Accessibility, Transaction Costs and the Take-up of Mortgage Assistance for Distressed Homeowners

Abstract

Program participation is a necessary but not sufficient condition for the success of housing policies such as mortgage assistance for distressed homeowners. Low rates of take-up of available assistance among eligible homeowners have hampered the potential success of programs such as the U.S. Treasury's Hardest Hit Fund initiative. This paper investigates the effect of accessibility and related transaction costs, measured in terms of geographic access to application intake agencies, on the likelihood of application completion for homeowners who begin the assistance application process. Using data from a large-scale mortgage assistance program in Ohio, the work is motivated by the observation that a relatively small percentage of homeowners who register for assistance submit a completed application. Consistent with the literature on access and transaction costs, we find that proximity to intake agencies increases the odds of application submission by roughly one percent per mile of proximity. The results suggest that further emphasis should be given to the interactions at the front lines of mortgage assistance programs.

Highlights

- Few homeowners eligible for mortgage assistance follow-through with the application process
- We model the take-up of mortgage assistance among eligible, distressed homeowners
- We examine whether accessibility and transaction costs affect take-up of assistance
- Proximity to counseling agencies increases the odds of complete application submission and thus take-up of mortgage assistance.

Keywords

Mortgage assistance; Accessibility; Transaction costs; Take-up; Foreclosure; Mortgage modification; Housing policy

Classification Codes

R210, R51, D14, D83,H120, I38

Introduction

The unprecedented housing crisis that began in 2007 left millions of American homeowners with unsustainable mortgage payments at increasing risk of delinquency and foreclosure. As part of a large-scale federal response to the crisis, the Hardest Hit Fund (HHF) was created in early 2010 by the U.S. Department of Treasury as a program under the Troubled Asset Relief Program (TARP). Under HHF, $7.6 billion of funding was set aside from TARP for the purpose of providing funding to 18 states that were most severely affected by the foreclosure crisis, with intervention programs to be designed and implemented by the state Housing Finance Agencies (HFAs). Like other federal foreclosure initiatives, the initial impact of the national HHF program has been limited due to lower than expected take-up, a fact noted by both federal auditors[1] and the popular press.[2]

Empirical analyses of the low take-up rates of mortgage assistance programs to date have focused on variations in program requirements, servicer structure, capacity and incentives, and mortgage financing structures (GAO 2011a; Agarwal et al. 2010; 2011; COP 2010; Immergluck 2011). However, drawing on the literatures of social assistance take-up, transaction costs, and accessibility (Heckman and Smith 2004; Moffitt 1983; Currie 2006), the homeowner's persistence through the program may also affect the take-up of mortgage assistance. Potentially-eligible homeowners may lack information about the program, its offered benefits, or the probability of receiving assistance from the program. While generic general information on the program may be available, because of the complexity of eligibility requirements, benefit levels, and application procedures, potential beneficiaries may not accurately interpret the information or their probability of being approved for assistance (e.g., Bucks and Pence 2008). Further, the expected effort required on the part of the applicant, such as the time costs of completing required paperwork, may outweigh the predicted benefits, weighted by the perceived probability of receiving those benefits. While informational frictions and transaction costs may be difficult to measure directly, both may be proxied by the accessibility of intake agencies, which are often required to assist homeowners with the application process. Specifically, as distance to intake agencies increase, transaction costs associated with the application process increase, and opportunities for information sharing through repeated interactions decrease, thereby reducing the probability of application completion.

[1] See SIGTARP, "Factors Affecting the Implementation of the Hardest Hit Fund," available: http://www.sigtarp.gov/Audit%20Reports/SIGTARP_HHF_Audit.pdf

[2] See, for example, *Los Angeles Times*, "Audit Faults Execution of Program to Aid Homeowners," April 12, 2012, available: http://articles.latimes.com/2012/apr/12/business/la-fi-mortgage-hardest-hit-20120412

In this paper, we investigate the relationship between accessibility and mortgage assistance take-up using unique data from Ohio's HHF program, referred to as Restoring Stability: A Save the Dream Ohio Initiative, (hereafter "Restoring Stability"). The Ohio program was allocated $570.4 million to be used over five years and was intended to serve up to 63,000 households, targeting assistance to homeowners facing specified financial hardships such as unemployment, decreased wages or increased medical expenses. In the first 18 months of the Restoring Stability program, more than 50,000 homeowners registered for mortgage assistance ("registrants"), while only roughly 10,000 submitted a complete application that entered the underwriting process for funding consideration ("applicants"). While some of registrants drop out of the application process because they are not eligible for the program, many registrants who do meet initial eligibility requirements do not make it through the process of submitting an application. Using program data on over 30,000 eligible registrants for Restoring Stability assistance, this paper evaluates the relationship between variation in homeowner geographical proximity to intake agencies and the take-up of mortgage assistance. Distance is found to be an impediment to completing applications, suggesting that transaction costs and informational barriers may prevent homeowners from receiving mortgage assistance. To the extent that these implementation barriers can be addressed through policy design, mortgage assistance programs may achieve greater success. This paper contributes not only to the broader literature examining the impediments to program take-up but also more specifically to the housing policy and mortgage assistance literature.

The remainder of the paper is organized as follows. First, a brief review of federal mortgage assistance programs and existing analyses is provided, followed by discussion of literature on take-up rates, transaction costs and geographical access that contributes to an understanding of barriers to mortgage assistance take-up. Next, the data and empirical strategy are described, including a short description of the Restoring Stability program and its application process. Finally, results are presented, followed by conclusions and implications for housing policy.

Mortgage Assistance Programs & Take-Up

A variety of new public and private mortgage assistance programs have been implemented since 2008 in an attempt to stem the tide of foreclosures. The programs have been motivated by the idea that foreclosure assistance potentially not only directly benefits recipients, but it can also protect the value of neighboring properties, which can be affected by foreclosures (Biswas, 2012; Schuetz et al. 2008). At the beginning of 2012, roughly two million home mortgages were in the process of

foreclosure, with more than four million mortgages foreclosed upon between 2008 through 2011 (Harvard Joint Center for Housing Studies, 2012). Proprietary and public mortgage modification programs are intended to renegotiate the terms (interest rate, duration) or principal balance of the mortgage for a borrower in distress, thereby reducing the probability of foreclosure, which is costly for both homeowners and lenders. For example, from the beginning of 2008 through the second quarter of 2012, the Office of the Comptroller of the Currency (OCC) reported more than 2.7 million mortgages had been modified by mortgage servicers (OCC 2012).

The largest federal initiatives include those implemented under the U.S. Treasury's Troubled Asset Relief Program (TARP), beginning in 2009 with the Home Affordable Mortgage Program (HAMP) and the Home Affordable Refinancing Program (HARP) and the Hardest Hit Fund (HHF) program in 2010. As a proportion of total modifications, federal programs have had an impact. Roughly half of the modifications reported by the OCC from 2009-2012 were modified under the federal HAMP program, with the remainder modified through proprietary programs (OCC 2012). However, the actual number of homeowners receiving assistance as of 2012 is well below initial program intent—just over 1.2 million homeowners received permanent modification under the federal HAMP program through December, 2012 (U.S. Treasury 2013), compared with 4 million projected (U.S. GAO 2011a). The state administered Hardest Hit Fund (HHF) program has also come under criticism for low participation, with only three percent of total funds expended and seven percent of projected total homeowners assisted at the end of the first year of the five year initiative (SIGTARP 2012).

When considering modification of a mortgage, servicers face tradeoffs between (1) the likelihood that that a borrower will become current or maintain payments without a costly modification; (2) the likelihood of becoming current with a modification, as opposed to default (perhaps more costly); and (3) the likelihood that a borrower would default even with a modification (Adelino et al. 2009; Eggert 2007). The decision to modify a mortgage is thus complex, relying on incomplete information. Several studies investigating the low take-up rates of recent mortgage assistance programs have identified a variety of complex factors that contribute to the problem, including the market structure of mortgages and securitization (Agarwal et al. 2011), lack of incentives and authority for servicers (GAO 2011a; Agarwal et al. 2010; 2011; COP 2010), narrow eligibility requirements (COP 2010), and lack of attention to second liens or underwater mortgages (COP 2010; Immergluck 2011). Securing servicer buy-in to participate in mortgage assistant programs, including HHF, has been a significant implementation challenge, particularly for more aggressive mortgage modification such as HFF that include principal reduction (Immergluck 2010;2011).

Observed loan and borrower risk characteristics, such as loan to value ratios and credit scores, predict a significant portion of the variation in servicer decisions to modify mortgages (Been et al. 2011). However, studies find significant variations in modification rates between servicers even after accounting for borrower and loan characteristics, suggesting that some of the factors preventing take-up may have to do with the implementation of the process by the servicers (Adelino et al. 2009; Agarwal et al. 2010). Traditional servicing models—highly programmed with limited discretion—were not designed to accommodate time intensive, complex, information rich decisions involved in mortgage modifications (Immergluck 2011). Borrowers seeking modifications have reported difficulties with the process, including lost documentation, difficulty contacting the servicer, and lack of sufficient information (GAO 2011b). Participation rates in mortgage assistance programs are thus also a function of the extent to which homeowners persist throughout the process.

The take-up of mortgage assistance programs can thus be thought of as a process of awareness, eligibility, and persistence (Heckman and Smith 2004). First, the homeowner must be aware that assistance exists and decide that it is worth looking into further, based on the perceived probability of receiving assistance. Second, the homeowner must not only meet eligibility requirements but must be able to provide the appropriate documentation in a timely manner to demonstrate eligibility. Finally, the homeowner must persist through the application process even in the presence of delays and challenges. Problems achieving ideal take-up rates may reflect the existence of barriers to participation by targeted beneficiaries at each of these stages (Heckman and Smith 2004).

Barriers to program take-up have been the subject of ongoing research across several disciplines. Economists, in particular, have been attracted to the subject because it is, at its core, an issue of individual decision-making regarding consumption of services. A traditional economic rationale would posit that all utility-maximizing individuals who are eligible for benefits would claim them, as long as the positive impact of the assistance outweighs the costs (Moffitt 1983). Since most public welfare programs are nominally free to beneficiaries, one would expect nearly full take-up rates for most programs. That this is not the case in many instances is plainly observable, so a stream a research has developed that seeks to understand and model the choices and decision-making processes of individuals concerning public assistance. Currie (2006) summarizes the existing literature on take-up and identifies three commonly cited factors in the determination of take-up rates for assistance programs: stigma, transaction costs of participation, and lack of knowledge.

Currie (2006) suggests that transaction costs likely outweigh stigma costs in most modern public assistance programs. In the case of nominally-free assistance programs, transaction costs arise from the

time and energy needed to learn about, apply for, and collect potential benefits. Many welfare programs have long, complex application procedures designed to effectively screen out ineligible beneficiaries. This screening process works both directly, by collecting information that determines eligibility, and indirectly, by discouraging applications from non-needy individuals. The extent to which these transaction costs screen out ineligible beneficiaries would be efficiency enhancing,[3] while programmatic efficiency would be decreased if eligible clients are scared away from benefits due to the costs of applying. This impact would depend, of course, on the elasticity of demand for the assistance.

For mortgage assistance programs, transaction costs associated with an application process could serve as a barrier to discourage less motivated applicants who would be less likely to maintain their mortgage payments if modified. This is a significant issue, as 40 to 60 percent of mortgages re-default within one year after modification (Adelino et al. 2009; Quercia et al. 2009; OCC 2012). Research has found that borrowers receiving HAMP modifications are significantly less likely to re-default on their mortgages than borrowers receiving proprietary modifications (Been et al. 2011). While part of this may be due to the terms and characteristics of HAMP modifications, differences persist even after controlling for observable characteristics. One hypothesis is that the HAMP application process, with more documentation and eligibility requirements than proprietary modifications, may actually weed out homeowners less likely to succeed with modifications. Costly screening may thus be a factor in reducing strategic re-default (Mayer, Morrison, Piskorski, Gupta 2011).

Despite potential benefits, there are concerns about the allocative efficiency of transaction costs as screening mechanisms to discourage distressed homeowners. Previous research suggests that the costs of complex application procedures fall disproportionately on persons of low socio-economic status who are often the very population that the programs are intended to help (Currie and Gahvari 2008). Further, research has found that subprime mortgage borrowers—more likely to be facing foreclosure with fewer options—have less knowledge about mortgage terms and programs, and are less likely to engage in search behaviors (Bucks and Pence 2008). Thus, the constraints and biases that led such borrowers to receive suboptimal mortgages in the first place—lack of information and present oriented preferences-- may also prevent them from persisting through to receive mortgage assistance.

Given the complexity of the participation process and homeowner constraints, nonprofit housing counseling agencies frequently serve as intermediaries to assist distressed homeowners. For example, in December of 2007, the U.S. Congress launched the National Foreclosure Mitigation Counseling program, appropriating $620 million (through 2012) for foreclosure mitigation services

[3] In addition to economic efficiency, screening out ineligible recipients may help curb political backlash.

provided by HUD-approved nonprofit counseling agencies (NeighborWorks 2012). Homeowners applying for HAMP modifications or other proprietary mortgage assistance programs contact the nonprofit agencies to assist them through the process, resulting in higher probability of completing the modification process and potentially lower rates of re-default (Collins, and Schmeiser 2013; Mayer et al. 2011). While the NFMC is a voluntary program, other mortgage assistance initiatives, such as the Hardest Hit Fund (HHF), have relied upon nonprofit organizations to provide required intake and screening assistance.

Theoretically, all distressed homeowners have the option of working with a housing counseling agency; however, physical access to such assistance varies based on geography. Physical access to public services has been a topic of much research, especially with regard to public health programs (e.g. Andersen 1995; Aday and Andersen 1974; Allard et al. 2003), as transaction costs (e.g. transportation) increase with distance, thereby impeding take-up. Further, opportunities for repeated interactions decrease with distance, thereby decreasing opportunities for information sharing. Such information sharing may be particularly important for homeowners in distress, given the likely complexity of their financial situations and the complexity of the assistance process. While technology (online or telephone interactions) may reduce transportation costs facing participants, such interactions have been found to be less effective at increasing take-up rates in other program areas (Ebenstein and Strange 2010). Distance to assistance providers may thus serve as a proxy for increased transaction costs and reduced information sharing for potential beneficiaries.

Program Background and Data

To investigate the impact of accessibility and related transaction costs on the take-up of foreclosure mitigation assistance, this study utilizes a rich set of administrative data from Ohio's Hardest Hit Fund program ("Restoring Stability"). The program provides up to $25,000 in assistance per homeowner through a variety of different payment structures.[4] Of the 54,464 homeowners who began the application process between September, 2010 and March, 2012 ("registrants"), only 10,188 submitted a complete application ("applicants"). For this analysis, we limit the sample to 33,368 homeowners who appeared eligible upon registration, and evaluate characteristics associated with persistence through the application process, including variation in access and transaction costs.

The application process for receiving assistance through Restoring Stability is the same regardless of the specific form of assistance being sought. Homeowners begin by registering online,

[4] See Appendix A for a more detailed description of program benefits.

over the phone, or in-person at a participating housing counseling agency, although the vast majority of individuals have registered online. The typical registrant takes between 30 and 90 minutes to complete the registration form, including basic information on the nature of their hardship. An initial eligibility check is automatically performed, which screens out ineligible registrants who do not meet the income, loan value, and hardship requirements. Those appearing eligible are automatically assigned to a HUD-certified housing counseling agency, and a counselor is required to make contact within ten days to complete the formal application (i.e., moving the homeowner from "registrant" status to "applicant" status). Homeowners are usually assigned to agencies based on most proximate geographical location.

Beyond the intake function of helping homeowners complete the online forms, the housing counselor is additionally responsible for the verification of the required paperwork that homeowners must submit with their application. Required documentation needed for the application includes pay stubs, bank account statements, loan documents, credit card bills, and proof of hardship. Proof of hardship can take the form of documentation from unemployment insurance payments, pay stubs documenting lost wage or hours, or a notarized letter documenting increased medical costs, divorce, or disability. Homeowners are not required to meet with counselors in person, but they must transmit a significant amount of required documents via fax or mail if they do not visit an agency.

As the focus of this analysis is the drop-off in participation in Restoring Stability between the registration and application stages of the intake process, Table 1 presents descriptive summaries for both groups. Differences between the groups may reveal evidence of systematic barriers to progress through the application process. Statistically significant differences between registrants and applicants are revealed on all variables except education level, although the differences could be considered quite small in a practical sense for a number of variables. Applicants are more likely to be African American and to have received a foreclosure notice on their home. Applicants also have a lower average salary by roughly $3,500 per year and lower monthly mortgage payments. One striking difference between the two groups is in the proportion of unemployed individuals, with applicants being unemployed over 79 percent of the time while 69 percent of registrants reported unemployment. One possible explanation for this difference would be that unemployed individuals have an easier time establishing an eligible hardship and thus are more likely to complete the application process. Unemployed homeowners were also the target of Restoring Stability's mortgage payment assistance program, and perhaps the state's early emphasis on this particular form of assistance led to more effort in assisting unemployed registrants through the application process compared to registrants seeking another form of assistance.

Other characteristics of the registrant population are worth noting. Seventy percent of registrants reported being delinquent on their mortgage payments, while roughly 30 percent had received a foreclosure notice at the time of registration. The relatively few registrants who had received foreclosure notices suggests that registrants were, on average, fairly recently experiencing mortgage distress. More than 80 percent of registrants reported that either unemployment or some other reduction of income was the primary hardship resulting in mortgage distress, while less than two percent of registrants reported no hardship. The average annual income of $23,336 and monthly mortgage payment of $943 corresponds with a mean monthly payment-to-income ratio of approximately 50 percent, well above standard affordability guidelines. The descriptive statistics show an overall picture of a population of registrants that matches well the targeted population of homeowners facing the threat of foreclosure.

[Insert Table 1 about here]

Some of the differences between registrants and applicants may be due to ineligible registrants skewing the averages of the registrant pool. This would partially explain higher average incomes and monthly mortgage payments compared to the applicant population. Screening out automatically-disqualified registrants leaves a population of over 33,300 homeowners. Descriptive statistics for this group are presented in Table 2. The mean mortgage payment for eligible registrants is $903 per month, while average monthly income is just over $1,800. The lower average monthly payment and income for eligible registrants compared to the overall pool of registrants reflects the disqualification of non-eligible homeowners based on income and loan amount.[5] The average eligible registrant is 46 years old and has owned the home for approximately nine years. Of note, distance to the assigned counseling agency is included as a proxy measure for transaction costs. The locations of registrant home addresses and counseling agencies were geocoded so that the distance to agency could be calculated. A simple linear measure, in miles, was used to capture distance to the assigned agency. The average registrant resided nearly 19 miles from their assigned intake agency. The mapped addresses of registrants and counseling agencies are presented in Figure 1.

[Insert Table 2 about here]

[5] The program has a household income ceiling of 115% of area median income, and mortgage amounts must be below the maximum FHA eligible loan in Ohio (roughly $432,000).

[Insert Figure 1about here]

Other summary statistics reflect averages of dummy variables and, thus, show the proportion of registrants possessing each characteristic. The variable *Big Four Lender* captures whether or not the registrant's loan was with one of the country's four largest mortgage lenders (Bank of America, Citigroup, JPMorgan Chase, and Wells Fargo.) The mortgage lender is of interest in assessing a foreclosure mitigation program because lender approval and cooperation is necessary when modification and transition assistance options are pursued. Large lenders may have had a greater capacity to process mitigation requests or, conversely, may have been overwhelmed with modification requests in comparison with smaller lenders. Within the population of eligible registrants, nearly 40 percent had a loan with one of the "big four" lenders. Seventeen percent of eligible registrants had a second loan against the property, potentially complicating the chances of successfully modifying the primary loan. Interestingly, nearly two-thirds of eligible residents reported at least one unemployed wage earner in the home, less than ten percent reported having zero income. This may reflect an unemployment spell for only one wage earner in partnered houses or possibly the underemployed individuals were self-reporting as unemployed despite having some income.

Table 2 also reveals that eligible registrants were at high risk of foreclosure, with less than 20 percent current on their loan. Thirty-four percent had already received a notice of foreclosure filing, and only nine percent had been able to recently modify their loan. Registrants were also asked about which specific type of assistance they were interested in. Nearly half were interested in mortgage payment assistance, while 19 percent wanted modification assistance and 26 percent were unsure. Very few registrants expressed an interest in assistance with deed-in-lieu of foreclosure agreements, short sales, or refinancing.

Empirical Strategy

Within the first 18 months of the Restoring Stability program, just over 10,000 applications were submitted, which represents a rate of roughly 30 percent of eligible registrants. This study is an attempt to better understand the various factors that influence the decision to work through the application process to completion. The focus in the take-up literature on transaction costs faced by program participants leads to speculation on the various costs faced by Restoring Stability registrants entering the application process. The requirement that registrants meet with their assigned housing counselor

introduces a travel cost into the decision making process.[6] Theory would suggest that greater travel costs, including the opportunity costs of time, would lead to lower likelihood of application. Equation 1 presents a simple logistic regression model of application completion that includes proximity to the intake agency as well as a number of control variables. The dependent variable *Complete* is a dichotomous indicator of whether or not the eligible registrant *i* completed an application for Restoring Stability assistance. Geographic access to the intake agency is captured with a continuous Euclidean distance measure. The proximity measure is transformed as an additive inverse for ease of interpretation, so that that the marginal effect of the variable can be interpreted as the effect of being one mile closer to the agency. Other important control variables include the amount of the monthly mortgage payment, the employment status of the registrant, demographic characteristics, information about the mortgage status and the registrant's financial wellbeing, and the registrant's stated preference for the type of assistance received, as reported at the time of registration.

Equation 1

$$\Pr(Complete_i = 1) = \exp(\beta_0 + \beta_1 Proximity_i + \beta_2 Mortgage_i + \beta_3 Unemp_i + \delta_1 X_i + \varepsilon_i) / (1 + \exp(\beta_0 + \beta_1 Proximity_i + \beta_2 Mortgage_i + \beta_3 Unemp_i + \delta_1 X_i + \varepsilon_i))$$

where

Pr($Complete_i$) = Probability that $Complete_i$ = 1, or eligible registrant i submits a complete Restoring Stability application,

$Proximity_i$ = Additive inverse of Euclidean distance in miles between registrant's home address and the address of their assigned counseling agency,

$Mortgage_i$ = Natural log of monthly mortgage payment for registrant i,

$Unemp_i$ = 1 if registrant i is unemployed at the time of registration,

X_i = A vector of control variables (race, gender, age, education, income, mortgage lender, number of years in home, mortgage status, bankruptcy status, and Restoring Stability program of interest) for registrant i, and

ε_i = Error term.

Because *Complete* is a dichotomous dependent variable, binary logistic regression is used. The main parameter of interest is B_1, which measures the impact of spatial proximity on the likelihood of an

[6] Registrants also have the option to work with a housing counselor over the telephone. However, the submission of required documents must be done either in person or through facsimile or mail, which represents its own transaction cost for applicants due to the large number of required documents (including mortgage documentation, credit card bills, pay stubs, and hardship documentation) to be sent.

eligible registrant completing an application. The model also includes a measure of monthly mortgage payment to control for the level potential benefits of receiving assistance. Mortgage payment assistance is greater for homeowners with larger mortgage payments, and thus, one would expect a positive coefficient on this variable. Unemployment is included in the model for several reasons. First, unemployed homeowners may have an extra incentive to work toward receiving assistance due to a more pressing financial necessity. Second, unemployed people may have more time to spend on an application and lower opportunity costs for doing so. Finally, it is possible that a hardship related to unemployment would be easier to verify due to the readily available paperwork associated with the collection of unemployment benefits compared the documentation of other hardships, such as medical illness or divorce, that may require notarized statements.

The socio-economic controls are included in the regression to account for characteristics that may be associated with higher take-up rates for registrants. For instance, homeowners that differ based on race or sex may perceive different barriers to program participation.

Because most of the housing counseling agencies are located in the most populous parts of the state (see Figure 1), the proximity of a registrant to an agency is likely correlated with residing in rural versus urban places. Thus, a concern arises that the coefficient on proximity would not only reflect the impact of proximity on likelihood of application but also the potentially differing preferences of rural and urban registrants. For instance, rural populations may be more comfortable with traveling long distances for services than their urban counterparts. Further, rural and urban registrants may have distinctly different access to public transportation, another potential factor in access intake agencies. As such, the regression shown in Equation 1 is also estimated separately on urban and rural registrants. The distinction is based on residence in a county with over 50 percent of its population living in urban areas, as defined by the US Census Bureau. Fifty-one of Ohio's 88 counties qualify as urban under this definition, and these counties are home to nearly 85 percent of the state's 2010 population and roughly 87 percent of eligible Restoring Stability registrants.

Results

A simple descriptive depiction of the relationship between proximity to the counseling agency and percentage of completed application is shown in Figure 2. Here a clear pattern is observed, with greater distances associated with lower percentages of complete applications. Those registrants who reside within five miles of their intake agency submit a complete application almost 32 percent of the time,

while those who live over 50 miles away apply at a rate of roughly 18 percent. This observation that distance appears to play an important role in application decisions is the motivation behind this research. However, a more rigorous empirical design, which controls for other factors that may also influence take-up, is needed in order to make more convincing claims regarding the effect of geographic access.

[Insert Figure2 about here]

The results of the binary logistic regression predicting application completion are displayed in Table 1 in the form of odds ratios. The first column shows the results for the full sample of eligible registrants, while the results for registrants in urban and rural counties are displayed in columns two and three. The variable of central interest, proximity to the intake agency, is positive and significant for all specifications.[7] For the full sample, the odds ratio for proximity of 1.008 can be interpreted as the odds of applying being 1.008 times greater for each mile closer the registrants resides in relation to their assigned intake agency, all else being constant. Transforming the odds ratio to a marginal probability, each mile closer to an intake agency increases the likelihood of applying by roughly .15 percentage points. For example, the expected percentage of application completion at a distance of ten miles to the intake agency is 25.32 percent, whereas the expected probability at nine miles is 25.47 percent. The impact of distance becomes clearer when comparing more disparate distances. Holding all other factors at their averages, the model predicts that a registrant residing five miles from their agency is almost seven percentage points more likely to apply than someone who lives 50 miles from an agency. Figure 3 graphs the expected probability of application by proximity to intake agency holding all other factors at their means. With a population of tens of thousands of registrants, these differing take-up rates potentially represent hundreds of cases that could see different outcomes if access to counseling agencies were to be increased.

[Insert Table 3about here]

[Insert Figure 3about here]

[7] Interactions between the proximity variable and other explanatory variables were also estimated in order to test whether there were variations in the ways in which different groups responded to access to the counseling agencies. For instance, less proximity to counseling may be a greater barrier to lower income homeowners who may have fewer transportation options. None of these differential effects proved to be statistically significant, so they were omitted from the model results presented here.

The coefficients for the control variables also reveal interesting factors in the determination of the likelihood of application, often in the expected direction. Larger mortgage payments result in less likelihood of application. This may be the result of larger mortgages being associated with loans above the allowed ceiling for program assistance or with incomes that disqualify the registrant from consideration. This could be possible if ineligible homeowners made it through the program's screening process by submitting incorrect self-reported income and loan data in the registration process but would have been unable to verify the information with their counselor during the intake phase. Unemployed registrants are significantly more likely to submit a full application, as are minorities and individuals with educational attainment beyond high school. The positive impact of unemployment may reflect more free time to navigate the application process or a more pressing need for assistance, and therefore, greater willingness to endure the process.

Having a current mortgage, being in active bankruptcy, having recently modified the loan, and having received a foreclosure notice are all negatively associated with likelihood of application. A non-delinquent mortgage status, though not a disqualifying characteristic for some Restoring Stability programs, limits the types of assistance that is available. For instance, applicants with current mortgages are not eligible for Rescue Payment Assistance or Transition Assistance. However, the interaction of current loan status and unemployment, both indications of a good fit with the mortgage payment assistance program, was strongly positively related to application. An active bankruptcy case is a disqualifying criterion, though a discharge letter received during the application process would allow for funding consideration. A recent modification may be associated with having an affordable loan payment, which would disqualify a homeowner from receiving assistance. Having received a foreclosure notice does not necessarily exclude one from consideration. In fact, an approaching foreclosure sale is intended to accelerate the application process. However, properties with foreclosure sales scheduled within 20 days are disqualified from consideration.

The number of weeks post program launch that a registrant entered the program was positively associated with rates of application, while the squared number of weeks post launch was negatively associated. This can be interpreted to mean that those homeowners who applied nearer to the September 2010 launch of the program were less likely to submit a complete application for funding. The negative sign on the quadratic term indicates that positive impact of time on likelihood of application diminishes as one gets further from the launch date. Several explanations may account for these observations. First, the very large volume of registrations at the start of the program may have

overwhelmed counselors and administrators such the less attention could be given to homeowners registering for the program. However, over time, the most qualified potential applicants entered the system earlier in the program, leaving a less qualified population remaining for subsequent months. Second, there may be administrative reasons for the declining rate of application. For instance, the program may have invested more energy in moving earlier applicants through the application process, thus leaving less time for the later rounds of applicants.

The results indicate that expressing an interest in mortgage payment assistance at the time registration was positively related to likelihood of application, while those interested in help with a short sale of the home were less likely to apply. The comparison group consists of those registrants who did not express an interest in a specific program. Restoring Stability's early emphasis on mortgage payment assistance for unemployed homeowners may have resulted in more energy being exerted in an effort to help registrants seeking this type of payment through the application process. The negative sign on interest in short sale assistance may be an indication that homeowners with such an interest were more likely to find a solution on their own or that the program's offering in this area were not strong enough to motivate persistence through the application process.

There are several limitations to the empirical strategy utilized in this study. The possibility of omitted variable bias is of primary concern due to the myriad possible reasons why a registrant might submit an application or not. While the empirical model controls for a number of possible correlates of application completion in addition to the measure of proximity, it is not possible to capture the exact cause of non-completion in all cases. For instance, homeowners who registered for the program and subsequently became employed would not continue in the application process for demand reasons, rather than the costs of application or other barriers. Second, the specific transaction costs associated with travel to an intake agency are assumed to be constant across cases. The data do not include information about access to an automobile or public transportation. If such access is spatially correlated, even after controlling for urban versus rural area, it would have a biasing impact on the estimates. Finally, the influence of the housing counselor is unaccounted for in this specification. The extent to which working with a certain individual counselor increases or decreases the costs of application, by providing varying levels of customer service, could be an important omitted variable.

Discussion

The ability of mortgage assistance programs to move potential beneficiaries efficiently through the application process is an important precondition to program success and expected societal impact. While a variety of factors have been analyzed to explain the lower than expected rates of take-up in federal mortgage assistance programs, transaction costs associated with the application process perhaps deserve more attention. This study has focused on a large, federally funded foreclosure-mitigation program in Ohio that was launched in an effort to address the housing slump and foreclosure crisis that began in 2007. Administrative decisions about application procedures and the placement of application intake locations may have played an import role in the program's struggle to move interested homeowners through the application process. Through the first 18 months of the program, roughly one-third of seemingly eligible program registrants went on to submit a full application for assistance. By exploiting variation in geographic access to intake agencies, this research provides evidence suggesting the importance of transaction costs in the take-up of mortgage assistance.

Using a simple logistic regression approach, geographic proximity to the assigned housing agency emerged as a significant, positive predictor of application for program registrants. Specifically, the probability of submitting an application increased by .15 percentage points for each mile more proximate the homeowner was to the assigned agency. The effect is starker when comparing the likelihood of application between homeowner who resides, for example, five miles from the agency and another who lives 50 miles from an agency. The registrant who is five miles from the agency is 6.75 percentage points more likely to apply for assistance, all other factors held constant. The effect of access to intake agencies was consistent across urban and rural places, indicating that travel costs are perceived similarly by urban and rural populations. With large, federally funded initiatives, such factors could make a critical difference in programmatic success and affect thousands of potential beneficiaries.

The finding that geographic access to intake agencies plays a role in take-up rates does not, of course, imply that agencies should be placed on every street corner. The benefits of increased access and, correspondingly, take-up should be weighed against the costs of increasing access. The transaction costs of application could potentially be lowered in a number of ways. Access to physical intake centers could be increased, for instance, by contracting with a greater number of non-profit agencies. The map displayed in Figure 1 shows geographical gaps in access to the current group of agencies in Ohio. Those geographical areas could be targeted for additional non-profit intake centers. The transaction costs of applying would also be reduced if alternate methods of applying, online or through the mail, were made

easier and less expensive. The current level of paperwork required to be transmitted via fax or mail could be reduced or fully web-based transmission procedures could be developed. The introduction of web-based application procedures has previously been found to have mixed results with regard to take-up rates of assistance benefits. Ebenstein and Stange (2010) found that unemployment insurance take-up did not significantly change following the introduction of internet-based claiming, while Kopczuk and Pop-Eleches (2007) do find that Earned Income Tax Credit claiming increased following establishment of electronic tax filing. Of course, any strategy to reduce transaction costs faced by potential participants may introduce new administrative costs, such as increased oversight and training for new partners or the development and maintenance costs of web-based improvements.

The transaction costs associated with applying for foreclosure mitigation assistance is only one element of the take-up equation. Decreasing transaction costs would likely result in an increased proportion of potential beneficiaries working through the application process, thus increasing the take-up rate. However, increasing the number of potential beneficiaries entering the application process, while keeping the transaction costs constant, would also result in an increased take-up rate. The literature suggests that the use of marketing to increase program awareness may be an important predictor in take-up, while simply increasing benefit levels also increases participation (Anderson and Meyer, 1997; Daponte et al., 1998). Administrators must consider the expected costs and benefits of each strategy in order to develop an effective approach to maximizing participation.

As we turn the corner on the housing crisis and begin to formulate strategies for the future housing finance system, it is important to not forget the lessons learned. Despite the criticisms of federal foreclosure intervention initiatives like HAMP, HARP and HHF (OCC 2012; SIGTARP 2012; U.S. GAO 2011a), the assistance provided by these programs has helped millions of homeowners who would have otherwise faced foreclosure. Nonetheless, numerous challenges inherent when implementing federal policy in a complex market environment reduced the projected impact of the programs. Further, weaknesses in the mortgage finance system, including the alignment of originator, servicer and market incentives will likely be the focus of housing policy reforms moving forward. This research suggests that the interactions at the front lines, between the homeowner (or renter) and the system designed to offer support, should not be overlooked.

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Table 1: Characteristics of Restoring Stability Registrants and Applicants (September 2010 to March 2012)

		Registrants (n=50,464)	**Applicants** (n=10,188)
Race*	White	72.4%	68.2%
	Black	21.9%	26.6%
	Other	5.7%	5.2%
Education	Below High School	5.6%	5.7%
	High School	54.4%	53.8%
	Two-Year College	20.7%	21.2%
	Bachelor's Degree or Above	19.2%	19.2%
Employment*	Unemployed	68.7%	79.4%
Housing*	Current on Mortgage	30.0%	28.4%
	Received Foreclosure Notice	31.2%	26.3%
Primary Hardship*	Death of Spouse or Divorce	5.2%	3.1%
	Disability, Illness, or Significant Medical Expense	11.4%	9.1%
	No Hardship	1.7%	0%
	Other Loss or Reduction in Income	32.1%	24.2%
	Unemployment	49.6%	63.5%
Mean Age+		46.89	47.84
Mean Annual Income+		$23,366	$19,852
Mean Monthly Mortgage Payment+		$943	$882

* = Significant Chi-square Test of Homogeneity (.95); + = Significant Independent Sample T-test (.95)

Table 2: Characteristics of Eligible Registrants (September 2010 to March 2012)

Variable	Mean	Standard Deviation
Distance to Counseling Agency (Miles)	18.7847	.11944
Monthly Mortgage Payment($)	902.39	433.14
Second Loan*	.1655	.37163
Race: Non-white*	.2757	.00248
Female*	.5028	.00274
Unemployed*	.6506	.00310
Above High School Education*	.3770	.00265
Big Four Lender*	.3890	.00267
Current on Mortgage*	.1960	.00217
Received Foreclosure Notice*	.3415	.00260
Filed for Bankruptcy in Last 12 Months*	.2519	.00238
Loan Modification in Last 6 Months*	.0908	.28731
Number of Weeks from Program Launch	29.96	24.349
Age	46.47	11.700
Number of Years in Home	9.06	7.708
Monthly Gross Income ($)	1,802.90	1,252.66
Zero Income*	.0938	.29152
Program of Interest: Deed-in-Lieu*	.0046	.06778
Modification*	.1888	.39133
Mortgage Payment Assistance*	.4987	.50001
Refinance*	.0432	.20341
Short Sale*	.0053	.07244
Not Sure*	.2594	.43828

N = 33,368

(* Coded as 1 = “Yes”, 0 = “No”)

Table 3: Binary Logistic Regression Results Predicting Probability of Application Completion

	(1)	(3)	(4)
VARIABLES	Full Sample	Urban	Rural
Proximity to Intake Agency (Inverse Miles)	1.009***	1.009***	1.011***
	(0.000956)	(0.00111)	(0.00236)
Monthly Mortgage Payment (ln)	0.873***	0.855***	1.109
	(0.0330)	(0.0343)	(0.129)
Second Loan ǂ	1.084*	1.109**	0.955
	(0.0488)	(0.0532)	(0.125)
Unemployed ǂ	1.340***	1.396***	0.979
	(0.0646)	(0.0718)	(0.137)
Race: Non-white ǂ	1.173***	1.202***	0.942
	(0.0466)	(0.0493)	(0.240)
Female ǂ	0.966	0.974	0.910
	(0.0339)	(0.0366)	(0.0923)
Above High School Education ǂ	1.094**	1.083**	1.199*
	(0.0390)	(0.0410)	(0.131)
"Big Four" Lender ǂ	1.048	1.055	1.001
	(0.0365)	(0.0391)	(0.104)
Current Mortgage ǂ	0.513***	0.532***	0.401***
	(0.0450)	(0.0497)	(0.104)
Filed for Bankruptcy ǂ	0.534***	0.511***	0.734***
	(0.0229)	(0.0235)	(0.0880)
Received Foreclosure Notice ǂ	0.815***	0.811***	0.839
	(0.0312)	(0.0332)	(0.0928)
Loan Modified in Last 6 Months ǂ	0.905*	0.900	0.939
	(0.0542)	(0.0575)	(0.165)
Number of Weeks from Program Launch	1.032***	1.034***	1.024***
	(0.00290)	(0.00310)	(0.00833)
# Weeks from Program Launch Squared	0.999***	0.999***	0.999***
	(3.99e-05)	(4.27e-05)	(0.000115)
Age	1.039***	1.040***	1.029
	(0.00747)	(0.00796)	(0.0217)
Age Squared	1.000***	1.000***	1.000
	(7.70e-05)	(8.19e-05)	(0.000229)
Number of Years in Home	0.994**	0.994**	0.994
	(0.00248)	(0.00263)	(0.00779)
Monthly Gross Income (Thousands $)	0.939***	0.947***	0.873**
	(0.0169)	(0.0180)	(0.0484)
Zero Income ǂ	0.552***	0.512***	0.823
	(0.0362)	(0.0367)	(0.140)
Program of Interest: Deed-in-Lieu ǂ	0.586	0.693	
	(0.195)	(0.234)	
Program of Interest: Modification ǂ	1.049	1.035	1.265
	(0.0588)	(0.0622)	(0.203)
Program of Interest: Mortgage Payment Assistance ǂ	1.519***	1.547***	1.416***
	(0.0637)	(0.0701)	(0.159)
Program of Interest: Refinance ǂ	0.978	0.988	0.966
	(0.0959)	(0.105)	(0.248)
Program of Interest: Short Sale ǂ	0.599*	0.710	
	(0.183)	(0.220)	
Interaction: Current Loan X Unemployed	1.653***	1.632***	1.785**
	(0.165)	(0.174)	(0.526)
Constant	0.344***	0.357***	0.163**
	(0.106)	(0.117)	(0.148)
Observations	19,919	17,465	2,436
Pseudo R-squared	.0676	.0716	.0565

Notes: Odds ratios presented. Standard errors in parentheses. ǂ Coded 1 = "Yes", 2 = "No".
*Significant at the 5% level. ** Significant at the 1% level.

Figure 1: Location of Restoring Stability Registrants and Counseling Agencies
(September 2010 to March 2012)

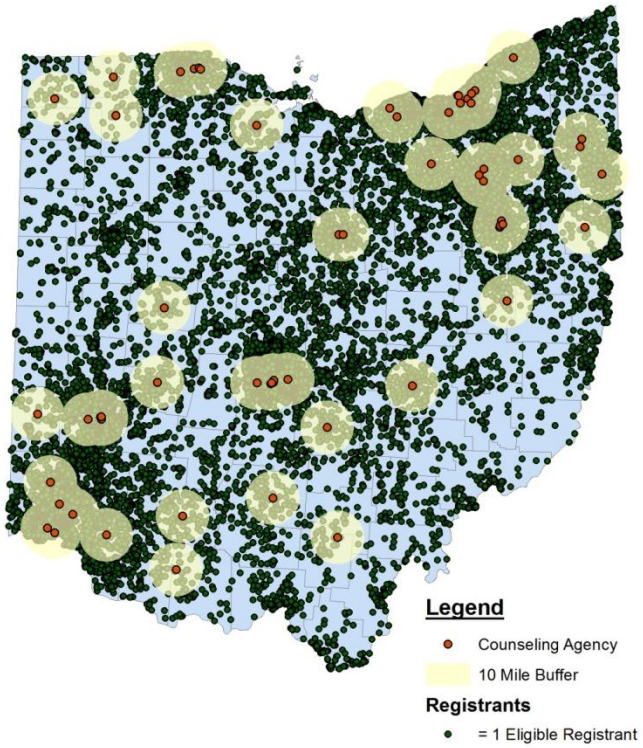


Figure 2: Percentage of Registrants that Applied by Distance in Miles (D) to Agency

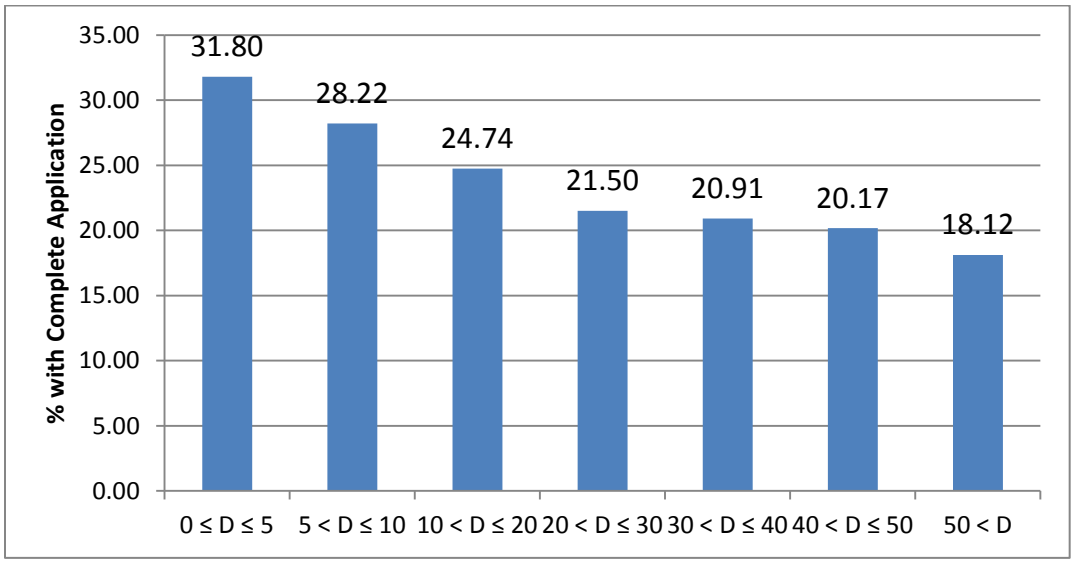
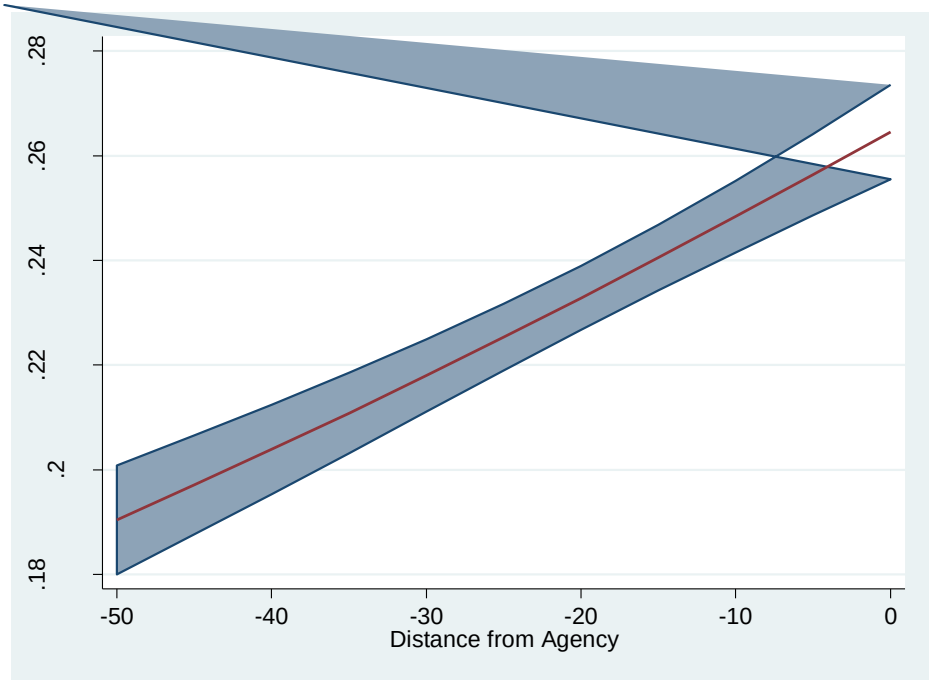


Figure 3: Probability of application by proximity to agency



Notes: All other factors held constant at their means.
95% confidence interval shaded blue.

Appendix A. Program Description

Ohio's Restoring Stability initiative originally funded four separate programs of foreclosure mitigation assistance: Partial Mortgage Payment Assistance (PMPA), Rescue Payment Assistance (RPA), Mortgage Modification with Principal Reduction (MMPR), and Transition Assistance (TA). A fifth mode of assistance, Lien Elimination Assistance (LEA), was later added in order to address the need for a program that could cancel loan obligations entirely. The variety of programs was intended to offer help to homeowners facing a wide array of problems. PMPA provides assistance up to 75 percent of monthly mortgage payments for unemployed homeowners for up to 15 months, while RPA provides up to $15,000 to bring delinquent mortgage borrowers current on their loans. MMPR provides matching funds to reduce principle balances to the extent that homeowners are eligible for mortgage modifications through their loan servicers, and LEA provides funding to cancel secondary liens on properties. Transition Assistance is provided as a monetary incentive, up to $3,000, to homeowners and lenders to facilitate a short sale or deed-in-lieu agreement in order to allow the homeowner to relocate to another area for employment. All Restoring Stability programs, except Transition Assistance, take the form of a non-recourse, non-amortizing, zero-percent interest loan that is secured by the property. Twenty percent of the loan is forgiven each year following the assistance so that it is entirely forgiven after five years. The only time that the loan would be repayable is through the equity proceeds of a sale or refinance of a home within five years of receiving assistance. Transition Assistance, which provides a cash incentive to households transitioning out of homeownership to leave their home in good condition, is a one-time payment, not a loan.