National Foreclosure Mitigation Counseling Program Evaluation

Preliminary Analysis of Program Effects

September 2010 Update

Prepared by

Neil Mayer

Peter A. Tatian

Kenneth Temkin

Charles A. Calhoun

With

Randy Rosso

Kaitlin Franks

Prepared for

NeighborWorks® America

December 2010

The Urban Institute

2100 M Street, NW

Washington, DC 20037

Contents

Tables

Figures

ACKNOWLEDGMENTS

The authors would like to thank the following persons for their help in preparing this report: Randy Rosso, Kaitlin Franks, and Leah Hendey of the Urban Institute for assistance in preparing the NFMC and LPS data and in carrying out the analyses described in this report; Trey Barnes and Kostya Gradushy of LPS Applied Analytics for their assistance in matching the NFMC and LPS loan records; and Tim Ware of the Urban Institute for administrative support and help in preparing this document.

EXECUTIVE SUMMARY

The National Foreclosure Mitigation Counseling (NFMC) program is a special federal appropriation, administered by NeighborWorks® (NW) America, that is designed to support a rapid expansion of foreclosure intervention counseling in response to the nationwide foreclosure crisis. As this is a federal appropriation, NW America must inform Congress and other entities of the NFMC program's progress. The Urban Institute (UI) was selected by NW America to undertake a two-year evaluation of the NFMC program.

This report presents an update of the preliminary analysis of program effects that were first described in our report of November 2009 (Mayer et al.). In that report, we found positive effects for homeowners receiving NFMC counseling in 2008 in avoiding entering foreclosure, successfully curing an existing foreclosure, and obtaining a more favorable loan modification.

In this report, we update those previous analyses to include homeowners receiving NFMC counseling in the second program year, 2009. These new models also use an improved comparison sample selection design, which addressed potential sample selection issues raised by reviewers of our first report. We also present an entirely new analysis of the 2008 cohort of counseled and non-counseled homeowners that measures whether NFMC counseling has a positive impact on helping sustain foreclosure and delinquency cures, avoiding redefaults.

The multivariate statistical analysis presented in this report is based on a sample of close to 180,000 loans and answers the following questions about the NFMC program's performance through December 2009.

- Did the NFMC program help homeowners cure an existing foreclosure?
- Did the NFMC program help homeowners receive loan modifications that resulted in lower monthly payments than they would have otherwise received without counseling?
- Did the NFMC program help homeowners who cured a serious delinquency or foreclosure to sustain the cure?

This evaluation of program effects indicates that the initial answer to these three questions is "Yes," although the magnitude of the effects varies depending on the particular outcome. As detailed further in this report:

- The NFMC program was effective at helping homeowners cure an existing foreclosure. Many NFMC clients entered counseling already in foreclosure (25 percent) or entered foreclosure after starting counseling (17 percent). During the first two years of the program, the relative odds of counseled homeowners curing their foreclosure were 1.7 times greater than if they had not received NFMC counseling. The resulting difference in the cure rate means that an estimated 32,000 more NFMC clients cured their foreclosure by the end of December 2009 than would have occurred without receiving services from NFMC counselors.
- Loan modifications received by NFMC clients resulted in significantly lower monthly mortgage payments than would have been received without the help of the program. Lower monthly payments may help reduce the likelihood of a subsequent recurrence of borrower mortgage problems. On average, we estimated that NFMC clients who received loan modifications in the first two program years reduced their monthly payments by $267 more than they would have without NFMC counseling.
- Homeowners who obtained a loan modification that allowed them to cure an existing serious delinquency or foreclosure were much more likely to remain current on their mortgage if their loan modification was obtained with help from NFMC counseling. For clients counseled in 2008, counseling produced a 45 percent increase in the relative odds that a post-counseling modification would be sustained through 2009. The sustainability of modifications received after starting counseling was greater than that of homeowners who got modifications without counseling not only because counseled homeowners received larger monthly payment reductions, but also because they benefitted from counseling in other ways, such as through assistance with financial management.
- Homeowners receiving loan modifications were much more likely to cure their defaults if they received counseling before the re-working of their loans. For clients counseled in 2008, the relative odds of bringing their loans to current were 53 percent higher if they received pre-modification counseling than if they did not. That means that counseling produced a combination of positive effects in moving people from serious delinquency or foreclosure to a sustained cure of their mortgages, increasing the odds of obtaining a cure in the first place and then raising the odds of sustaining the larger number of cures that resulted.

Overall, our ongoing analysis of the NFMC program suggests that the program is having its intended effect of helping homeowners facing loss of their homes through foreclosure. The effects are strong and consistent through the second program year. The analysis in this report substantially extends our previous findings by observing two years of counseled borrowers, instead of just one year, and by being able to follow early entrants to counseling over a longer time. That enabled us to examine for the first time the sustainability of cures of troubled loans.

In subsequent analyses, to be presented in a third update and in a final evaluation report, we will be able to estimate the program's impact on clients over a still longer period of time, which will allow a better summative measurement of the overall impact of the NFMC program. We will also be able to assess additional sustainability issues, including the effect of counseling in avoiding redefault by people curing their delinquencies and foreclosures without loan modifications.

INTRODUCTION

The National Foreclosure Mitigation Counseling (NFMC) program is a special federal appropriation, administered by NeighborWorks® (NW) America, that is designed to support a rapid expansion of foreclosure intervention counseling in response to the nationwide foreclosure crisis. The NFMC program seeks to help homeowners facing foreclosure by providing them with much needed foreclosure prevention and loss mitigation counseling. NW America distributes funds to competitively selected Grantee organizations, which in turn provide the counseling services, either directly or through Subgrantee organizations.

As this is a federal appropriation, NW America must inform Congress and other entities of the NFMC program's progress. The Urban Institute (UI) was selected by NW America to undertake a two-year evaluation of Rounds 1 and 2 of the NFMC program. This report updates the results of preliminary analyses that were reported to NW America in November (Mayer, et al. 2009) that measured the effects of Round 1 of the NFMC program on counseled homeowners.[1] The November report was the first in this evaluation to use multivariate analysis techniques to answer the question: What would have happened to NFMC clients had they not used the services offered by the program's Grantees?

If the NFMC program did not exist, presumably some NFMC clients would have not taken any action to avoid foreclosure. Others might have (1) attempted to self-cure their delinquency, (2) contacted their mortgage servicer to negotiate a loan modification on their own, or (3) used the services of other counseling agencies not funded by the NFMC program. Some persons would have been successful in avoiding foreclosure, while others would not.

Furthermore, even with NFMC-provided counseling, it is not reasonable to expect that all foreclosures could be avoided. For instance, some homeowners are in homes that they simply cannot afford. While counselors may be able to help some of these clients negotiate better outcomes than foreclosure, some foreclosures are likely inevitable in such cases.

Therefore, the supposition of this evaluation is that *the NFMC program has a positive effect if it results in better outcomes for clients than would have been achieved without the availability of services provided by NFMC Grantees.* The NFMC program's major objective is to

[1] Rounds 1 and 2 represent two distinct funding periods for NFMC, but there were only minor programmatic differences between the two rounds. While not all of the Grantees and Subgrantees were funded in both rounds, the program remained essentially the same in both years.

help homeowners avoid foreclosure. To evaluate the effectiveness of the program, we conducted and have now updated analyses to determine the following:

- Did the NFMC program help homeowners cure an existing foreclosure?
- Did the NFMC program help homeowners receive loan modifications that resulted in lower monthly payments than they would have otherwise received without counseling?

Furthermore, in this report, we present our first analysis of the sustainability of loan cures that borrowers obtain, addressing two questions:

- For homeowners who cured a serious delinquency or foreclosure through a loan modification, did NFMC counseling help them to remain current on their modified loans longer and more frequently than they would have without counseling?
- For borrowers with seriously troubled loans, did NFMC counseling increase their chances of first obtaining a curing modification and then sustaining that cure and avoiding redefault?

To answer these questions, we used a series of multivariate models to determine the impact of counseling in each of the cases listed above. The models were estimated on a representative sample of the approximately 800,000 homeowners who received NFMC counseling during the first 24 months of the program (January 2008 through December 2009) and a comparison sample of non-NFMC counseled homeowners. Our data included detailed characteristics of the mortgage loans and borrowers, which were used to control for differences between the two samples, as well as information on the performance of mortgage loans (foreclosure and delinquency status) through December 2009. The size of the NFMC analysis sample was approximately 180,000 loans; the comparison sample of non-NFMC loans was 155,000.

This second preliminary evaluation of program effects indicates that the initial answer to each of these questions is “Yes,” although the magnitude of the effects varies depending on the particular outcome. As detailed further in this report:

- The NFMC program was effective at helping homeowners cure an existing foreclosure. Many NFMC clients entered counseling already in foreclosure (25 percent), or entered foreclosure after starting counseling (17 percent). During the first two years of the program, the relative odds of counseled homeowners curing their foreclosure were 1.7 times greater than if they had not received NFMC counseling. The resulting difference in the cure rate means that an estimated 32,000 more NFMC clients cured their foreclosure by the end of December 2009 than would have occurred without receiving services from NFMC counselors.

- Loan modifications received by NFMC Grantee clients resulted in significantly lower mortgage payments than would have been received without the help of the program. Lower monthly payments may help reduce the likelihood of a subsequent recurrence of borrower mortgage problems. On average, we estimated that NFMC clients who received loan modifications in the first two program years reduced their monthly payments by $267 more than they would have without NFMC counseling.
- Homeowners who obtained a loan modification that allowed them to cure an existing serious delinquency or foreclosure were much more likely to remain current on their mortgage if their loan modification was obtained with help from NFMC counseling. For clients counseled in 2008, counseling produced a 45 percent increase in the relative odds that a post-counseling modification would be sustained through 2009.
- The sustainability of modifications received after starting counseling was greater than that of homeowners who got modifications without counseling not only because counseled homeowners received larger monthly payment reductions, but also because they benefitted from counseling in other ways, such as through assistance with financial management. Indeed the latter effect was substantially larger.
- Homeowners receiving loan modifications were much more likely to cure their defaults if they received counseling before the re-working of their loans. For clients counseled in 2008, the relative odds of bringing their loans to current were 53 percent higher if they received pre-modification counseling than if they did not. That means that counseling produced a combination of positive effects in moving people from serious delinquency or foreclosure to a sustained cure of their mortgages, increasing the odds of obtaining a cure in the first place and then raising the odds of sustaining the larger number of cures that resulted.

In the following sections of this report we discuss the results from the models that estimate the NFMC program's effects on the three program objectives listed above. This is followed by an explanation of the methodology used, including the data and how the control group was created; and a discussion of the methodological challenges inherent in a statistical study of this nature, how we compensated for these challenges and the possible implications for our results. The report concludes with a brief overview of the preliminary policy conclusions that might be drawn from our findings.

DATA USED IN THE ANALYSIS

Three main data sources were used in the outcomes modeling analysis that is described in this report. These sources include administrative data collected by NW America from NFMC program Grantees on counseled homeowners, as well as two national data sources on mortgage loans and borrowers in the U.S. In this section, we describe these three data sources and explain how they were used to create a sample of NFMC counseled homeowners and a comparison sample of non-counseled homeowners for our multivariate analysis. We also describe the three outcome variables (foreclosure cure, monthly payment reduction from loan modification, and serious delinquency/foreclosure cure sustainability) and the other control variables used in our models, including an explanation of how they were constructed using the available data.

NFMC Program Production Data

NFMC program Grantees are required to provide client-level data (referred to as *production data*), along with quarterly reports on aggregate activity toward overall goals established under the grant award. The production data are submitted by Grantees on an ongoing basis through an electronic submission system. Production data consist of a record for each “counseling unit” provided by the Grantee or Subgrantee to an individual homeowner.

The NFMC program recognizes three distinct levels of counseling services. In Level 1 counseling, the NFMC Grantee or Subgrantee conducts a client intake process and develops a budget and a written action plan for the client. After Level 1 counseling is completed, it is up to the client to follow through with any activities on the action plan. In Level 2 counseling, the Grantee or Subgrantee verifies the client's budget and takes additional steps to obtain solutions outlined by the action plan. Level 3 counseling is when Level 1 and Level 2 counseling are completed in succession by the same Grantee or Subgrantee. Since an individual homeowner may receive both Level 1 and Level 2 counseling, these sessions are counted and referred to as separate “units” of counseling.[2]

[2] In addition, for Round 2 a new counseling level, Level 4, was added for homeowner counseling services provided to fulfill requirements of the federal Home Affordable Modification Program (HAMP). While we hope to devote more attention to HAMP and its impact on the efficacy of counseling in future analysis, Level 4 counseling units are not included in the analysis presented in this report.

The production data provide the list of homeowners who have received NFMC program counseling in some form and, therefore, constitute the *treatment group* for our analysis of program impacts. The data consist of information on the counseled homeowner, including identifying data (name, address), demographic characteristics, and household income; information on the client's mortgage loan, including the current servicer, loan terms, and current default status; and information on the type and amount of foreclosure mitigation counseling received. For this report, we used production data on approximately 960,000 clients counseled during Rounds 1 and 2 of the NFMC program in 2008 and 2009 and reported to NW America as of January 22, 2010.

Grantees also can report outcomes for each counseling unit, although individual outcome reporting is not required for all counseling units in the production data. As a result, 13 percent of Level 1 counseling units in the first round of the program and 14 percent of Level 1 counseled households in the second round did not have a further reported outcome. Even for records with Grantee-reported outcomes, the outcome might be "currently in negotiation with servicer; outcome unknown" (35 percent of Round 2 counseled households) or "initiated forbearance agreement" (10 percent), which still leaves open the question as to whether the forbearance agreement was sufficient to avoid foreclosure.

Given these limitations on Grantee-reported outcomes, to model the impacts of the NFMC program on key outcomes of interest we needed to match the homeowners from the production data with external data on mortgage performance. In addition, to model the "what if" case of households who did not receive counseling, we needed an additional sample of loans for non-NFMC program participants, including their outcomes regarding foreclosure. We used data from LPS Applied Analytics, Inc. and from the Home Mortgage Disclosure Act, therefore, to supplement the production data.

LPS Applied Analytics Loan Performance Data

LPS Applied Analytics, Inc., (LPS) is a commercial company that compiles home mortgage performance data from large loan-servicing organizations. These data were originally compiled by McDash Analytics, Inc., but that company was acquired by LPS in 2008. As of June 2010, the LPS estimates that its database covered nearly 70 percent of the active residential mortgages in the United States. LPS compiles loan-level data from mortgage servicers, including nine of the ten largest servicers in the U.S., and tracks several aspects of loan performance for active mortgage loans. NW America has negotiated an agreement to purchase LPS's loan level database, which has approximately 36 million mortgage loan records, for use in this study.

The LPS data include numerous characteristics of each mortgage loan, including the borrower's FICO score at loan origination, the original loan amount, the current interest rate of the loan, the loan type (fixed rate, adjustable rate, option ARM), and the ZIP code of the mortgaged property. The data also track various loan performance indicators, including when a

borrower defaulted on a loan and whether the loan has gone into foreclosure. The LPS loan performance data are updated monthly, which permits tracking of delinquency and foreclosure status on a month-to-month basis.

Home Mortgage Disclosure Act Data

The Home Mortgage Disclosure Act (HMDA), enacted in 1975, requires most lending institutions to report detailed data on mortgage application outcomes and approved loans to the Federal Financial Institutions Examination Council. HMDA data are routinely used to determine if housing credit needs are being met in particular neighborhoods and to identify discriminatory lending patterns. HMDA data are released publicly on an annual basis and the public data include the fields such as the race, sex, and income of the borrower; the loan amount and type; and the census tract of the mortgaged property. For this analysis, we had access to national loan-level HMDA data from 2002 through 2008.

We used the HMDA data to link additional borrower characteristics with the LPS data. Furthermore, since census tract is reported on the HMDA data, by combining LPS and HMDA records we were able to link additional census tract information for the non-counseled loans. (The counseled loans already had geocoded tract identifiers.) These census tract characteristics allowed us to control for neighborhood effects in our models.[3]

NFMC Analysis Sample

Data for this analysis were drawn from approximately 960,000 NFMC “counseling unit” records reported to NW America, as of January 22, 2010, for clients who received counseling services between January 2008 and December 2009. A counseling unit refers to a client who received one or more counseling sessions at a given level of service from the same Grantee. It is possible, however, for a person to receive counseling at different levels from the same Grantee or to receive counseling from different Grantees. These would be reported in the NFMC program production data as separate counseling units. We were able to filter out multiple instances of counseling provided to the same homeowner, however, through our match with the LPS database.[4]

The NFMC counseling unit records were matched to the LPS database by the loan servicer name and the servicer’s loan identification number. While these two pieces of information are included in the data reported by NFMC Grantees, they are not included in the data provided by LPS for the NFMC evaluation. LPS does, however, maintain this information in

[3] To test whether requiring our comparison group of non-counseled loans be matched to HMDA records resulted in a biased sample, we also did analysis with a comparison group based on a sample of non-counseled loans that were not matched to HMDA. This is discussed further in the Potential Modeling Issues section.

[4] About 17 percent of the matched LPS loans corresponded to two different NFMC-reported counseling units; 1.0 percent to three or four counseling units.

its internal database. Therefore, LPS was able to merge the records for us, matching the loan servicer and loan identification number reported by the NFMC Grantees to the corresponding fields in their database and provide the internal loan identification number for those loans. This information was used to append the LPS loan information to the NFMC counseling records.

Not every NFMC loan could be successfully matched to a loan in the LPS database. First, the LPS database covers about 70 percent of U.S. mortgages, so some NFMC-counseled loans may simply not be in the database. In addition, some loans in the LPS database do not contain real servicer loan identification numbers, but rather an internal number generated by the servicer solely for LPS reporting purposes. These loans could not, therefore, be matched.[5] In addition, errors in reporting or recording data in either the LPS or NFMC databases would result in match failures. While all of these issues likely affected the ability to match loans between the NFMC and LPS databases, it is not possible to determine how much each factor contributed to lowering the overall match success rate.

The matching process resulted in 180,000 unique LPS loans matched to NFMC records, a match rate of about 22 percent.[6] Although not randomly selected, a comparison of the NFMC-LPS matched loans with the NFMC population revealed that, based on key observable characteristics such as borrower age, borrower income, type of mortgage, amount of monthly payment, loan delinquency status, and level of counseling provided, the matched loans constitute a representative sample of all the NFMC clients counseled in the first twelve months of the program. A comparison of the characteristics of the NFMC sample and population can be found in appendix L.

Non-NFMC Analysis Sample

As noted in the introduction, the performance of the NFMC program should be assessed relative to what would have happened had counseling services provided by NFMC not been available. To make this comparison, we selected a group of non-counseled homeowners against which performance of loans for NFMC-counseled homeowners can be compared. The method we used to draw the comparison sample attempted to match selected characteristics of loans in the NFMC sample. In addition, we used multivariate analysis to control for any differences between the two sets of loans that might affect the outcomes of interest.

---

[5] The lack of real loan identification numbers for particular servicers was a possible source of selection bias in our sampling methods. This turned out not to be the case, however, as is discussed in the Potential Modeling Issues section.

[6] In a very small number of cases (557) the same NFMC counseling unit matched against multiple LPS loan records. These counseling units were deleted from the analysis. In a larger share (38,067 counseling units), the same LPS loan was matched to multiple counseling unit records. In these cases, the counseling unit with the highest level of counseling service provided was retained. In cases where two or more units had the same highest level of counseling, the record with the latest counseling intake date was kept.

The "gold standard" for evaluation analysis is an experimental design with random assignment of treatment. In an experimental study design, homeowners seeking foreclosure assistance would be randomly assigned to two groups – one that would receive counseling services and one that would not. The two groups would then be followed and any differences in outcomes between the two could reasonably be attributed to the effect of the counseling.

The virtue of the experimental design is that, if done properly, the two groups should be indistinguishable from each other in both observable and unobservable characteristics, except for the fact that one group received counseling. The NFMC program was not set up as an experimental design, however, so differences between the counseled homeowners and the comparison group of non-counseled homeowners must be controlled for using statistical methods. In this analysis, therefore, we used two different multivariate modeling techniques (logistic regression and ordinary least squares regression), which allowed us to control for differences in characteristics between the counseled and non-counseled loans.

For the purposes of modeling program effects, we selected a group of mortgage loans that did not receive NFMC counseling to serve as a "comparison sample" in our model estimations. One possible method for selecting the comparison sample would have been to choose randomly a portion of loans among those LPS database records that were not matched to NFMC loans. We chose not to use this approach because NFMC clients have characteristics that are very different from the overall population of residential mortgages. For one, NFMC clients are much more likely to be delinquent on their loans than homeowners in general. Close to 70 percent of NFMC clients were delinquent on their mortgage when they enter into foreclosure prevention counseling, compared to an overall delinquency rate of 9.55 percent for all mortgages as of June 2010 (LPS 2010). As a consequence, a randomly chosen sample of all U.S. mortgages that did not receive NFMC counseling would almost certainly yield a group of loans that was quite different from the NFMC-counseled population in a number of important respects.

While many of these variations between the NFMC loans and a random sample of non-NFMC loans would be controlled for in the subsequent modeling, the large differences in the distributions of the control variables would reduce the efficiency of the model estimates, as well as possibly increase the impact of selection bias. We discuss the issue of selection bias in the Potential Modeling Issues section later in this report (p. 21). The issue of efficiency of the model estimates can be described as follows: Suppose that almost all of the NFMC loans were adjustable rate mortgages and almost all of the non-NFMC loans were fixed rate. It would be very difficult (if not impossible) to separate statistically the effect of the NFMC program on foreclosures from the effect of the mortgage type on foreclosures since there would be very few loans of the same type that were in different treatment groups. The problem, therefore, is not that we would get the *wrong* answer regarding NFMC impacts, but rather that we would get *no answer at all*. By having NFMC and non-NFMC samples that are relatively similar on observable

borrower and loan characteristics, our models will be more likely to separate program effects from other statistical "noise."

Therefore, instead of a random sample, we chose a comparison sample by implementing a "propensity scoring model" to match the characteristics of the NFMC and non-NFMC samples as closely as possible on several important dimensions. A propensity scoring model is a technique for drawing matched data samples based on a set of common characteristics.[7] For each loan in the NFMC sample, the propensity scoring model found the closest match among the non-NFMC loans in the database. The propensity scoring model matched NFMC and non-NFMC samples using the following characteristics as of loan origination and counseling intake month:

- Year of loan origination.
- Whether the loan was fixed or adjustable rate at origination.
- Whether the loan was grade B/C (subprime) at origination.
- Current interest rate in the month of counseling intake.
- Months delinquent in the month of counseling intake.
- Whether the loan was in foreclosure in the month of counseling intake.
- Whether the loan was in the portfolio of Fannie Mae or Freddie Mac; was held in a private portfolio; was a private securitized loan; or was owned by another entity in the month of counseling intake.
- State where the mortgaged property was located.

In our previously reported modeling analysis (Mayer et al. 2009), we selected the non-NFMC comparison sample based on loan characteristics at one point in time—January 2008, the point when the first NFMC program clients received counseling. Doing this resulted in loans that matched well at the start of the year, but that had a different loan performance profile over the subsequent twelve months. For example, while the share of NFMC and non-NFMC sample loans that were current on their mortgage payments as of January 2008 were virtually identical (63 percent each), by June only 51 percent of the NFMC loans that had not yet entered counseling were current, compared to 69 percent of the non-NFMC loans. By December, the share of NFMC loans that were current had dropped to 29 percent, while the non-NFMC loans had held steady at 65 percent. Even though we controlled for loan status at the month of intake in our models, to eliminate any potential source of selection bias we have now changed our sample selection method to match loan characteristics, including delinquency and foreclosure

[7] We used a version of the propensity scoring match algorithm implemented as a SAS macro by Parsons (no date) to select our comparison sample.

status, as of the counseling intake month. By matching NFMC loans using a pool of outstanding loans at the time of intake, we increased the likelihood that the non-NFMC loans did not pay-off (either through a refinance or a sale of the home) at a different rate than the NFMC loans.

As noted earlier, HMDA data were also used in the analysis to add consistent race, ethnicity, and census tract characteristics to the non-NFMC loan records since those characteristics are not part of the data LPS collects from loan servicers. Since these variables were seen as potentially key predictors of the foreclosure outcomes that we were studying, we felt that it was important to include them in our models. Since our HMDA data only included loans originated between 2002 and 2008, we were limited to matching HMDA characteristics to NFMC counseled loans of this vintage. Fortunately, the vast majority of NFMC-counseled mortgages (85 percent) were originated between 2002 and 2008, so this restriction did not appreciably affect our sample selection.

The methodology for matching the loan records to the HMDA data is described in appendix A. Because there were no unique identifiers that could be used to match data directly between the two sources, we matched on several loan characteristics, including ZIP code, origination year, and original loan amount. Because our analysis required an exact match, we excluded any loans where the matching was ambiguous; that is, where there was more than one HMDA loan that met the match criteria for a given LPS loan. Despite these stringent matching requirements, a much higher match rate was achieved than with the NFMC-LPS match. Out of the original 35 million LPS loans active as of January 2008 or originated during 2008, 1.1 million were successfully matched to HMDA records and were therefore available for use in the multivariate analysis as the NFMC analysis sample.

We carried out two separate propensity scoring matching rounds, one for loans counseled in 2008 and a second for loans counseled in 2009. For each round, matching was done monthly based on the intake date of counseling—loans for NFMC clients were matched against LPS loans outstanding in that particular month. Within a given year, matching was done without replacement of previously selected loans, that is, a loan could only be selected once to be included in the non-NFMC sample. When starting the second matching round for 2009, however, we allowed loans to have been previously selected for the 2008 comparison sample to be potential matches for the 2009 sample. Limiting our pool of loans to only those that had not been selected in 2008 would have severely limited the available supply of loans and increased the likelihood of our ending up with poor quality matches, that is, loans that did not have the same characteristics as the NFMC loans. To avoid this problem, we allowed matching with replacement of previously-matched loans between 2008 and 2009.

The propensity scoring model was run against the 180,000 NFMC analysis sample and approximately 1.1 million LPS loans originated between 2002 and 2008 that were not previously matched to NFMC records but that were matched to HMDA. These LPS loans that were not matched to NFMC loans were presumed *not* to have received NFMC counseling. Nonetheless,

we must acknowledge that some of these homeowners may have received foreclosure counseling from some other program. It is also possible that some may have received counseling from the NFMC program itself but could not be matched to the LPS database because they were not in the LPS universe of loans, because they were in the portfolio of a servicer that did not report loan identification numbers to LPS, or because of data errors in the matching variables.

The propensity scoring process actually resulted in two NFMC analysis samples. The matched NFMC sample includes only those 155,000 loans that were successfully paired with a non-NFMC loan through the propensity scoring process. The non-matched NFMC sample includes the full set of 180,000 NFMC loans, combining the 155,00 matched sample loans plus the remaining loans that were not matched to a non-NFMC loans. To test the robustness of our results, we ran our analyses using both sets of NFMC loans and found no important differences in the results based on which NFMC sample we used.

To validate the success of the propensity scoring matching process, we compared the characteristics of the NFMC and non-NFMC sample loans. As shown in tables 1 and 2, the two NFMC analysis samples and the non-NFMC sample selected by the propensity scoring model matched very well on the characteristics used in the propensity scoring. The largest discrepancies were in the shares of loans that are current on counseling intake (11 percentage point difference between NFMC matched sample and the non-NFMC sample), whether the loan was held by Fannie Mae or Freddie Mac (7 percentage point difference), the share of loans four months or more delinquent (7 percentage points), and the share of adjustable rate loans (5 percentage points).

We emphasize, however, that the success of our modeling does not depend on the NFMC and non-NFMC samples matching exactly. To the extent that we are controlling for characteristics that affect our foreclosure outcomes, differences between the two samples should not bias our modeling results. There are, nonetheless, some possible sources of bias in our data that we address in the Potential Modeling Issues section of this report.

Table 1: Comparison of NFMC and Non-NFMC Analysis Samples by Loan Characteristics as of Counseling Intake Month

	NFMC Sample (Matched Only)	NFMC Sample (Matched + Unmatched)	Non-NFMC Sample
Number of loans	154,865	180,287	154,927
Percent by loan origination year			
2002	3.2	4.1	2.9
2003	7.2	7.1	6.6
2004	9.2	10.2	8.7
2005	19.5	19.6	19.8
2006	30.5	30.1	32.7
2007	24.5	23.6	24.1
Average interest rate (%)	6.8	6.9	6.9
Percent of adjustable rate loans	34.3	34.3	39.1
Percent by investor			
Fannie Mae/Freddie Mac	50.0	47.1	42.9
Private securitized	36.3	40.1	39.9
Private portfolio	12.9	12.1	16.3
Other	0.8	0.7	0.9
Percent by delinquency status at intake			
Current	36.7	40.4	47.7
1 month	12.6	11.2	12.8
2 months	11.1	9.8	8.9
3 months	8.1	7.2	6.2
4+ months	31.5	31.4	24.5
Percent in foreclosure	13.8	13.8	16.7

Source: Authors' calculations from NFMC program data and LPS loan performance data for Jan. 2008.

Table 2: Comparison of NFMC and Non-NFMC Analysis Samples by State

	NFMC Sample (Matched Only)	NFMC Sample (Matched + Unmatched)	Non-NFMC Sample (Matched)
Number of loans	154,927	180,287	154,927
Percent by state			
Alabama	0.6	0.5	1.0
Alaska	0.1	0.1	0.2
Arizona	3.1	3.6	2.7
Arkansas	0.3	0.3	0.6
California	19.5	21.8	15.0
Colorado	2.6	2.4	2.6
Connecticut	1.1	1.2	1.2
Delaware	0.4	0.4	0.5
District of Columbia	0.3	0.3	0.3
Florida	7.2	7.1	6.8
Georgia	4.1	3.8	4.3
Hawaii	0.2	0.1	0.3
Idaho	0.3	0.3	0.5
Illinois	5.5	5.5	4.7
Indiana	1.3	1.2	1.9
Iowa	0.9	0.9	1.3
Kansas	0.4	0.3	0.7
Kentucky	0.4	0.6	1.1
Louisiana	0.5	0.4	0.8
Maine	0.2	0.2	0.4
Maryland	3.8	4.0	3.3
Massachusetts	2.3	2.3	2.1
Michigan	4.4	1.3	3.9
Minnesota	1.6	1.4	1.9
Mississippi	0.5	0.4	0.8
Missouri	2.3	2.2	2.5
Montana	0.1	0.1	0.2
Nebraska	0.2	0.2	0.4
Nevada	2.4	2.5	2.3
New Hampshire	0.3	0.2	0.4
New Jersey	2.2	2.1	2.4
New Mexico	0.4	0.3	0.6
New York	3.1	2.9	3.1
North Carolina	3.3	3.1	3.2
North Dakota	0.0	0.0	0.2
Ohio	4.9	4.9	4.1
Oklahoma	0.5	0.4	0.9
Oregon	1.0	0.9	1.2
Pennsylvania	3.9	4.1	3.1
Rhode Island	0.8	0.8	0.9
South Carolina	1.7	1.6	1.8
South Dakota	0.2	0.2	0.3
Tennessee	1.5	1.4	1.9
Texas	3.8	3.5	4.0
Utah	0.3	0.3	0.6
Vermont	0.1	0.0	0.1
Virginia	2.3	2.0	2.8
Washington	1.5	1.4	1.7
West Virginia	0.2	0.2	0.4
Wisconsin	1.3	1.2	1.6
Wyoming	0.0	0.0	0.1

Outcome Variables

Our updated preliminary analysis of the effects of the NFMC program focused on three key outcomes of interest:

- Did the NFMC program help homeowners cure an existing foreclosure?
- Did the NFMC program help homeowners receive loan modifications that resulted in lower monthly payments than they would have otherwise received without counseling?
- Were modified loans for NFMC clients more likely to remain current and not re-default?

To measure these effects, we used the data sources described above to construct outcome variables corresponding to each of the above questions for both the NFMC and non-NFMC loan samples. In determining whether individual outcomes were a result of the NFMC program, we proceeded as follows: For loans in the non-NFMC comparison sample, all of the outcomes were assumed to be "non-counseling" effects, that is, if a non-NFMC loan experienced a foreclosure cure, a loan modification, or a redefault, then these outcomes were not attributed to the NFMC program. For NFMC sample loans, however, the outcomes were assumed to be counseling or non-counseling effects depending on when the outcome took place relative to the start of counseling. For example, if an NFMC client received a loan modification *before* beginning to receive counseling services, then this outcome was deemed to be a non-counseling effect. If, however, the loan modification was received *after* the start of counseling, then the result was attributed to the NFMC program.

The above classification was used in models estimated on the combined NFMC and non-NFMC samples as well as models estimated only with NFMC loans. In this way, we could estimate NFMC program performance both with and without relying on the non-NFMC comparison sample, which provided an important validation that our results were not biased by any possible issues stemming from the way in which the comparison loans were selected.

Foreclosure cure

A key outcome of interest is whether, once a foreclosure process has started, NFMC counseling was effective in helping homeowners avoid losing their home to a foreclosure sale. We refer to this outcome, where the servicer removes the borrower from the foreclosure process, as a "foreclosure cure." In ideal circumstances, the homeowner would be able to remain in the home by becoming current on their loan, possibly through a loan modification or refinancing. We also counted as a foreclosure cure, however, cases where the homeowner gave up the home through a property sale because this outcome would be considered more advantageous to the client than a foreclosure sale, which would have a severely negative

impact on the borrower's credit score. Furthermore, the LPS data do not permit one to distinguish between home sales and mortgage refinancings.[8]

The population of loans eligible for a foreclosure cure in this analysis was all those that were in the foreclosure process sometime between January 2008 and December 2009, including those whose foreclosure may have started prior to January 2008. For NFMC clients, this included both loans that entered foreclosure prior to the homeowner seeking counseling and those that entered foreclosure after starting counseling. In each month from the foreclosure start, we track the LPS data to see if the loan exited foreclosure *without* ending up in foreclosure sale or as a real estate owned (REO) property. As noted above, cases where the loan is paid in full through a refinancing or property sale are also counted as a foreclosure cure. To account for variation in the length of current foreclosure spells, we also measured the *number of months that the loan had been in foreclosure* and included this as an explanatory variable in our models of foreclosure cure.[9]

This definition of foreclosure cure is somewhat different than the definition used for cures of serious delinquency or foreclosure in the recidivism models, as is discussed below.

Reduction in monthly payment from loan modifications

Previous analyses of outcome data for the NFMC program have highlighted the importance of loan modifications in achieving successful outcomes for troubled homeowners. NFMC-counseled homeowners who received loan modifications were less likely to either have their loan go into foreclosure or to have a foreclosure completed after the start of counseling, compared to NFMC clients who did not receive a loan modification (Mayer, Temkin, and Tatian 2009). Other research on loan performance has also highlighted a positive relationship between better mortgage outcomes (such as foreclosure avoidance and reduced delinquency recidivism) and significant reductions in monthly loan payments (Office of the Comptroller of the Currency and Office of Thrift Supervision 2009, Quercia and Ding 2009). Therefore, to the extent that NFMC Grantees were able to help homeowners obtain more beneficial loan modifications from lenders, one would expect to see improved client outcomes, making payment reduction a potentially important intermediate outcome of the NFMC program.

---

[8] The LPS database codes deed-in-lieu transfers and short sales as "foreclosure completions," because they involve involuntary relinquishing of the property by the borrower. It is not possible to distinguish in the data between these two outcomes and actual foreclosure sales. Therefore, they are all treated as foreclosures in our models.

[9] It is possible that the length of the foreclosure spell is endogeneous with participation in the NFMC program, that is, persons who are in foreclosure longer may be more (or less) likely to seek counseling help. While we have no way of compensating for this in our models that use both counseled and non-counseled homeowners, we note that we obtained very similar results in foreclosure cure models estimated *only* on borrowers who received NFMC counseling. These models would not be affected by possible endogeneity with entry into NFMC since all of these loans eventually got counseling.

While the LPS data track several characteristics of the mortgage loan, including current monthly payment[10] and interest rate, there is no specific flag in the database to indicate a loan modification. Based on our analysis of the LPS data, we created a series of criteria to identify loan modifications based on changes in the monthly loan characteristics.

1. **Mortgage modified by lowering interest rate only**: For fixed rate mortgages, if the interest rate was *reduced* from one month to the next, by any amount, this was identified as a lower interest rate modification.

   If the loan was an adjustable rate mortgage (ARM), we determined whether the reduction in interest rate between one month and the next exceeded a pre-determined threshold and, if so, identified this as a lower interest rate modification:[11]

   - For ARMs with one-month reset periods where the next payment due date was one month after the previous payment due date (that is, where the borrower either remained current or stayed the same number of months delinquent as they were previously), the threshold was 100 basis points.
   - For ARMs using the COFI index (San Francisco Eleventh District Cost of Funds[12]), the threshold was 200 basis points.
   - For all other ARMs, the threshold was 300 basis points.
2. **Mortgage modified by increasing loan term only**: Remaining term of the loan increased from one month to the next.
3. **Mortgage modified by lowering loan principal only:** If the difference between the previous principal balance and the current principal balance was at least $5,000 greater than the maximum possible change in principal balance within the loan's terms, the loan was flagged as a lower loan principal modification. Only loans that were not paid in full and did not have a foreclosure completed in the month of the principal drop were flagged as a lowered-principal modification.

---

[10] Monthly payment includes amounts paid by the homeowner to the loan servicer for mortgage principle, interest, taxes, and insurance.

[11] The LPS data do not provide enough information to determine, with certainty, when an ARM should reset and how much the reset payment should be. Therefore, some observed ARM rate reductions may result from the index declining from its previous reset period and not from a loan modification. Because of this, to identify interest rate modifications we used a conservatively large threshold, represented by the maximum decline in an index between January 2008 (when the first NFMC client was reported into the system) and December 2009.

[12] The COFI is a common index used to adjust the interest rates of ARMS. It reflects the weighted-average interest rate paid by 11th Federal Home Loan Bank District (Arizona, California, and Nevada) savings institutions for savings and checking accounts, advances from the Federal Home Loan Bank, and other sources of funds.

4. **Mortgage modified with a combination of lower interest rate, longer term and/or lower principal**: Any combination of the three modifications above.

If none of the above changes were observed, those loans were not flagged as having been modified in that month. Because we were only interested in identifying modifications that would likely lower the probability of a foreclosure, we deliberately set thresholds for loan modifications that were likely to result in *lower monthly payments* for homeowners. Indeed, applying these criteria to the all NFMC-counseled loans showed that about 75 percent of the above-identified modifications resulted in a lower monthly mortgage payment, with 48 percent of modifications lowering the payment by 20 percent or more. For loan modifications received by non-NFMC clients, 57 percent had a payment reduction, and 27 percent of all of the modification to non-NFMC clients had a payment reduction of at least 20 percent.

Sustainability Outcomes

For this report, we used a series of models to measure the impacts of counseling on the ability of homeowners to cure a serious delinquency or foreclosure, and subsequently sustain those cures and remain current on their mortgages. The models estimated the independent impacts of counseling assistance through obtaining better loan modifications as well as other aspects of counseling, such as financial planning assistance or referrals to other needed services.

For these models, we focused exclusively on 2008 counseled and non-counseled loans experiencing a serious delinquency, defined as three or more months of missed payments, or in the foreclosure process sometime in 2008 or 2009. We examined three outcomes for these models:

Cure. Mortgages that were in serious delinquency or foreclosure but later were observed to become completely current (i.e., no late payments and not in foreclosure) were identified as "cures." Cures may have resulted from a loan modification (see below) or from some other means, such as a self-cure.

Curing loan modifications. We characterized a loan as receiving a curing loan modification (or "modification cure") if that loan was in serious delinquency or foreclosure at the time of receiving the modification and if the modification resulted in the loan becoming completely current (i.e., no late payments and not in foreclosure). Loan modifications were identified by observing changes in the mortgage characteristics in the monthly LPS data, as described in the previous section. The corresponding switch to current status had to have been recorded in the LPS data within one month (before or after) of the time of the loan modification to be identified as a modification cure.

Redefault. Loans that cured, either through a modification or some other means, were observed for possible subsequent redefault. Because it is not uncommon to observed missed payments of one or two months which then self cure, we restricted redefault for the

sustainability models to only cases where the homeowner missed three payments or more or was placed in foreclosure by the servicer.

It should be noted that the definition for a cure and modification cure for the sustainability analysis was different than that used for the foreclosure cure model. For the sustainability models, the mortgage had to return to *fully current* status to be registered as a cure, whereas for the foreclosure cure model the loan only had to be removed from the foreclosure process but might still be delinquent, even seriously delinquent.

Control Variables

Many factors, apart from counseling, potentially have an impact on whether a home ends up in foreclosure. The more we are able to measure and include such factors in our analysis, the better our models would be able to isolate and estimate the impact of counseling in particular. The existing literature on loan performance and the impacts of counseling helps identify many of the likely factors. Our own early reconnaissance and initial look at NFMC quarterly report material further filled in and refined the list (Mayer et al. 2008). The data available to us, of course, limits the variables we can actually employ.

In initial modeling attempts, we used a list of some 85 characteristics, including the state of residence, as control variables in our models. Based on initial model runs, many of these characteristics proved to have no statistically significant impact on foreclosure outcomes. This extensive list of controls also challenged the capacity of our computer hardware and software and, because combinations of them could be closely correlated with each other, made it difficult to obtain reliable estimates of the model parameters. For these reasons we filtered down our variable list to those that proved statistically significant in many, if not all, of the model alternatives. These variables are listed in table 3. (Summary descriptive statistics for these variables are provided in appendix B.)

Most of these explanatory variables are standard borrower and mortgage characteristics that are often included in models of loan performance. A few deserve some further explanation, however. The income variable that we used in the models came from two different sources, depending on whether the homeowner received NFMC counseling or not. For homeowners receiving NFMC counseling, income is reported by the NFMC Grantees based on intake information collected at the start of counseling. For non-NFMC homeowners, however, current income was not available. To obtain income for these homeowners we had to rely on our HMDA matching, which provided income reported at the time the mortgage was originated.

To test for possible problems with the fact that income was measured at two different times for the NFMC and non-NFMC samples, we estimated all of our models both with and without the income variable. The program impact results were virtually identical under both model specifications for all models, indicating that differences in the definition of the income variable where not biasing our results. Because income is such an important determinant of

many of the outcomes we are examining, we have chosen to present the versions of the models that included the income control variable in this report.

To control for surrounding community effects on foreclosures, we included two measures of *neighborhood quality*, both derived from HMDA data for 2006 and 2007: the home mortgage approval rate and the median value of new home purchase mortgages. Both of these variables were identified as key measures of neighborhood quality by Galster, Hayes, and Johnson (2005).

We also included a control variable for *mortgages with a loan-to-value (LTV) ratio at origination not equal to 80 percent*. This variable is included because the LTV may not reflect all mortgages originated to a property's owner. In particular, owners may finance a purchase with both a first lien mortgage and a second lien or piggyback loan. Unfortunately, it is not possible in the LPS database to match first lien mortgages with corresponding second liens, so secondary financing cannot be observed directly. As noted in Foote, et al. (2009), however, a large number of loans in the LPS database have LTV at origination equal to 80 percent, which strongly suggests that these loans were accompanied by a second mortgage. To control for the impact of second liens on loan performance outcomes, the "LTV not equal to 80 percent" dummy variable estimates any decrease in risk for homes purchased without piggyback loans.

Table 3: Explanatory Variables Used in Models

Variable Label	Description
Status at intake	Number of months delinquent (1, 2, 3, 4 or more). For NFMC loans, the status is as of the month when client entered counseling; for non-NFMC loans, the status is as of the month when the loan's matched NFMC pair entered counseling.
Black borrower	Equals 1 if client is African-American.*
Hispanic borrower	Equals 1 if client is Hispanic/Latino.*
Asian/PI borrower	Equals 1 if client is Asian or Pacific Islander.*
Other race borrower	Equals 1 if client is other race.*
Income	Homeowner income ($ thousands). For NFMC loans, reported at time of counseling intake; for non-NFMC loans, reported at time of mortgage origination. (See text for discussion.)
FICO/Credit Score – Original	Client's FICO score at origination.
Current Interest Rate	Current interest rate of client's loan (%).
Grade B/C mortgage	Equals 1 if loan is subprime (grade B or C as reported by mortgage servicer in LPS data).
ARM loan	Equals 1 if loan is an ARM.
Option ARM loan	Equals 1 if loan is an Option ARM.
Other interest type loan	Equals 1 if loan has an interest type other than ARM, Option ARM, or fixed.
Agency loan	Equals 1 if loan is a Fannie Mae or Freddie Mac loan.
Jumbo loan	Equals 1 if client's loan was a jumbo loan at origination.
Portfolio	Equals 1 is loan is held in portfolio by the originator.
Government	Equals 1 is loan is government insured.
Home mortgage approval rate (%), 2006-07	Percentage of loan applications that were approved between 2006 and 2007 in census tract in which client's home is located.
Mortgage Originations Median Amount Home Purchase - In Thousands	Median purchase loan amount for mortgages originated in a client home's census tract between 2006 and 2007.
Monthly unemployment rate	Unemployment rate (%) reported by the Bureau of Labor Statistics for the MSA or state in which the mortgaged property is located.
Change in unemployment. rate since Jan. 2008	Percentage change in the current month's unemployment rate from the January 2008 rate.
Quarterly housing price index	The Federal Housing Finance Agency (FHFA) quarterly house price index for the MSA or state in which the mortgaged property is located.
Change in HPI since Q1-2008	Percentage change in the current quarter's FHFA house price index from the first quarter 2008 index value.

Variable Label	Description
Year Originated	Dummy variables for loans originated in 2003 to 2008. (2002 is the omitted reference year.)
Loan-to-value ratio	The loan-to-value ratio at origination, as a percentage.
Dummy for LTV not = 80%	Equals 1 if loan-to-value ratio at origination is not 80 percent.
Original loan amount	Amount of the original mortgage loan ($ thousands). (This variable is used in the loan modification model to control for the size of the loan relative to the reduction amount.)

Note: *Whites were the omitted race category in the models, that is, the values of the parameter estimates for blacks, Hispanics, etc. are relative to white clients.

MODELS OF PROGRAM EFFECTS

This section describes the multivariate models that we used to estimate the effects of the NFMC program on counseled homeowners, using the data sources presented in the previous section. We begin with a discussion of key issues that might affect the accuracy of our model estimates, including the problem of selection bias into the NFMC program, the inability to control for potential differences in behaviors of servicers, and other issues. We discuss how we attempted to address any potential modeling issues and conclude by presenting a description of the models that we estimated for each of the three program outcomes.

Potential Modeling Issues

Program Selection and Omitted Variable Bias

A key challenge presented in evaluating the effects of the NFMC program is a common problem in most multivariate analyses, that of *selection bias.* Put simply, people who are more likely to seek counseling from NFMC Grantees may also be more likely to be in some sort of financial distress, compared with the overall population of homeowners and, therefore, more likely to end up in foreclosure. The analysis sample of 180,000 loans originated to NFMC clients who received counseling in 2008 or 2009 indicated that 42 percent were in foreclosure at some point between January 2008 and December 2009 (table 4).[13] This was much higher than the U.S. average of 3.65 percent of all mortgages in foreclosure as of June 2010 (LPS 2009). Furthermore, many NFMC clients (25 percent) sought counseling after their loans had already entered foreclosure. In theory, we can control for factors that would explain whether a person is more likely to go into foreclosure and, therefore, would be more likely to enter counseling. In practice, however, we do not have the data that may be necessary to control for all of these external factors. For example, while LPS data contain several characteristics that help to predict loan performance over time (such as a borrower's credit score), they do not provide information that

[13] Note that the share of NFMC clients who experienced a foreclosure is higher than the share of NFMC clients whose last observed loan status is in foreclosure. The reason is that NFMC clients can enter into foreclosure, but then, through curing the loan by themselves or through a loan modification, can leave foreclosure. These foreclosure cures were analyzed as an outcome later in the report.

Table 4: NFMC Loans In Foreclosure Between January 2008 and December 2009

	Loans	% of Loans	% of Loans in Foreclosure
Total sample loans for NFMC clients served through Dec. 2009	180,287	100	n/a
Total loans in foreclosure at some point between Jan. 2008 and Dec. 2009	76,019	42	100
Foreclosure start prior to counseling	44,962	25	59
Foreclosure start after counseling	31,057	17	41
No foreclosure between Jan. 2008 and Dec. 2009	104,268	58	n/a

Source: Authors' calculations from NFMC program data for Jan. 2008 to Dec. 2009 and LPS loan performance data through Dec. 2009.

can be used to predict the likelihood of a borrower experiencing a trigger event (such as a job loss or unexpected medical expenses). According to information provided by Grantees, 58 percent of NFMC clients indicated that a reduction or loss of income was the primary reason for their default. Personal reasons, such as medical issues, a divorce or separation, a death of a family member or poor budgeting skills were cited by another 18 percent of NFMC clients as the primary reason for their loan default.

Such trigger events can create financial distress and lead to mortgage delinquencies that would push people to seek NFMC counseling. If we do not have any information that can be used to predict the likelihood of adverse trigger events occurring, then we cannot control for a potentially important difference between the NFMC sample and the non-NFMC comparison sample. Consider the following example. Assume that 20 percent of a town's residents work for a particular firm and that firm goes out of business such that every person working for that company loses his/her job and perhaps seeks counseling. In this hypothetical case, the observable characteristics from the loan performance database would be identical for the homeowners who lost their jobs and the other residents in the town. Given that many counseling clients are in financial distress, the foreclosure rate for these owners will be higher than the other residents. But, the data we have do not indicate whether or not a homeowner works for the company that closed, so an analysis of foreclosure rates between counseled residents and non-counseled residents will show higher rates of foreclosure among the counseled group of residents.

In summary, then, we cannot control for all of the relevant differences between the NFMC and non-NFMC samples because some information is unavailable to us. These unobservable differences (such as a job loss) might lead us to draw incorrect conclusions about

the effect of the NFMC program on foreclosure outcomes. Because we are, by necessity, omitting information from our models, this problem is also referred to as *omitted variable bias.*

Econometricians have long recognized the problems of selection and omitted variable bias and have developed techniques to produce unbiased estimates when such problems are present. For example, a common method is to use instrumental variables which predict whether a person seeks treatment but do not influence the outcome of interest. Unfortunately, this approach does not work for us here as we do not have a set of indicators that would allow us to predict whether someone seeks counseling, but which would have no effect on a loan's time to foreclosure. Furthermore, the econometric literature offers limited support for an instrumental variables approach in the context of duration models which we use to estimate the effect of the NFMC program on foreclosure avoidance.

Since standard correction methods are unavailable to us, we chose an alternative approach to address the problem: we estimated a parallel set of models using *only* the NFMC-counseled loans. In these models, we compared the performance of the NFMC loans *before* counseling to their performance *after* counseling has started. In this way, the selection bias problem was largely avoided since we were not comparing the performance of the NFMC loans to the non-NFMC loans.[14]

A second omitted variable bias issue relates to our method of adding the LPS-derived outcomes to the NFMC loans, which could possibly result in different servicers being represented in the NFMC and non-NFMC loan samples.

As described earlier, we matched the LPS and NFMC data by the servicer name and loan number. Since, however, some servicers do not provide actual loan numbers to LPS, loans from these servicers cannot be matched to the NFMC data. These servicers would still be represented in the entire population of loans in the LPS database and may, therefore, have been included in the comparison sample of non-NFMC loans. As a result, the non-NFMC comparison loans may include servicers who were not included in the NFMC sample.

Fortunately, an analysis performed at our request by LPS has greatly diminished this source of bias as a concern in our analysis. Using our original comparison group sample from our previous modeling analysis report, LPS found that less than 1 percent of loans in the non-NFMC sample were from servicers that were not in the NFMC sample. We will conduct a similar analysis for the Round 2 clients, but based on the previous results, the possibility for bias because of different distribution of services within the two groups is extremely remote.

[14] The NFMC-only modeling approach does not completely eliminate the problem of selection bias, as there may still be unobservable differences among NFMC clients that cause some to start counseling sooner than others. These differences might also lead to different foreclosure outcomes that would not properly be attributed to the effect of counseling itself. Nonetheless, we believe that the selection bias problem has largely to do with the decision to enter counseling or not, rather than the timing of the start of counseling.

Furthermore, to address this and other potential bias issues from our comparison sample selection, we ran a set of models estimated only with NFMC loans. Any bias issues are more likely to be a problem when comparing the performance of NFMC and non-NFMC loans because of the possibility of unobservable characteristic differences across the two respective samples. By only looking at the NFMC loans, therefore, we can lessen any potential effects of bias. Examining just the NFMC loans does not, of course, solve the problem that our analysis may omit some important servicers altogether. Nevertheless, in the NFMC-only models we would at least be comparing "apples to apples." If the NFMC-only models yield results consistent with the comparison models, then we can reasonably conclude that our findings based on differences between the NFMC and non-NFMC loans have not been significantly biased.

In fact, as will be presented in the discussion of our findings, we found consistent, positive results for the NFMC vs. non-NFMC models that analyzed foreclosure cures and loan modifications. (The models of the sustainability of loan modifications were run with non-NFMC and NFMC loans because of issues associated with NFMC clients who received loan modifications prior to counseling. These loan modifications had a high rate of redefault, which is the likely reason why such owners sought counseling.) Based on these results, it seems unlikely that the servicers included in our NFMC sample somehow reflect an unrepresentative sample of organizations that have either too liberal or too restrictive policies toward troubled homeowners, relative to the non-NFMC loans.

Another issue related to using NFMC loans that match to LPS records is that the servicers included in the NFMC matched loan sample may not include servicers of loans originated to NFMC clients who are not in the matched LPS sample. Therefore, to the extent that this is an issue, the findings may not be representative of all NFMC loans. Our use agreement with LPS restricts us from conducting any analyses, by servicer, that uses LPS's data. Therefore, we are prohibited from reporting analyses that compare the share of loans serviced by a particular company in the matched sample as compared to all NFMC clients. Such results would provide information about the servicers who report data to LPS. However, we can report that a large share of all NFMC clients' loans are serviced by the 10 largest servicers of single family mortgages, as are loans within the matched sample. Moreover, any discrepancy between the share of all NFMC clients' loans serviced by a given firm and the share of such loans in the matched sample serviced by the same firm raises a potential bias only if that firm, for some reason, is materially different in its servicing procedures regarding loan modification and/or forbearance requests.

To the extent that servicers have different attitudes towards such requests, our results are not biased to the extent that the distribution of attitudes among servicers included in the matched sample is similar to that for all NFMC clients. Given our review of the servicers included in the matched sample, compared to the NFMC population, we do not think that there

is any empirical foundation for concluding that the distribution of the types of servicers is different in the matched sample and NFMC client population.

Another possible source of selection bias is that NFMC Grantees may "cherry pick" clients to serve who are more likely to achieve better outcomes. Such behavior, if it existed, might make the performance of the NFMC program appear better than it would have been if clients were assigned randomly for treatment in the program. We find no reason to believe that such cherry picking takes place, however.

First, there is no financial incentive for counselors to serve only "easy" clients as NFMC program compensation is not based on obtaining particular results. Grantees are paid a flat rate for providing a pre-defined level of counseling service, regardless of the outcome achieved for a client. Second, the cherry-picking hypothesis presupposes that counselors can readily distinguish between easy and difficult clients at intake. In fact, a thorough assessment of the clients situation by the counselor is most likely needed before such a determination could even be attempted. Furthermore, the ease at which a homeowner's case can be resolved often depends a great deal on negotiations with the servicer, which cannot be assessed in advance.

Third, our surveys and interviews with NFMC Grantees informed us that counselors deal with all manner of clients who come through their doors and do not turn people away because they have difficult situations. Indeed, the foreclosure data cited above indicate that counseled homeowners tend to have far worse circumstances than typical homeowners.

Potential Bias Selecting Comparison Group from LPS Loans Matched to HMDA

Our requirement that all of the non-NFMC LPS loans used in the analysis be matched to HMDA records, so that we could include race, income, and census tract characteristics in our models, resulted in a large number of potential non-NFMC loans being eliminated from the sample. If the HMDA matching success could be deemed to be independent of factors that would affect our foreclosure outcomes, then this would not present a problem. It is possible, however, that certain types of loans or borrowers are more likely to match successfully to the LPS database than others, and that exclusion of the non-matching loans might bias our results.

While we could see no reason why HMDA matching success should be correlated with our foreclosure outcomes, we nonetheless tested for this potential problem by selecting an entirely new set of comparison loans, using the same propensity scoring methodology described above, but from a random sample of LPS loans that were *not* required to be matched to HMDA data. We then reran our NFMC vs. non-NFMC models using this new comparison sample. The results were consistent with those that we obtained when using the HMDA-matched comparison sample. This confirmed for us that the HMDA matching requirement did not introduce any bias into our sampling selection or analysis.

Given that HMDA provides a number of important characteristics that would be unavailable to us otherwise, namely race, ethnicity, and income, we chose to continue to use

the HMDA-matched loans as the basis for selecting our non-NFMC comparison samples. In principle, as another approach we could have used a probabilistic match in which we assigned race and income to individual loan records based on the distribution of such data in HMDA. This process, however, could have introduced errors at the loan level, which we believe would be more problematic than any potential bias introduced by restricting our propensity scoring selection process exclusively to non-NFMC LPS loans matched to HMDA.

Contamination of Non-NFMC Sample

One aspect of our modeling approach relies on our comparison sample of LPS loans that were not matched to an NFMC-reported counseling unit. We have designated this as the non-NFMC comparison sample and have assumed that this group did not receive NFMC counseling. There are two potential issues with this assumption. First, some loans in this group may have indeed received NFMC counseling but failed to have been matched to an LPS loan. The failure to match might have occurred either because that loan is not in the LPS database or because information (i.e., servicer name, loan identification number) was not available to make a successful match. Second, loans in the non-NFMC comparison group may have received counseling assistance outside of the NFMC program, and so would not be recorded in the production data reported by Grantees. This non-NFMC counseling might have been provided by groups not participating in the NFMC program at all or by NFMC Grantees or Subgrantees but supported by other funding sources.

In either case, we may have a slightly contaminated sample in that some members of our “non-counseled” comparison group may have indeed received some counseling. Even if this is the case, however, we do not believe that it undermines the positive impacts of the NFMC program that we have reported for two reasons.

First, to the extent that we find that housing counseling has positive impacts on foreclosure cures, better loan modifications, and sustainability of cures, these impacts will be *understated* if the comparison group also included some counseled loans that would have benefited from the same effects. Put another way, if some of the non-NFMC comparison sample is receiving counseling treatment then that group’s outcomes would look relatively *worse* if those homeowners could be identified and removed from the sample and, consequently, the (positive) difference between the performance of the NFMC and non-NFMC samples would be even greater.

Second, for all of our models we ran versions both with and without the non-NFMC comparison sample. For the latter, we used only the NFMC counseled loan sample but relied on outcomes, such as loan modifications, that occurred before and after counseling intake to measure the effect of counseling. (This same distinction between outcomes before or after counseling intake was made in models estimated with both NFMC and non-NFMC loans.) These “NFMC only” models yielded very consistent program effects from those estimated with

both the NFMC and non-NFMC samples, which tells us that the non-NFMC sample is not biasing our results in a significant way.

Modeling Approach

Our research approach was to analyze the NFMC program's effects on; (1) the ability of clients to cure a foreclosure; (2) the reduction in a client's monthly payment resulting from a loan modification and (3) the extent to which NFMC clients who received loan modifications were able to avoid re-entering serious delinquency or foreclosure. When analyzing these effects, we used different multivariate models, as was appropriate for each outcome being measured, to control for other factors that might also explain these outcomes, and thereby isolate the impact of the NFMC program.

For our analyses of foreclosure cures and loan modifications, we estimated two sets of models: one set comparing outcomes of NFMC-counseled loans to the comparison sample of non-NFMC loans, and another set estimating the effects using only the NFMC loans. As discussed above, comparing the NFMC to non-NFMC loans was essential to addressing the central question of this analysis: "What would have been the foreclosure cure and loan modification outcomes for NFMC clients had the services offered by NFMC Grantees not been available to them?" The benefit of further analyzing *only* the NFMC loans, however is that it largely eliminates any selection bias issues related to selection into the program and unobservable differences between the NFMC and non-NFMC loan samples. Both sets of models, therefore, were essential to obtain a fuller understanding of the effects of the NFMC program.

Our sustainability analyses required models that had both NFMC and non-NFMC loans because there was no way to contrast performance of loan modifications with and without counseling using only NFMC client loans.

Foreclosure Cure

We estimated models of foreclosure "cure" for NFMC client and non-NFMC comparison group loans. Our hypothesis is that unobservable characteristics (such as a job loss) make it more likely for NFMC clients to experience financial distress than non-NFMC homeowners. Because we cannot control for these unobservable events, however, it is more challenging to find positive program effects for an outcome like foreclosure avoidance because an unobservable (to us) future job loss may push a counseled homeowner into foreclosure, despite the best efforts of the housing counselor.

For foreclosure cure, however, we are looking only at loans that are *already* in foreclosure and we can therefore assume that the same factors that led to a foreclosure for a non-NFMC loan, whatever they may be, also created financial distress for the NFMC client. Consequently, the importance of unobservable events, like a job loss, is diminished as these

events are likely to have already taken place for both the NFMC and non-NFMC homeowners. Furthermore, in addition to the standard control variables listed in Table 3, in the foreclosure cure models we also control for the length of the current foreclosure spell and, therefore, are accounting for differences in outcomes between homeowners who may be experiencing longer periods of distress.[15]

Foreclosure cures can only be observed monthly in the LPS data, so the outcome must be considered to be measured in *discrete time*. In other words, we have a relatively small number of observations (at most 24) for each loan. In this situation, the appropriate modeling choice is a logistic regression model (LOGIT) that is used to measure the monthly probability of foreclosure cures (Allison 1982). This is the model that we have used to estimate the NFMC program's effect on foreclosure cures.

Monthly Payment Reductions

We compared the reductions in monthly payments between loan modifications to mortgages held by NFMC clients to those held by non-NFMC clients. While we did not know if the demand for loan modifications was the same across the two groups of loans, we assumed that non-NFMC owners who sought a loan modification were in the same level of financial distress as NFMC owners who sought a loan modification and that, therefore, differences in the payment reductions between these two groups of loans were a result of the NFMC program. Moreover, in addition to the control variables presented in Table 3, we included a control variable that measures whether a loan was current in the month prior to when LPS reports the change in the monthly payment resulting from the loan modification.[16]

For this outcome, the dependent variables were the amount of reduction in the monthly mortgage payment (payment increases were coded as a negative reduction), expressed as a dollar amount and as a percentage of the original monthly payment. Because we were dealing with a continuous variable as an outcome, we used a standard ordinary least squares regression to model these outcomes.

Sustainability of Loan Modifications

The potential for recidivism has been identified by servicers, lenders, and investors as a significant factor in their reluctance to provide loan modifications. The claim is that the costs and potential economic losses associated with providing a modification, which includes temporarily extending the period of loan non-payment and risking an eventual redefault and foreclosure loss, can be higher than those from foreclosure alone. In addition, servicers and investors note

[15] See footnote 9 for discussion of possible endogeneity issue with this variable.

[16] The addition of the loan status prior to modification is a change in our model specification from our November 2009 report.

that a good many homeowners cure their defaults on their own, without modifications, so that it may be economically logical to simply wait to see whether such cures occur after either no action or merely forbearance granted by servicers.

In response, however, housing counseling organizations and homeowner advocates note that many loan modifications, particularly those at the beginning of the foreclosure crisis, did not result in substantial reductions in monthly payments for homeowners. Consequently, homeowners were just as likely to find these modified loans as unaffordable as they were under their original terms. Groups with this perspective claim that modifications that reduce monthly payments to levels that are truly affordable, based on current household income, can be sustainable and economically beneficial for both the homeowner and the lender.

Counseling may affect recidivism by increasing the size of loan modification payment reductions, by helping borrowers meet payments through improved budgeting and similar financial advisory assistance, or both. In this part of our analysis, we looked at the experience of counseled and non-counseled borrows in sustaining the cures of their serious delinquencies (three months or more) and foreclosures, to begin to measure the extent of recidivism and, especially, the impact of counseling on its prevalence.

Since we must observe loans over sufficient time for them to be cured and subsequently to be sustained or to redefault, this analysis uses only Round 1 NFMC loans counseled between January and December 2008 and their comparison group of non-counseled loans. Loan performance is observed throughout both 2008 and 2009, however.

Our analyses used two measures of sustainability. First, we considered only those loans whose defaults or foreclosures were cured during the two year observation period. For this analysis, cured loans were those that become current, in many cases with the help of loan modifications and/or NFMC counseling. Our first measure of sustainability was simply the *percentage of cured loans that have not gone back into serious delinquency or foreclosure* in the period for which we were able to observe them.[17] For this outcome, we examined whether homeowners who received loan modifications in combination with counseling had a higher percentage of sustained cures, and a corresponding lower percentage of renewed defaults, than homeowners who had their loans modified without the benefit counseling or who did not obtain a modification at all. We undertook both descriptive tabulations and multivariate statistical analysis in assessing this impact of counseling.[18]

Our second sustainability measure took into account the fact that a default cure cannot be sustained unless the cure is obtained in the first place. This second measure looked at all

[17] In this sustainability analysis, for a loan to be "cured," we required that the foreclosure status be cleared and that the loan became current on all its monthly payments.

[18]The multivariate analyses are restricted to people curing with modifications, while the tabulations include all cures, including those occurring without modifications.

seriously delinquent and foreclosed loans, not just those that cured, and computed the expected likelihood that they were cured, to combine with the likelihood that the cure was then sustained through the observation period. We again compared this measure for loans that received modifications with and without the benefit of counseling and, in our tabulations but not yet in multivariate analysis, for loans that were not modified. This cure analysis was coupled with the assessment of differences in sustaining modifications discussed in the previous paragraph. This analysis, therefore, examined a possible two-stage effect of counseling on sustainability—increasing the likelihood of a cure given default and the likelihood of avoiding recidivism given a cure.

As with our foreclosure cure models, our sustainability cure models used LOGIT models to estimate the probabilities of a serious delinquency/foreclosure cure and a subsequent loan redefault while controlling for relevant loan and borrower characteristics and the use of NFMC counseling.

FINDINGS

As detailed below, our latest preliminary modeling results indicated that the NFMC program has thus far had favorable effects in helping homeowners facing foreclosure. Homeowners who received counseling services starting in 2008 and through the end of 2009 from NFMC Grantees were more likely to come out of foreclosure and received loan modifications with larger payment reductions. Furthermore, homeowners counseled in 2008 were more likely to remain current on their mortgages after receiving a loan modification, compared to homeowners who did not receive assistance from NFMC-funded counseling agencies.

NFMC Program's Effect on Foreclosure Cures

Receiving a foreclosure notice does not mean that a homeowner will lose his/her home. Homeowners may be able to cure a foreclosure by paying all or part of the outstanding amount owed, by negotiating a forbearance agreement or new loan terms with the lender, or by some combination of both payment and negotiation. Some homeowners may be able to cure their foreclosure through their own efforts, while others may need the services of a housing counselor to avoid a foreclosure sale.

For this outcome, we estimated whether homeowners in foreclosure were more likely to cure their foreclosure if they made use of counseling services provided by NFMC Grantees. Based on our analysis of the NFMC and LPS data, 42 percent of counseled homeowners in our loan sample were in foreclosure sometime between 2008 and 2009. We observed each of these loans to determine whether a foreclosure cure occurred after the start of the current foreclosure episode, but before January 2010. In some cases, homeowners who eventually sought NFMC counseling cured their foreclosure prior to the start of counseling, and we did not count these pre-counseling cures as an effect of the program. We only included cures that occurred *after* the start of counseling as a program effect.

We estimated the NFMC program's effect on a client's likelihood of curing a foreclosure with two types of models. The first used both NFMC and non-NFMC loans and the second used only loans for NFMC clients. For the former, we estimated two versions of the model, one with a simple counseling effect and another to estimate the effects of different levels of counseling service provided.

The estimates from all models showed statistically significant, positive effects of the NFMC program (table 5; full model results may be found in appendices C and D). During the

first two years of the program, the relative odds of counseled homeowners curing their foreclosure were *1.7 times greater* than if they had not received NFMC counseling.[19] The estimated impact was nearly identical when NFMC clients were compared to non-NFMC clients (the NFMC vs. non-NFMC model) and when we compared the NFMC clients pre- and post-counseling experiences (NFMC-only models).

Table 5: LOGIT Model Odds Ratio Estimates for Counseling Effects on Likelihood of Foreclosure Cure

	Odds Ratio Estimates for Foreclosure Cure		
	Point Estimate	**95 Percent Confidence Interval**	
NFMC vs. Non-NFMC Model: Simple Counseling Effect			
Effect of Counseling	1.696	1.641	1.752
NFMC-Only Model: Simple Counseling Effect			
Effect of Counseling	1.324	1.286	1.363
NFMC vs. Non-NFMC Model: Counseling Level Effects			
Counseling Level 1	1.635	1.576	1.695
Counseling Level 2	1.737	1.666	1.812
Counseling Level 3	1.781	1.710	1.854
Counseling Hours	0.998	0.995	1.001

Source: LOGIT model estimates from NFMC program data for Jan. 2008 to Dec. 2009 and LPS loan performance data through Dec. 2009.

Note: Models that used non-NFMC loans included all NFMC loans, without regard to whether they were matched in the propensity scoring process. Results using only matched loans were not materially different.

[19] The odds of an event are related to, but not the same as, the probability of that event occurring. For example, an event with a 50 percent probability would have odds of 1:1; an event with 25 percent probability would have odds of 1:3. LOGIT model parameter estimates are easily converted into odds ratios, which we report in Table 5, but as discussed we also calculate probabilities for typical loans in our sample based on the model parameters.

The odds ratio estimates from the LOGIT models indicate how the relative odds of foreclosure cure change by receiving counseling or from the level of counseling received. Since the odds ratios can be somewhat difficult to interpret, we also estimated the probability of a loan curing in a particular month with and without counseling for a typical loan in our sample based on the means and modes of the explanatory variables. Means were used for continuous variables (such as income); modes (or the most frequent values) were used for discrete or dummy variables (such as whether the loan was subprime).

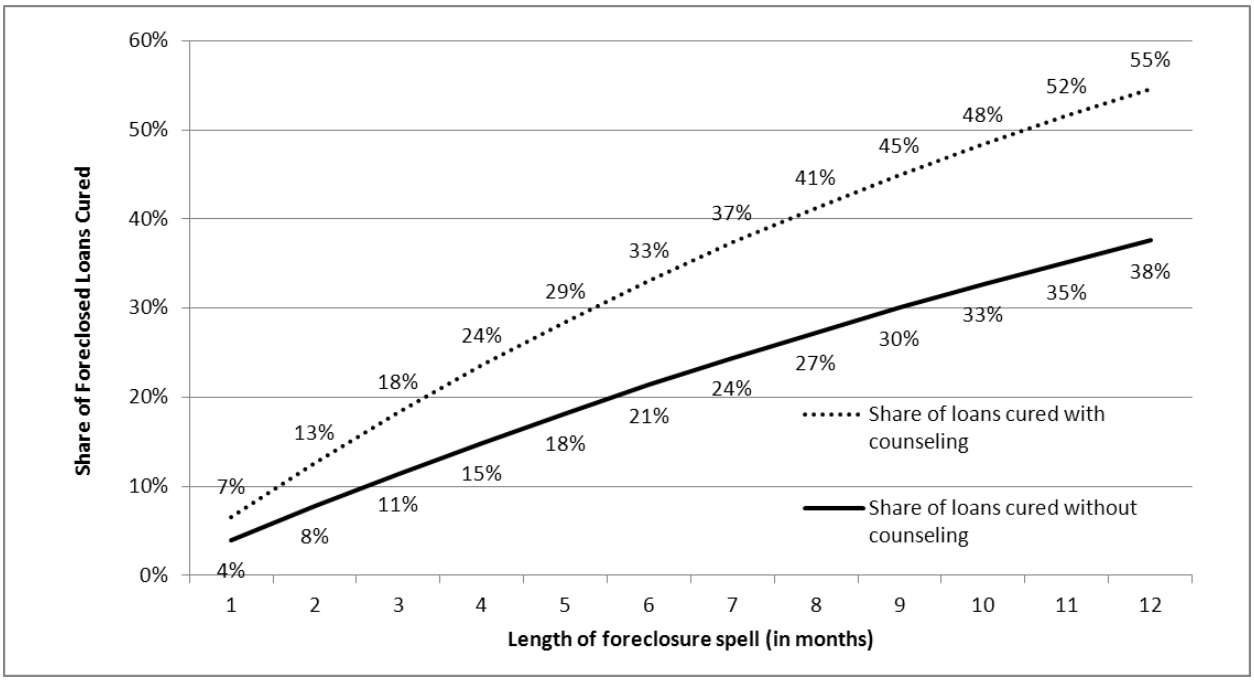
In a given month, a typical loan for which the homeowner was in foreclosure and receiving counseling had about a 6.6 percent probability of curing, compared to a probability of about 4.0 percent for an owner not receiving counseling. It is important to note that these probabilities only reflect the likelihood of curing within a single month;[20] to determine the cumulative effect of counseling for a given cohort of loans in foreclosure, we estimated the total share of loans that would cure, over time, assuming that all of the owners received counseling at the time their loan went into foreclosure, and compared the cumulative cure rate assuming that the same cohort of owners did not enter counseling at any point. These results are shown in Figure 1.

The difference in the monthly probability of a foreclosure cure for an NFMC loan, when compared to a non-NFMC loan, means that, by the end of the sixth month (the typical spell for loans in foreclosure) 33 percent of counseled owners whose loan was in foreclosure would cure their foreclosure, compared to 21 percent of non-NFMC owners. Over twelve months, the share of foreclosures cured would be 55 percent for typical NFMC-counseled loans and 38 percent for non-counseled loans. The key point is that the relatively modest difference in the odds or probability of an NFMC owner curing his/her foreclosure in a particular month, when compared to non-counseled owners, translates into larger cumulative differences over time.

Given an approximate 12 percentage point difference between the predicted share of loans that would cure a foreclosure with counseling and the share without counseling, for a typical foreclosure spell of six months, we estimate that NFMC counseling increased the number of clients whose foreclosed loan cured by about 32,000. This estimate assumes that, rather than the actual 46 percent of loans that were in foreclosure at some point either at or after intake that had a cure by the end of December 2009, 40 percent of such loans would have cured. The resulting difference in the cure rate means that an estimated 32,000 more NFMC clients cured their foreclosure by the end of December 2009 than would have occurred without receiving services from NFMC counselors.

[20] The probability of a foreclosure cure for either an NFMC or non-NFMC loan declined slightly as the length of the spell increased. The monthly probabilities in the figure reflect these changes.

Figure 1: Estimated Difference in Cumulative Foreclosure Cure Rates Between Counseled and Non-Counseled Homeowners



Source: LOGIT model estimates from NFMC program data for Jan. 2008 to Dec. 2009 and LPS loan performance data through Dec. 2009.

Note: Models that use non-NFMC loans include all NFMC loans, without regard to whether they were matched in the Propensity Scoring process. The results using only matched loans were not materially different.

As noted earlier, one potential issue with our analysis is that not all servicers are represented in our NFMC sample, whereas it is likely that non-NFMC loans are serviced by a representative sample of all servicers that report information to LPS. Nonetheless, the estimated program effect on the likelihood of foreclosure cures was the same whether we compared NFMC and non-NFMC loans or we examined only NFMC loans. Based on these results, it seems unlikely that the servicers included in our NFMC sample somehow reflect an unrepresentative sample of organizations that have either too liberal or too restrictive policies toward foreclosure cures, relative to the non-NFMC loan sample.

The positive program effect on foreclosure cures was about the same regardless of the level of treatment received by a client. Recipients of Level 1, Level 2 and Level 3 counseling services all had relative odds of curing a foreclosure in any given month that were 1.6 to 1.8 times greater than persons who received no counseling. The differences in the effect of Level 1 counseling, which involves only an initial session with the client but no follow-up, were smaller and statistically significant from the effect of Level 2 and 3 counseling, in which the counselor provides additional assistance in implementing the client's proposed solution. This may indicate that more intensive services result in better outcomes for NFMC clients. Furthermore, after

controlling for counseling level, the number of hours spent counseling the client did not significantly impact, positively or negatively, the likelihood of a foreclosure cure (i.e., the odds ratio for hours of counseling provided was not statistically different from 1.0). This may be because the counseling level, by itself, adequately captures the variation in counseling services being provided. In addition, spending a larger number of hours with clients may reflect the greater complexity of these cases, which in turn makes it more difficult to achieve a successful outcome.

NFMC Program's Effect on Loan Modifications

Based on information we collected from Grantees during our case study site visits, an important service provided by NFMC counselors is to call a client's loan servicer to discuss the possibility of modifying the mortgage to make it more affordable to the homeowner. Before contacting the servicer, NFMC counselors use the expense and income information provided by the client to determine what type of loan modification would result in a new monthly payment that would be affordable to the homeowner. Non-NFMC homeowners, of course, can contact loan servicers themselves and request loan modifications. For this analysis, we estimated whether loan modifications received for counseled clients were more beneficial to those homeowners than modifications negotiated outside of the NFMC program.

As described earlier, the LPS data allowed us to identify loan modifications, although not with absolute precision. Our method for identifying modifications was based on observed changes in loan terms that were most likely to have reduced the monthly payments for the homeowner. Using this methodology, we identified modified loans within both the NFMC and non-NFMC samples. We also observed the reduction in monthly mortgage payment (for principle, interest, taxes, and insurance) that was reported by the servicer after the modification, both as an absolute dollar amount and as a percentage change from the previous payment level.

About one quarter of loan modifications received by NFMC clients occurred prior to their meeting with an NFMC counselor. As was the case with the other outcomes we examined, we did not count these pre-counseling modifications as a program effect when we estimated the program impact: pre-intake modifications were included with non-NFMC loan modifications in the models that used non-NFMC loans. In the models that used only NFMC loans, pre-intake modifications were compared to post-intake modifications. Although both clients received counseling, pre-intake modifications happened without the assistance of an NFMC counselor, and so, in that regard are like non-NFMC loans, and therefore are a valid measure of what would have happened without counseling.

Key informants that we interviewed as part of this evaluation[21] said that the overall quality of all modifications being provided for all borrowers has improved because of the standards promulgated by HAMP. That is, HAMP has set a new benchmark for loan modifications in the industry and many borrowers are benefiting from this whether or not they receive an actual HAMP modification. There is some evidence that these observations are accurate: the median payment reduction for loan modifications that took place in 2008 for clients whose modification took place after intake was $225; the median payment reduction for such modifications in 2009 (HAMP started in April 2009) was $337. There are also larger median payment reductions for non-NFMC loan modifications in 2009 when compared to 2008: the median payment reduction for non-NFMC client loan modifications increased from 2008 to 2009 by $110.

To determine the effect of the NFMC program on a client's loan modification, we ran ordinary least squares (OLS) regression models that estimated the payment reduction while controlling for other factors that might affect the amount that the monthly payment was lowered. We used the same control variables as in our previous models, but also added the original loan amount to control for the size of the loan, since larger loans would tend to have larger monthly payments and therefore might be expected to receive larger payment reductions. As with the other outcomes, we estimated a model comparing NFMC with non-NFMC loans, as well as models measuring counseling effects for only the NFMC loans.

All models yielded consistent, statistically-significant results indicating that NFMC-counseled homeowners received much more favorable loan modification terms from their servicers than homeowners who received modifications without the benefit of NFMC counseling (tables 6 and 7; full model results may be found in appendices E and F). When using information about non-NFMC loans, 2008 and 2009 NFMC client loans that were modified had a resulting monthly payment that was *$267 less*, on average, than the non-NFMC-counseled loans that received a modification. This corresponds to an average payment that was 12 percent less than would have been the case without counseling.

Results from the models estimated with only NFMC loans found similar positive program effects, when compared to the model that uses non-NFMC loans. The overall counseling effect from the NFMC-only model showed that counseling through the NFMC program resulted in loan modifications that had monthly payments *$275 less*, on average than modifications that took place before an NFMC client entered counseling, or about 13 percent of the pre-modified monthly original payment.

---

[21] We report our findings regarding the impact of HAMP and other issues in Mayer, Neil and Kenneth Temkin. 2010. *Reconnaissance Findings and Suggested Case Study Topics. Report prepared for NeighborWorks® America.* June 1.

We also modeled the effects of different levels of counseling on payment reductions. The results from the NFMC vs. non-NFMC model showed that all three levels of counseling service provided benefits to counseled homeowners, with average additional payment reductions increasing from an average of $214 for Level 1 to $265 for Level 2 and $335 for Level 3 counseling, when compared to non-NFMC modifications. These findings suggest that more extensive counseling (Level 2 or Level 3) resulted in loan modifications with larger payment reductions when compared to clients who received Level 1 counseling. The results based on the percentage of the monthly payment also showed a larger effect for counseling Level 3, indicating that the result was not solely a function of the pre-modification monthly payment size for persons who received higher levels of counseling.

The number of individual counseling hours provided to the client had no statistically significant impact on the amount of payment reduction received from the loan modification. It is likely that this result reflects the additional time required to counsel more difficult cases which, for reasons beyond the control of the counselor, may in turn make it less likely for the homeowner to receive a better loan modification (Table 6).

Table 6: OLS Regression Model Estimates for Counseling Effects on Dollar Reduction in Monthly Payment Resulting from Loan Modifications

	Average Additional Reduction ($) in Monthly Payment		
	Parameter Estimate	**95 Percent Confidence Interval**	
NFMC vs. Non-NFMC Model: Simple Counseling Effect			
Effect of Counseling	267	251	283
NFMC-Only Model: Simple Counseling Effect			
Effect of Counseling	275	259	290
NFMC vs. Non-NFMC Model: Counseling Level Effects			
Counseling Level 1	214	193	236
Counseling Level 2	265	238	292
Counseling Level 3	335	311	359
Counseling Hours	-0.81	-3.20	1.59

Source: OLS model estimates from NFMC program data for Jan. 2008 to Dec. 2009 and LPS loan performance data through Dec. 2009.

Note: Models that used non-NFMC loans included all NFMC loans, without regard to whether they were matched in the propensity scoring process. The results using only matched loans were not materially different.

Table 7: OLS Regression Model Estimates for Counseling Effects on Percentage Reduction in Monthly Payment Resulting from Loan Modifications

	Average Additional Reduction (%) in Monthly Payment		
	Parameter Estimate	**95 Percent Confidence Interval**	
NFMC vs. Non-NFMC Model: Simple Counseling Effect			
Effect of Counseling	12.1	11.6	12.6
NFMC-Only Model: Simple Counseling Effect	12.7	12.2	13.2
Effect of Counseling			
NFMC vs. non-NFMC Model: Counseling Level Effects			
Counseling Level 1	10.6	9.9	11.2
Counseling Level 2	11.9	11.1	12.8
Counseling Level 3	14.3	13.6	15.1
Counseling Hours	-0.06	-0.13	0.02

Source: OLS model estimates from NFMC program data for Jan 2008. to Dec. 2009 and LPS loan performance data through Dec. 2009.

Note: Models that used non-NFMC loans included all NFMC loans, without regard to whether they were matched in the propensity scoring process. The results using only matched loans were not materially different.

As noted earlier, research on loan performance has highlighted a positive relationship between better mortgage outcomes (such as foreclosure avoidance and reduced delinquency recidivism) and significant reductions in monthly loan payments. Therefore, to the extent that NFMC Grantees were able to help homeowners obtain more beneficial loan modifications from servicers and lenders, one would expect to see improved client outcomes. In the following section we present our analyses of the impact of NFMC counseling on the sustainability of loan modifications.

NFMC Program's Effect on Sustainability of Loan Modifications

An important issue that has emerged in the debate regarding interventions to help homeowners avoid foreclosure and remain in their homes is whether such efforts are sustainable over the long term. With regard to the NFMC program, a key question of interest is whether homeowners who receive counseling help to obtain modifications of their mortgages are subsequently able to remain current on their monthly payments; or whether they eventually become delinquent again and end up back in foreclosure, a result often referred to as "recidivism."

We shaped our analysis of this sustainability issue based on a common sense understanding of what parties to the debate focus on in their discussions. We addressed two key questions.

1. Given a homeowner who receives a loan modification that cures a serious mortgage delinquency (i.e., three or more months of missed payments) or a foreclosure, how likely is it that this homeowner then stays out of trouble (i.e., does not redefault on their mortgage) and how does counseling affect the likelihood of a homeowner remaining current? This corresponds to an "Is it worth helping people get modifications, through counseling and other interventions?" discussion.
2. Going back one step further, what is the likelihood that a homeowner who is in serious delinquency or foreclosure first receives a curing loan modification and then is able to sustain it? This corresponds to the issue: "How good are the chances of going from troubled loan to sustainably current loan" and how does counseling affect that answer?

In the first question, we concentrate only on homeowners who have already obtained default-curing modifications and examine their experience in using counseling to help remain current on their modified loans. In the second question, we start with all borrowers in serious trouble, examining first their likelihood of curing defaults with modifications and then of avoiding new delinquency and foreclosure on their cured loans.

Our analysis, detailed below, provides positive answers about the impact of counseling for both questions. In the first, counseled homeowners who had cured their loans from a serious delinquency or foreclosure were more likely to remain current afterward than were either non-counseled homeowners or counseled homeowners who obtained their loan modifications prior to, and therefore without the benefit of, NFMC counseling. Specifically, we found that initially troubled homeowners who received counseling and then obtained loan modifications had *45 percent higher odds of avoiding a renewed default* than both borrowers with modifications but no counseling at all and borrowers who received counseling only *after* their modifications were in hand.

On the second question, we found that homeowners with a mortgage in serious delinquency or foreclosure were more likely to cure their default and keep their loan current if they received a loan modification with the help of counseling, in contrast to homeowners who received a modification but no counseling or who got counseling only after obtaining a modification. Our multivariate analysis showed that initially troubled homeowners had *53 percent higher odds of curing their loans with modifications* when they received pre-modification counseling than when they did not. Together with our finding of counseling's effect on sustaining of cured loans, that means counseled homeowners significantly raised the odds both of curing their defaults and then of sustaining the increased cures they obtained.

We used both descriptive tabulations and multivariate analysis to examine the sustainability of cures. The evidence on both questions was consistent between the two sets of methods. In the next part of this section, we present a descriptive overview of the sample of loans that were used in the sustainability analysis and our first recidivism measure. In the following two sections, we discuss the estimates obtained from the multivariate models of the program impacts corresponding to questions 1 and 2 above.

Descriptive Analysis of Sustainability of Cures

We built our sustainability analysis for both questions 1 and 2 on the experience of borrowers with initially troubled loans, either delinquent at least three months or in foreclosure (but not yet finally foreclosed). We focused on borrowers entering NFMC counseling during 2008 and their matched non-NFMC counterparts, but we followed their experience through 2009 so that there was opportunity to track their post-modification record of recidivism or sustainability over a significant period.

Table 8 presents an initial descriptive look at the sample of 2008 NFMC counseled loans (Round 1 of the program) and the corresponding matched sample of non-NFMC loans that experienced either a seriously delinquency or a foreclosure episode in 2008 or 2009. These loans are further broken out by whether they received a loan modification during this same period and, in the case of NFMC loans, whether that modification occurred before or after the start of NFMC counseling. (In this table, we are looking at *all* loan modifications, not necessarily those that resulted in a delinquency or foreclosure cure.)

From our sample of Round 1 loans, about 57,000 NFMC program clients and 34,000 non-NFMC homeowners experienced a serious delinquency or a foreclosure between January 2008 and December 2009. One-quarter of the NFMC loans in delinquency or foreclosure received a loan modification, a slightly higher share than for non-NFMC loans, of which 18 percent were modified. A very large share of counseled loans receiving a modification did so *after* the start of counseling (21 percent of all troubled NFMC loans), while a much smaller share were modified before going to see a counselor (4 percent).

Table 8: Loans that Experienced a Serious Delinquency or Foreclosure in 2008 or 2009 by Counseling and Loan Modification Status Round 1 NFMC and Non-NFMC Loans

		Loans	Percent
NFMC	**Total**	**57,065**	**100.0**
	Pre-counseling modification	2,155	3.8
	Post-counseling modification	11,911	20.9
	No modification	42,999	75.4
Non-NFMC	**Total**	**34,383**	**100.0**
	Modification	6,084	17.7
	No modification	28,299	82.3

Source: NFMC program data Jan. through Dec. 2008 and LPS loan performance data through Dec. 2009.
Note: Serious delinquency is three months or more.

Table 9 provides an initial descriptive look at our first sustainability measure (question 1), the recidivism patterns of borrowers who have cured a previous serious delinquency or foreclosure. These loans are a subset of the loans in Table 8, since we only consider loans that cured their serious delinquency or foreclosure by some means. The top half of table 9 shows absolute numbers of loans and the bottom half the percentages for each column. For example, the first column of percentages shows that, of all NFMC-counseled loans that returned to current after a serious delinquency or foreclosure, 50 percent remained current through 2009, 30 percent slipped to seriously delinquent status after the cure, and 20 percent fell all the way into foreclosure.

Table 9: Sustainability and Recidivism Patterns for Loans that Cured a Serious Delinquency or Foreclosure in 2008 or 2009 by Counseling and Loan Modification Status
Round 1 NFMC and Non-NFMC Loans

	Number of Loans						
	NFMC				Non-NFMC		
	Total	Pre–Counseling Mod.	Post-Counseling Mod.	No Mod.	Total	Mod.	No Mod.
Total loans that cure	19,546	603	8,731	10,212	9,134	3,048	6,086
No redefault	9,755	48	5,759	3,948	4,329	1,707	2,622
Redefault to seriously Delinquent	5,855	215	1,971	3,669	2,065	599	1,466
Redefault to foreclosure	3,936	340	1,001	2,595	2,740	742	1,998

	Percentage of Loans						
	NFMC				Non-NFMC		
	Total	Pre-Counseling Mod.	Post-Counseling Mod.	No Mod.	Total	Mod.	No Mod.
Total loans that cure	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No redefault	49.9	8.0	66.0	38.7	47.4	56.0	43.1
Redefault to seriously Delinquent	30.0	35.7	22.6	35.9	22.6	19.7	24.1
Redefault to foreclosure	20.1	56.4	11.5	25.4	30.0	24.3	32.8

Source: NFMC program data Jan. 2008 through Dec. 2008, and LPS loan performance data through Dec.2009.
Note: Serious delinquency is three months or more.

A key measure is the set of outcomes for homeowners who obtained NFMC counseling help first and subsequently obtained a loan modification ("Post-Counseling Mod." in the table). People who received this combination of counseling assistance and a loan modification fared by far the best in sustaining their cured loans. Sixty-six (66) percent of such homeowners sustained their cures and only 12 percent fell into foreclosure (table 9).[22] In contrast, homeowners who obtained modifications *before* entering NFMC counseling, perhaps on their own or possibly with some other type of assistance, sustained only 8 percent of their cures and ended up in foreclosure 56 percent of the time. This is consistent with our earlier findings that people who obtained loan modifications without the benefit of counseling were less likely to have payment reductions and to have smaller reductions when they did obtain them.

Even NFMC-counseled homeowners who cured without a loan modification fared much better than those who cured with pre-counseling modifications, sustaining 39 percent of their cures (table 9). It is possible that this group had stronger unobserved financial resources that enabled them to cure without modification. But they still fell well short of the sustainability level for those who got their modifications with the help of counselors.

In comparison, non-NFMC homeowners sustained 47 percent of their cures, somewhat more when those involved loan modifications and slightly less when they did not. Nonetheless, these non-counseled borrowers were *well over twice as likely* to have ended up in foreclosure as people who got a loan modification with the help of (pre-modification) counseling.

NFMC Program's Effect on Sustaining Delinquency and Foreclosure Cures

Based on the above descriptive analysis, homeowners who obtained NFMC counseling help, and then with that aid obtained modifications, were a good deal more likely to sustain cures of serious delinquencies or foreclosures than other groups of cured borrowers. With counselors helping them to get their loan modifications and to become current, a significant majority of these homeowners were able to keep their loans current thereafter. And, of those who were not able to keep fully current, only a third subsequently entered foreclosure by the end of 2009.

The descriptive analysis above does not control, however, for the large number of other characteristics—of loans, borrowers, and markets—that can affect foreclosure outcomes and recidivism in particular and make the tabulated impacts of counseling seem larger or smaller than they really are. As with impacts of counseling on foreclosure cures and modification amounts, we constructed multivariate models to test our results for the impact of counseling on delinquency and foreclosure recidivism, while controlling for other important factors.

[22] While we would interpret the impact of a loan modification received after the client begins counseling as an effect of the NFMC program, we have no way of knowing the extent to which counseling played a direct or indirect role in whether the homeowner obtained a modification or in the quality of the modification that was received.

We expected counseling to affect redefault of those already cured in two possible ways, which our modeling allowed us to distinguish. The first was through counseling's impact on the *size of the reduction in monthly payments resulting from loan modification*. Our surveys of counseling providers and housing industry observers, as well as our review of NFMC Grantees' quarterly program reports, indicated that counselors work with borrowers and servicers to try to obtain more significant reductions in payments. Our own results earlier in this report showed large effects of counseling on loan modification size, and recent research (Quercia and Ding 2009) also demonstrated a significant effect of the dollar size of loan payment reduction on borrower redefault.

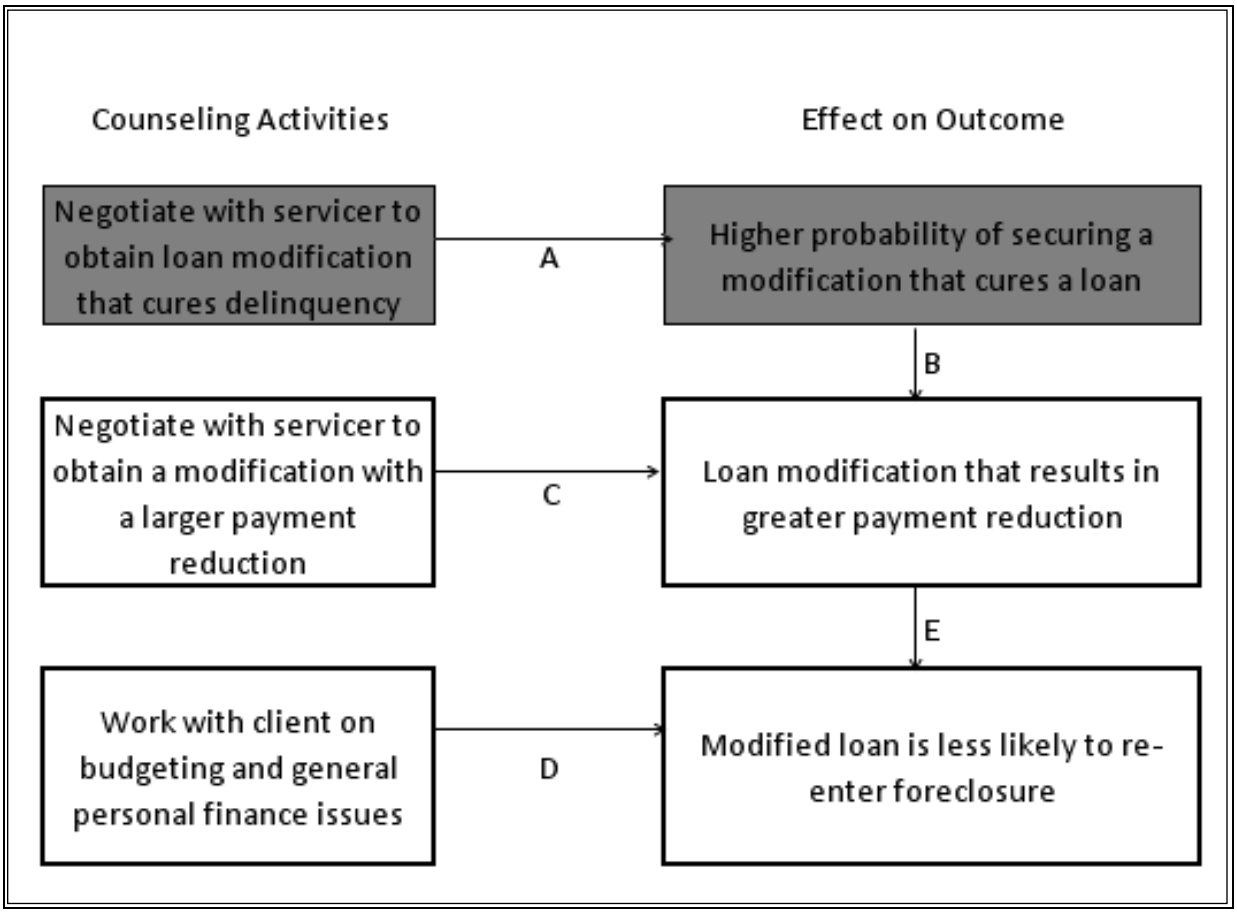
The second impact of counseling on sustaining cured loans, also highlighted by counselors in our earlier surveys and case studies, derives from *counselors' work with borrowers on financial planning and management*, in areas including budgeting for the short and longer term, non-mortgage credit management, cost-cutting, and revenue generation.[23] These contribute to borrowers' ability to meet newly modified mortgage payments on a continuing basis. While the data we have do not permit us to observe the specifics of these types of assistance provided by counselors, as we will show, the construction of our models allowed us to estimate the effect of this second important component of counseling assistance, independent of any effect of the size of the loan modification the homeowner received.

A graphical representation of the structure of counseling's potential impact on sustaining cured loans is presented in the lower four white boxes and arrows C, D, and E of figure 2. The bottom right box represents the desired sustainability result of counseling—reduced recidivism of modified loans. The middle row of boxes represents the possibility of counseling producing larger payment reductions in loan modifications, with resulting effects in reducing recidivism; and the bottom left box reflects the possibility of counseling having a direct effect on recidivism through financial management assistance. For this first measure of sustainability, only loans once troubled and then subsequently cured by modifications enter the middle row, then to be sustained or not.

Note that the entire figure 2 diagram encompasses sustainability question 2 as well, addressing counseling's impact first on cure rates and then on sustaining the cures. The shaded top row of boxes representing counseling's effect on modification/cure rates for troubled loans feed into the likelihood of recidivism given that a modification/cure has occurred as shown in the unshaded rows. We will revisit the entire diagram when we discuss our analysis of question 2, the likelihood of curing and sustaining together, beginning on page 59.

[23] In a small minority of cases, counseling agencies also had access to emergency and/or longer-term financial assistance, which could be another component of aid in sustainability outside of the size of the loan modification obtained.

Figure 2: Framework of Counseling's Effects on Loan Curing and Sustaining Outcomes



Returning to sustainability question 1, sustaining cures, we developed our models to examine these effects in two steps. As indicated in the conceptual framework (figure 2), counseling's impact on redefault is influenced by (C) its effect on the size of NFMC clients' *loan modification* and in turn those modifications' effects on the likelihood of redefaults, and (D) the effects of counseling on *financial management* that influence redefault without regard to the reduction in a client's loan payment.

Our key findings were that counseling had a statistically significant impact in reducing recidivism of modification-cured loan loans through *both* increasing payment reductions and providing financial management and other guidance. But the impact of aid with financial management and other matters (irrespective of loan modification size) was much larger than the payment reduction effect. The combined effect of the two factors raised the relative odds of avoiding redefault by a substantial 45 percent for borrowers who receive pre-modification counseling. To obtain these estimates for sustainability question 1, we used a series of

multivariate models, which are summarized in the first three equations in the box on page 52 and described in the next three subsections.

The Loan Modification Component of Counseling Impact on Redefault

To determine how counseling affects sustainability through lower monthly payments as a result of a loan modification, we used a two-stage modeling approach. First, we re-estimated the effect of counseling on reduction in loan payment, but this time just for those NFMC and non-NFMC borrowers *receiving modifications that brought them current* (as represented in equation 1 in the box on page 45). Besides a dummy variable representing counseling before a modification, the model also included the standard loan, borrower, and market characteristics used as controls in our other models. We then estimated a second model (equation 2) that predicted the probability of borrower redefault for a given level of monthly payment reduction. By combining the results of the two models, we were able to estimate the effect of counseling on the relative odds of redefault based on the additional reduction in the monthly payment amount that could be attributed to counseling assistance.

As in our descriptive tabulations, the data used in the sustainability models included Round 1 counseled and non-counseled homeowners, tracked through the end of 2009. Throughout the sustainability modeling analysis, however, we focused exclusively on *loan modifications that resulted in cures of serious delinquencies (three months or more of missed mortgage payments) or foreclosures*. That is, the loan modification must bring a previously defaulting mortgage to current status, with no delinquencies and no pending foreclosure.[24] This is different from our earlier multivariate analysis of loan modification impacts (discussed in the section "NFMC Program's Effect on Loan Modifications," above), which looked at all loan modifications, regardless of whether they brought the loan current. The loan modifications examined here represent a specific subset of all modifications.[25]

As we had done previously, we estimated two versions of the payment reduction model—one estimating the counseling impact on monthly payment reduction in absolute size (dollars) and one as a percentage of the pre-modification monthly payment. Consistent with our earlier models, the effects of counseling before receiving a loan modification, compared to counseling after modification or to receiving no counseling at all, were substantial and

[24] In operational terms, to be included in this analysis the loan modification had to occur within one month of the loan becoming current on all monthly payments.

[25] The loan payment reduction analysis earlier in this report, on the other hand, looks at Round 1 and Round 2 modifications and follows them through the end of 2009. That is the principal reason for the differences in results for these two models: $171 per month in the paragraph below, versus $241 per month in the case of all Round 1 and 2 borrowers combined in the cure analysis in Table 6. A secondary difference may be the inclusion of some non-curing modifications in the analysis earlier in the paper, whereas in the sustainability analysis in this section we deal only with curing modifications.

statistically significant. The difference in absolute size of the payment reduction for a counselor-assisted loan modification was nearly $171 per month (see Table 10; full model results are in appendix G). For a typical loan, the $171 difference translated into a $535 reduction in monthly payment for post-counseling modifications, compared to a $364 payment reduction for other borrowers—an increase of almost 50 percent.[26] Borrowers receiving Level 2 and 3 services obtained much more substantial payment reductions than those receiving only Level 1.

Table 10: OLS Regression Model Estimates for Counseling Effects on Reduction in Monthly Payment Resulting from Loan Modifications that Cured a Serious Delinquency or Foreclosure Round 1 Loans Tracked through December 2009

	Parameter Estimate	95 Percent Confidence Interval	
Dollar reduction ($)	171	137	205
Simple Counseling Effect			
Counseling Level Effects			
Level 1	88	48	128
Level 2	230	186	274
Level 3	270	228	312
Percentage reduction (%)	6.3	5.8	6.8

Source: OLS model estimates from NFMC program data Jan. 2008 through Dec. 2008, and LPS loan performance data through Dec. 2009.
Note: Serious delinquency is three months or more.

[26] The payment reduction for a "typical loan" was estimated using the mean and mode values for the independent variables in our regression model.

Description of Models Used to Estimate Counseling's Effects on Sustainability

Equation 1: Effect of counseling on monthly payment reduction

$$M = a*L + b*E$$

where *M* is size of a modification's payment reduction; *L* is the many borrower, loan, and market control characteristics; and *E* is a dummy variable taking the value 1 for borrowers who obtained a modification with the assistance of counseling, and 0 for borrowers with a modification without counseling assistance (either persons who did not receive counseling or who went to counseling after getting their modification).

Equation 2: Effect of size of monthly payment reduction on redefault

$$Probability(Y=1 \mid loan\ modified\ and\ cured) = f(M, L, T(t))$$

where the left hand side of the equation is the conditional probability that a loan, once-cured through a loan modification, falls again into default. It is determined by *M*, the size of the loan modification payment reduction; *L*, the set of loan, borrower, and neighborhood and regional characteristics for which we want to control; and *T*, the time since the loan was cured. We expected *M* to have a negative effect on the probability of recidivism (bigger mod, smaller likelihood of renewed trouble). Note that, as shown in Eq.1, *M* is itself determined in part by pre-modification counseling, if it takes place.

Equation 3: Independent effects of size of payment reduction and non-modification counseling assistance on redefault

$$Probability(Y=1 \mid loan\ modified\ and\ cured) = g(M, L, T(t), E)$$

with variables as in equations (1) and (2). The introduction of the parameter *E* to this model represents the effects of counseling assistance independent of the effects of monthly payment reduction from a loan modification.

Equation 4: Effect of counseling on curing a serious delinquency or foreclosure

$$Probability(C=1 \mid foreclosed\ or\ delinquent,\ modified) = h(L, S(t), E)$$

where the left-hand side of the equation is the conditional probability of a loan cure from being seriously delinquent or in foreclosure using a modification; *S(t)* is the time elapsed since entry into foreclosure or serious delinquency; and the other variables are as above.

In the next stage of the analysis, we estimated the probability of redefault for a given level of loan payment reduction using equation (2) in the box on page 52. This model as estimated in two different ways:

- *Using only the sample of non-NFMC loans.* This estimate effectively isolates the effect of counseling solely to its impact on modification size but misses any differences between the effect of payment reduction in non-NFMC and NFMC cases.
- *Using all NFMC and non-NFMC loans.*[27] This estimate captures possible differences in payment reduction's impact between NFMC and non-NFMC cases but may mix other unobservable effects of counseling on redefault with those of reduced loan payments.

We estimated the equations as LOGIT models of the monthly redefault rate (rate of previously modified-and-cured loans becoming seriously delinquent or entering foreclosure in each month), similar to those we employed earlier in estimating foreclosure cure rates. A key difference in this version of the cure model, however, was that the amount of monthly payment reduction received from a loan modification was included as one of the independent variables. This allowed us to measure directly the impact of the size of the payment reduction on the probability of redefault. One would expect to see a negative effect of payment reduction, with larger modifications producing lower likelihood of redefault. As a further control, we added the time since the loan modification occurred, as one would expect to see lower likelihood of redefault once a borrower has successfully made several payments.

The results of the redefault models are summarized in Table 11 (full model results included in appendix H). The impact of the size of the reduction in the monthly mortgage payment was statistically significant for both the non-NFMC and combined samples in absolute and percentage differences in modifications. A borrower receiving a modification that resulted in a $1,000 additional reduction in monthly loan payment would have had only about 0.83 times the relative odds of redefault in a given month as a borrower without that additional payment reduction. Put another way, each $1,000 reduction in the monthly loan payment would reduce the odds of redefault by 14 to 20 percent.[28] Similarly, a one percent reduction in payment yielded a 1.5 percent reduction in relative odds of redefault.[29] The estimated impact was not substantially different between the non-NFMC and the NFMC and non-NFMC models.

---

[27] With modifications.

[28] For the non-NFMC only model, the reduction is 1.00 - 0.86 = 0.14, or 14 percent. For the all-loans model, the reduction is 1.00 – 0.80 = 0.20, or 20 percent.

[29] From the percentage model, 1.00 – 0.985 = 0.015, or 1.5 percent.

Table 11: LOGIT Model Odds Ratio Estimates for Counseling Effects through Loan Modification on Likelihood of Redefault
Round 1 NFMC and Non-NFMC Loans

	Parameter Estimate	95 Percent Confidence Interval	
Non-NFMC Only Model			
Dollars (000s) in payment reductions	0.86	0.78	0.94
Percentage payment reductions	0.99	0.98	0.99
NFMC and Non-NFMC Model			
Dollars (000s) in payment reductions	0.80	0.75	0.85
Percentage payment reductions	0.98	0.98	0.99

Source: LOGIT model estimates from NFMC program data Jan. 2008 through Dec. 2008, and LPS loan performance data through Dec. 2009.

By combining the payment reduction (equation 1) and redefault model (equation 2) results together, we obtained an overall estimate of counseling's impact on recidivism that was a result of counseled homeowners obtaining better loan modifications. Between the two sets of models, we know that counseling prior to modification produced an average monthly payment reduction that was $171 larger, compared to counseling after modification or no counseling, and that a $1,000 larger reduction produced 14 to 20 percent reduced odds of redefault in a given month. Therefore, the $171 average additional monthly payment reduction produced by counseling would have reduced the relative odds of redefault by about 3 percent compared to the odds of redefault without that additional reduction in payment. (The reduction in the odds of redefault would be 1.5 to 2 percent more for Level 2 or 3 counseling.)[30]

Alternatively, using *percentage* rather than absolute impact on modification payment reduction, a post-counseling modification produced a 6.3 percent deeper payment reduction, compared to a pre-counseling modification or a modification with no counseling at all. There was a 1.5 percent odds-of-recidivism impact for each 1 percent reduction in payment. We computed that a payment reduction of 6.3 percent would reduce the relative odds of redefault

[30] (171/1000) times 17 percent (where 17 percent is the mid-point of the 14-20 percent range) is about 3 percent..

by about 9.5 percent.[31] Thus we estimate a reduction in the odds of redefault in the range of 3 to 10 percent from just the effect of counseling on the size of loan modifications' payment reductions.

The Non-Loan-Modification Component of Counseling Impact on Redefault

The above analysis assumes that counseling's only impact on recidivism occurs by way of NFMC's effect on the size of loan modifications. But there may well be a further effect of counseling, presumably from help to borrowers in managing their finances (with a given modification) or in addressing other issues that may be affecting their ability to make their mortgage payments. We can model that possibility by adding a dummy variable to our redefault LOGIT model (original equation 2), while keeping the payment reduction through loan modification variable in place. Variable *E* in equation 3 in the box on page 45 represents counseling begun before a loan modification and estimates the potential independent effect of non-loan-modification-related assistance.[32]

We can hypothesize in advance that the additional direct impact of pre-modification counseling on redefault will be negative: that is, the additional assistance counselors provide on financial management, budgeting, etc., would make it less likely that a homeowner will redefault. The key results of this second model are summarized in Table 12 (complete models are in appendix I). The impact of the size of the monthly payment reduction (*M*) remained significant and negative. In addition, the separate effect of counseling on recidivism (*E*) was large, negative, and statistically significant as well. Indeed, the effect of non-modification counseling impacts was far larger than the effect of counseling through its impact on loan modification size, indicating that these counseling effects made a greater impact on reducing the likelihood of redefault than did the simple reduction in monthly loan payment.

[31] 6.3 times 1.5 percent.

[32] For borrowers obtaining counseling prior to their loan modifications.

Table 12: LOGIT Model Odds Ratio Estimates for Counseling Effects through Loan Modification and Directly on Likelihood of Redefault
Round 1 NFMC and Non-NFMC Loans

	Odds Ratio	95 percent confidence interval	
Change in payment in dollars			
Effect of payment reduction (per $1,000)	0.82	0.77	0.87
Direct effect of pre-modification counseling outside of payment reductions	0.72	0.66	0.78
Change in payment as a percent of payment			
Effect of payment reduction (per 1 percent)	0.99	0.98	0.99
Direct effect of pre-modification counseling outside of payment reductions	0.76	0.7	0.83

Source: LOGIT model estimates from NFMC program data Jan. through Dec. 2008, and LPS loan performance data through Dec. 2009.

Combining the effect of counseling on payment reduction size from Table 10 with the results in Table 12 for effect of payment reductions, the impact of counseling through loan modifications alone again ranges from 3 percent reduction in the relative odds of redefault for the dollar reduction model to 10 percent reduction in the relative odds of redefault for the percentage reduction model (represented by arrows C and E and the boxes they connect in figure 2). [33]

But in this new model we have a major additional effect of counseling through its impacts outside of loan modification size. The model estimates indicated a reduction in the relative odds of redefault by 28 percent in the dollar amount model and by 24 percent in the percentage model (as shown in Table 12) from the financial management and other impacts of counseling outside of its effect on the size of the loan modification received (the bottom two boxes and arrow D of figure 2).[34] The result establishes a clear and direct impact of pre-modification

[33] This time the odds ratio for $1,000 payment reduction is 0.82, meaning $1,000 reduction has an 18% impact on odds and thus $171 dollar payment reduction from counseling has a (171/1000)*18 = 3 percent impact essentially as before. For the 1 percent payment reduction, we have 1.0-0.985 = .015, multiplied again by the 6.3 percent impact of counseling on payment reduction, or again about 10 percent impact on the relative odds.

[34]The percentage reduction in relative odds is one minus the odds ratio, or 1.0 - 0.72 = 0.28 or 28 percent for the dollars model and 1.0 -0.76 = 0.24 or 24 percent for the percentage model..

counseling on reducing the rate of recidivism that is independent of counselors' efforts to obtain better loan modifications for clients.

The combined impact of counseling from these two sources—impact on modification size and impact outside of modification size—is multiplicative.[35] That combined impact totals a *30 to 32 percent reduction in the relative odds of redefault as the result of pre-modification counseling*, for the dollar and percentage models.[36] Put more positively, the relative odds of sustaining a cure are increased by about 45 percent for borrowers who enter counseling before obtaining a modification, compared to those who do not.[37] The differences in impact of different levels of counseling, comparing Level 3 to the mean, are not sufficient to change these results (though there is a noticeable difference between Level 1 and Level 3). While the mix between these two impacts of counseling differs a bit between the dollar and percentage model versions, the total results are similar and very substantial.

Figure 3 illustrates the difference between the rate of curing loan modifications being sustained by borrowers receiving pre-modification counseling and the rate for modifications sustained but receiving no counseling, after controlling for the usual loan, borrower, and market characteristics in our models. It tracks the cumulative percentage of homeowners who will have sustained their loans by the same given time period after they receive their modifications.[38]

By eight months after homeowners received their curing modifications, 64 percent of those with counseling had avoided recidivism, compared to 51 percent avoiding recidivism among those who obtained curing modifications on their own. This is quite close to the levels of actual cumulative sustaining of mod-cures for counseled and non-counseled borrowers through December, 2009 (64 percent and 56 percent in Table 9).[39] The 13 percentage point difference in sustainability rates means that counseling lowers recidivism rates by over one quarter. The

---

[35] The specific structure of LOGIT models, in which log of the odds ratio of the dependent event variable is a linear function of the independent variables, assures that the odds ratio for impact of two separate independent variables is the product of the individual odds ratios.

[36] These are obtained by multiplying the odds ratio for non-mod impact by the odds ratio for mod impact—the latter already multiplied by the size of the mod reduction under counseling—and then subtracting from 1.0. For dollars model: 1 - 0.97*0.72 =0.30. For percentage model: 1- 0.90*0.76=0.32. Translating this into probabilities, for a typical loan, the probability of redefault in a given month falls from about 5.3 to 3.7 percent.

[37] A 31 percent reduction in relative odds of recidivism with counseling, to 69 percent of the odds without counseling, is algebraically equivalent to an increase in sustainability (the opposite of recidivism) by a factor of (1/0.69) = 1.45.

[38] See appendix K for a summary of the calculations that were used to produce figure 3.

[39] Table 9 figures may differ from Figure 3 because various homeowners have by December, 2009 experience different time periods since their loan modification, whereas Figure 3 measure the same time period for all loans, and because Figure 3 holds all the control variables at means and modes in order to better compare NFMC and NFMC rates of sustainability.

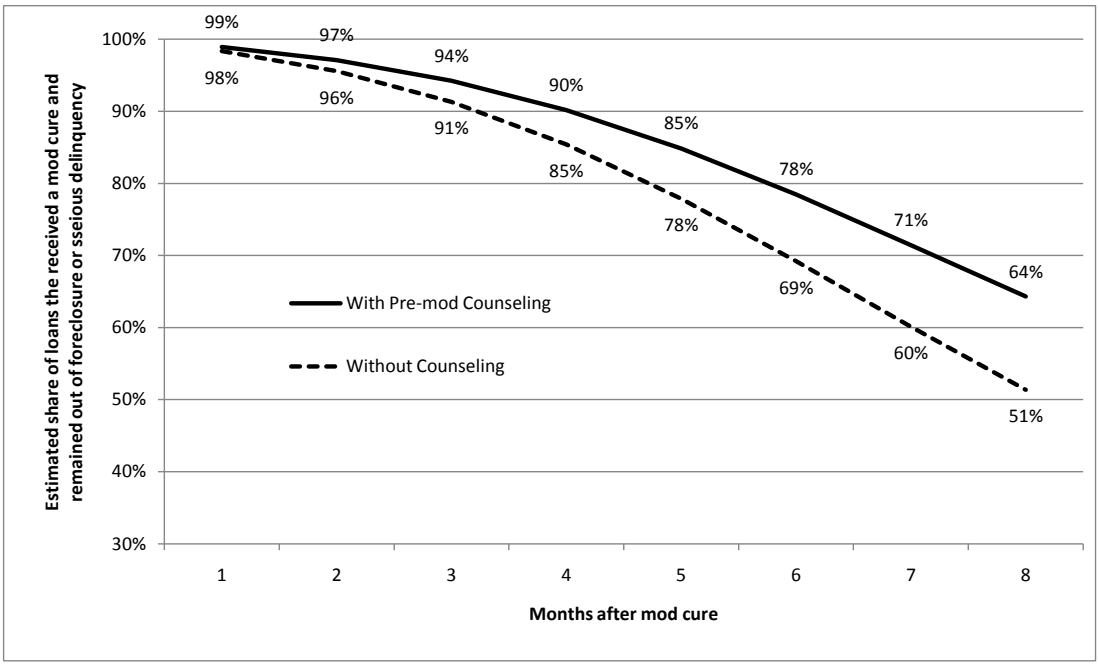
analysis shows significant value to counseling in avoiding redefault, even though we have limited ourselves here only to loans that received curing modifications, whether or not borrowers received counseling.

The overall size of this effect is significant. Among just the about 39,700 borrowers who initially suffered serious delinquency or foreclosure and obtained a loan modification that brought their loans current with the aid of counseling, their NFMC pre-modification counseling increased the number of these families able to avoid redefault by about 5,160 over the number of sustained modifications had they not been counseled. Sustained cures are one important element of foreclosure prevention program success, and NFMC make a substantial difference in their number.

It is important to note that these redefaults avoided are only for borrowers who were seriously delinquent or foreclosed upon and cured their mortgage default with a loan modification aided by counseling. . If counseling helps homeowners obtain more modifications that do cure their defaults or more modifications in general, and modifications and cures contribute to sustainability, the sustainability value of NFMC could be wider. In addition, many other borrowers cured without a modification, indeed more than cured with a modification. Further, some borrowers obtained modifications but did not cure their loans, and others simply stayed delinquent. The sustainability of those conditions may be also affected by counseling. We will try to estimate these potential effects in our next modeling steps as well.

It is also crucial to note that while there is significant improvement in sustainability arising from counseling, the recidivism rate is high both without counseling--49 percent at 8 months after modification-- and even with counseling--36 percent recidivism rate at 8 months. This is an important challenge for homeowners, servicers, counselors, lender/investors, and policy-makers. We would hope to see improvement in sustainability once HAMP was underway (in general the modifications we examined here preceded HAMP's implementation) and more modifications were made that actually reduced mortgage payments. Our next round of modeling should capture and include many HAMP modifications and later servicer proprietary modifications, as entrants to counseling during 2009 are included in our new recidivism analysis.

Figure 3: Sustained Loan Modification Cures With and Without Counseling



Source: LOGIT model estimates from NFMC program data for Jan 2008. to Dec. 2009 and LPS loan performance data through Dec. 2009.

The clear conclusion of our analysis is that obtaining NFMC counseling prior to receiving a loan modification matters in the sustainability of delinquency and foreclosure cures. As explained above, we can see that this is a result of counseling's separate effects on loan modification size—a smaller effect-- and on some mix of aid to borrowers in budgeting, other financial management, and in a few cases financial assistance-- a larger effect—and their combination.

The Effect of Post-Loan-Modification Counseling on Redefault

We considered a final component of this analysis of sustainability question 1: the effect on redefault of counseling that begins only *after* the homeowner has obtained a curing mortgage modification. It is possible that counseling begun after a modification could still reduce recidivism as a result of its usefulness from a financial management side, aiding in budgeting,

dealing with non-mortgage debt, etc. Adding another dummy variable to the LOGIT analysis, this time for entry to counseling after modification,[40] allowed us to examine that possibility.

The direction of an apparent effect of counseling after a loan modification was more difficult to predict. There certainly could be help provided by counseling to borrowers dealing with their already-modified loans. On the other hand, borrowers choosing to obtain counseling even after receiving a modification that brings them current might well be relatively rare and concentrated among people who suffer a second misfortune (job loss, health problem) and a resulting default. Indeed our tabulations indicated that only about 10 percent of the once-cured potential recidivists who entered counseling did so after modifications. The bulk of post-modification entrants to counseling were already seriously delinquent, or about to become so. when they sought counseling Because we did not have separate data for possible adverse events (such as loss of job or serious health issue) that could also affect the likelihood of redefault, these non-counseling effects may be picked up by our dummy variable for post-modification counseling, obscuring the counseling effect on recidivism and even producing an apparent but deceiving positive impact.

When we estimated the model that is indeed what appears to occur, because the direction of this dummy's impact on recidivism shows up as positive. That is, counseling after receiving a loan modification was correlated with an increased likelihood of mortgage redefault. We were thus unable to isolate a positive impact on sustainability of counseling begun only after loan modification. A further effort to deal with this effect, controlling for status of loans at their time of intake to counseling in interaction with post-modification counseling, still did not produce evidence of a favorable recidivism effect of assistance at that later stage.

It may well be that borrowers coming to counseling only after their modifications are often too deeply in default, and have exhausted too many options, to be rescued by counseling activity. This reinforces our previous finding that getting counseling earlier on, before obtaining a loan modification, is where the counseling impact on sustainability lies. It also indicates that analysis that attempts to find counseling's impact solely in the form of effects of post-modification entrance to counseling on recidivism could well miss the strong effects that pre-modification counseling does have.

Descriptive Analysis of Obtaining and Sustaining Cures

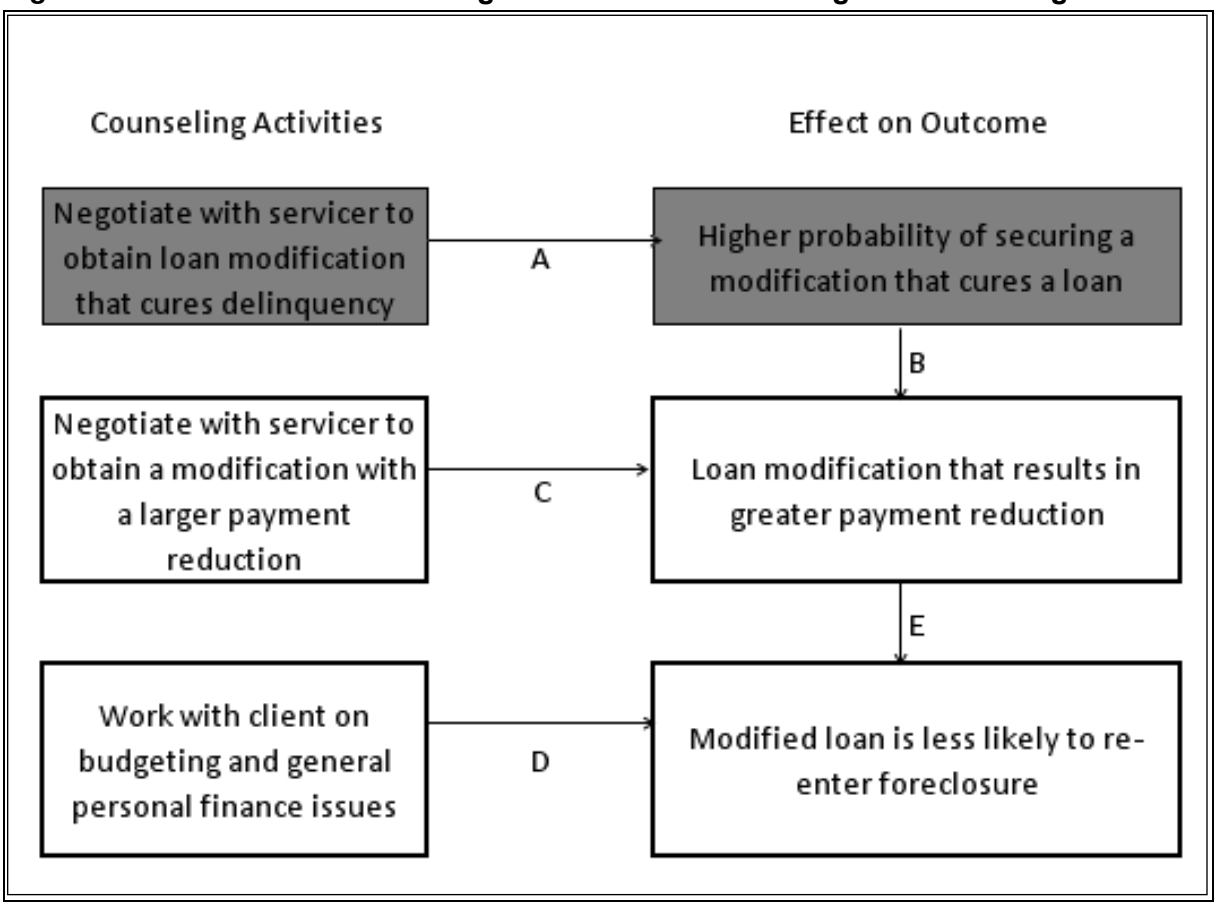
All of the recidivism analysis reported to this point, aimed at answering sustainability question 1, takes the initial curing of loans as a given and analyzes the sustainability of those cures from that point. But, as we have seen earlier, cures themselves are in part a result of

[40]The excluded category is that of no counseling, with both dummies set to zero. The "counseling begun after modification" dummy is a time-varying covariate that becomes 1 when the borrower does enter counseling after a modification and remains so thereafter.

counseling. Ultimately an important part of what we care about is curing defaulted loans for people in difficulty with their mortgages and keeping them cured. Our second sustainability measure, discussed below, combined the likelihood that a troubled loan was cured and that a cure was sustained. These two likelihoods could be used to compute the rate at which defaults became sustained cures, both with counseling help and without.

To illustrate this combined effect conveniently, we repeat the analytic framework in figure 2 here as figure 4. The top 2 boxes of figure 4 represent the first portion of this model: counseling improving loan-cure rates for initially seriously troubled loans. These cured loans then feed into the middle and bottom rows of boxes which determine what share of modification-cured loans are thereafter sustained, as explained in our discussion of our first sustainability measure above. The entire figure represents the combining of increased curing and increased sustaining given a cure. Here we outline the analysis of the top two boxes regarding loan-cure rates and then the combined impact of counseling within the entire figure, covering cure rates and sustaining the cures.

Figure 4: Framework of Counseling's Effects on Loan Curing and Sustaining Outcomes



We again began the analysis with descriptive tabulations, starting with the relationship between counseling and cure rates. Dividing the loan numbers in Table 9 by those in Table 8 in each category, we obtained the *cure rate of troubled loans* for each counseling and modification category. For example, for pre-counseling modifications, 949 cures from Table 9 are divided by 1,684 troubled loans in Table 8. The result, 56 percent, is the cure rate for troubled loans that receive counseling after a loan modification. Table 13 provides the cure rates for each category of defaulted NFMC and non-NFMC loans.

Table 13: Percentage of Loans That Cured a Serious Delinquency or Foreclosure by Counseling and Loan Modification Status: Round 1 NFMC and Non-NFMC Loans

		Cure Rate (%)
NFMC	**Total**	**34.3**
	Pre-counseling modification	28.0
	Post-counseling modification	73.3
	No modification	23.7
Non-NFMC	**Total**	**26.6**
	Modification	50.1
	No Modification	21.5

Source: NFMC program data Jan. 2008 through Dec. 2008, and LPS loan performance data through Dec. 2009.
Note: Serious delinquency is three months or more.

Homeowners with serious delinquencies or mortgages in foreclosure who first received NFMC counseling and then obtained loan modifications (post-counseling modifications) had easily the highest cure rates at 73 percent, more than 2.5 times as large as the percentage who had no NFMC assistance (27 percent) and the percentage who got their modifications before beginning counseling (28 percent).

Table 14 presents an initial approximation of the combined impacts of counseling on sustainable cures, multiplying cure rates from Table 13 by the rates of sustaining cures (no redefault) in Table 9. Overall, homeowners who obtained loan modifications after entering counseling were more likely to have sustainable cures. Just under half (48 percent) of those in serious delinquency or foreclosure who entered counseling and, thereafter, obtained a loan modification ended up with a cure that has been sustained through our period of observation.

Table 14: Percentage of Loans that Both Received and Sustained a Cure of a Serious Delinquency or Foreclosure by Counseling and Loan Modification Status: Round 1 NFMC and Non-NFMC Loans

		Sustained Cure Rate (%)
NFMC	**Total**	**17.1**
	Pre-counseling modification	2.2
	Post-counseling modification	48.4
	No modification	9.2
Non-NFMC	**Total**	**12.6**
	Modification	28.1
	No modification	9.3

Source: NFMC program data Jan. 2008 through Dec. 2008, and LPS loan performance data through Dec. 2009.
Note: Serious delinquency is three months or more.

This was the highest sustained cure rate of all of the groups and more than 20 times as high as the sustained cure rate for those who went to counseling only after receiving their loan modification (2 percent for pre-counseling modification). And it was more than 1.7 times the sustainable cure rate for people who got loan modifications and received no counseling at all (28 percent). The difference in sustained cure rates between all counseled and all non-counseled troubled homeowners was, however, significantly narrower (17 percent and 13 percent). The reason was that the cure-and-sustain rates did not differ much between counseled and non-counseled homeowners who did not obtain modifications and was slightly lower for the fraction of them who were counseled. And there were many more homeowners who did not obtain modifications than who did. Clearly, it was the *combination* of modification and counseling that produced the best results. These computations are highly suggestive of counseling's multiple impacts but of course do not yet control for differences in loan, borrower, and market characteristics among the various NFMC and non-NFMC, mod and no-mod groups. To apply those controls, we again use multivariate modeling.

NFMC Program's Effect on Both Curing and Sustaining Together

Turning to multivariate analysis of the two-part, cure-and-sustain impact of counseling, we combined the separate analyses we have already undertaken regarding cures and sustainability of cures. As with our previous multivariate analysis, focus was on loans cured to current with the aid of modifications. We re-estimated the same cure model presented earlier (NFMC Program's Effect on Foreclosure Cures), only with all of the following changes:

- We used only loans that entered counseling in 2008 (Round 1) and their non-NFMC counterparts,
- We limited the data sample to loans that had been modified,
- We combined initially foreclosed and seriously delinquent loans into the one set of loans with potential to be cured, and
- We defined a cure specifically as becoming current (no delinquency) rather than attaining any of several non-foreclosure statuses.

The effect of this was to make the results of the cure model match up with the redefault model, which also addresses only sustainability of loans previously cured-to-current with a modification, but limiting the analysis to only loans that were in foreclosure or serious delinquency in 2008 or 2009.[41] Table 15 reports the key parameters of that revised cure model, while the equation itself is equation 4 in the box on page 52 and the full model estimation is in appendix J.

For the simple entry to counseling before a modification, the relative odds of obtaining a cure increased by 53 percent, compared to the odds without counseling assistance (Table 15). This very substantial effect occurred even though all the counseled and non-counseled borrowers were ones who obtained loan modifications, most with at least some lowering of monthly payments. The impacts of differing levels of counseling were only modestly different from each other and from the impact of the variable simply for counseling entry. Once the level of counseling was controlled for, hours of counseling were not separately significant.

We now have two key results for the important case of seriously delinquent and foreclosed loans that are modified. Counseling improves their chances of being cured. And once cured, counseling improves their chances of avoiding redefault. In concept, we are in position to compare the combined probability of curing a seriously troubled loan with a modification and then sustaining the cure with the help of counseling begun pre-modification, to the probability of doing the same without such counseling.

For such a combined model, counseling has already been shown in this report to accomplish three things. It:

- raised the cure rate for loans being modified, preparing more loans for potential cure- and-sustain outcomes,
- increased the size of the reduction in mortgage payment in modified and cured loans, with a resulting positive impact on sustainability, and

[41] These differences at the same time explain the differing odds ratio estimates for counseling's effect on cure rates between the analysis in this section and those in the cures section earlier in the paper.

- raised sustainability of modified and cured loans additionally outside of the effect on loan payment level, presumably through financial counseling and some limited financial assistance.

Figure 3's arrows A, C, and D respectively reflect these three impacts.

Counseling prior to loan modification raises the odds of curing a troubled loan when modification occurs as specified in Table 15; and it raises the odds of sustaining that cure once obtained as specified in Table 12 and the paragraphs that follow it. It will clearly raise the odds of both curing and sustaining.

Before we can actually implement the modeling of these combined counseling impacts, we need to make some technical improvements in our current two key pieces. We will undertake those improvements before our next impacts report. As with counseling's impacts on recidivism of cured loans, such combined cure-and-sustain results will apply directly only to loans being cured through modification of the mortgage. Other homeowners in our data have also been able to cure their delinquencies without receiving a loan modification. In our next round of work, we will expand this analysis of potential counseling impacts to include borrowers who cured their defaulted mortgages without loan modifications and, if possible, to mortgages with and without modifications that avoid foreclosure without being cured. We will also attempt to examine counseling's impact, if any, on which group—modify or not, cure or not—homeowners may fall into, with possible implications on their likelihood of curing and sustaining thereafter.

Table 15: LOGIT Model Odds Ratio Estimates for Counseling Effects on Likelihood of Cure for Seriously Delinquent and Foreclosed Loans: Round 1 Loans Cured to Current with Modifications in 2008 or 2009

	Odds Ratio Estimates for Cure		
	Point Estimate	**95 Percent Confidence Interval**	
Entered Counseling	1.531	1.428	1.642
(Counseling Level Effects)		1.361	1.598
Level 1	1.475		
Level 2	1.602	1.468	1.748
Level 3	1.604	1.476	1.743
Counseling Hours	0.995	0.990	1.001

Source: LOGIT model estimates from NFMC program data for Jan. to Dec. 2008 and LPS loan performance data through Dec. 2009.

CONCLUSION

Round 1 and Round 2 of the NFMC program served over 800,000 clients through December 2009. An overwhelming share of the program's clients were in financial distress, most likely due to a loss or reduction in their income. About 70 percent of NFMC clients were delinquent on their mortgage when they started counseling, including 22 percent of clients who received a foreclosure notice before they obtained counseling services.

Although NFMC clients were frequently in a perilous financial situation, our preliminary analysis showed that counselors employed by the program's Grantees were able to achieve better results, for several key client outcomes, than would have been the case had the client not used NFMC-funded services. NFMC counselors made it more likely that such clients (as well as clients who received foreclosure notices after they started counseling) would be able to cure their foreclosure. Compared to non-NFMC homeowners who received foreclosure notices, NFMC clients had a relatively likelihood of curing their foreclosure that was 1.7 times greater than if they had not received counseling from NFMC grant recipients. NFMC clients received loan modifications that resulted in lower monthly payments, as compared to non-NFMC clients. We estimated that NFMC clients, without counseling, would have received a loan modification with a monthly payment $267 higher than the modification they actually received.

Finally, counseling has a positive effect on the ability of clients to cure delinquent mortgages to fully current with a modification, and these loans are less likely to go back into delinquency or foreclosure. Borrowers in default who entered counseling before obtaining loan modifications were much more likely to be able to cure their defaults than were other borrowers. Their relative odds of gaining a cure when they received a modification were 53 percent higher than uncounseled borrowers who also received modifications.

Borrowers who entered NFMC counseling before they obtained curing loan modifications were much more likely to sustain their modifications without further default than were borrowers who went uncounseled or who enter counseling after their modifications were in place. These earlier counseling entrants' sustainability outcomes improved both because they gained larger mortgage payment reductions and benefitted from counseling in other ways , likely from aid in financial management. The effects combined to produce a 45 percent increase in the odds that a curing modification would be sustained.

In conclusion, our preliminary analysis of the NFMC program, using data on clients and loan performance through December 2009, suggests that the program is having its intended effect of helping homeowners who are facing loss of their homes through foreclosure.

REFERENCES

Allison, Paul D. 1982. “Discrete-Time Methods for the Analysis of Time Histories.” *Sociological Methods*, 13, 61-98.

Ambrose, Brent W. and Charles A. Capone. 1998. “Modeling the Conditional Probability of Foreclosure in the Context of Single-Family Mortgage Default Resolutions.” *Real Estate Economics*, 26(3), 391-429.

Coulton, Claudia, Tsui Chan, Michael Schramm, and Kristen Mikelbank. 2008. “Pathways to Foreclosure: A Longitudinal Study of Mortgage Loans, Cleveland and Cuyahoga County, 2005-2008." Case Western Reserve University, Center on Urban Poverty and Community Development, Cleveland, OH.

Dubitsky, Rod, Larry Yang, Stevan Stevanovic, Thomas Suehr. 2008. *Subprime Loan Modifications Update.* Credit Suisse. October 1.

Elmer, Peter J. and Steven A. Seelig. 1998. “The Rising Long-Term Trend of Single-Family Mortgage Foreclosure Rates.” FDIC Working Paper 98-2. Washington, DC: Federal Deposit Insurance Corporation.

Foote, Christopher L., Kristopher S. Gerardi, Lorenz Goette, and Paul S. Willen. 2009. *Reducing Foreclosures.* Boston, MA: Federal Reserve Bank of Boston. Public Policy Discussion Papers. No. 09-2.

Galster, George, Chris Hayes, and Jennifer Johnson. 2005. “Identifying Robust, Parsimonious Neighborhood Indicators.” *Journal of Planning Education and Research* 24, 265-280.

Gardner, Mona J. and Dixie L. Mills. 1989. “Evaluating the Likelihood of Default on Delinquent Loans.” *Financial Management*, 18(4), 55-63.

Goodman, Laurie, Roger Ashworth, Brian Landy, and Ke Yin. *Everything You Always Wanted To Know About Modification But Were Afraid To Ask.* Amherst Mortgage Insight. June 23.

Hartarska, Valentina and Claudio Gonzalez-Vega. 2005. "Credit Counseling and Mortgage Termination by Low-Income Households." *Journal of Real Estate Finance and Economics,* 30 (3), 227-43.

Hirad, Abdighani and Peter M. Zorn. 2001. “A Little Knowledge is a Good Thing: Empirical Evidence of the Effectiveness of Pre-Purchase Homeownership Counseling.” McLean, VA: Freddie Mac.

LPS Applied Analytics. 2010. *LPS Mortgage Monitor: July 2010 Mortgage Performance Observations, Data as of June, 2010 Month-end.*

Mayer, Neil and Kenneth Temkin. 2010. *Reconnaissance Findings and Suggested Case Study Topics*. Washington, D.C.: The Urban Institute. Prepared for NeighborWorks® America. November.

Mayer, Neil, Peter A. Tatian, Kenneth Temkin, and Charles Calhoun. 2009. *National Foreclosure Mitigation Counseling Program Evaluation: Preliminary Analysis of Program Effects.* Washington, D.C.: The Urban Institute. Prepared for NeighborWorks® America. November.

Mayer, Neil, Peter A. Tatian, Kenneth Temkin, Elizabeth Guernsey, and Leah Hendey. 2008. *National Foreclosure Mitigation Counseling Program Evaluation: Interim Report #1.* Washington, D.C.: The Urban Institute. Prepared for NeighborWorks® America. December 19.

Office of the Comptroller of the Currency and Office of Thrift Supervision. 2009. *OCC and OTS Mortgage Metrics Report: Second Quarter 2009*. Washington, D.C.: U.S. Department of the Treasury. September.

Quercia, Roberto G., Lei Ding, and Janneke Ratcliffe. 2009. *Loan Modification and Redefault Risk.* Chapel Hill, NC: Center for Community Capital, University of North Carolina. Working paper. March.

Quercia, Roberto G., George W. McCarthy, and Michael A. Stegman. 1995. “Mortgage Default among Rural, Low-Income Borrowers.” *Journal of Housing Research*, 6(2): 349-369.

Quercia, Roberto G., Michael A. Stegman, and Walter R. Davis. 2005. "The Impact of Predatory Loan Terms on Subprime Foreclosures: The Special Case of Prepayment Penalties and Balloon Payments." The University of North Carolina at Chapel Hill , Center for Community Capitalism, Chapel Hill, NC.

Quercia, Roberto G. and Lei Ding. 2009. “Loan Modifications and Redefault Risk: An Examination of Short-Term Impact.” *Cityscape* 11(3):171-194.

Stegman, Michael A., Roberto G. Quercia, Janneke Ratcliffe, Lei Ding, and Walter R. Davis. “Preventive Servicing Is Good for Business *and* Affordable Homeownership Policy.” *Housing Policy Debate.* 18(2). 243-278.

Appendix A: HMDA Matching Methodology

HMDA loan application records (LARs) for mortgages originated between 2002 and 2008 were match merged with LPS loan records for mortgages that were active as of January 2000 or originated during 2008. The objective was to attain a sufficient number of exact loan matches to generate a comparison sample of LPS loan records containing information on race, gender, ethnicity, and Census tract location obtained from the matching HMDA loan records.

The matching procedure included the following steps:

1. Prepared LPS loan records starting with loans outstanding from January 2008 for matching within counties by assigning LPS 5-digit ZIP codes to 5-digit FIPS state-county codes using commercially available ZIP-to-county conversion data.
2. Prepared extracts of HMDA LARs for originated mortgages for all years from 2002 to 2008. HMDA LARs include information on Census tract, and 5-digit FIPS state-county codes.
3. Develop additional common matching variables for both LPS and HMDA loan records, including:

    FIPS 5-digit State-County Code

    Origination Year

    Original Loan Amount

    Lien Status

    Loan Type (Conventional, FHA, VA, Other)

    Loan Purpose (Purchase, Home Improvement, Refinance)

    Property Type (Single Family, Manufactured, Multi-Family)

    High Interest Rate Loan
4. The HMDA and LPS loan records were matched by successively loading each year of HMDA data and match merging all LPS originated in the corresponding year. First, all LPS loans outstanding in January 2008 were first matched against each year of HMDA data from 2002 through 2008. Then LPS loans originated during 2008 were matched against the HMDA for 2008..
5. Lien status, property type, and ethnicity were included in HMDA only since 2004, so these variables were not used in matching for HMDA years 2002 and 2003. The high-interest-rate loan indicator was excluded from the final matching algorithm due to limitations on the available data in HMDA (reported as yield spread only when exceeding yield on corresponding Treasury maturity by specified margins).

6. Only loans with unique combinations of the variables used for matching were retained as potential candidates for matching. This eliminated the possibility of duplicate matches prior to matching. Thus, each matched pair of HMDA and LPS loans is unique among the possible combinations of county, origination year, loan amount, lien status, loan type, loan purpose, and property type. This conservative approach to matching reduces the potential for measurement error in the variables assigned from HMDA to LPS loans.
7. Matching loan records for each HMDA year were then combined into a single matched-loan file. These loan records included LPS loan IDs and additional variables from HMDA for race, gender, ethnicity, and Census tract location that provide statistical controls comparable to those available for NFMC clients.
8. A total of 35,376,272 LPS loans active as of January 2008 or originated during 2008 were used in matching to HMDA LAR records for loans originated during 2002 to 2008. This resulted in a total of 1,146,823 matched LPS loans.

Appendix B: Descriptive Statistics for Model Explanatory Variables

NFMC Sample Loans, 2008 and 2009

Var	Label	N	Mean	StdDev
Black	Black borrower	173766	0.251	0.433
Asian	Asian/PI borrower	173766	0.043	0.203
OthRace	Other race borrower	173766	0.046	0.208
Hispanic	Hispanic borrower	176169	0.239	0.427
year03	Loan originated 2003	180287	0.065	0.247
year04	Loan originated 2004	180287	0.087	0.281
year05	Loan originated 2005	180287	0.198	0.398
year06	Loan originated 2006	180287	0.327	0.469
year07	Loan originated 2007	180287	0.241	0.428
year08	Loan originated 2008	180287	0.053	0.224
CurrentIntRate	Current Interest Rate	180255	6.932	1.443
MrtGrdBC	Grade B/C mortgage	180287	0.199	0.399
IntTypeARM	ARM loan	180287	0.390	0.488
IntTypeOth	Other interest type loan	180287	0.014	0.119
OptionARM	Option ARM loan	176014	0.080	0.271
InvAgency	Agency loan	179687	0.472	0.499
InvGov	Government loan	179687	0.004	0.060
InvPortfolio	Portfolio loan	179687	0.122	0.327
Jumbo	Jumbo loan	180287	0.109	0.312
ApprovalRateHomePurch_06_07	Census tract home mortgage approval rate (%), 2006-07	180115	59.431	11.285
MrtgOrigMedAmt_thou	Census tract median home purchase mortgage origination amount in $1,000s, 2006-07	180095	200.373	110.541
Unemp	Monthly unemployment rate, Jan 2008 (%)	180287	5.546	1.527
Unemp_chg_pct	Pct change in unemp. rate, Jan 2008 - Dec 2009	180287	87.523	26.187
Hpi	Quarterly housing price index (HPI), 2008-Q1	180287	239.764	61.447
Hpi_chg_pct	Pct change in HPI, 2008-Q1 - 2009-Q4	180287	-16.259	10.644
FICOOrg	FICO/Credit Score – Original	149532	657.436	67.318
LTV	Loan-to-value ratio	165602	81.906	15.915
LTVnot80	Dummy for LTV not = 80	165602	0.823	0.382
OriginalLoanAmt_thou	Original loan amount in $1,000s	166826	234.157	155.150
income_thou	Income in $1,000s	180211	47.160	38.350

Non-NFMC Sample Loans, 2008 and 2009

Var	Label	N	Mean	StdDev
Black	Black borrower	136168	0.076	0.265
Asian	Asian/PI borrower	136168	0.026	0.158
OthRace	Other race borrower	136168	0.019	0.136
Hispanic	Hispanic borrower	137569	0.070	0.254
year03	Loan originated 2003	154927	0.071	0.257
year04	Loan originated 2004	154927	0.102	0.303
year05	Loan originated 2005	154927	0.196	0.397
year06	Loan originated 2006	154927	0.301	0.459
year07	Loan originated 2007	154927	0.236	0.424
year08	Loan originated 2008	154927	0.052	0.223
CurrentIntRate	Current Interest Rate	154927	6.903	1.573
MrtGrdBC	Grade B/C mortgage	154927	0.161	0.367
IntTypeARM	ARM loan	154927	0.396	0.489
IntTypeOth	Other interest type loan	154927	0.007	0.085
OptionARM	Option ARM loan	147295	0.142	0.349
InvAgency	Agency loan	153836	0.432	0.495
InvGov	Government loan	153836	0.002	0.049
InvPortfolio	Portfolio loan	153836	0.164	0.370
Jumbo	Jumbo loan	154927	0.292	0.455
ApprovalRateHomePurch_06_07	Census tract home mortgage approval rate (%), 2006-07	152568	63.958	9.557
MrtgOrigMedAmt_thou	Census tract median home purchase mortgage origination amount in $1,000s, 2006-07	152560	212.533	201.218
Unemp	Monthly unemployment rate, Jan 2008 (%)	154927	5.552	1.533
Unemp_chg_pct	Pct change in unemp. rate, Jan 2008 - Dec 2009	154927	81.603	25.760
Hpi	Quarterly housing price index (HPI), 2008-Q1	154927	293.122	110.669
Hpi_chg_pct	Pct change in HPI, 2008-Q1 - 2009-Q4	154927	-13.191	9.479
FICOOrg	FICO/Credit Score – Original	127708	673.724	70.071
LTV	Loan-to-value ratio	146698	78.688	24.113
LTVnot80	Dummy for LTV not = 80	146698	0.884	0.320
OriginalLoanAmt_thou	Original loan amount in $1,000s	147775	390.153	533.401
income_thou	Income in $1,000s	144158	137.511	147.615

Appendix C: Parameter Estimates for LOGIT Model of Foreclosure Cure – NFMC vs. Non-NFMC

Foreclosure Cure: Entered Counseling

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	202757.45	198341.06
SC	202768.26	198741.05
-2 Log L	202755.45	198267.06

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	4488.3885	36	<.0001
Score	4116.0408	36	<.0001
Wald	3973.5660	36	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept	1	-0.8686	0.1278	46.1956	<.0001
Entered_counseling	1	0.5280	0.0167	1005.0123	<.0001
Months_foreclosure	1	-0.00625	0.00141	19.7690	<.0001
Delinqintk1	1	-0.0308	0.0320	0.9233	0.3366
Delinqintk2	1	-0.0260	0.0302	0.7372	0.3906
Delinqintk3	1	-0.1055	0.0303	12.0960	0.0005
Delinqintk4	1	-0.1166	0.0232	25.2959	<.0001
Black	1	0.2381	0.0169	197.3885	<.0001
Asian	1	0.0439	0.0359	1.4982	0.2209
OthRace	1	0.0380	0.0300	1.6029	0.2055
Hispanic	1	0.0472	0.0174	7.3232	0.0068
year03	1	0.0246	0.0428	0.3286	0.5665
year04	1	-0.0562	0.0406	1.9138	0.1665
year05	1	-0.0846	0.0376	5.0483	0.0247
year06	1	-0.0986	0.0368	7.1767	0.0074
year07	1	-0.0924	0.0375	6.0814	0.0137
year08	1	-0.4670	0.1267	13.5945	0.0002

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
FICOOrg	1	-0.00155	0.000115	182.0152	<.0001
CurrentIntRate	1	-0.0256	0.00581	19.4461	<.0001
MrtGrdBC	1	0.0715	0.0183	15.3390	<.0001
IntTypeARM	1	-0.00175	0.0164	0.0114	0.9150
IntTypeOth	1	0.0982	0.0466	4.4411	0.0351
OptionARM	1	-0.7023	0.0291	583.6399	<.0001
InvAgency	1	0.0818	0.0183	19.9020	<.0001
InvGov	1	-0.2758	0.1096	6.3361	0.0118
InvPortfolio	1	0.1803	0.0246	53.7932	<.0001
Jumbo	1	-0.0707	0.0294	5.7649	0.0163
ApprovalRateHomePurc	1	0.00344	0.000637	29.1316	<.0001
MrtgOrigMedAmt_thou	1	0.000864	0.000095	81.9157	<.0001
Unemp	1	-0.0256	0.00335	58.6948	<.0001
Unemp_chg_pct	1	-0.00290	0.000230	159.6223	<.0001
Hpi	1	-0.00134	0.000128	110.0616	<.0001
Hpi_chg_pct	1	0.00373	0.000916	16.5582	<.0001
LTV	1	-0.00160	0.000420	14.5615	0.0001
LTVnot80	1	-0.0264	0.0173	2.3354	0.1265
OriginalLoanAmt_thou	1	-0.00056	0.000080	48.1809	<.0001
income_thou	1	-0.00057	0.000155	13.8116	0.0002

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
Entered_counseling	1.696	1.641	1.752
Months_foreclosure	0.994	0.991	0.997
Delinqintk1	0.970	0.911	1.033
Delinqintk2	0.974	0.918	1.034
Delinqintk3	0.900	0.848	0.955
Delinqintk4	0.890	0.850	0.931
Black	1.269	1.227	1.312
Asian	1.045	0.974	1.121
OthRace	1.039	0.979	1.102

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
Hispanic	1.048	1.013	1.085
year03	1.025	0.942	1.115
year04	0.945	0.873	1.024
year05	0.919	0.854	0.989
year06	0.906	0.843	0.974
year07	0.912	0.847	0.981
year08	0.627	0.489	0.804
FICOOrg	0.998	0.998	0.999
CurrentIntRate	0.975	0.964	0.986
MrtGrdBC	1.074	1.036	1.113
IntTypeARM	0.998	0.967	1.031
IntTypeOth	1.103	1.007	1.209
OptionARM	0.495	0.468	0.524
InvAgency	1.085	1.047	1.125
InvGov	0.759	0.612	0.941
InvPortfolio	1.198	1.141	1.257
Jumbo	0.932	0.880	0.987
ApprovalRateHomePurc	1.003	1.002	1.005
MrtgOrigMedAmt_thou	1.001	1.001	1.001
Unemp	0.975	0.968	0.981
Unemp_chg_pct	0.997	0.997	0.998
Hpi	0.999	0.998	0.999
Hpi_chg_pct	1.004	1.002	1.006
LTV	0.998	0.998	0.999
LTVnot80	0.974	0.941	1.007
OriginalLoanAmt_thou	0.999	0.999	1.000
income_thou	0.999	0.999	1.000

Foreclosure Cure: Counseling Levels

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	202757.45	198319.43
SC	202768.26	198751.85
-2 Log L	202755.45	198239.43

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	4516.0187	39	<.0001
Score	4153.0662	39	<.0001
Wald	4007.5284	39	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-0.8765	0.1278	47.0164	<.0001
level_1_intk	1	0.4915	0.0186	698.6850	<.0001
level_2_intk	1	0.5524	0.0214	667.9681	<.0001
level_3_intk	1	0.5770	0.0206	787.0066	<.0001
counseling_hours	1	-0.00162	0.00159	1.0386	0.3081
Months_foreclosure	1	-0.00636	0.00141	20.4745	<.0001
Delinqintk1	1	-0.0290	0.0320	0.8193	0.3654
Delinqintk2	1	-0.0250	0.0302	0.6806	0.4094
Delinqintk3	1	-0.1082	0.0303	12.7093	0.0004
Delinqintk4	1	-0.1185	0.0232	26.1146	<.0001
Black	1	0.2304	0.0170	182.9517	<.0001
Asian	1	0.0385	0.0359	1.1505	0.2834
OthRace	1	0.0472	0.0300	2.4731	0.1158
Hispanic	1	0.0412	0.0175	5.5617	0.0184
year03	1	0.0214	0.0428	0.2485	0.6181
year04	1	-0.0597	0.0406	2.1599	0.1417
year05	1	-0.0878	0.0376	5.4382	0.0197
year06	1	-0.1013	0.0368	7.5806	0.0059

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
year07	1	-0.0955	0.0375	6.4954	0.0108
year08	1	-0.4714	0.1267	13.8527	0.0002
FICOOrg	1	-0.00154	0.000115	180.4872	<.0001
CurrentIntRate	1	-0.0261	0.00581	20.0847	<.0001
MrtGrdBC	1	0.0731	0.0183	16.0255	<.0001
IntTypeARM	1	-0.00131	0.0164	0.0063	0.9366
IntTypeOth	1	0.0963	0.0466	4.2713	0.0388
OptionARM	1	-0.7040	0.0291	586.2059	<.0001
InvAgency	1	0.0833	0.0183	20.6139	<.0001
InvGov	1	-0.2742	0.1096	6.2608	0.0123
InvPortfolio	1	0.1797	0.0246	53.3916	<.0001
Jumbo	1	-0.0698	0.0294	5.6260	0.0177
ApprovalRateHomePurc	1	0.00352	0.000638	30.4669	<.0001
MrtgOrigMedAmt_thou	1	0.000869	0.000095	82.9447	<.0001
Unemp	1	-0.0256	0.00335	58.3203	<.0001
Unemp_chg_pct	1	-0.00289	0.000230	157.8783	<.0001
Hpi	1	-0.00132	0.000128	106.5354	<.0001
Hpi_chg_pct	1	0.00341	0.000919	13.7648	0.0002
LTV	1	-0.00161	0.000420	14.7059	0.0001
LTVnot80	1	-0.0258	0.0173	2.2168	0.1365
OriginalLoanAmt_thou	1	-0.00056	0.000080	48.3737	<.0001
income_thou	1	-0.00056	0.000154	13.1442	0.0003

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
level_1_intk	1.635	1.576	1.695
level_2_intk	1.737	1.666	1.812
level_3_intk	1.781	1.710	1.854
counseling_hours	0.998	0.995	1.001
Months_foreclosure	0.994	0.991	0.996
Delinqintk1	0.971	0.912	1.034
Delinqintk2	0.975	0.919	1.035

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
Delinqintk3	0.897	0.846	0.952
Delinqintk4	0.888	0.849	0.930
Black	1.259	1.218	1.302
Asian	1.039	0.969	1.115
OthRace	1.048	0.988	1.112
Hispanic	1.042	1.007	1.078
year03	1.022	0.939	1.111
year04	0.942	0.870	1.020
year05	0.916	0.851	0.986
year06	0.904	0.841	0.971
year07	0.909	0.845	0.978
year08	0.624	0.487	0.800
FICOOrg	0.998	0.998	0.999
CurrentIntRate	0.974	0.963	0.985
MrtGrdBC	1.076	1.038	1.115
IntTypeARM	0.999	0.967	1.031
IntTypeOth	1.101	1.005	1.206
OptionARM	0.495	0.467	0.524
InvAgency	1.087	1.048	1.127
InvGov	0.760	0.613	0.942
InvPortfolio	1.197	1.141	1.256
Jumbo	0.933	0.880	0.988
ApprovalRateHomePurc	1.004	1.002	1.005
MrtgOrigMedAmt_thou	1.001	1.001	1.001
Unemp	0.975	0.968	0.981
Unemp_chg_pct	0.997	0.997	0.998
Hpi	0.999	0.998	0.999
Hpi_chg_pct	1.003	1.002	1.005
LTV	0.998	0.998	0.999
LTVnot80	0.975	0.942	1.008
OriginalLoanAmt_thou	0.999	0.999	1.000
income_thou	0.999	0.999	1.000

Appendix D: Parameter Estimates for LOGIT Model of Foreclosure Cure – NFMC Only

Foreclosure Cure (NFMC Only): Entered Counseling

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	244194.58	238228.70
SC	244205.50	238567.18
-2 Log L	244192.58	238166.70

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	6025.8758	30	<.0001
Score	5780.0415	30	<.0001
Wald	5587.8413	30	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept	1	0.3250	0.0792	16.8514	<.0001
Months_foreclosure	1	-0.00667	0.00125	28.5986	<.0001
Entered_counseling	1	0.2805	0.0149	352.9563	<.0001
OriginalLoanAmt_thou	1	-0.00018	0.000066	7.8468	0.0051
year03	1	-0.1143	0.0317	12.9952	0.0003
year04	1	-0.0799	0.0290	7.5749	0.0059
year05	1	-0.0764	0.0250	9.3348	0.0022
year06	1	-0.0516	0.0238	4.7109	0.0300
year07	1	-0.0181	0.0249	0.5306	0.4664
year08	1	-0.2653	0.0394	45.2348	<.0001
FICOOrg	1	-0.00191	0.000101	358.9281	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
CurrentIntRate	1	-0.1412	0.00352	1604.2466	<.0001
MrtGrdBC	1	0.0944	0.0159	35.4002	<.0001
IntTypeARM	1	-0.1515	0.0145	109.4968	<.0001
IntTypeOth	1	-0.1526	0.0828	3.3950	0.0654
OptionARM	1	-0.7298	0.0292	626.5916	<.0001
InvAgency	1	0.0194	0.0154	1.5984	0.2061
InvGov	1	-0.3311	0.1167	8.0506	0.0045
InvPortfolio	1	-0.3164	0.0171	342.0209	<.0001
Jumbo	1	-0.0494	0.0273	3.2839	0.0700
Unemp	1	-0.0249	0.00302	68.0451	<.0001
Unemp_chg_pct	1	-0.00189	0.000203	87.2915	<.0001
Hpi	1	-0.00046	0.000049	88.1461	<.0001
Hpi_chg_pct	1	0.00282	0.000793	12.6225	0.0004
LTV	1	-0.00002	0.000063	0.0682	0.7940
LTVnot80	1	-0.0283	0.0185	2.3355	0.1265
black	1	0.1326	0.0142	86.9955	<.0001
asian	1	-0.0205	0.0321	0.4078	0.5231
othrace	1	-0.0224	0.0275	0.6630	0.4155
hispanic	1	-0.0242	0.0152	2.5526	0.1101
income_thou	1	0.00152	0.000137	123.3902	<.0001

Appendix E: Parameter Estimates for OLS Regression Models of Reduction in Monthly Payment for Loans Receiving a Modification – NFMC vs. Non-NFMC

Dollar Reduction in Monthly Payment Amount: Entered Counseling

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	36	4222717121	117297698	248.31	<.0001
Error	36741	17356208132	472393		
Corrected Total	36777	21578925254			

Root MSE	687.30885	R-Square	0.1957
Dependent Mean	387.23264	Adj R-Sq	0.1949
Coeff Var	177.49249		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-227.84774	72.92159	-3.12	0.0018
Entered_counseling	Entered counseling prior to loan modification	1	266.77857	8.22688	32.43	<.0001
Delinqintk1	1 mo. late at Intake	1	24.39584	12.22062	2.00	0.0459
Delinqintk2	2 mos. late at Intake	1	3.15006	12.59004	0.25	0.8024
Delinqintk3	3 mos. late at Intake	1	-14.60968	13.74337	-1.06	0.2878
Delinqintk4	4+ mos. late at Intake	1	-39.22295	9.74293	-4.03	<.0001
prev_current	Current in Month Prior to Mod	1	189.08739	8.35435	22.63	<.0001
Black	Black borrower	1	71.51905	9.79789	7.30	<.0001
Asian	Asian/PI borrower	1	3.66005	21.82628	0.17	0.8668
OthRace	Other race borrower	1	54.29377	20.53273	2.64	0.0082
Hispanic	Hispanic borrower	1	44.88027	10.91774	4.11	<.0001
OriginalLoanAmt_thou	Original Loan Amount in $1,000s	1	0.23215	0.02098	11.07	<.0001
year03	Loan originated 2003	1	-11.34249	33.04556	-0.34	0.7314
year04	Loan originated 2004	1	53.67545	29.11694	1.84	0.0653
year05	Loan originated 2005	1	39.60229	27.80454	1.42	0.1544
year06	Loan originated 2006	1	115.68068	27.25481	4.24	<.0001
year07	Loan originated 2007	1	176.34334	27.46044	6.42	<.0001
year08	Loan originated 2008	1	215.42412	59.91750	3.60	0.0003
FICOOrg	FICO/Credit Score – Original	1	0.16175	0.06454	2.51	0.0122

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
CurrentIntRate	Current Interest Rate	1	2.06005	2.73973	0.75	0.4521
MrtGrdBC	Grade B/C mortgage	1	289.17721	10.77784	26.83	<.0001
IntTypeARM	ARM loan	1	142.99986	10.17940	14.05	<.0001
IntTypeOth	Other interest type loan	1	286.04849	42.04978	6.80	<.0001
OptionARM	Option ARM loan	1	-193.64651	12.76438	-15.17	<.0001
InvAgency	Agency loan	1	-47.47562	11.29748	-4.20	<.0001
InvGov	Government loan	1	-86.95761	107.16703	-0.81	0.4171
InvPortfolio	Portfolio loan	1	-135.97110	10.72426	-12.68	<.0001
Jumbo	Jumbo loan	1	335.68251	13.61135	24.66	<.0001
ApprovalRateHomePurch_06_07	Home mortgage approval rate (%), 2006-07	1	1.28841	0.38040	3.39	0.0007
MrtgOrigMedAmt_thou	Median home purchase mortgage amount, 2006-07 avg. ($1,000s)	1	0.51538	0.03477	14.82	<.0001
Unemp	Unemployment rate, Jan 08	1	-22.62927	3.01825	-7.50	<.0001
Unemp_chg_pct	Pct change in unemp. rate, Jan-Dec 08	1	-0.73823	0.17972	-4.11	<.0001
Hpi	House price index, 2008Q1	1	-0.02088	0.04851	-0.43	0.6669
Hpi_chg_pct	Pct change in house price index, 2008Q1-2008Q4	1	-6.97025	0.54739	-12.73	<.0001
LTV	Loan-to-value ratio	1	0.00118	0.14393	0.01	0.9935
LTVnot80	Dummy for LTV not = 80	1	-85.04756	10.85891	-7.83	<.0001
income_thou	Income in $1,000s	1	-0.77189	0.05324	-14.50	<.0001

Dollar Reduction in Monthly Payment Amount: Counseling Levels

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	39	4258765244	109199109	231.62	<.0001
Error	36738	17320160009	471451		
Corrected Total	36777	21578925254			

Root MSE	686.62276	R-Square	0.1974
Dependent Mean	387.23264	Adj R-Sq	0.1965
Coeff Var	177.31531		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-228.19872	72.85581	-3.13	0.0017
level_1_intk	Level 1	1	214.43088	11.06228	19.38	<.0001
level_2_intk	Level 2	1	265.17016	13.61799	19.47	<.0001
level_3_intk	Level 3	1	334.59171	12.26913	27.27	<.0001
counseling_hours		1	-0.80575	1.21975	-0.66	0.5089
Delinqintk1	1 mo. late at Intake	1	27.77627	12.21498	2.27	0.0230
Delinqintk2	2 mos. late at Intake	1	6.45701	12.58413	0.51	0.6079
Delinqintk3	3 mos. late at Intake	1	-13.06075	13.73098	-0.95	0.3415
Delinqintk4	4+ mos. late at Intake	1	-38.53950	9.73400	-3.96	<.0001
prev_current	Current in Month Prior to Mod	1	187.26738	8.34958	22.43	<.0001
Black	Black borrower	1	63.58945	9.83520	6.47	<.0001
Asian	Asian/PI borrower	1	0.84118	21.80701	0.04	0.9692
OthRace	Other race borrower	1	60.22953	20.52525	2.93	0.0033
Hispanic	Hispanic borrower	1	41.02238	10.91872	3.76	0.0002
OriginalLoanAmt_thou	Original Loan Amount in $1,000s	1	0.23032	0.02096	10.99	<.0001
year03	Loan originated 2003	1	-11.52609	33.01261	-0.35	0.7270
year04	Loan originated 2004	1	49.53763	29.09179	1.70	0.0886
year05	Loan originated 2005	1	36.67188	27.77884	1.32	0.1868
year06	Loan originated 2006	1	112.55878	27.23004	4.13	<.0001

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
year07	Loan originated 2007	1	174.06648	27.43431	6.34	<.0001
year08	Loan originated 2008	1	215.99511	59.85981	3.61	0.0003
FICOOrg	FICO/Credit Score – Original	1	0.15718	0.06448	2.44	0.0148
CurrentIntRate	Current Interest Rate	1	1.76938	2.73732	0.65	0.5180
MrtGrdBC	Grade B/C mortgage	1	287.07197	10.77067	26.65	<.0001
IntTypeARM	ARM loan	1	142.27435	10.16979	13.99	<.0001
IntTypeOth	Other interest type loan	1	282.23439	42.01259	6.72	<.0001
OptionARM	Option ARM loan	1	-191.68736	12.75410	-15.03	<.0001
InvAgency	Agency loan	1	-44.01517	11.29602	-3.90	<.0001
InvGov	Government loan	1	-86.91960	107.06097	-0.81	0.4169
InvPortfolio	Portfolio loan	1	-134.41024	10.71511	-12.54	<.0001
Jumbo	Jumbo loan	1	336.58122	13.59822	24.75	<.0001
ApprovalRateHomePurch_06_07	Home mortgage approval rate (%), 2006-07	1	1.33644	0.38015	3.52	0.0004
MrtgOrigMedAmt_thou	Median home purchase mortgage amount, 2006-07 avg. ($1,000s)	1	0.51878	0.03474	14.93	<.0001
Unemp	Unemployment rate, Jan 08	1	-22.58085	3.01566	-7.49	<.0001
Unemp_chg_pct	Pct change in unemp. rate, Jan-Dec 08	1	-0.70547	0.17960	-3.93	<.0001
Hpi	House price index, 2008Q1	1	-0.01771	0.04847	-0.37	0.7148
Hpi_chg_pct	Pct change in house price index, 2008Q1-2008Q4	1	-7.10532	0.54722	-12.98	<.0001
LTV	Loan-to-value ratio	1	0.00389	0.14379	0.03	0.9784
LTVnot80	Dummy for LTV not = 80	1	-84.45674	10.84894	-7.78	<.0001
income_thou	Income in $1,000s	1	-0.77505	0.05319	-14.57	<.0001

Percent Reduction in Monthly Payment Amount: Entered Counseling

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	36	3990851	110857	234.36	<.0001
Error	36741	17378972	473.01304		
Corrected Total	36777	21369823			

Root MSE	21.74886	R-Square	0.1868
Dependent Mean	14.78512	Adj R-Sq	0.1860
Coeff Var	147.09966		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-8.99196	2.30749	-3.90	<.0001
Entered_counseling	Entered counseling prior to loan modification	1	12.07895	0.26033	46.40	<.0001
Delinqintk1	1 mo. late at Intake	1	0.96382	0.38670	2.49	0.0127
Delinqintk2	2 mos. late at Intake	1	-0.41775	0.39839	-1.05	0.2944
Delinqintk3	3 mos. late at Intake	1	-1.14008	0.43489	-2.62	0.0088
Delinqintk4	4+ mos. late at Intake	1	-2.65072	0.30830	-8.60	<.0001
prev_current	Current in Month Prior to Mod	1	7.68762	0.26436	29.08	<.0001
Black	Black borrower	1	1.22709	0.31004	3.96	<.0001
Asian	Asian/PI borrower	1	-0.35508	0.69066	-0.51	0.6072
OthRace	Other race borrower	1	-0.08983	0.64973	-0.14	0.8900
Hispanic	Hispanic borrower	1	0.78301	0.34548	2.27	0.0234
OriginalLoanAmt_thou	Original Loan Amount in $1,000s	1	-0.00230	0.00066389	-3.46	0.0005
year03	Loan originated 2003	1	-0.70846	1.04568	-0.68	0.4981
year04	Loan originated 2004	1	0.64786	0.92136	0.70	0.4820
year05	Loan originated 2005	1	1.32790	0.87983	1.51	0.1312
year06	Loan originated 2006	1	3.40788	0.86244	3.95	<.0001
year07	Loan originated 2007	1	4.97528	0.86894	5.73	<.0001
year08	Loan originated 2008	1	-6.31213	1.89600	-3.33	0.0009
FICOOrg	FICO/Credit Score – Original	1	0.01360	0.00204	6.66	<.0001

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
CurrentIntRate	Current Interest Rate	1	0.40301	0.08669	4.65	<.0001
MrtGrdBC	Grade B/C mortgage	1	10.27923	0.34105	30.14	<.0001
IntTypeARM	ARM loan	1	5.62947	0.32211	17.48	<.0001
IntTypeOth	Other interest type loan	1	6.56052	1.33060	4.93	<.0001
OptionARM	Option ARM loan	1	-2.09545	0.40391	-5.19	<.0001
InvAgency	Agency loan	1	1.19092	0.35749	3.33	0.0009
InvGov	Government loan	1	-1.91336	3.39114	-0.56	0.5726
InvPortfolio	Portfolio loan	1	0.01076	0.33935	0.03	0.9747
Jumbo	Jumbo loan	1	0.25348	0.43071	0.59	0.5562
ApprovalRateHomePurch_06_07	Home mortgage approval rate (%), 2006-07	1	-0.00635	0.01204	-0.53	0.5976
MrtgOrigMedAmt_thou	Median home purchase mortgage amount, 2006-07 avg. ($1,000s)	1	0.00564	0.00110	5.13	<.0001
Unemp	Unemployment rate, Jan 08	1	-0.26028	0.09551	-2.73	0.0064
Unemp_chg_pct	Pct change in unemp. rate, Jan-Dec 08	1	-0.00961	0.00569	-1.69	0.0910
Hpi	House price index, 2008Q1	1	-0.00402	0.00153	-2.62	0.0088
Hpi_chg_pct	Pct change in house price index, 2008Q1-2008Q4	1	-0.14591	0.01732	-8.42	<.0001
LTV	Loan-to-value ratio	1	-0.01499	0.00455	-3.29	0.0010
LTVnot80	Dummy for LTV not = 80	1	-2.33184	0.34361	-6.79	<.0001
income_thou	Income in $1,000s	1	-0.00988	0.00168	-5.86	<.0001

Percent Reduction in Monthly Payment Amount: Counseling Levels

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	39	4026382	103241	218.69	<.0001
Error	36738	17343442	472.08453		
Corrected Total	36777	21369823			

Root MSE	21.72751	R-Square	0.1884
Dependent Mean	14.78512	Adj R-Sq	0.1876
Coeff Var	146.95521		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-9.01204	2.30545	-3.91	<.0001
level_1_intk	Level 1	1	10.55914	0.35006	30.16	<.0001
level_2_intk	Level 2	1	11.94640	0.43093	27.72	<.0001
level_3_intk	Level 3	1	14.33421	0.38824	36.92	<.0001
counseling_hours		1	-0.05514	0.03860	-1.43	0.1531
Delinqintk1	1 mo. late at Intake	1	1.06643	0.38653	2.76	0.0058
Delinqintk2	2 mos. late at Intake	1	-0.31882	0.39821	-0.80	0.4234
Delinqintk3	3 mos. late at Intake	1	-1.09155	0.43450	-2.51	0.0120
Delinqintk4	4+ mos. late at Intake	1	-2.62831	0.30802	-8.53	<.0001
prev_current	Current in Month Prior to Mod	1	7.63395	0.26421	28.89	<.0001
Black	Black borrower	1	0.98632	0.31123	3.17	0.0015
Asian	Asian/PI borrower	1	-0.44120	0.69006	-0.64	0.5226
OthRace	Other race borrower	1	0.09334	0.64950	0.14	0.8857
Hispanic	Hispanic borrower	1	0.66870	0.34551	1.94	0.0530
OriginalLoanAmt_thou	Original Loan Amount in $1,000s	1	-0.00235	0.00066328	-3.55	0.0004
year03	Loan originated 2003	1	-0.71482	1.04465	-0.68	0.4938
year04	Loan originated 2004	1	0.51851	0.92058	0.56	0.5733
year05	Loan originated 2005	1	1.23741	0.87903	1.41	0.1592
year06	Loan originated 2006	1	3.31236	0.86167	3.84	0.0001
year07	Loan originated 2007	1	4.90297	0.86813	5.65	<.0001

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
year08	Loan originated 2008	1	-6.30681	1.89421	-3.33	0.0009
FICOOrg	FICO/Credit Score – Original	1	0.01345	0.00204	6.59	<.0001
CurrentIntRate	Current Interest Rate	1	0.39467	0.08662	4.56	<.0001
MrtGrdBC	Grade B/C mortgage	1	10.21734	0.34083	29.98	<.0001
IntTypeARM	ARM loan	1	5.60845	0.32181	17.43	<.0001
IntTypeOth	Other interest type loan	1	6.44693	1.32945	4.85	<.0001
OptionARM	Option ARM loan	1	-2.03374	0.40359	-5.04	<.0001
InvAgency	Agency loan	1	1.29519	0.35745	3.62	0.0003
InvGov	Government loan	1	-1.91385	3.38784	-0.56	0.5721
InvPortfolio	Portfolio loan	1	0.06051	0.33907	0.18	0.8584
Jumbo	Jumbo loan	1	0.28265	0.43030	0.66	0.5113
ApprovalRateHomePurch_06_07	Home mortgage approval rate (%), 2006-07	1	-0.00499	0.01203	-0.42	0.6780
MrtgOrigMedAmt_thou	Median home purchase mortgage amount, 2006-07 avg. ($1,000s)	1	0.00575	0.00110	5.23	<.0001
Unemp	Unemployment rate, Jan 08	1	-0.25857	0.09543	-2.71	0.0067
Unemp_chg_pct	Pct change in unemp. rate, Jan-Dec 08	1	-0.00851	0.00568	-1.50	0.1343
Hpi	House price index, 2008Q1	1	-0.00391	0.00153	-2.55	0.0108
Hpi_chg_pct	Pct change in house price index, 2008Q1-2008Q4	1	-0.14985	0.01732	-8.65	<.0001
LTV	Loan-to-value ratio	1	-0.01489	0.00455	-3.27	0.0011
LTVnot80	Dummy for LTV not = 80	1	-2.31189	0.34330	-6.73	<.0001
income_thou	Income in $1,000s	1	-0.00998	0.00168	-5.93	<.0001

Appendix F: Parameter Estimates for OLS Regression Models of Reduction in Monthly Payment for Loans Receiving a Modification – NFMC Only

Amount Reduction in Monthly Payment Amount (NFMC Only): Entered Counseling

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	31	4230472539	136466856	377.10	<.0001
Error	25254	9139026752	361884		
Corrected Total	25285	13369499292			

Root MSE	601.56822	R-Square	0.3164
Dependent Mean	473.54441	Adj R-Sq	0.3156
Coeff Var	127.03523		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-484.40619	77.37831	-6.26	<.0001
Entered_counseling	Entered counseling prior to loan modification	1	274.53422	7.91875	34.67	<.0001
Black	Black borrower	1	69.61648	10.11649	6.88	<.0001
Asian	Asian/PI borrower	1	12.50587	22.39515	0.56	0.5766
OthRace	Other race borrower	1	7.60681	19.30405	0.39	0.6935
Hispanic	Hispanic borrower	1	47.00921	10.89055	4.32	<.0001
income_thou	Income in $1,000s	1	0.06612	0.10658	0.62	0.5350
OriginalLoanAmt_thou	Original Loan Amount in $1,000s	1	1.49374	0.04288	34.83	<.0001
year03	Loan originated 2003	1	-15.79245	28.60695	-0.55	0.5809
year04	Loan originated 2004	1	-6.66937	26.82541	-0.25	0.8037
year05	Loan originated 2005	1	-81.04672	24.79492	-3.27	0.0011
year06	Loan originated 2006	1	5.79048	24.12298	0.24	0.8103
year07	Loan originated 2007	1	78.00340	24.44090	3.19	0.0014
year08	Loan originated 2008	1	155.42456	70.55833	2.20	0.0276
FICOOrg	FICO/Credit Score – Original	1	0.40997	0.06941	5.91	<.0001
CurrentIntRate	Current Interest Rate	1	25.72592	2.94667	8.73	<.0001
MrtGrdBC	Grade B/C mortgage	1	412.29818	10.69296	38.56	<.0001
IntTypeARM	ARM loan	1	92.33237	10.32355	8.94	<.0001

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
IntTypeOth	Other interest type loan	1	241.76204	42.26145	5.72	<.0001
OptionARM	Option ARM loan	1	-272.04548	14.08794	-19.31	<.0001
InvAgency	Agency loan	1	-55.92876	11.82822	-4.73	<.0001
InvGov	Government loan	1	-134.43263	104.43404	-1.29	0.1980
InvPortfolio	Portfolio loan	1	-144.43764	12.10717	-11.93	<.0001
Jumbo	Jumbo loan	1	119.18387	17.40217	6.85	<.0001
ApprovalRateHomePurch_06_07	Home mortgage approval rate (%), 2006-07	1	1.28579	0.39403	3.26	0.0011
MrtgOrigMedAmt_thou	Median home purchase mortgage amount, 2006-07 avg. ($1,000s)	1	0.36618	0.05878	6.23	<.0001
Unemp	Unemployment rate, Jan 08	1	-22.67369	3.21693	-7.05	<.0001
Unemp_chg_pct	Pct change in unemp. rate, Jan-Dec 08	1	-0.70904	0.19367	-3.66	0.0003
Hpi	House price index, 2008Q1	1	0.01398	0.07735	0.18	0.8566
Hpi_chg_pct	Pct change in house price index, 2008Q1-2008Q4	1	-5.32832	0.59196	-9.00	<.0001
LTV	Loan-to-value ratio	1	-1.20298	0.23364	-5.15	<.0001
LTVnot80	Dummy for LTV not = 80	1	-82.24412	10.92365	-7.53	<.0001

Percent Reduction in Monthly Payment Amount (NFMC Only): Entered Counseling

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	31	2609403	84174	201.54	<.0001
Error	25254	10547381	417.65190		
Corrected Total	25285	13156784			

Root MSE	20.43653	R-Square	0.1983
Dependent Mean	18.87092	Adj R-Sq	0.1973
Coeff Var	108.29644		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	95% Confidence Limits	
Intercept	Intercept	1	-13.56951	2.62870	-5.16	<.0001	-18.72192	-8.41710
Entered_counseling	Entered counseling prior to loan modification	1	12.69675	0.26902	47.20	<.0001	12.16946	13.22404
Black	Black borrower	1	1.45156	0.34368	4.22	<.0001	0.77793	2.12519
Asian	Asian/PI borrower	1	0.56802	0.76081	0.75	0.4553	-0.92322	2.05925
OthRace	Other race borrower	1	-0.62079	0.65580	-0.95	0.3438	-1.90619	0.66461
Hispanic	Hispanic borrower	1	1.06897	0.36997	2.89	0.0039	0.34380	1.79414
income_thou	Income in $1,000s	1	-0.01216	0.00362	-3.36	0.0008	-0.01926	-0.00506
OriginalLoanAmt_thou	Original Loan Amount in $1,000s	1	0.00742	0.00146	5.09	<.0001	0.00456	0.01027
year03	Loan originated 2003	1	-0.70997	0.97184	-0.73	0.4651	-2.61483	1.19489
year04	Loan originated 2004	1	-0.17485	0.91132	-0.19	0.8479	-1.96108	1.61138
year05	Loan originated 2005	1	0.19262	0.84234	0.23	0.8191	-1.45841	1.84364
year06	Loan originated 2006	1	2.55132	0.81951	3.11	0.0019	0.94504	4.15761
year07	Loan originated 2007	1	4.74069	0.83031	5.71	<.0001	3.11324	6.36814
year08	Loan originated 2008	1	4.19846	2.39701	1.75	0.0799	-0.49983	8.89674

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	95% Confidence Limits	
FICOOrg	FICO/Credit Score – Original	1	0.03296	0.00236	13.98	<.0001	0.02834	0.03758
CurrentIntRate	Current Interest Rate	1	0.57754	0.10010	5.77	<.0001	0.38133	0.77375
MrtGrdBC	Grade B/C mortgage	1	13.53464	0.36326	37.26	<.0001	12.82263	14.24666
IntTypeARM	ARM loan	1	5.06186	0.35071	14.43	<.0001	4.37445	5.74928
IntTypeOth	Other interest type loan	1	5.34721	1.43571	3.72	0.0002	2.53314	8.16129
OptionARM	Option ARM loan	1	-5.32029	0.47860	-11.12	<.0001	-6.25837	-4.38221
InvAgency	Agency loan	1	-0.10709	0.40183	-0.27	0.7898	-0.89470	0.68052
InvGov	Government loan	1	-5.35931	3.54784	-1.51	0.1309	-12.31329	1.59467
InvPortfolio	Portfolio loan	1	-0.84740	0.41131	-2.06	0.0394	-1.65359	-0.04122
Jumbo	Jumbo loan	1	-1.21662	0.59119	-2.06	0.0396	-2.37538	-0.05786
ApprovalRateHomePurch_06_07	Home mortgage approval rate (%), 2006-07	1	-0.01070	0.01339	-0.80	0.4242	-0.03694	0.01554
MrtgOrigMedAmt_thou	Median home purchase mortgage amount, 2006-07 avg. ($1,000s)	1	0.00083755	0.00200	0.42	0.6749	-0.00308	0.00475
Unemp	Unemployment rate, Jan 08	1	-0.09002	0.10929	-0.82	0.4101	-0.30422	0.12419
Unemp_chg_pct	Pct change in unemp. rate, Jan-Dec 08	1	-0.00507	0.00658	-0.77	0.4412	-0.01796	0.00783
Hpi	House price index, 2008Q1	1	-0.00234	0.00263	-0.89	0.3734	-0.00749	0.00281
Hpi_chg_pct	Pct change in house price index, 2008Q1-2008Q4	1	-0.13617	0.02011	-6.77	<.0001	-0.17558	-0.09675
LTV	Loan-to-value ratio	1	-0.08327	0.00794	-10.49	<.0001	-0.09883	-0.06772
LTVnot80	Dummy for LTV not = 80	1	-2.39420	0.37110	-6.45	<.0001	-3.12157	-1.66682

Appendix G: Parameter Estimates for OLS Regression Models of Reduction in Monthly Payment for Loan Modifications that Cured a Serious Delinquency or Foreclosure

Amount Reduction (in $000s) for Loan Modifications for Round 1 Clients that Cured a Serious Delinquency or Foreclosure

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	28	2529.22818	90.32958	239.10	<.0001
Error	9101	3438.27389	0.37779		
Corrected Total	9129	5967.50207			

Root MSE	0.61465	R-Square	0.4238
Dependent Mean	0.50281	Adj R-Sq	0.4221
Coeff Var	122.24345		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-0.82551	0.09542	-8.65	<.0001
Post_counseling_mod	Post-counseling mod	1	0.17093	0.01716	9.96	<.0001
income_thou	Household/borrower income ($ thous.)	1	-0.00070670	0.00013896	-5.09	<.0001
Black	Black borrower	1	0.07987	0.01706	4.68	<.0001
Asian	Asian/PI borrower	1	-0.03588	0.04655	-0.77	0.4408
OthRace	Other race borrower	1	0.07210	0.03325	2.17	0.0301
Hispanic	Hispanic borrower	1	0.04772	0.01995	2.39	0.0168
OriginalLoanAmt_thou	Original loan amount ($ thous.)	1	0.00289	0.00007956	36.39	<.0001
year03	Loan originated 2003	1	-0.00130	0.05090	-0.03	0.9796
year04	Loan originated 2004	1	0.03734	0.04603	0.81	0.4173
year05	Loan originated 2005	1	0.00580	0.04376	0.13	0.8945
year06	Loan originated 2006	1	-0.00056922	0.04283	-0.01	0.9894
year07	Loan originated 2007	1	0.09193	0.04360	2.11	0.0350
CurrentIntRate	Current Interest Rate	1	0.06382	0.00515	12.40	<.0001

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
MrtGrdBC	Grade B/C mortgage	1	0.25866	0.01878	13.77	<.0001
IntTypeARM	ARM loan	1	-0.03429	0.01714	-2.00	0.0455
IntTypeOth	Other interest type loan	1	0.21758	0.07041	3.09	0.0020
InvAgency	Agency loan	1	-0.05019	0.01989	-2.52	0.0116
InvGov	Government loan	1	-0.15907	0.17966	-0.89	0.3760
InvPortfolio	Portfolio loan	1	-0.10864	0.01969	-5.52	<.0001
Jumbo	Jumbo loan	1	-0.13841	0.03028	-4.57	<.0001
ApprovalRateHomePurch_06_07	Home mortgage approval rate (%), 2006-07	1	0.00224	0.00066808	3.35	0.0008
MrtgOrigMedAmt_thou	Mortgage Originations Median Amount Home Purchase - In Thousands	1	-9.61035E-7	0.00010222	-0.01	0.9925
Unemp	Monthly unemployment rate (%)	1	-0.00783	0.00351	-2.23	0.0257
Unemp_chg_pct	Pct change in unemp. rate since 1/08	1	0.00206	0.00024236	8.49	<.0001
Hpi	Quarterly housing price index	1	-0.00017975	0.00010603	-1.70	0.0901
Hpi_chg_pct	Pct change in HPI since 1/08	1	-0.00553	0.00103	-5.39	<.0001
LTV	Loan-to-value ratio	1	-0.00125	0.00041181	-3.04	0.0024
LTVnot80	Dummy for LTV not = 80	1	-0.04846	0.01922	-2.52	0.0117

Percent Reduction for Loan Modifications for Round 1 Clients that Cured a Serious Delinquency or Foreclosure

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	28	991272	35403	116.32	<.0001
Error	9101	2770044	304.36701		
Corrected Total	9129	3761316			

Root MSE	17.44612	R-Square	0.2635
Dependent Mean	20.62562	Adj R-Sq	0.2613
Coeff Var	84.58467		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-9.88185	2.70854	-3.65	0.0003
Post_counseling_mod	Post-counseling mod	1	6.27006	0.48702	12.87	<.0001
income_thou	Household/borrower income ($ thous.)	1	-0.01401	0.00394	-3.55	0.0004
Black	Black borrower	1	1.18689	0.48421	2.45	0.0143
Asian	Asian/PI borrower	1	0.49973	1.32123	0.38	0.7053
OthRace	Other race borrower	1	0.84448	0.94368	0.89	0.3709
Hispanic	Hispanic borrower	1	2.04022	0.56638	3.60	0.0003
OriginalLoanAmt_thou	Original loan amount ($ thous.)	1	0.02276	0.00226	10.08	<.0001
year03	Loan originated 2003	1	-0.49296	1.44464	-0.34	0.7329
year04	Loan originated 2004	1	1.19997	1.30652	0.92	0.3584
year05	Loan originated 2005	1	2.35480	1.24220	1.90	0.0580
year06	Loan originated 2006	1	3.41145	1.21567	2.81	0.0050
year07	Loan originated 2007	1	6.52672	1.23762	5.27	<.0001
CurrentIntRate	Current Interest Rate	1	2.05969	0.14608	14.10	<.0001

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
MrtGrdBC	Grade B/C mortgage	1	8.07498	0.53312	15.15	<.0001
IntTypeARM	ARM loan	1	2.80411	0.48648	5.76	<.0001
IntTypeOth	Other interest type loan	1	7.00157	1.99864	3.50	0.0005
InvAgency	Agency loan	1	-0.49080	0.56461	-0.87	0.3847
InvGov	Government loan	1	-5.38743	5.09944	-1.06	0.2908
InvPortfolio	Portfolio loan	1	4.22899	0.55898	7.57	<.0001
Jumbo	Jumbo loan	1	-3.36852	0.85958	-3.92	<.0001
ApprovalRateHomePurch_06_07	Home mortgage approval rate (%), 2006-07	1	0.03245	0.01896	1.71	0.0870
MrtgOrigMedAmt_thou	Mortgage Originations Median Amount Home Purchase - In Thousands	1	-0.00533	0.00290	-1.84	0.0662
Unemp	Monthly unemployment rate (%)	1	0.16282	0.09964	1.63	0.1023
Unemp_chg_pct	Pct change in unemp. rate since 1/08	1	0.07782	0.00688	11.31	<.0001
Hpi	Quarterly housing price index	1	-0.00232	0.00301	-0.77	0.4404
Hpi_chg_pct	Pct change in HPI since 1/08	1	-0.24011	0.02916	-8.23	<.0001
LTV	Loan-to-value ratio	1	-0.09114	0.01169	-7.80	<.0001
LTVnot80	Dummy for LTV not = 80	1	-2.23138	0.54566	-4.09	<.0001

Amount Reduction (in $000s) for Loan Modifications for Round 1 Clients that Cured a Serious Delinquency or Foreclosure: Counseling Levels

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	31	2571.51521	82.95210	222.23	<.0001
Error	9098	3395.98686	0.37327		
Corrected Total	9129	5967.50207			

Root MSE	0.61096	R-Square	0.4309
Dependent Mean	0.50281	Adj R-Sq	0.4290
Coeff Var	121.50942		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-0.85845	0.09491	-9.05	<.0001
level_1_intk	Level 1	1	0.08787	0.01969	4.46	<.0001
level_2_intk	Level 2	1	0.22956	0.02195	10.46	<.0001
level_3_intk	Level 3	1	0.27043	0.02066	13.09	<.0001
counseling_hours	Total individual foreclosure counseling hours received	1	-0.00604	0.00141	-4.28	<.0001
income_thou	Household/borrower income ($ thous.)	1	-0.00071276	0.00013818	-5.16	<.0001
Black	Black borrower	1	0.05907	0.01709	3.46	0.0005
Asian	Asian/PI borrower	1	-0.04046	0.04627	-0.87	0.3819
OthRace	Other race borrower	1	0.08185	0.03306	2.48	0.0133
Hispanic	Hispanic borrower	1	0.03381	0.01989	1.70	0.0892
OriginalLoanAmt_thou	Original loan amount ($ thous.)	1	0.00289	0.00007909	36.58	<.0001
year03	Loan originated 2003	1	0.00507	0.05060	0.10	0.9202
year04	Loan originated 2004	1	0.03481	0.04576	0.76	0.4468
year05	Loan originated 2005	1	0.00560	0.04351	0.13	0.8975

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
year06	Loan originated 2006	1	-0.00153	0.04258	-0.04	0.9713
year07	Loan originated 2007	1	0.09170	0.04334	2.12	0.0344
CurrentIntRate	Current Interest Rate	1	0.06317	0.00512	12.34	<.0001
MrtGrdBC	Grade B/C mortgage	1	0.25530	0.01867	13.67	<.0001
IntTypeARM	ARM loan	1	-0.03745	0.01704	-2.20	0.0280
IntTypeOth	Other interest type loan	1	0.20142	0.07001	2.88	0.0040
InvAgency	Agency loan	1	-0.04349	0.01979	-2.20	0.0280
InvGov	Government loan	1	-0.15082	0.17859	-0.84	0.3984
InvPortfolio	Portfolio loan	1	-0.10414	0.01958	-5.32	<.0001
Jumbo	Jumbo loan	1	-0.13914	0.03012	-4.62	<.0001
ApprovalRateHomePurch_06_07	Home mortgage approval rate (%), 2006-07	1	0.00231	0.00066437	3.47	0.0005
MrtgOrigMedAmt_thou	Mortgage Originations Median Amount Home Purchase - In Thousands	1	0.00003077	0.00010168	0.30	0.7622
Unemp	Monthly unemployment rate (%)	1	-0.00515	0.00350	-1.47	0.1412
Unemp_chg_pct	Pct change in unemp. rate since 1/08	1	0.00201	0.00024114	8.32	<.0001
Hpi	Quarterly housing price index	1	-0.00014721	0.00010545	-1.40	0.1627
Hpi_chg_pct	Pct change in HPI since 1/08	1	-0.00572	0.00102	-5.59	<.0001
LTV	Loan-to-value ratio	1	-0.00122	0.00040940	-2.97	0.0029
LTVnot80	Dummy for LTV not = 80	1	-0.04449	0.01911	-2.33	0.0199

Percent Reduction for Loan Modifications for Round 1 Clients that Cured a Serious Delinquency or Foreclosure: Counseling Levels

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	31	1008602	32536	107.53	<.0001
Error	9098	2752714	302.56255		
Corrected Total	9129	3761316			

Root MSE	17.39433	R-Square	0.2682
Dependent Mean	20.62562	Adj R-Sq	0.2657
Coeff Var	84.33357		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-10.56327	2.70202	-3.91	<.0001
level_1_intk	Level 1	1	4.79129	0.56046	8.55	<.0001
level_2_intk	Level 2	1	7.48366	0.62484	11.98	<.0001
level_3_intk	Level 3	1	8.30178	0.58827	14.11	<.0001
counseling_hours	Total individual foreclosure counseling hours received	1	-0.16211	0.04020	-4.03	<.0001
income_thou	Household/borrower income ($ thous.)	1	-0.01425	0.00393	-3.62	0.0003
Black	Black borrower	1	0.79357	0.48646	1.63	0.1029
Asian	Asian/PI borrower	1	0.40961	1.31738	0.31	0.7559
OthRace	Other race borrower	1	1.02583	0.94133	1.09	0.2758
Hispanic	Hispanic borrower	1	1.78304	0.56629	3.15	0.0016
OriginalLoanAmt_thou	Original loan amount ($ thous.)	1	0.02277	0.00225	10.11	<.0001
year03	Loan originated 2003	1	-0.34519	1.44058	-0.24	0.8106
year04	Loan originated 2004	1	1.15885	1.30273	0.89	0.3737
year05	Loan originated 2005	1	2.37013	1.23864	1.91	0.0557

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
year06	Loan originated 2006	1	3.40853	1.21215	2.81	0.0049
year07	Loan originated 2007	1	6.52160	1.23399	5.28	<.0001
CurrentIntRate	Current Interest Rate	1	2.05072	0.14571	14.07	<.0001
MrtGrdBC	Grade B/C mortgage	1	8.01593	0.53169	15.08	<.0001
IntTypeARM	ARM loan	1	2.74587	0.48513	5.66	<.0001
IntTypeOth	Other interest type loan	1	6.69256	1.99324	3.36	0.0008
InvAgency	Agency loan	1	-0.36476	0.56330	-0.65	0.5173
InvGov	Government loan	1	-5.19894	5.08445	-1.02	0.3066
InvPortfolio	Portfolio loan	1	4.31392	0.55748	7.74	<.0001
Jumbo	Jumbo loan	1	-3.40802	0.85751	-3.97	<.0001
ApprovalRateHome Purch_06_07	Home mortgage approval rate (%), 2006-07	1	0.03334	0.01891	1.76	0.0780
MrtgOrigMedAmt_t hou	Mortgage Originations Median Amount Home Purchase - In Thousands	1	-0.00462	0.00289	-1.60	0.1103
Unemp	Monthly unemployment rate (%)	1	0.21683	0.09960	2.18	0.0295
Unemp_chg_pct	Pct change in unemp. rate since 1/08	1	0.07667	0.00687	11.17	<.0001
Hpi	Quarterly housing price index	1	-0.00168	0.00300	-0.56	0.5766
Hpi_chg_pct	Pct change in HPI since 1/08	1	-0.24363	0.02910	-8.37	<.0001
LTV	Loan-to-value ratio	1	-0.09051	0.01166	-7.77	<.0001
LTVnot80	Dummy for LTV not = 80	1	-2.14880	0.54416	-3.95	<.0001

Appendix H: Parameter Estimates for LOGIT Model of Likelihood of Redefault—Counseling Effect through Loan Modification

Likelihood of Redefault or Foreclosure: Round 1 Client Modification in $000s

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	28483.857	27344.719
SC	28493.020	27619.615
-2 Log L	28481.857	27284.719

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	1197.1379	29	<.0001
Score	1341.6211	29	<.0001
Wald	1270.1835	29	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept	1	-4.0239	0.2428	274.6486	<.0001
MoPmt_reduction_amt_	1	-0.2250	0.0310	52.7533	<.0001
Months_mod	1	0.1358	0.00412	1087.4386	<.0001
income_thou	1	0.000138	0.000332	0.1727	0.6777
Black	1	0.0991	0.0445	4.9591	0.0260
Asian	1	0.1296	0.1276	1.0315	0.3098
OthRace	1	0.0329	0.0887	0.1374	0.7109
Hispanic	1	-0.0179	0.0553	0.1047	0.7463
OriginalLoanAmt_thou	1	0.000979	0.000215	20.7347	<.0001
year03	1	-0.0417	0.1395	0.0893	0.7651
year04	1	0.1535	0.1212	1.6048	0.2052
year05	1	0.1339	0.1156	1.3419	0.2467
year06	1	0.3120	0.1129	7.6297	0.0057

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
year07	1	0.4295	0.1158	13.7622	0.0002
CurrentIntRate	1	-0.0174	0.0130	1.7792	0.1822
MrtGrdBC	1	0.0683	0.0500	1.8682	0.1717
IntTypeARM	1	-0.1100	0.0464	5.6141	0.0178
IntTypeOth	1	-0.00973	0.2165	0.0020	0.9641
InvAgency	1	-0.1554	0.0547	8.0622	0.0045
InvGov	1	0.1765	0.5213	0.1147	0.7349
InvPortfolio	1	-0.0913	0.0510	3.2030	0.0735
Jumbo	1	-0.1765	0.0820	4.6297	0.0314
ApprovalRateHomePurc	1	0.000222	0.00178	0.0157	0.9004
MrtgOrigMedAmt_thou	1	-0.00032	0.000282	1.2763	0.2586
Unemp	1	-0.00688	0.00905	0.5777	0.4472
Unemp_chg_pct	1	-0.00410	0.000671	37.3370	<.0001
Hpi	1	0.000321	0.000266	1.4472	0.2290
Hpi_chg_pct	1	-0.00611	0.00278	4.8476	0.0277
LTV	1	0.00331	0.000973	11.5924	0.0007
LTVnot80	1	0.2034	0.0544	13.9665	0.0002

Likelihood of Redefault or Foreclosure: Round 1 Client Modification as a Percent

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	28483.857	27142.812
SC	28493.020	27417.708
-2 Log L	28481.857	27082.812

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	1399.0450	29	<.0001
Score	1537.2130	29	<.0001
Wald	1452.2607	29	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-4.0431	0.2439	274.8485	<.0001
MoPmt_reduction_pct	1	-0.0159	0.000990	258.5553	<.0001
Months_mod	1	0.1328	0.00413	1033.5055	<.0001
income_thou	1	0.000025	0.000335	0.0054	0.9412
Black	1	0.1136	0.0444	6.5311	0.0106
Asian	1	0.1537	0.1276	1.4509	0.2284
OthRace	1	0.00622	0.0890	0.0049	0.9443
Hispanic	1	0.00554	0.0553	0.0101	0.9201
OriginalLoanAmt_thou	1	0.000779	0.000206	14.3440	0.0002
year03	1	-0.0472	0.1397	0.1143	0.7353
year04	1	0.1562	0.1214	1.6573	0.1980
year05	1	0.1654	0.1158	2.0402	0.1532
year06	1	0.3537	0.1131	9.7762	0.0018
year07	1	0.5172	0.1161	19.8456	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
CurrentIntRate	1	0.00144	0.0133	0.0118	0.9134
MrtGrdBC	1	0.1363	0.0503	7.3483	0.0067
IntTypeARM	1	-0.0633	0.0466	1.8417	0.1748
IntTypeOth	1	0.0437	0.2167	0.0407	0.8401
InvAgency	1	-0.1692	0.0545	9.6290	0.0019
InvGov	1	0.1184	0.5214	0.0515	0.8204
InvPortfolio	1	-0.0166	0.0511	0.1058	0.7450
Jumbo	1	-0.2344	0.0818	8.2157	0.0042
ApprovalRateHomePurc	1	0.000393	0.00178	0.0491	0.8247
MrtgOrigMedAmt_thou	1	-0.00031	0.000280	1.2611	0.2615
Unemp	1	-0.00234	0.00904	0.0673	0.7954
Unemp_chg_pct	1	-0.00345	0.000673	26.3069	<.0001
Hpi	1	0.000286	0.000267	1.1483	0.2839
Hpi_chg_pct	1	-0.00811	0.00277	8.5771	0.0034
LTV	1	0.00267	0.00101	6.9921	0.0082
LTVnot80	1	0.1819	0.0547	11.0805	0.0009

Appendix I: Parameter Estimates for LOGIT Model of Likelihood of Redefault—Counseling Effect through Loan Modification and Directly

Probability of Redefault or Foreclosure: Round 1 Modification in $000s

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	28483.857	27289.178
SC	28493.020	27573.236
-2 Log L	28481.857	27227.178

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	1254.6796	30	<.0001
Score	1407.1102	30	<.0001
Wald	1328.2072	30	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept	1	-3.7245	0.2444	232.1498	<.0001
MoPmt_reduction_amt_	1	-0.2019	0.0310	42.3085	<.0001
Months_mod	1	0.1322	0.00414	1018.0165	<.0001
Post_counseling_mod	1	-0.3314	0.0435	58.0887	<.0001
income_thou	1	-0.00040	0.000359	1.2105	0.2712
Black	1	0.1528	0.0450	11.5322	0.0007
Asian	1	0.1721	0.1278	1.8117	0.1783
OthRace	1	0.1166	0.0895	1.6982	0.1925
Hispanic	1	0.0419	0.0560	0.5601	0.4542
OriginalLoanAmt_thou	1	0.000938	0.000219	18.4142	<.0001
year03	1	-0.0413	0.1396	0.0876	0.7673
year04	1	0.0824	0.1217	0.4589	0.4981
year05	1	0.0613	0.1161	0.2788	0.5975

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
year06	1	0.2384	0.1134	4.4166	0.0356
year07	1	0.3714	0.1162	10.2252	0.0014
CurrentIntRate	1	-0.00405	0.0130	0.0975	0.7549
MrtGrdBC	1	0.0321	0.0502	0.4082	0.5229
IntTypeARM	1	-0.1302	0.0466	7.8096	0.0052
IntTypeOth	1	0.00191	0.2166	0.0001	0.9930
InvAgency	1	-0.1743	0.0547	10.1502	0.0014
InvGov	1	0.1831	0.5213	0.1234	0.7254
InvPortfolio	1	-0.1136	0.0511	4.9402	0.0262
Jumbo	1	-0.2329	0.0825	7.9629	0.0048
ApprovalRateHomePurc	1	0.000318	0.00178	0.0321	0.8579
MrtgOrigMedAmt_thou	1	-0.00003	0.000280	0.0114	0.9149
Unemp	1	-0.00877	0.00900	0.9498	0.3298
Unemp_chg_pct	1	-0.00320	0.000677	22.3265	<.0001
Hpi	1	-0.00025	0.000281	0.8213	0.3648
Hpi_chg_pct	1	-0.00649	0.00276	5.5310	0.0187
LTV	1	0.00303	0.000964	9.8888	0.0017
LTVnot80	1	0.1824	0.0545	11.1876	0.0008

Probability of Redefault or Foreclosure: Round 1 Client Modification as Percent

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	28483.857	27107.161
SC	28493.020	27391.220
-2 Log L	28481.857	27045.161

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	1436.6962	30	<.0001
Score	1582.1963	30	<.0001
Wald	1490.8324	30	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept	1	-3.8018	0.2457	239.4478	<.0001
MoPmt_reduction_pct	1	-0.0151	0.00100	227.8457	<.0001
Months_mod	1	0.1298	0.00416	974.7066	<.0001
Post_counseling_mod	1	-0.2689	0.0437	37.9313	<.0001
income_thou	1	-0.00041	0.000359	1.3233	0.2500
Black	1	0.1576	0.0450	12.2710	0.0005
Asian	1	0.1890	0.1278	2.1871	0.1392
OthRace	1	0.0793	0.0897	0.7819	0.3766
Hispanic	1	0.0545	0.0559	0.9497	0.3298
OriginalLoanAmt_thou	1	0.000767	0.000208	13.5817	0.0002
year03	1	-0.0467	0.1398	0.1118	0.7382
year04	1	0.0997	0.1218	0.6705	0.4129
year05	1	0.1055	0.1163	0.8232	0.3642

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
year06	1	0.2918	0.1136	6.5934	0.0102
year07	1	0.4671	0.1165	16.0820	<.0001
CurrentIntRate	1	0.0115	0.0132	0.7530	0.3855
MrtGrdBC	1	0.1035	0.0506	4.1922	0.0406
IntTypeARM	1	-0.0806	0.0468	2.9733	0.0846
IntTypeOth	1	0.0532	0.2168	0.0603	0.8060
InvAgency	1	-0.1864	0.0545	11.6755	0.0006
InvGov	1	0.1248	0.5213	0.0573	0.8108
InvPortfolio	1	-0.0384	0.0513	0.5606	0.4540
Jumbo	1	-0.2751	0.0822	11.1955	0.0008
ApprovalRateHomePurc	1	0.000499	0.00178	0.0788	0.7789
MrtgOrigMedAmt_thou	1	-0.00008	0.000279	0.0871	0.7679
Unemp	1	-0.00398	0.00900	0.1957	0.6582
Unemp_chg_pct	1	-0.00272	0.000679	16.0845	<.0001
Hpi	1	-0.00018	0.000281	0.4332	0.5104
Hpi_chg_pct	1	-0.00834	0.00276	9.1444	0.0025
LTV	1	0.00248	0.00100	6.1607	0.0131
LTVnot80	1	0.1644	0.0547	9.0203	0.0027

Appendix J: Parameter Estimates for LOGIT Model of Modifications that Result in a Foreclosure Cure—Seriously Delinquent and Foreclosed Loans

Probability of Round 1 Clients Receiving a Modification that Cures a Foreclosure or Serious Delinquency

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	49199.130	45254.599
SC	49208.424	45598.485
-2 Log L	49197.130	45180.599

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	F	Pr > ChiSq
Likelihood Ratio	4016.5310	36	<.0001
Score	3828.3823	36	<.0001
Wald	3474.6582	36	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept		-2.7016	0.2623	106.0616	<.0001
Entered_counseling		0.4259	0.0356	143.0368	<.0001
Months_fcl_dlq		0.1354	0.00492	758.5405	<.0001
Months_fcl_dlq_sq		-0.00281	0.000150	351.7125	<.0001
Delinqintk1		-0.2800	0.0441	40.2709	<.0001
Delinqintk2		-0.4744	0.0435	119.0592	<.0001
Delinqintk3		-0.6072	0.0479	160.9162	<.0001
Delinqintk4		-1.1975	0.0437	751.5672	<.0001
Black		-0.1732	0.0332	27.2512	<.0001
Asian		-0.2760	0.0915	9.1022	0.0026

Analysis of Maximum Likelihood Estimates					
Parameter	**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
OthRace		-0.1345	0.0655	4.2190	0.0400
Hispanic		-0.0769	0.0387	3.9473	0.0469
year03		-0.1398	0.1074	1.6943	0.1930
year04		-0.1068	0.0975	1.2018	0.2730
year05		-0.1139	0.0927	1.5085	0.2194
year06		-0.0425	0.0912	0.2170	0.6413
year07		-0.0535	0.0926	0.3344	0.5631
FICOOrg		-0.00050	0.000244	4.1264	0.0422
CurrentIntRate		-0.0186	0.0112	2.7655	0.0963
MrtGrdBC		0.1689	0.0374	20.3451	<.0001
IntTypeARM		-0.1222	0.0364	11.2603	0.0008
IntTypeOth		-0.0735	0.1268	0.3365	0.5619
OptionARM		0.2922	0.0482	36.7526	<.0001
InvAgency		0.0434	0.0402	1.1664	0.2801
InvGov		0.2736	0.4420	0.3832	0.5359
InvPortfolio		0.2390	0.0428	31.2289	<.0001
Jumbo		0.1987	0.0580	11.7461	0.0006
ApprovalRateHomePurc		0.00463	0.00134	12.0083	0.0005
MrtgOrigMedAmt_thou		-0.00056	0.000199	8.0345	0.0046
Unemp		0.0158	0.00699	5.0893	0.0241
Unemp_chg_pct		0.00847	0.000492	296.4313	<.0001
Hpi		0.000164	0.000211	0.6025	0.4376
Hpi_chg_pct		-0.00690	0.00196	12.3652	0.0004
LTV		-0.00074	0.000754	0.9725	0.3240
LTVnot80		0.0457	0.0384	1.4197	0.2335
OriginalLoanAmt_thou		-0.00044	0.000120	13.3070	0.0003
income_thou		-0.00186	0.000436	18.0820	<.0001

Probability of Round 1 Clients Receiving a Modification that Cures a Foreclosure or Serious Delinquency: Counseling Levels

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	49199.130	45251.698
SC	49208.424	45623.467
-2 Log L	49197.130	45171.698

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	F	Pr > ChiSq
Likelihood Ratio	4025.4314	39	<.0001
Score	3834.1825	39	<.0001
Wald	3478.6614	39	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	F	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept		-2.7075	0.2625	106.4036	<.0001
level_1_intk		0.3885	0.0409	90.1001	<.0001
level_2_intk		0.4710	0.0445	111.8326	<.0001
level_3_intk		0.4724	0.0424	123.9871	<.0001
counseling_hours		-0.00463	0.00267	3.0192	0.0823
Months_fcl_dlq		0.1352	0.00492	755.6589	<.0001
Months_fcl_dlq_sq		-0.00280	0.000150	350.3597	<.0001
Delinqintk1		-0.2767	0.0442	39.2662	<.0001
Delinqintk2		-0.4693	0.0435	116.1826	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	**F**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Delinqintk3		-0.6052	0.0479	159.6633	<.0001
Delinqintk4		-1.1965	0.0437	748.0547	<.0001
Black		-0.1844	0.0335	30.2859	<.0001
Asian		-0.2803	0.0915	9.3787	0.0022
OthRace		-0.1287	0.0656	3.8529	0.0497
Hispanic		-0.0829	0.0388	4.5596	0.0327
year03		-0.1434	0.1074	1.7823	0.1819
year04		-0.1144	0.0975	1.3775	0.2405
year05		-0.1208	0.0927	1.6965	0.1927
year06		-0.0497	0.0912	0.2970	0.5857
year07		-0.0608	0.0926	0.4314	0.5113
FICOOrg		-0.00051	0.000244	4.3735	0.0365
CurrentIntRate		-0.0186	0.0112	2.7526	0.0971
MrtGrdBC		0.1669	0.0375	19.8295	<.0001
IntTypeARM		-0.1213	0.0364	11.0829	0.0009
IntTypeOth		-0.0839	0.1269	0.4367	0.5087
OptionARM		0.2946	0.0482	37.3446	<.0001
InvAgency		0.0473	0.0402	1.3817	0.2398
InvGov		0.2525	0.4426	0.3256	0.5683
InvPortfolio		0.2411	0.0428	31.7852	<.0001
Jumbo		0.1968	0.0580	11.5198	0.0007
ApprovalRateHomePurc		0.00464	0.00134	12.0623	0.0005
MrtgOrigMedAmt_thou		-0.00055	0.000199	7.5967	0.0058
Unemp		0.0167	0.00699	5.7137	0.0168
Unemp_chg_pct		0.00845	0.000492	294.1348	<.0001
Hpi		0.000184	0.000211	0.7591	0.3836
Hpi_chg_pct		-0.00715	0.00196	13.2397	0.0003
LTV		-0.00070	0.000755	0.8661	0.3520

Analysis of Maximum Likelihood Estimates					
Parameter	**F**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
LTVnot80		0.0493	0.0384	1.6446	0.1997
OriginalLoanAmt_thou		-0.00044	0.000120	13.5176	0.0002
income_thou		-0.00185	0.000436	18.0514	<.0001

Appendix K: Calculations Used in Sustainability Analysis

Cumulative Redefault Rate Calculation

Probability of Recidivism for a Given Month After Mod Cure							
Mod Cure Received After Counseling							
1	2	3	4	5	6	7	8
0.010895	0.01854	0.029326	0.043118	0.058982	0.075193	0.089551	0.099882
No Counseling							
1	2	3	4	5	6	7	8
0.01666	0.02824	0.04441	0.06483	0.08794	0.11117	0.13143	0.14581

Share of Loans That Survive for a Given Number of Months After Mod Cure							
Mod Cure Received After Counseling							
1	2	3	4	5	6	7	8
99	97	94	90	85	78	71	64
Share of Loans That Survive for a Given Number of Months After Mod Cure							
1	2	3	4	5	6	7	8
98	96	91	85	78	69	60	51

Appendix L: Comparison of NFMC Sample and Population

	NFMC Loans by Subgroup		
	All NFMC Loans	NFMC Loans Matched to LPS Database	NFMC Loans with NFMC Reported Outcome
Counseling Units	960,042	192,624	180,419
% Client's Age			
Missing	3.3	2.2	4.8
Age 18 to 34	15.0	16.0	15.1
Age 35 to 44	29.7	30.9	29.8
Age 45 to 54	29.9	30.0	29.1
Age 55 to 64	16.1	15.5	15.2
Age 65 and above	6.0	5.4	6.0
Total	100.0	100.0	100.0

	NFMC Loans by Subgroup		
	All NFMC Loans	NFMC Loans Matched to LPS Database	NFMC Loans with NFMC Reported Outcome
Counseling Units	960,042	192,624	180,419
% Client's Income			
$0 - $20,000	22.4	19.1	25.3
$20,000 - $35,000	23.0	22.3	22.8
$35,000 - $50,000	20.7	21.2	19.9
$50,000 - $75,000	20.4	22.3	19.7
$75,000 - $100,000	8.7	9.5	8.3
$100,000 and above	4.8	5.5	4.0
Total	100.0	100.0	100.0

	NFMC Loans by Subgroup		
	All NFMC Loans	NFMC Loans Matched to LPS Database	NFMC Loans with NFMC Reported Outcome
Counseling Units	960,042	192,624	180,419
% Client's Gender			
Female	51.9	50.3	51.9
Male	48.1	49.7	48.1
Total	100.0	100.0	100.0

	NFMC Loans by Subgroup		
	All NFMC Loans	NFMC Loans Matched to LPS Database	NFMC Loans with NFMC Reported Outcome
Counseling Units	960,042	192,624	180,419
% Client's Race/Ethnicity			
Missing	3.5	3.6	4.4
Non-Hispanic White	40.6	40.3	43.7
Non-Hispanic Black	27.1	25.3	26.1
Hispanic	20.8	22.6	18.4
Non-Hispanic Asian/Pacific Isldr.	3.2	4.0	2.7
Non-Hispanic American Indian	0.3	0.3	0.4
Non-Hispanic Other or Multiple Race	4.5	4.0	4.5
Total	100.0	100.0	100.0

	NFMC Loans by Subgroup		
	All NFMC Loans	NFMC Loans Matched to LPS Database	NFMC Loans with NFMC Reported Outcome
Counseling Units	960,042	192,624	180,419
% Client's State			
AK	0.1	0.1	0.2
AL	0.7	0.6	1.0
AR	0.3	0.3	0.3
AZ	3.1	3.5	2.3
CA	17.0	20.7	13.2
CO	1.9	2.4	2.0
CT	1.0	1.1	0.7
DC	0.3	0.3	0.2
DE	0.4	0.4	0.6
FL	7.5	6.9	6.8
GA	4.0	4.0	5.4
GU	0.0	.	0.0
HI	0.2	0.1	0.3
IA	0.9	0.9	0.5
ID	0.2	0.3	0.4
IL	5.0	5.5	4.7
IN	1.3	1.3	1.3
KS	0.3	0.3	0.5
KY	1.1	0.6	1.2
LA	0.6	0.4	0.5
MA	2.4	2.3	2.0
MD	4.0	3.9	3.8
ME	0.2	0.2	0.2
MI	4.4	4.5	5.2
MN	3.4	1.4	3.6
MO	2.2	2.3	2.5
MP	0.0	.	.
MS	1.0	0.5	0.5
MT	0.3	0.1	0.2
NC	4.0	3.3	6.4
ND	0.0	0.0	0.1
NE	0.2	0.2	0.3
NH	0.2	0.2	0.2
NJ	1.8	2.0	2.2
NM	0.4	0.3	0.3
NV	1.6	2.4	2.1
NY	2.9	2.9	2.3
OH	6.6	5.4	5.3
OK	0.4	0.4	0.8
OR	0.7	0.9	0.7

	NFMC Loans by Subgroup		
	All NFMC Loans	NFMC Loans Matched to LPS Database	NFMC Loans with NFMC Reported Outcome
PA	4.1	4.4	5.6
PR	0.4	0.0	0.5
RI	0.6	0.8	0.2
SC	2.0	1.7	1.1
SD	0.2	0.2	0.5
TN	1.7	1.6	2.8
TX	3.4	3.6	3.4
UT	0.3	0.3	0.4
VA	1.9	2.0	1.8
VI	0.0	.	0.0
VT	0.1	0.0	0.1
WA	1.3	1.4	1.6
WI	1.1	1.2	1.2
WV	0.2	0.2	0.2
WY	0.0	0.0	0.1
Total	100.0	100.0	100.0

	NFMC Loans by Subgroup		
	All NFMC Loans	NFMC Loans Matched to LPS Database	NFMC Loans with NFMC Reported Outcome
Counseling Units	960,042	192,624	180,419
% Counseling level			
Level 1	63.7	51.8	57.2
Level 2	15.1	19.7	18.6
Level 3	21.2	28.5	24.2
Total	100.0	100.0	100.0

	NFMC Loans by Subgroup		
	All NFMC Loans	NFMC Loans Matched to LPS Database	NFMC Loans with NFMC Reported Outcome
Counseling Units	960,042	192,624	180,419
% Counseling Intake Month			
Jan-08	0.4	0.3	0.5
Feb-08	0.4	0.4	0.5
Mar-08	2.2	1.8	2.9
Apr-08	2.5	2.2	3.5
May-08	2.6	2.3	3.3

	NFMC Loans by Subgroup		
	All NFMC Loans	NFMC Loans Matched to LPS Database	NFMC Loans with NFMC Reported Outcome
Jun-08	3.0	2.8	2.8
Jul-08	4.0	4.0	4.1
Aug-08	4.1	3.9	4.6
Sep-08	4.0	4.3	4.2
Oct-08	5.2	5.5	5.4
Nov-08	4.4	4.9	4.5
Dec-08	4.7	5.4	5.0
Jan-09	5.5	6.0	6.9
Feb-09	5.7	6.7	6.8
Mar-09	8.0	9.6	8.2
Apr-09	7.3	9.5	6.1
May-09	6.4	7.1	5.1
Jun-09	6.4	5.4	5.4
Jul-09	6.5	5.5	4.7
Aug-09	5.4	4.6	4.2
Sep-09	4.0	3.0	4.1
Oct-09	3.3	2.3	3.1
Nov-09	2.6	1.7	2.7
Dec-09	1.5	0.9	1.3
Total	100.0	100.0	100.0

	NFMC Loans by Subgroup		
	All NFMC Loans	NFMC Loans Matched to LPS Database	NFMC Loans with NFMC Reported Outcome
Counseling Units	960,042	192,624	180,419
% Counseling Mode			
Missing	3.3	3.1	2.2
phone	45.9	43.5	48.0
face to face	44.6	48.3	38.8
Internet	2.0	1.5	4.3
video conference	0.0	0.0	0.0
Other	4.3	3.6	6.7
Total	100.0	100.0	100.0

	NFMC Loans by Subgroup		
	All NFMC Loans	NFMC Loans Matched to LPS Database	NFMC Loans with NFMC Reported Outcome
Counseling Units	960,042	192,624	180,419
% Monthly PITI			
Missing	2.2	1.8	2.1
Less than $500	5.5	2.9	6.6
$500 to $1,000	24.3	21.4	26.5
$1,000 to $1,500	24.6	25.5	24.6
$1,500 to $2,000	17.2	18.8	16.4
More than $2,000	26.3	29.6	23.8
Total	100.0	100.0	100.0

	NFMC Loans by Subgroup		
	All NFMC Loans	NFMC Loans Matched to LPS Database	NFMC Loans with NFMC Reported Outcome
Counseling Units	960,042	192,624	180,419
% Type of First Loan Product at Intake			
Fixed rate currently under 8%	47.6	54.3	47.2
Fixed rate current 8% or greater	13.0	8.8	13.8
ARM current under 8%	17.7	19.0	14.2
ARM current at 8% or greater	13.5	11.3	13.6
Other	8.3	6.6	11.3
Total	100.0	100.0	100.0