Data and Methods

For this analysis, we created a unique dataset that merges loan-level data on subprime home mortgages that are managed by Corporate Trust Services (CTS) with loan-level data on borrowers from the Home Mortgage Disclosure Act (HMDA). This merged dataset allows us to analyze whether there are differences in loan modification terms by the race and ethnicity of the borrower, and assess the extent to which these modifications are successful in preventing subsequent redefault.

CTS is a service of Wells Fargo Bank, N.A. that provides information on a variety of investment vehicles administered by the bank. The CTS data cover privately securitized mortgages for which Wells Fargo serves as the trustee, and includes mortgages with different interest rate structures, different purposes, different property types, and different lien statuses (Quercia and Ding, 2009; White, 2009b).[5] The database includes loans originated as early as the 1980s and tracks performance until the loan is paid off or foreclosed upon, and includes over 4 million individual loans. Each monthly loan record contains the borrower's FICO credit score, loan-to-value (LTV) ratio at origination, the last 12 month's delinquency history, the property zip code, the type of loan, and the original and current balance of the loan. Importantly, the CTS data include a modification indicator, which represents all formal and permanent loan modifications and equals one for every period after the loan is modified. The reports also have information about the loan balance, mortgage payment, and

[5]These investor report files are available at www.ctslink.com.

interest rate, both before and after modification, which enables us to identify whether total mortgage debt, interest rate, or mortgage payments are changed for individual homeowners.

The CTS dataset, however, does not include any information on the borrower other than their FICO score. For this reason, we merge the CTS data with loan level HMDA data. HMDA data provide information on the race and ethnicity of the borrower, their income, and the geographic location of the property securing the loan. To match the data, we sorted CTS and HMDA loans into the census tracts of the purchased property using a geographic crosswalk file, and then matched loan originations on the following variables: origination date, loan amount, lien status, and loan purpose. We limited the matching to loans originated between 2004 and 2007, and garnered a 69.2 percent match rate.

For this paper, we focus on the universe of first lien, owner occupied loans originated in 2005 (approximately 113,000 loans), and limit our analysis to loans that were active in December 2006.[6] We observe modifications and loan performance through December 2012. Data on modifications from the OCC shows that the volume of modifications peaked in early 2010 and then declined throughout 2011 and 2012, meaning that our sample captures the period during which the vast majority of modifications were made. Because our interest in this paper is to understand the relationship between modification types and re-default for different types of borrowers, in the analysis that follows, we focus only on modified loans, reducing our sample to 15,072 loans. Importantly, we only consider permanent, not trial, modifications. Using cross sectional linear probability models, we examine the performance of these loans at 6 and 12 months after modification, accounting for a wide range of loan, borrower, and housing market characteristics.[7]

The control variables in our analysis include borrower race/ethnicity, income, FICO score at origination, a no documentation dummy, a prepayment penalty dummy, and the combined loan-to-value (CLTV) ratio. We coded the race and ethnicity variables in the HMDA data

[6]We limit our analysis to 2005 originations for several reasons. First, 2005 originations reflect characteristics typical of the subprime boom. Second, by limiting it to a single year of originations, we minimize the impact of time sensitive variables. Third, our CTS and HMDA match rate was highest for 2005.

[7]Using a cross-sectional model design versus a panel structure did not change our substantive findings, so we present the cross-sectional results to ease interpretation.

as "Black\African American," "Hispanic\Latino," and "Asian\Hawaiian\Pacific Islander,"[8] and "Non-Hispanic White." Because borrower income is not normally distributed, we take a log transformation of income in the models. To account for changes in the housing market, we use monthly data from Zillow at the zip code level and calculate relative house prices changes for each loan, allowing us to see the effect of a borrower's equity position on the likelihood of cure. All of our models also include state level fixed effects to account for other market level conditions that may influence re-default. Finally, we create a proxy variable to test for the influence of the HAMP program on loan modification terms and re-default rates. While we cannot observe directly whether a modification in the CTS data is a HAMP modification, we can determine whether a borrower would have been eligible for HAMP based on borrower income and loan balance guidelines.

One significant limitation of the CTS data is its coverage of the mortgage market, in particular, the lack of coverage of prime loans and loans held by banks in portfolio. Nevertheless, given that subprime mortgages account for more than half of all foreclosures, and that the vast majority of subprime loans that led to the crisis were privately securitized, this sample provides important insights into the performance of loan modifications to date. Also, given the potential that modifications are more challenging among privately securitized loans (meaning loans not managed by Fannie Mae, Freddie Mac or Ginnie Mae), this sample is particularly relevant for policy-makers. Finally, one of the other strengths of this data and study is its national coverage; as noted above, other studies that have examined detailed loan modification outcomes by borrower race and/or ethnicity have tended to focus on borrowers in New York City. Expanding the analysis to a national sample of loans allows us to determine the extent to which the New York studies' findings on race and ethnicity are applicable to a broader range of borrowers and geographies.

5. Findings

In this section, we present the results of our analysis, focusing first on the descriptive characteristics of our sample. Table 1 presents summary statistics for CTS loans that were

[8] Also includes small percentage of Native American and other races.

originated in 2005, still active in December 2006, and that saw a permanent modification of their loan terms between 2007 and the end of 2012. The descriptive means for these variables are measured at origination with the exception of our HAMP eligibility proxy, which is determined at the time of modification and takes into account the timing of the HAMP program launch.

For our purposes in this paper, it is noteworthy that the sample is demographically diverse. While the plurality of borrowers are white (43 percent), the sample also includes 20 percent Black\African American borrowers, 24 percent Hispanic\Latino borrowers, and 4 percent Asian borrowers. The majority of loans (62 percent) listed a male borrower as the primary applicant. The average credit score of borrowers in the sample was 620 (consistent with the fact that these are subprime and Alt-A loans bundled into private label securities). The average applicant income at origination was $83,000. Focusing next on loan characteristics, we find that the average loan amount for the loans in our sample is $236,000, with a mean loan-to-value ratio of 83 percent. The vast majority of loans were adjustable rate mortgages (79 percent), with an average interest rate of 7.6 percent. Approximately one out of five modified loans were HAMP eligible, suggesting that a fair number of loans underwent proprietary modifications. However, in additional analysis we found that among loans that were never modified in the CTS data, none were HAMP eligible, suggesting that the program did provide incentives for servicers to modify loans.

Table 2 displays descriptive statistics for the modification and loan performance variables. Most loan modifications involve a rate change; 74 percent of all modifications included some form of interest forgiveness, with an average rate reduction of 2.6 percentage points. In contrast, only 6 percent of modifications included principal forgiveness; in fact, on average, modified loans saw a 3 percent increase in their loan balance, suggesting that many servicers add unpaid payments onto the unpaid principal of the loan. Consistent with other studies, in these descriptive results, we do not find significant racial or ethnic differences in the types of modifications received. Overall the rates of various loan modification types and terms are remarkably consistent across racial and ethnic categories; the one exception is among Latino borrowers who saw slightly higher rates of interest rate and principal reductions.

In the bottom two panels of Table 2, we present descriptive statistics on re-default rates at

6 and 12 months after modification. Six months after modification, approximately 19 percent of loans have missed two payments, with about 8 percent of modified loans in foreclosure. Within a year, almost 30 percent of borrowers have missed two payments, and 13 percent of borrowers have received a notice for foreclosure. In comparison to White and African American borrowers, Asian and Latino borrowers have slightly higher 60+ delinquency rates one year after a modification, but only marginally so. Indeed, what is striking about this table is the relative homogeneity of outcomes among borrowers who received a loan modification, and the fairly high rates of success (especially compared to the re-default rates of modified loans pre-HAMP).

In the first two columns of Table 3, we present linear probability models to determine whether or not there are differences in the quality of the modification recevied by race and/or ethnicity. The second two columns present ordinary least square models on the strength of the modification, in terms of the amount of the interest rate or principal reduction. In addition to the variables presented in the table, each of these models controls for FICO and CLTV quarters, the difference in house price at the zip code level from origination to modification (logged), the length of delinquency at the time of modification, the borrower's income at origination (logged), and state fixed effects.

Importantly, we find very few differences in the likelihood of either interest rate reductions or principal forgiveness by race or ethnicity. Compared to white borrowers, Latino borrowers are slightly more like to receive a modification that entails principal forgiveness, perhaps due to the fact that Latino borrowers are concentrated in the sand states, which saw sizable drops in house values. However, the model also reveals that for all borrowers, borrowers living in zip codes with more drastic house price declines between origination and modification reduced the likelihood of receiving a principal reduction. For some servicers, concerns of re-default in a declining market may have changed their net present value calculation, since a foreclosure six months down the line in a declining market would likely lead to greater investor losses. Consistent with other studies, we find that loans with adjustable rate mortgages are more likely to result in larger rate reductions. We also find that borrowers who are at least 60 days delinquent at the time of modification are slightly more likely to see interest or principal rate reductions, and also see their balance go down further than borrowers who were current or

only a month behind on their payments.

Our HAMP proxy has a significant, positive effect on the type of modification a borrower receives. Conditional on receiving a modification, borrowers who fit within HAMP eligibility criteria were 30 percent more likely to receive an interest rate reduction and 7 percent more likely to receive a principal reduction on their loan. While not conclusive, these results suggest that the incentives within the HAMP program have been effective at getting servicers to modify loans and to offer modifications that lead to real reductions in loan costs.

Looking at changes in interest rates and balances also fails to reveal significant disparities for homeowners of color. Latinos saw slightly larger interest rate reductions than Whites, but there is no significant difference in either interest rate or balance changes for African Americans or Asians. Again, we find a significant impact from the HAMP variable. For borrowers who received a modification, if they were eligible for HAMP, average interest rates went down by 1.3 percentage points. However, HAMP did not have a significant impact on the amount of principal forgiveness. This may reflect the emphasis of the HAMP program on bringing payments in line with a borrower's monthly income, rather than on helping borrowers in a negative equity position.

Which of these modifications were most effective in terms of preventing default? Table 4 presents our cross-sectional linear probability modifications at 6 months and 12 months after modification.[9] As with the previous models, non-reported controls include FICO and CLTV quartiles, a no documentation dummy, a prepayment penalty dummy, and state level fixed effects.

First, focusing on differences by race and ethnicity, we find that only Latino borrowers are more likely to re-default than White borrowers after modification. Specifically, 12 months after modification, Latinos are more likely to be in every stage of delinquency (30, 60 and 90+), and they are more likely to experience a foreclosure. These results can in part be explained by the concentration of Latino borrowers in states that saw significant price declines as well as a dramatic and prolonged contraction in their labor markets (e.g. Arizona, Cali-

[9]Columns (1)-(3) and (7) do not include loans modified after May 2012, since they do not have 6 months out in the sample. Columns (4)-(6) and (8) do not include loans modified after December 2011.

fornia, Florida and Nevada) - while a modification can help a borrower stay in their homes, it is much more difficult to prevent foreclosure over the long-term if a borrower experiences long-term unemployment and cannot make even the modified payments. Higher incomes at origination and higher loan balances also increase the likelihood of re-default. Borrowers who were at least 60 days delinquent are less likely to re-default after a modification. While this may be in part picking up a selection effect (in that servicers are effectively identifying borrowers who need a modification to stay in their homes), it also sugges that modifications are an effective way of resolving a delinquency and can help borrowers who were struggling to make their payments stay in their homes.

Second, we find that the terms of the modifications also matter. In particular, principal forgiveness has a significant, positive effect, preventing re-defaults 12 months after modification, while interest forgiveness helps prevent both 6 month and 12 month re-default rates. Interest rate forgiveness also helps guard against foreclosure filings within 6 months of modification. HAMP eligibility also significantly reduces the likelihood of re-default. Importantly, modifications that were HAMP eligible reduce the likelihood of foreclosure after 12 months by 7 percent, even after controlling for a wide range of other characteristics.

Third, the models also show that housing market conditions also matter. Borrowers in neighborhoods that saw house prices either rebound or not continue to decline were significantly less likely to re-default, after controlling for other factors. An important avenue for future research would be to understand how modifications and foreclosure prevention efforts at the borrower level interact and support policies that focus on neighborhood stabilization.

6. Conclusions

Confronted with a rising number of foreclosures, the federal government launched HAMP in 2009 with a goal of greatly increasing the scale and impact of loan modifications. Since then, concerns have emerged over whether loan modifications are successful at preventing foreclosure, and whether there are any racial or ethnic differences in who benefits from a modification. Using a sample of national subprime and Alt-A loans, we find no evidence of racial disparities in the types of loan modifications received. Overall, race or ethnicity is not a significant factor in predicting the likelihood of either an interest rate or principal

reduction, or the amount of a reduction the borrower receives. The one exception is for Latino borrowers, who are slightly more likely to receive principal forgiveness, as well as see slightly larger decreases in their annual interest rate. These findings stand in stark contrast to the literature on mortgage originations, which has revealed persistent differences in loan outcomes by race and ethnicity in terms of loan pricing and terms (Avery et al., 2006; Bocian et al., 2008; Nichols et al., 2004).

Our findings on the effectiveness of loan modifications are more mixed, although we find that modifications that reduce either the interest rate or prinicpal are largely effective at keeping borrowers in their homes. Yet not all modifications are created equal. On average, loan modifications are much more likely to decrease the interest rate on the loan, but this is also often accompanied by an increase in the principal balance. However, borrowers that receive principal reductions see their balance go down by an average of 11 percent. Importantly, we find that these principal reductions greatly decrease the likelihood of re-default, even 12 months after modification. The fact that lenders continue to be resistant to principal reductions, particularly in markets with large price declines, suggest that there is room to better incentivize principal reductions among servicers. In addition, Congress should vote to extend the Mortgage Forgiveness Debt Relief Act of 2007, which protects homeowners who have had mortgage debt forgiven or canceled (e.g. through a loan modification) from having to pay income tax on the forgiven debt.

We also find that HAMP eligibility significantly increases not only the likelihood of a modification, but also the likelihood of long-term success of the modification. This suggests that the oversight and structure of the HAMP program on servicing practices, as well as the clear guidelines for loan modification terms and emphasis on the affordability of payments, are important components of any loss mitigation program. There is much more that can be learned about how servicing practices influence homeownership sustainability, which is particularly relevant as the Consumer Financial Protection Bureau moves forward to institute servicer guidelines and practices.

We also believe our findings highlight the need for further research to help tease out what is responsible for the lack of differences in loan modifications by race and ethnicity. Are there lessons from the loan modification process that could help us to design more

sustainable paths to homeownership going forward? For example, one possible explanation for the lack of disparities along race or income is the role that housing counselors have played in the foreclosure prevention process. Does the presence of a trusted intermediary, who may be able to navigate the complicated world of loan modifications on the borrower's behalf, help to ensure more equitable loan modification outcomes? Recent studies examining the role of counseling for mortgage borrowers in default are suggestive that counseling and related interventions may in fact play a role for successfully avoiding foreclosure. Ding, Quercia, and Ratcliffe (2008) examine the association between telephone-based default counseling and the likelihood of curing a delinquency among loans made to low-income borrowers. Studies by Collins and Schmeiser (2010) and a preliminary evaluation of the National Foreclosure Mitigation Counseling Program (Mayer et al., 2009) also find positive impacts of default counseling on loan outcomes.

Finally, our research also demonstrates that not all loan modifications are successful, and that the strength of the local labor and housing market also influences the likelihood of homeownership sustainability. Borrowers of color, especially those who are lower-income or who work in lower-skilled jobs, may face increased risk and income volatility associated with structural changes in the labor market. In addition, lower-income homeowners have a smaller financial cushion with which to withstand the impact of negative life events, such as unemployment or serious illness, or to meet unanticipated repair costs, and by virtue of their limited housing choices, they are more likely to buy houses in need of repair. For these borrowers, loan terms may not be the only, or even the most, important factor influencing the sustainability of homeownership. Focusing on policies that provide post-purchase support, in addition to transparent and effective guidelines for loan servicing, can help to ensure that borrowers of color are able not only to access homeownership, but also stay in their homes and experience the benefits of homeownership.

Adelino, Manuel, Kristopher S. Gerardi, and Paul Willen, "Why Don't Lenders Renegotiate More Home Mortgages? Redefaults, Self-Cures, and Securitization," 2009. Federal Reserve Bank of Boston. Policy Discussion Paper No. 09-4.

Agarwal, Sumit, Gene Amromin, Itzhak Ben-David, Souphala Chomsisengphet, and Douglas D. Evanoff, "The Role of Securitization in Mortgage Renegotiation," *Journal of Financial Economics*, 2011, *102* (3), 559 – 578.

Ambrose, Brent W. and Charles A. Capone, "Do Lenders Discriminate in Processing Default?," *Cityscape: A Journal of Policy Development and Research 2(1): 89-98*, 1996.

Avery, Robert B., Kenneth P. Brevoort, and Glen B. Canner, "Higher Priced Home Lending and the 2005 HMDA Data," *Federal Reserve Bulletin*, 2006, *92* (September), a123–a166.

Bocian, Debbie Gruenstein, Wei Li, and Keith S. Ernst, "Race, Ethnicity and Subprime Loan Pricing," *Journal of Economics and Business*, 2008, *60* (1-2), 110–124.

_ , _ , Carolina Reid, and Roberto G. Quercia, *Lost Ground, 2011: Disparities in Mortgage Lending and Foreclosures*, Center, 2011.

Chan, Sewin, Claudia Sharygin, Vicki Been, and Andrew F. Haughwout, "Pathways after Default: What Happens to Distressed Mortgage Borrowers and Their Home?," *Journal of Real Estate Finance and Economics*, 2014, *48*, 342–379.

Collins, J. Michael and Carolina Reid, "Who Receives a Mortgage Modification? Race and Income Differentials in Loan Workouts," *Federal Reserve Bank of San Francisco Working Paper 2010 - 07*, 2010.

_ and Maximillian D. Schmeiser, "Estimating the Effects of Foreclosure Counseling for Troubled Borrowers," 2010. Available at SSRN: http://ssrn.com/abstract=1670859.

Cordell, Larry, Karen Dynan, Andreas Lehnert, Nellie Liang, and Eileen Mauskopf, "Designing Loan Modifications to Address the Mortgage Crisis and the Making Home Affordable Program," 2009. Finance and Economics Discussion Series 2009-43. Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board.

_ , _ , _ , _ , **and** _ , *The Incentives of Mortgage Services and Designing Loan Modifications to Address the Mortgage Crisis* Lessons from the Financial Crisis: Causes, Consequences, and Our Economic Future, New Jersey: John Wiley & Sons, Inc., 2010.

Cutts, Amy C. and William Merrill, *Interventions in Mortgage Defaults: Problems and Practices to Prevent Home Loss and Lower Costs* Borrowing to live: Consumer and mortgage credit revisited., Washington, DC: Brookings Institution Press., 2008.

Ding, Lei, Roberto G. Quercia, and Janneke Ratcliffe, "Post-Purchase Counseling and Default Resolutions among Low- and Moderate- Income Borrowers," *Journal of Real Estate Research*, 2008, *30* (3), 315–344.

Eggert, Kurt, "Comment on Michael A. Stegman et al.'s "Preventive Servicing Is Good Business and Affordable Homeownership Policy": What Prevents Loan Modifications?," *Housing Policy Debate*, 2007, *18* (2), 279–297.

GAO, "Troubled Asset Relief Program: More Efforts Needed on Fair Lending Controls and Access for Non-English Speakers in Housing Programs," *United States Government Accountability Office GAO-14-117*, 2014.

Gelpern, Anna and Adam J. Levitin, "Rewriting Frankenstein Contracts: The Workout Prohibition in Residential Mortgage-Backed Securities," *Southern California Law Review*, 2009, *82*, 1077–1152.

Haughwout, Andrew, Ebiere Okah, and Joseph Tracy, "Second Changes: Subprime Mortgage Modification and Re-Default," 2010. Staff Report No. 417. Federal Reserve Bank of New York.

Levitin, Adam J. and Tara Twomey, "Mortgage Servicing," *Georgetown Public Law and Legal Theory Research Paper No. 11-09*, 2011.

Mayer, Neil and Matt Piven, "Experience of People of Color, Women and Low-Income Homeowners in the Home Affordable Modification Program," *The Urban Institute*, 2012.

_ , **Peter A. Tatian, Ken. Temkin, and Charles . A. Calhoun**, "National Foreclosure Mitigation Counseling Program Evaluation: Preliminary Analysis of Program Effects," 2009. Washington, DC: The Urban Institute.

Nichols, Joseph, Anthony Pennington-Cross, and Anthony Yezer, "Borrower Self-Selection, Underwriting Costs, and Subprime Mortgage Credit Supply," *The Journal of Real Estate Finance and Economics*, 2004, *30* (2), 197–219.

Office of the Comptroller of the Currency, "OCC and OTS Mortgage Metrics Report: Disclosure of National Bank and Federal Thrift Mortgage Loan Data, Third Quarter 2008," 2008.

_ , "OCC Mortgage Metrics Report for the Fourth Quarter 2013," Technical Report, Office of the Comptroller of the Currency 2014.

Pikorski, Tomasz, Amit Seru, and Vikrant Vig, "Securitization and Distressed Loan Renegotiation: Evidence from the Subprime Mortgage Crisis," 2009. Research Paper No. 09-02. Booth School of Business.

Quercia, Roberto G. and Lei Ding, "Loan Modifications and Redefault Risk: An Examination of Short-Term Impacts," *Cityspace: A Journal of Policy Development and Research*, 2009, *11* (3), 171–193.

US Department of the Treasury, "Making Home Affordable: Program Performance Report through January 2014," Technical Report, US Department of the Treasury 2014.

Voicu, Ioan, Vicki Been, Mary Weselcouch, and Andrew John Tschirart, "Performance of HAMP Versus Non-HAMP Loan Modifications - Evidence from New York City," *New York University Law and Economics Working Paper*, 2012, (1-1-2012).

Weselcouch, Ioan Voicu Vicki Been Mary and Scott Murff, "Determinants of the incidence of U.S. Mortgage Loan Modifications," *Journal of Banking and Finance*, 2013, *37*, 3951–3973.

White, Alan M., "Deleveraging the American Homeowner: The Failure of 2008 Voluntary Mortgage Contract Modifications," *Connecticut Law Review*, 2009, *41.*

_ , "Rewriting Contracts, Wholesale: Data on Voluntary Mortgage Modifications from 2007 and 2008 Remittance Reports," *Fordham Urban Law Journal*, 2009, *36* (509-).

Table 1: Descriptive Information

Borrower Characteristics		Loan Characteristics	
Black	0.20	ARM	0.79
	(0.37)		(0.41)
Hispanic	0.24	Current Balance	236,157.14
	(0.40)		(147,564.99)
Asian	0.04	HAMP Eligible	0.21
	(0.18)		(0.41)
White	0.51	Combined Loan-to-Value Ratio	83.02
	(0.50)		(12.07)
Male Borrower/Co	0.62	Interest Rate	7.60
	(0.49)		(1.19)
FICO	620.62	HPI	304,030.01
	(65.62)		(167,255.24)
Applicant Income	82.85		
	(76.18)		
Observations=15,072			

Source: Corporate Trust Services (CTS) Dec. 2006-Dec. 2012. Means reported for period 1 (Dec 2006), standard deviations in parentheses. All loans are modified in the sample. Black, Hispanic, Asian, White, Male are based on HMDA data. FICO is credit score at the time of application and Income is applicants' income at time of application. ARM =1 for adjustable rate mortgages, HAMP Eligible is based on the HAMP rules for interest rates and current balances, at final period, Dec. 2012. HPI is the monthly zip code-level housing price index from Zillow.

Table 2: Summary Statistics: Loan Performance

	White	Black	Asian	Hispanic	Other	Total
Upon Modification						
Pre-Mod Rate	7.72	7.82	6.24	7.25	7.79	7.56
	(1.39)	(1.38)	(1.23)	(1.15)	(0.66)	(1.35)
Rate Change	-2.52	-2.70	-2.68	-2.78	-2.71	-2.63
	(1.92)	(2.00)	(1.84)	(1.89)	(1.90)	(1.93)
Percent Balance Change	0.03	0.03	0.02	0.02	0.01	0.03
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
Forgave Principal	0.05	0.06	0.06	0.08	0.08	0.06
	(0.22)	(0.24)	(0.24)	(0.27)	(0.27)	(0.24)
Forgave Interest	0.73	0.73	0.77	0.78	0.76	0.74
	(0.45)	(0.44)	(0.42)	(0.41)	(0.43)	(0.44)
Percent Balance Change	-0.09	-0.11	-0.20	-0.13	-0.10	-0.11
(if Principal Forgiven)	(0.17)	(0.19)	(0.25)	(0.19)	(0.16)	(0.18)
Percent Balance Change	0.03	0.04	0.03	0.03	0.02	0.04
(if Principal Not Forgiven)	(0.15)	(0.15)	(0.14)	(0.15)	(0.16)	(0.15)
Within 6 Months After Modification						
At least 30 days behind	0.26	0.27	0.27	0.28	0.29	0.27
	(0.44)	(0.44)	(0.44)	(0.45)	(0.45)	(0.44)
At least 60 days behind	0.18	0.18	0.20	0.20	0.21	0.19
	(0.38)	(0.39)	(0.40)	(0.40)	(0.41)	(0.39)
At least 90 days behind	0.12	0.12	0.16	0.15	0.17	0.13
	(0.33)	(0.33)	(0.37)	(0.36)	(0.38)	(0.34)
Decision for Foreclosure	0.07	0.07	0.09	0.09	0.09	0.08
	(0.26)	(0.26)	(0.29)	(0.29)	(0.28)	(0.27)
Within 12 Months After Modification						
At least 30 days behind	0.39	0.42	0.35	0.41	0.41	0.40
	(0.49)	(0.49)	(0.48)	(0.49)	(0.49)	(0.49)
At least 60 days behind	0.31	0.34	0.28	0.34	0.38	0.32
	(0.46)	(0.47)	(0.45)	(0.48)	(0.49)	(0.47)
At least 90 days behind	0.26	0.29	0.25	0.30	0.34	0.27
	(0.44)	(0.45)	(0.43)	(0.46)	(0.47)	(0.45)
Decision for Foreclosure	0.12	0.13	0.12	0.15	0.15	0.13
	(0.33)	(0.34)	(0.33)	(0.36)	(0.36)	(0.34)
Observations	6,291	2,449	481	2,931	189	12,341

Source: Corporate Trust Services (CTS) Dec. 2006-Dec. 2012. Means reported, standard deviations in parentheses. Forgave interest and forgave principal are dummy variables regarding the type of modification. Rate change and balance change reflect the changes pre and post modification, where balance change is recorded in percentage terms.

Table 3: What do modifications look like?

	(1)	(2)	(3)	(4)
	Forgave Interest	Forgave Principal	Rate Change	Balance Change
Black	0.014	-0.002	-0.093	0.003
	(0.011)	(0.007)	(0.051)	(0.004)
Hispanic	0.018	0.017**	-0.189***	-0.000
	(0.010)	(0.006)	(0.045)	(0.004)
Asian	0.013	0.014	-0.158	0.004
	(0.020)	(0.013)	(0.092)	(0.008)
ARM	0.037***	0.026***	-0.485***	-0.008*
	(0.009)	(0.005)	(0.042)	(0.004)
ln(income)	-0.005	0.014**	-0.027	0.003
	(0.008)	(0.005)	(0.038)	(0.003)
HAMP Eligible	0.297***	0.066***	-1.262***	-0.005
	(0.009)	(0.007)	(0.046)	(0.005)
$ln(HPI_t) - ln(HPI_0)$	0.010	-0.034***	0.304***	-0.002
	(0.010)	(0.006)	(0.045)	(0.004)
> 60 Days Behind Before Mod	0.035***	-0.014*	-0.021	-0.031***
	(0.010)	(0.005)	(0.042)	(0.004)
Observations	11,989	11,989	11,377	11,436

Notes: Source: Corporate Trust Services (CTS) 2006 - December, 2012. Model: Linear Probability (1)-(2) and OLS (3)-(4) all conditional on modification; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Forgave interest and forgave principal are dummy variables regarding the type of modification. Rate change and balance change reflect the change in interest rate and current balance before and after modification, where balance change is recorded in percentage terms. Black, Hispanic, and Asian are based on HMDA data, white is the excluded group. ARM is a dummy for an adjustable rate mortgage, ln(income) is at the time of application, HAMP Eligible is based on the HAMP rules for interest rates and current balances, $ln(HPI_t) - ln(HPI_0)$ marks the difference in house prices between origin and the time of modification, > 60 marks the delinquency status the month prior to modification. Model also controls for FICO and CLTV quartiles, a no documentation dummy, a prepayment penalty dummy, and state-level fixed effects.

Table 4: Mods

	After 6 months			After 12 months			After 6 months	After 12 months
	$\geq$ 30 days behind	$\geq$ 60 days behind	$\geq$ 90 days behind	$\geq$ 30 days behind	$\geq$ 60 days behind	$\geq$ 90 days behind	Foreclosure	Foreclosure
Black	-0.009	-0.001	-0.006	0.021	0.024	0.018	-0.005	0.004
	(0.012)	(0.011)	(0.009)	(0.014)	(0.013)	(0.013)	(0.007)	(0.010)
Hispanic	0.017	0.017	0.018*	0.027*	0.037**	0.034**	0.011	0.026**
	(0.011)	(0.010)	(0.009)	(0.012)	(0.012)	(0.012)	(0.007)	(0.009)
Asian	0.025	0.027	0.035	0.003	-0.000	0.004	0.021	0.016
	(0.022)	(0.020)	(0.018)	(0.026)	(0.024)	(0.024)	(0.014)	(0.019)
Male Borrower/Co	0.001	-0.004	-0.005	0.014	0.009	0.006	-0.003	0.007
	(0.009)	(0.008)	(0.007)	(0.010)	(0.010)	(0.009)	(0.005)	(0.007)
Forgave Principal	-0.010	-0.011	-0.020	-0.069***	-0.052**	-0.035	-0.011	-0.017
	(0.017)	(0.015)	(0.013)	(0.020)	(0.019)	(0.019)	(0.011)	(0.015)
Forgave Interest	-0.076***	-0.065***	-0.057***	-0.086***	-0.080***	-0.066***	-0.033***	-0.011
	(0.010)	(0.009)	(0.008)	(0.011)	(0.011)	(0.011)	(0.007)	(0.008)
$>$ 60 Days Behind Before Mod	-0.065***	-0.064***	-0.051***	-0.023	-0.030**	-0.045***	-0.037***	-0.044***
	(0.010)	(0.009)	(0.008)	(0.012)	(0.012)	(0.011)	(0.006)	(0.008)
ARM	0.035***	0.029***	0.021**	0.031**	0.029**	0.025**	0.014**	0.029***
	(0.009)	(0.008)	(0.007)	(0.010)	(0.009)	(0.009)	(0.005)	(0.007)
Current Balance	0.018***	0.012**	0.010**	0.031***	0.025***	0.025***	0.006	0.008*
	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.003)	(0.004)
ln(income)	0.013	0.017*	0.017*	0.013	0.020*	0.025**	0.021***	0.022**
	(0.009)	(0.008)	(0.007)	(0.010)	(0.010)	(0.009)	(0.006)	(0.007)
HAMP Eligible	-0.116***	-0.093***	-0.063***	-0.180***	-0.176***	-0.165***	-0.038***	-0.066***
	(0.011)	(0.009)	(0.008)	(0.014)	(0.012)	(0.011)	(0.006)	(0.008)
$ln(HPI_6) - ln(HPI_mod)$	-0.352***	-0.328***	-0.330***				-0.296***	
	(0.059)	(0.054)	(0.049)				(0.041)	
$ln(HPI_12) - ln(HPI_mod))$				-0.295***	-0.263***	-0.246***		-0.204***
				(0.039)	(0.038)	(0.038)		(0.032)
Total Observations	10,908	10,908	10,908	9,895	9,895	9,895	10,868	9,613

Notes: Source: Corporate Trust Services (CTS) 2006 - December, 2010. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Model: Linear Probability; Additional controls include a no documentation dummy, a prepayment penalty dummy, state-level fixed effects and FICO and CLTV quartiles. Black, Hispanic, and Asian are based on HMDA data, white is the excluded group.ARM is a dummy for an adjustable rate mortgage, ln(income) is at the time of application, Forgave Principal is a dummy equal to one if the principal was reduced with the modification, HAMP Eligible is based on the HAMP rules for interest rates and current balances, $>$ 60 marks the delinquency status the month prior to modification. $ln(HPI_6) - ln(HPI_mod)$ and $ln(HPI_12) - ln(HPI_mod)$ mark the difference in house prices between 6 or 12 month after modification and the time of modification.