RISK REDUCTION AND SUSTAINABLE LENDING: THE EFFECT OF

PRE-PURCHASE HOMEBUYER EDUCATION

ON MORTGAGE FORECLOSURE

by

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Thesis

Submitted to the Faculty of

Peabody College of Vanderbilt University

in Partial Fulfillment of the Requirements

for the Degree of

MASTER OF EDUCATION

in

Community Development and Action

May 2010

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ACKNOWLEDGMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

In the wake of the recent housing market bust, there is renewed interest over whether pre-purchase homebuyer education is effective as a tool for promoting sustainable homeownership. However, strikingly little is known regarding whether homebuyer education is positively affecting mortgage outcomes. The earliest roots of homebuyer education and counseling stemmed from the U. S. Department of Housing and Urban Development's (HUD's) instituting foreclosure and post-purchase counseling as an after-the-fact corrective measure to the wave of foreclosures that came out of HUD's Section 235 Program, which provided mortgage insurance and interest subsidies to lower income homebuyers (Quercia & Wachter, 1996). However, in the mid-1990s with the emergence of low-income lending mandates for Fannie Mae and Freddie Mac, stricter enforcement of the Community Reinvestment Act, and President Clinton's goal of increasing homeownership in the US by 2.5 percentage points, new measures were needed if federal goals were to be met without significant increases in default rates (Quercia & Wachter, 1996). Pre-purchase homebuyer education re-emerged out of this context, offering a preventative measure for decreasing default risk by preparing previously untapped segments of the population to be first-time homeowners and a means to increase homeownership by functioning as a cost-effective sorting mechanism for helping banks find qualified borrowers in these new markets.

The intuitive logic of homebuyer education—educated homebuyers should have better loan outcomes than non-educated homebuyers—has a strong appeal. However, there has been a notable dearth of empirical studies on the effects of pre-purchase homebuyer education on homeowners' long-term mortgage outcomes, especially given the extent to which it is has become an essential tool of state and federal housing policy. Discerning the effect homebuyer education has on homeownership outcomes, particularly among lower-income and higher credit risk populations who were the main targets of efforts to increase homeownership rates, is also of prime importance in understanding how to move forward in shaping the future of US housing policy. Despite interest in gaining a greater understanding of the effectiveness of homebuyer education, a multiplicity of data, research design, and ethical challenges (detailed later in this paper) have stymied most research attempts to date. Thus, the effects of homebuyer education, which has become a key tool in low-income lending because of its wide ranging use, practicality, and perceived utility in reducing foreclosure risk, have been relatively untested. This paper is an effort to lay out a conceptual model for how homebuyer education may contribute to sustainable homeownership and to contribute to the empirical knowledge base of the effects of homebuyer education.

This study is divided into three parts. The first part develops an understanding of the chain of causal linkages between homebuyer education and mortgage outcomes by proposing a synthesis of implicit causal models used in the research literature. This causal model provides a working framework for assessing what is currently known about homebuyer education and mortgage default. The second part contains empirical analysis of loans originated between 2002 and 2006 held by the Tennessee Housing Development

Agency to determine the effects of homebuyer education on foreclosure and prepayment

rates. The final part examines the strengths and weaknesses of the study and provides

methodological and substantive recommendations for future research and policymaking.

CHAPTER II

LITERATURE REVIEW

The subtitle of Hirad and Zorn's (2001) frequently cited study of the relationship

between homebuyer education and 90 day delinquency, "A Little Education Is A Good

Thing," essentially frames an underlying causal model and justification for providing

homebuyer education that has been used in empirical studies to date:

Figure 1: Implied Casual Model of Homebuyer Education

Homebuyer Education	→	Positive Homeownership Outcomes
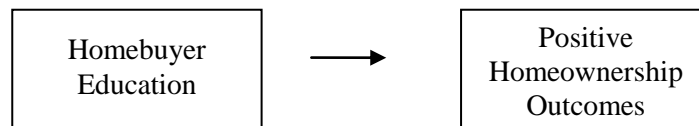
Willis (2009), looking more narrowly at financial education, outlines an implicit model of

what an effective financial education program does that serves as a useful building block

toward framing a more complete model to serve as a heuristic device for assessing the

current status of the literature on homebuyer education and suggesting directions for

future research:

Figure 2: Implied Causal Model of Financial Education

Financial Education	→	Financial Literacy	→	Good Financial Decisions and Behavior
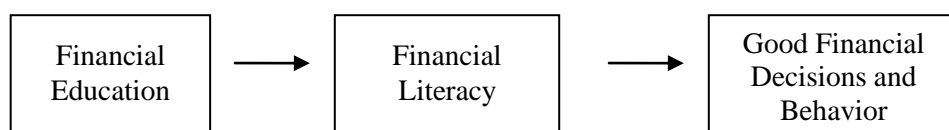
The following represents an integration of these two models and a more nuanced reading of the different elements of a homebuyer education program to establish a basic causal framework for understanding how homebuyer education affects homeownership outcomes:

Figure 3: Proposed Causal Model for Pre-Purchase Homebuyer Education

Homebuyer Education	→	Financial Knowledge	→	Good Financial Decisions and Behavior	↘	
Homebuyer Education	→	Homebuying Knowledge	→	Good Home and Mortgage Selection	→	Positive Homeowning Outcomes
Homebuyer Education	↘	Home Maintenance Knowledge	→	Good Physical Maintenance of Home	↗	
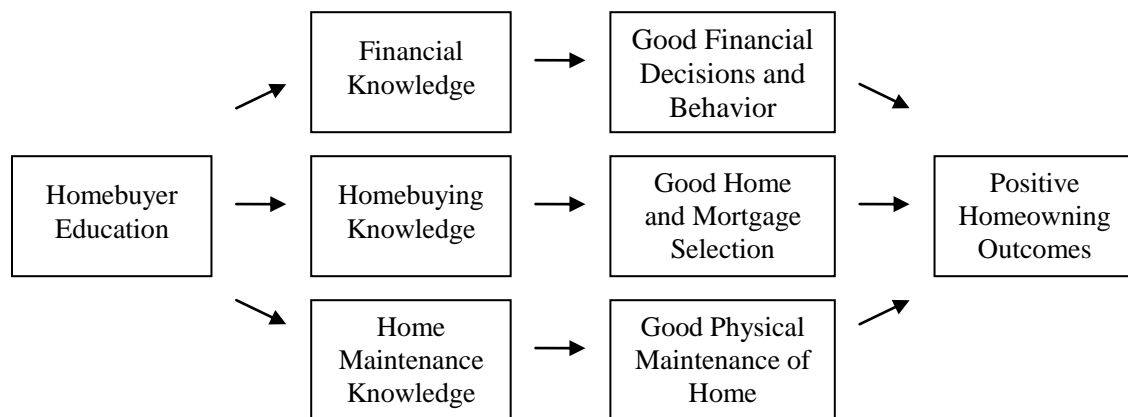
Studies of the impact of homebuyer education on homeownership outcomes to date have directly examined the link between homebuyer education and mortgage outcomes, treating the intermediate linkages of obtaining knowledge and knowledge producing changes in behavior as a black box. Other studies have more narrowly focused on a general link between financial education and financial behavior. To date, no studies have been conducted examining the linkages between homebuying knowledge and home and mortgage selection or between the home maintenance portion of homebuyer education and maintenance outcomes. Additionally, no outcomes studies to date have had sufficient data to be able to account for the intermediate linkages. This study is unable to resolve this problem, given the data available, and utilizes the black box approach of

Figure 1 while recognizing the need for future research designs to consider a more comprehensive approach.

To assess the research literature in the context of this proposed model, I begin by highlighting the methodological and data challenges and constraints that have limited research on homebuyer education to date. I then examine both the limited number of studies on the relationship between homebuyer education and mortgage outcomes and the broader group of studies focusing more narrowly on the intermediate link between financial education and financial behavior. Finally, I survey the more extensive mortgage default literature to identify key factors other than homebuyer education that influence mortgage outcomes to control for in the present study, and identify the gaps this study addresses in the context of these three bodies of literature.

Challenges in Researching Homebuyer Education

The challenges in studying homebuyer education can be divided into two main categories: data problems and methodological problems, with a third category of ethical challenges being interwoven throughout. With respect to data problems, a PricewaterhouseCoopers feasibility study conducted in 1999 (in Mallach, 2001) found that lenders did not have specific data on counseling, that loan performance data were nearly impossible to link to origination data due to securitization and sale of loan packages, and that little to no demographic data were available from lender sources. The problems that PricewaterhouseCoopers discovered also highlight how data needed to conduct a homebuyer education study is typically siloed such that education providers have detailed demographic and counseling-related information while lenders have comprehensive data on loan origination and performance. Additionally, collecting data

solely from housing counseling agencies usually fails to provide for an adequate comparison group, as all their clients have received the intervention. By using data from a state housing finance agency that records both loan and homebuyer education information (though with more detail on the former) this study provides a unique opportunity for overcoming the data hurdles that have limited previous attempts to study homebuyer education.

Methodological problems in studying homebuyer education abound. The most perplexing challenge is the non-standardized nature of the homebuyer education industry in a variety of categories: curriculum, duration of program, teacher or counselor experience and training, delivery method, types of providers, and size of providers. A second critical problem is an inability to eliminate selection bias in establishing a reasonable comparison group in the absence of experimental designs. Homebuyer education often is required in order to receive various forms of financial assistance with a mortgage, eliminating contrasts between those who received education and those who did not, confounding homebuyer education with the effects of financial assistance, and potentially creating an ethical dilemma in withholding education in the absence of alternate provisions. In cases where homebuyer education is voluntary, the potential effect of selection bias may be large, as Hirad and Zorn's (2001) study will demonstrate. Added to these challenges is the fact that wide variation in housing market conditions and economic conditions across local areas make it difficult to generalize study findings outside of the areas where the study sample was located. Also, referring back to Figure 3, different components of homebuyer education content can also have differential effects on outcomes, but these potential differences have been left unexplored due to data siloing

between financial institutions and homebuyer education providers as well a lack of longitudinal data on changes in homebuyer's financial behavior. Finally, the definition of success in a homebuyer education program is contingent on the stakeholder perspective being used. From the borrower's perspective, foreclosure may actually be the optimal decision if the home is deep in negative equity, but foreclosure is not considered a successful loan outcome by most lenders. Similarly, providing financial education to borrowers in homebuyer education may provide them with a greater understanding of when it is to their advantage to refinance their home, which would also produce a less favorable result for lenders.

Homebuyer Education

Hirad and Zorn (2001) completed the largest study to date on pre-purchase homebuyer education, using a two-stage logistic regression model to analyze a sample of almost 40,000 Freddie Mac Affordable Gold loans. They found that homeownership counseling was associated with a 19% decrease in the likelihood of a borrower ever becoming 90-days delinquent. This study also examined whether the delivery method and borrower assignment or selection explained varying effectiveness. Prior to controlling for borrower selection, individual counseling was found to be most effective with a 34% reduction in the likelihood of ever becoming 90-days delinquent, while classroom counseling was associated with a 26% reduction. A two-stage least-squares analysis to control for borrower selection demonstrated that not all of the observed effect was due to selection, but that only classroom education still had a significant effect among the program types after accounting for selection bias.

The results of the study are slightly misleading though, as the measure of homebuyer education's effectiveness that was proposed in the hypothesis was 90-day delinquency rates, but the actual analysis is of whether homeownership counseling reduces the likelihood of *ever* becoming 90 days delinquent over the course of the loan to the present time. A 90-day delinquency rate is the number of active loans 90 days or more delinquent at a given point in time, which produces a smaller count than assessing whether a loan has *ever* been 90 days delinquent, as seriously delinquent borrowers can still "cure" their loans by becoming current on their payments. An additional factor to consider in the findings are that the program mix of the sample used was weighted toward less personal and less effective forms of homebuyer education: 77% of the sample had home or telephone study, while 10% and 9% received individual and classroom counseling respectively.

Hartarska and Gonzalez-Vega (2006) assessed a pre-purchase credit counseling program targeted at low-to-moderate income organized by a major bank in Ohio to fulfill Community Reinvestment Act requirements. A single organization (Consumer Credit Counseling Services) was used as the counseling provider, and only those who could demonstrate a zero or positive cash flow for a given loan size and interest rate were permitted to graduate, highlighting the sorting function of homeownership counseling programs for banks. For graduates who qualified for a loan, the maximum loan size was $75,000, with a down payment of the lesser of 5% or $1,000 (though gifts or grants could be applied toward this amount). Using a Cox proportional hazards survival model, counseled borrowers were found to have a 39% lower default hazard, and, consistent with other studies in the mortgage default literature, the default hazard was found to peak at 18

months before decreasing (Bunce, Gruenstein, Herbert, & Scheessele, 2001; Quercia &

Stegman, 2007). Additionally, counseled borrowers exercised their option to default on

the home more ruthlessly, suggesting an association between credit counseling and

greater awareness of when foreclosure is the most beneficial financial choice for the

homeowner.

However, because credit counseling more narrowly focuses on the financing

aspect of homeownership, this study can not be directly used to estimate the effect of

homebuyer education, as it omits components like home selection and maintenance. The

sample size of 233 loans is also somewhat small for a maximum-likelihood based model

with 20 variables and 2 interaction terms, so the study was likely underpowered. The

researchers were also unable to estimate a competing risks model to account for the

possible outcome of mortgage prepayment, as the researchers had information only on

current and defaulted loans from the program.

Financial Education and Financial Behavior

There is a small but growing literature examining the key causal link between

financial education and changes in financial behavior that is assumed to occur as a result

of receiving homebuyer education. Some elements of this literature focus more heavily

on areas like changes in behaviors related to retirement planning (i.e., Lusardi, 2002;

Lusardi, 2004; Lusardi, 2008), but I focus here on studies directly examining links

between financial education, financial literacy, or credit counseling and changes in

financial knowledge and behavior. Measuring the change in borrowers' credit scores,

retrospective surveys, and pre-test post-test surveys from financial education classes have

been the primary methodologies used to try to assess the link between programs designed to increase financial knowledge and resultant behavior changes.

Two studies attempted to measure changes in borrowers' financial behavior from financial education by measuring changes in credit scores. Birkenmaier and Tyuse (2005) used a pre-post test research design without a separate comparison group, comparing participants' credit scores only one year after the pre-counseling measure of credit score. Not surprisingly, they failed to establish a link between homeownership counseling and credit score improvement, as there are many factors that enter into a credit score that were not controlled for in the study, contributing to the severe omitted variable bias in the model. Also, the one-year timeframe may be insufficient for showing significant credit score improvement, particularly if the past credit history is spotty.

In the second study, Elliehausen, Lundquist, and Staten (2007) examined the impact of credit counseling on borrower behavior by comparing credit reports between 7,979 counseled borrowers and a comparison group of 65,901 non-counseled borrowers three years after receipt of credit counseling. After controlling for selection bias through the use of instrumental variables, credit counseling was found to produce negligible differences between counseled and non-counseled groups' credit scores three years later, though both groups had notable gross improvements in their credit scores. However, credit counseling did produce a significant reduction in debt and credit account usage for counseled borrowers relative to the comparison, especially in the lower quintiles of initial credit scores.

In both studies, the initial credit score was assumed to be a proxy for the level of personal financial management skills. This assumption may be misleading though as an

increased credit score is not necessarily a sign of changed financial behaviors. For example, having a greater amount owed can result in increasing credit scores. There may also be a regression to the mean effect, as individuals seeking counseling after a negative credit event may naturally see a rise in their credit score, in part from being unable to obtain additional credit until their score recovers. On the other hand, some borrowers may seek out counseling in anticipation of an impending negative credit event, resulting in a sharp drop in their credit score after counseling. Additionally, Elliehausen, Lundquist, and Staten (2007) also acknowledge that their research design cannot distinguish between changes in credit scores due to changes in behavior from restructuring of borrower debt portfolios. Thus, attempting to measure financial behavior through credit scores represents poor operationalization and also fails to illuminate any underlying causal mechanisms that convert financial education interventions into behavioral change.

Surveys represent the other main methodology researchers have used with varying success in attempting to explore the link between increasing financial knowledge and resulting behavioral changes. One study specifically attempted to examine the link between housing counseling and financial behaviors using a self-report mail survey asking about counseled homeowners' current experience and recall of experience prior to homeownership (Carswell, 2009). However, the survey primarily focused on whether homeowners had more difficulty in making payments compared to their experience as renters. This is a potentially questionable approach to assessing homebuyer education's effect on financial behavior, as the opportunity cost of failing to make a housing payment is generally higher for homeowners regardless of whether the homebuyer is educated or not. The survey questions in general also seemed to be focused more on the homebuyer's

mortgage outcomes than on illuminating the narrower relationship between financial education and behavior. The only direct question about financial behavior that could demonstrably be linked to homebuyer education came in the form of changes in prioritization of mortgage payments relative to other bills, with 86% indicating their mortgage took top priority. Some survey questions were also worded in a way that made the results uninterpretable, such as asking whether mortgage non-payment patterns improved post-counseling, as such a question would be answered negatively by those who consistently paid their mortgage before and after counseling.

Though the aforementioned studies failed to establish direct links between financial education and behavior change, Shelton and Hill (1995) conducted a survey of first-time homebuyers' using an index of financial knowledge and budgeting behaviors. The surveys were administered before and immediately after borrowers completed the three week budgeting portion of an eight week homebuyer education course using a repeated measures design. A significant change in the index of budgeting behavior was found, with subgroup analyses revealing greater positive effects on financial behavior for females, African Americans, younger homebuyers, less educated homebuyers, and lower-income homebuyers. However, some of the most important indicators on the scale—developing a written spending plan, adjusting spending patterns, and comparing spending plans with spending patterns—showed little change. Additionally, caution should be shown in generalizing the results of the study, as it was designed to assess a small pilot program in two mid-size Georgia cities using a non-standard curriculum. The short time frame between the pre and post test also limits generalization about longer-term behavioral changes.

As a whole, the literature on the linkage between financial education and changes in financial behavior is still quite weak, with research design issues preventing solid conclusions from being made in either direction. Further research in the vein of Shelton and Hill (1995) is needed to assess the strength and validity of the causal link between financial education and changes in financial behavior, especially in determining whether changes last in the long run or decay over time.

Factors Influencing Mortgage Default

There are currently two main theoretical camps in the mortgage default literature, options theory and trigger theory, with correspondingly different ideas on the key factors that influence mortgage outcomes, and thus different opinions about which variables are important to control for in mortgage default models. Options theory views the foreclosure decision from a pure financial perspective, positing default as a put option where the buyer has the choice to stop making loan payments if the house is worth less than the outstanding loan value, while trigger theory proposes that insolvency is the main underlying reason behind mortgage default (Elmer & Seelig, 1999).

Options Theory.

While options theory would indicate that the option to default is "in the money" as soon as the home enters negative equity, researchers in this theoretical camp have recognized that various transactions costs associated with the loss of the home and length of tenure affect the "ruthlessness" of the exercise of this option, that is the level of negative equity required to induce the borrower to default (Ambrose & Capone, 1998). These factors include both financial costs (i.e., the negative impact on borrower credit and moving costs) and emotional or psychological costs to the borrower (i.e., emotional

attachment to a home, value of ownership, and guilt in reneging on the commitment to pay the lender).

The loan-to-value (LTV) ratio at origination, defined as the value of the loan relative to the sale price of the home, has emerged as a significant predictor of foreclosure in several mortgage default studies, but sometimes in opposite directions. In a study of a large national subprime loan database, Quercia, Stegman, and Davis (2007) found a higher LTV at loan origination to be a significant predictor of foreclosure. However, Elmer and Seelig (1998) found that there was little difference in foreclosure patterns between conventional loans and FHA loans, which allow for high LTV ratios, casting doubt on the contribution of high LTV ratios to foreclosure. Additionally, Elmer and Seelig's (1998) empirical work initially found LTV to be statistically significant in predicting default but found that it lost its significance once broader measures of the consumer's personal financial leverage were added. Delgadillo and Gallagher (2006) also did not find the LTV ratio to be a significant predictor of mortgage default for a sample of FHA loans, but this may have been due to low variation in the loan-to-value ratios of the loans in the sample. At the same time, Hendershott and Schultz (1993) found that loans with less than 90% LTV were more likely to foreclose, indicating an effect in the opposite direction. Similarly, Hartarska and Gonzalez-Vega (2006) also found higher LTV at origination to be negatively associated with foreclosure, which they speculate could potentially be occurring through banks adding loans that help affect the level of down payment for borrowers.

In modeling mortgage outcomes, several borrower and mortgage factors besides the loan-to-value ratio have been shown to have a significant association with mortgage

default rates, but either have not shown a clear direction in their effects on default rates or have not come out as significant in every study. In assessing borrower factors, the age of the borrower was not found to be significant in Hartarska and Gonzalez-Vega's (2006) study of homebuyer education, while Anderson and Vanderhoff (1999) found age to be a significant predictor of default, with younger borrowers being more likely to default. Elmer and Seelig (1999) argue that the age of the homeowner is likely to be significant because home equity forms a much larger proportion of wealth for younger households relative to older households with more diversified wealth holdings, all other things being equal, and thus declines in home equity are more closely linked to insolvency. However, Ambrose and Capone (1998) explain the inconsistency of age's effect as a function of younger borrowers simultaneously having lower savings levels but also having a greater chance of finding employment more quickly after the loss of a job. Evidence has also been mixed on whether the number of dependents has an effect on housing cost burden, with the variable turning out to be significant as often as it has not in studies to date that have included it as a factor (Chi & Laquatra, 1998; Hakim & Haddad, 1999; Noecker-Guadagno, 1992; Vandell & Thibodeau, 1985). Findings on the effects of race on default have been less equivocal, as Hartarska and Gonzalez-Vega (2006) found that African American borrowers had three times the default hazard of non-African American borrowers. Hirad and Zorn (2001) and Pedersen and Delgadillo (2007) found that minority census tracts were significantly likely to have higher default rates.

Trigger Theory.

In contrast to options theory, trigger theory proposes that insolvency is the main underlying reason behind mortgage default (Elmer & Seelig, 1999). While a strategic

defaulter is unlikely to cure, having determined that foreclosing is the financially optimal position (unless interest rates or home prices change during the delinquency period), trigger-based defaulters would only foreclose if they were unable to regain sufficient income to resume mortgage payments (Ambrose & Capone, 1998). From a trigger perspective, delinquency on loan payments essentially allows borrowers to use non-payment of the mortgage to finance other expenditures. Job loss, unexpected major medical expenses, divorce, or other negative events that reduce income or events like a failed investment or stock market crash that reduce personal wealth can force borrowers into delinquency and eventually to foreclosing on the home if the borrower is unable to recover from the financial shock in time to resume payments. Trigger theory may be particularly relevant for understanding default decisions among low income homeowners, young households, and other groups that tend to have lower levels of savings and for whom the home is the primary source of wealth. Coincident with trigger theory, unemployment, lower incomes, and slower income growth have all been found to be significant predictors of foreclosure as well, coincident with trigger theory (Case & Shiller, 1996; Hendershott & Schultz, 1993; Phillips, Rosenblatt, & Vanderhoff, 1996).

Elmer and Seelig (1999) use a consumer choice model to theorize that interest rate shocks should not independently act as trigger events for default as they have equal effects on the prepayment and strategic default option. Given that interest rates have the same effect on the value of prepaying the home and on defaulting on the home, if an increase in interest rates produced a negative shock, prepayment (through sale of the home or refinancing the loan) always would be the preferable option to default in order to fulfill the mortgage obligation because its transactions costs are lower. However, Elmer

and Seelig's model does not factor into account potential constraints on the exercise of the prepayment option, such as constricted credit markets, which might negate the increase in the value of the prepayment option. Additionally, their argument implicitly assumes that the loan has a fixed rate. In loan samples with adjustable rate mortgages, increases in market interest rates could directly act as a trigger event. Delgadillo and Gallagher (2006) found the interest rate of the loan to be a significant factor in determining the probability of foreclosure, but since they did not include credit scores in their model, the significance of the interest rate is confounded with initial creditworthiness of the borrower.

Synthesis.

Mortgage default researchers are increasingly acknowledging that options and trigger theories explain differing motivations for default rather than seeking to use one or the other as a reductionistic explanation (Ambrose & Capone, 1998). Deciding which theory has preeminence in explanatory power may be a function of the time period and geography of the loan sample, including state foreclosure law. In some cases borrowers who have never been delinquent on their homes and can afford to continue making payments have chosen to default on their homes in the recent economic crisis because of the negative equity produced by steep declines in home values. Thus, options theory may have greater explanatory power in predicting foreclosure activity in areas like Nevada, Arizona, and Florida where home prices have declined by 50% or more and strategic defaults are more common (Zingales, 2010).

On the other hand, economic crises are also associated with increased unemployment and can also increase the likelihood of other potential trigger events such

as divorce. These trigger events create income shocks that can result in the loss of a home through foreclosure. Trigger events seem to be particularly likely to lead to foreclosure when combined with two constraints on exercising a pre-payment option that have been seen in the most recent economic crisis: illiquid credit markets that prevent owners from tapping into their home equity and illiquid housing markets that prevent the sale of the home. Resetting adjustable rate loans to an interest rate above the original rate also can serve as a trigger event, as it effectively creates a negative income shock that can lead to foreclosure.

Homebuyer education can be situated in both the options and trigger theoretical models in terms of how it affects loan outcomes. In the context of options theory, as Hartarska and Gonzalez-Vega (2006) demonstrated, borrowers who received credit counseling exercised their default option more ruthlessly when it was the best financial option for them. This would imply an association between increased financial literacy or savviness developed in credit counseling and a better understanding of one's current financial position and concurrent logical financial decisions based on that knowledge. Thus, homebuyer education could actually increase foreclosures in situations where it is the optimal choice for the borrower. Thus, whether homebuyer education produces better mortgage outcomes under options theory therefore depends on whether one is viewing the situation from the borrower or lender's perspective.

At the same time, homebuyer education theoretically should ameliorate the effects of trigger events in two ways. First, financial education can have a measurable average effect on savings and budgeting behavior, and increased savings or greater awareness of current expenses and how to reduce them could potentially help borrowers avoid

becoming delinquent in the face of an income shock. Second, financial education has been shown to influence the help-seeking behavior of borrowers in financial trouble, though a report by Fields, Libman, Saegert, Clark, and Justa (2007) for NeighborWorks indicated only a minimal effect in this area.

The Present Study

This study evaluates the effect of homebuyer education on mortgage outcomes, specifically focusing on its effects on foreclosure, after controlling for borrower and mortgage factors that also influence foreclosure rates. The data for this study is from a loan database with origination information and monthly payment history from 2002-2009 from the Tennessee Housing Development Agency (THDA), Tennessee's state housing finance agency. The choice of 2002 as the start date for the study coincides with the beginning of THDA's homebuyer's education program and the beginning of a loan program with down payment assistance from THDA.

The current study addresses several gaps in the homebuyer education literature to date and is able to overcome several (though not all) of the research challenges documented in the literature. With regard to data challenges, the data set from THDA for this study addresses many of the problems that made the PricewaterhouseCoopers study infeasible. First, THDA tracks whether their homebuyers received homebuyer education and the provider from which they received the education. Second, a substantial amount of demographic data is available in the dataset as well, which in turn allows for stronger control variables. Additionally, while direct information linking homeowners to the type and duration of education received was not available, THDA sets homebuyer education standards for its statewide trainers, provides standardized curriculum materials to

educators, and uses the classroom format almost exclusively. These parameters reduce problems around the effects that unobserved differences in the curriculum, duration, and format of homebuyer have had on outcomes in previous studies. Finally, THDA only holds whole loans, so the loan performance data is directly linked to origination data as the loan goes directly from the originator to THDA and stays there rather than being securitized and sold off to third parties.

This study fills in additional research gaps by being the first study of pre-purchase education that has a sample that includes information on active, prepaid, and foreclosed mortgages, allowing the estimation of the effects of homebuyer education on the competing risks of pre-payment and foreclosure. Second, this study affords stronger comparison groups than previous studies of homebuyer education. One analysis contrasts borrowers in a 30-year fixed rate loan program who did not take homebuyer education to those who took it voluntarily. The other analysis takes advantage of a natural experiment to contrast borrowers in a 2002 loan cohort who took homebuyer education as a precondition for down payment assistance and those who ended up receiving the down payment assistance without taking homebuyer education during the first few months of the program before the homebuyer education network was fully in place. Additionally, both analyses are able control for borrowers' initial creditworthiness, a factor missing from the Hartarksa and Gonzalez-Vega study (2006). Finally, this study focuses on the terminal outcomes of loans rather than 90-day delinquencies, avoiding statistical problems associated with loans self-curing.

However, it should be noted that the pool of THDA loans tend to be safer than securitized subprime loan pools used in other foreclosure studies, as there are no exotic

mortgage structures or adjustable rate loans, and they are better documented and monitored. Additionally, THDA is a government agency and has a profit cap, so while it does function like a business, its primary mission is promoting successful homeownership rather than profit-making, unlike private lending organizations. Thus, the generalizability of this study to lower quality loan pools that contain exotic mortgage structures and to private mortgage institutions may be somewhat limited. Also, while the comparison groups for this study are relatively strong, they are not experimental groups, so the problem of selection bias remains, particularly for the Great Rate cohort being examined, as these borrowers are voluntarily choosing to take the education. Finally, this study does not have the data for assessing the causal paths by which homebuyer education influences mortgage outcomes, so it is still constrained to a black box modeling approach.

CHAPTER III

DESCRIPTION OF THDA HOMEBUYER EDUCATION PROGRAM

In 2001 the Tennessee Housing Development Agency (THDA) revived a down payment assistance loan program, termed "Great Start." Coinciding with the new loan program was a requirement for the borrower to take homebuyer education. However, in early 2002 there were few certified homebuyer education trainers, wide variations in program delivery, and no network for forming training partnerships. In the fall of 2002, THDA partnered with a major regional bank and the Neighborhood Reinvestment Corporation (NRC, now NeighborWorks America) to deliver three four-day training sessions across the state to train the trainers on using the NRC's "Realizing the American Dream" curriculum. An additional training session in May 2003 increased the number of certified homebuyer education trainers to 145. THDA was also awarded a Housing Counseling grant from HUD in 2002 to help launch the program. THDA continues to organize peer support sessions to assist non-profits in their efforts to implement homebuyer education programs.

In July 2003, THDA's board approved a homebuyer education payment program that provides up to a $150 reimbursement to certified non-profit agencies for any client who closes on a THDA loan after having taken a homebuyer education course (whether they choose a down payment assistance loan or not). THDA provides the "Realizing the American Dream" training materials to the training agencies at no cost to the agency.

This curriculum covers 4 basic content areas: 1) Budgeting and Credit, 2) Shopping for a Home, 3) Getting a Mortgage Loan, and 4) Keeping Your Home and Managing Your Finances (including instruction on home maintenance). The clients are required to receive 8 hours of training, which is predominantly classroom-based, though one-on-one instruction is offered on a limited basis in some rural areas.

Hirad and Zorn (2001) found that the delivery method of homebuyer education (HBE) has a significant effect on delinquency outcomes, and Collins (2007) found that spending a higher number of hours in the program has a significant effect on delinquency as well. While direct information linking the borrower to the type and duration of homebuyer education received was not available, both of these limitations were at least partially addressed with information gathered through informal interviews with THDA staff. First, THDA requires its certified trainer agencies to provide direct education and/or counseling services to its clients, meaning that borrowers either have classroom education or face-to-face counseling. The large majority of THDA's clients take homebuyer education in a classroom setting, with a small handful of homebuyers taking one-on-one counseling, which primarily occurs in rural areas or special circumstances. With respect to duration, THDA asks its certified providers to abide by the American Homeownership Education and Counseling Institute's guidelines which mandate a minimum of 8 hours of education. Collins' (2007) study found that there was little marginal benefit gained by having more than 8 hours of program exposure, so THDA's program is designed to optimize the benefit received. Hirad and Zorn's (2001) study also found the type of provider to be significant with non-profit classroom counseling being associated with the greatest reduction in ever becoming 90 days delinquent other than individual counseling

by a mortgage insurer. THDA exclusively uses non-profit providers, some of which are able to offer the service for free using grant funding (generally from HUD) and others that charge a fee for services. THDA has asked that all fee-based agencies not charge more than $25 per client, though a few providers on the approved list have charged up to $50-$75 for the service.

CHAPTER IV

METHODS

Hypotheses and Regression Methodology

The mortgages in the THDA dataset can have one of three terminal outcomes. The first is that the loan is still active as of October 15, 2010. The second is that the mortgage has been terminated due to foreclosure on the home. The final option is that the homeowner prepays the mortgage, selling the home and paying off the mortgage balance. Given the three possible mutually exclusive categorical loan outcomes, a multinomial logit model was chosen, comparing the likelihood of foreclosure and prepayment to the likelihood of the excluded group of the loan being active. In addition to the mortgage and borrower characteristics previously mentioned, I control for the age of the loan in months to account for the time of exposure to the different outcome risks. For a subgroup analysis of the Great Rate loan program, I also control for the loan cohort to account for any unobserved differences between the two cohorts being used (2005 and 2006).

A two-stage propensity score analysis, predicting to who would receive homebuyer education and who would not to try to control for selection bias, was not used based on comparative research of quasi-experimental design methods. Bloom (2005) compared the biases from propensity score analyses and ordinary regression with covariates relative to experimental results, and found that the two alternative analyses did about equally well. Given that propensity score analysis would be unlikely to be an

improvement on ordinary regression analysis, I chose to utilize a multinomial logistic regression model.

The first hypothesis was that borrowers who voluntarily took homebuyer education in the Great Rate program for loans originated during 2005 and 2006 would be less likely to foreclose than those who did not take homebuyer education after controlling for borrower and mortgage characteristics, loan cohort, and loan age. It is difficult to predict a direction for the effect of homebuyer education on prepayment because there are two competing forces at work. On one hand, Hartarska, Gonzalez-Vega, and Dobos (2002) hypothesized that home purchase credit counseling could make borrowers more strategic, and thus more likely to prepay when it would be an optimal decision. Thus counseled borrowers may be more likely to prepay than non-counseled borrowers. However, prepayment can also be a sign of mortgage trouble if the borrower sells the home after falling behind on payments in order to avoid foreclosure. In the latter case, we would expect to see lower prepayment rates for those with homebuyer education if homebuyer education is improving financial behaviors.

The second hypothesis was that those in the Great Start program in 2002 who took homebuyer education would be less likely to foreclose than those who did not take homebuyer education (due to lack of availability when the program began), after controlling for borrower and mortgage characteristics, and loan age. The Great Start analysis does not incorporate property type as a variable due to insufficient variation and collapses the race categories used in the Great Rate analysis into White and Black by combining the small number of Hispanic and Other borrowers (20 total) into the White category.

The following equation for a multinomial logit model expresses the probability of a loan, i, ending in foreclosure (j=1) or prepayment (j=2) relative to the loan remaining active (j=0):

$$P(y_i = j) = \frac{e^{\beta_j z_i}}{1 + \sum_{k=1}^{2} e^{\beta_k z_i}} \; for \; j = 1, 2$$

$$P(y_i = j) = \frac{1}{1 + \sum_{k=1}^{2} e^{\beta_k z_i}} \; for \; j = 0$$

β represents a coefficient vector and Z represents a vector of the values of the independent variables, including borrower, mortgage, and loan exposure factors (as well as a loan cohort dummy variable for the Great Rate analysis).

Data

The initial data for the study was obtained from THDA's loan database comprising loans that were closed on or after January 1, 2002 until October 15th, 2009. The start date was determined by the beginning of THDA's homebuyer education program in 2002, and the database had monthly payment information up to October 15, 2009. The original data set had 22,269 loans. Based on information from interviews with THDA staff, 210 loans (less than 1% of the total loans) were identified as having irreconcilable data entry errors on variables being used in the study and were excluded from the data set, leaving 22,059 total loans that were originated between 2002 and 2009. A cutoff date for loan origination of December 31st, 2006 was chosen to allow a sufficient history of payments, given that research to date has shown that default hazards tend to peak around 18-24 months after origination (Quercia & Spader, 2008). Applying this cutoff also eliminated a few small loan programs that THDA established in the last three years that had insufficient payment history data to be included in the study. After

applying the December 31st, 2006 cutoff and eliminating small extraneous loan programs, the data set was reduced to 12,372 loans from THDA's two main loan programs, Great Rate and Great Start, which served as the basis for subsequent analysis and forming of further sub-samples for the regression analyses.

The Great Rate program is THDA's oldest and largest program and offers the lowest interest rate with no down payment assistance. Homebuyer education is not required for this loan, but an average of 10% of people in this program still chose to voluntarily take it between 2005 and 2006. The average interest rate for Great Rate loans was 5.346% ranging from a high of 5.862% in 2002 to a low of 5.029% in 2003. The Great Start loan, begun in 2002, makes available up to 4% of the loan amount available for assistance with down payment and closing costs in exchange for a higher interest rate and required homebuyer education. The average interest rate for Great Start loans was 6.324%, approximately 1% higher than Great Rate loans, ranging from a high of 6.813% in 2002 to a low of 6.030% in 2005. While THDA only offered direct down payment assistance for the Great Start program, other programs such as the American Dream Downpayment Initiative can be applied to qualified Great Rate borrowers. Because of access to down payment assistance, many of the loans in the THDA database are listed as having zero down payments, as the down payment variable in THDA's database is recorded only as the amount of the homebuyer's own money put toward the purchase price of the home. However, the amount of down payment assistance is still accounted for in the loan-to-value ratio by decreasing the mortgage amount relative to the purchase price. Table 1 summarizes the characteristics of each loan program.

Table 1

Loan Programs and Insurance Types

Loan Program	Downpayment Assistance	Homebuyer Education	# Loans 2002-2006	# Loans 2002-2009
Great Start	None	Optional	4,378	6,608
Great Rate	4% of price	Required	7,996	13,506

	2002-2006		2002-2009	
Loan Insurance Type	Count	% Total	Count	% Total
FHA	9,672	78.2%	13,295	66.1%
VA	401	3.2%	610	3.0%
RECD	1,521	12.3%	2,344	11.7%
Conventional Insured LTV 97.01-100%	78	0.6%	2,491	12.4%
Conventional Insured LTV 78%-97%	144	1.2%	574	2.9%
Conventional Uninsured LTV 78% or less	259	2.1%	482	2.4%
Other	297	2.4%	318	1.6%
Total	12,372	100.0%	20,114	100.0%

RECD=USDA Rural Economic and Community Development Loan Program
VA=Veterans Administration
FHA=Federal Housing Administration

In terms of loan insurance, as shown in Table 1, THDA loans are a mixture of conventional (insured and uninsured) loans and loans insured by the Federal Housing Administration (FHA), Veterans Administration (VA), and the US Department of Agriculture's Rural Development division's Rural Economic and Community Development (RECD) program. THDA loans have no pre-payment penalties though the loans are subject to a federal recapture tax. A recapture tax means that if a borrower sells or otherwise disposes of their home before a nine-year window, the borrower may have to pay the lesser of the original THDA loan amount times 6.25% or half of the actual gain from the sales or disposal of the home. Whether a homebuyer actually has to pay the

recapture tax or not is based on a complex formula that factors in the original loan amount, time spent in the home while financed by a THDA loan, current income and family size at time of sale, and the gain from the sale of the home. Buyers can refinance the loan without penalty but still are subject to the nine-year provision. Finally, the origination fee is a maximum of 1% and the discount point is a maximum of ¼% on the first mortgage.

In considering the demographics THDA targets with these loans, all loan programs have the same maximum household income and sales prices which vary by county. For 2009, the maximum acquisition cost (sales price of the home) ranged from $200,160 to $226,100. The household income limits differ by whether the household is comprised of 1-2 persons or 3 or more persons and is based on area median income. The income limit range for 1-2 persons was $54,500-$64,900 and for households of 3 or more persons the range was from $62,675-$74,635. THDA has a requirement that a buyer must be a first-time homebuyer, defined as not having owned a home in the previous three years, unless the homebuyer lives in a HUD targeted county, HUD targeted census tract, or a presidentially declared disaster area, in which case the first-time homebuyer requirement is waived. The THDA database does not have information on whether borrowers in these areas are first-time homebuyers or not.

Variables Used

Quercia and Wachter (1996) recommend controlling for six determinants of default decisions, four of which are available in the THDA dataset: 1) Loan-to-Value Ratio, 2) Household income, 3) Mortgage payment, and 4) Property tax and insurance

payments. While information on household composition is available at the time of

origination, information on changes in household composition is not available.

Table 2

Definitions of Variables Used

<u>Dependent</u>

Active	Loan still active as of October 15th, 2009
Foreclosed	Foreclosure completed, terminating loan
Prepaid	Full payment of mortgage prior to end of loan term (either through sale of home or refinancing)
Troubled Sale	Borrower pre-paid while one or more months delinquent
Time To Foreclosure	Time between loan origination and foreclosure sale, if foreclosed
Time To Troubled Prepayment	Time between origination and troubled prepayment, if applicable
Time to Prepayment	Time between origination and prepayment, if prepaid
Delinquency (Highest Level)	Longest period of delinquency during the course of the loan
Delinquency Episodes per Loan	Count of the number of unique delinquency episodes for a loan
Delinquency Episodes Cured	Number of episodes ended by becoming current on payments

<u>Independent</u>

Underwriting and Mortgage Characteristics:

Homebuyer Education	Binary variable indicating if homebuyer education was taken
HBE, Voluntary	Homebuyer voluntarily took HBE (within Great Rate program)
HBE, Required	Homebuyer required to take education as part of loan program
Credit Score[1]	Borrower's Credit Score.
LTV Ratio[2]	Ratio of Mortgage Amount to Acquisition (Sale) Price of home.
Down Payment	Binary variable indicating whether a down payment was made (not including THDA down payment assistance)
Property Type	Type of property purchased. Includes Single Family, Multifamily, Condominium/Townhome, Manufactured/Modular, and Planned Development (PUD)/Zero Line Lot
Monthly Payment	Monthly principal and interest payment on the mortgage
Insurance	Cost of insurance on the home
Property Taxes	Cost of property taxes on the home

Borrower Characteristics:

Age	Age of borrower
Race	Race of borrower. Includes White, Black, Hispanic, and Other
Gender	Gender of borrower (% Male)
Number in Household	Number of individuals in borrower's household

Additional Characteristics:

Loan Age	Number of months loan active or months until loan terminated

[1]THDA attempts to draw credit reports from the three major credit agencies. It takes the median score if three reports are available, the lesser score if two are available, and if only one report is available, that score is used.
[2]LTV can exceed 100% under certain circumstances with FHA loan for covering insurance cost.

The data set contains no information on the final recommended variable, employment changes. Table 2 defines the variables that are used in this study. I interviewed an experienced staff member in the Single Family Housing Division at THDA to ascertain how the organization defined and calculated the financial ratios in their underwriting and database as well as other key variables.

Sample

As mentioned earlier, one of the key challenges in studying homebuyer education to date has been finding adequate comparison groups. For THDA loans closed between 2002 and 2006, an overall average of 32.7% of borrowers took homebuyer education. However, homebuyer education was required for the Great Start program and was combined with financial assistances, as well as different interest rates, so homebuyer education was largely confounded with these factors. However, within the data available in this study there are two relatively strong non-experimental comparison groups for testing the effects of homebuyer education, though each has their own weaknesses.

First, an average of 10% of borrowers in the Great Rate program between 2005 and 2006 took homebuyer education voluntarily. These are the first two years where enough borrowers participated in homebuyer education to allow for a meaningful contrast between those who did and did not participate in the program, and growing awareness of the program likely explains a portion of the quick rise in the conditional percentage of those taking HBE voluntarily as a proportion of all who took homebuyer education between 2003 and 2005. While this comparison is more likely to be influenced by selection bias, given the voluntary nature of the program, it avoids the problems with confounding in trying to compare across loan types and periods.

Second, as mentioned earlier, at the beginning of the Great Start program in 2002, there was a 7 month period as the program was beginning where the homebuyer education programs were not fully in place. As a result, 65% of the 2002 Great Start loan cohort received these loans with down payment assistance without taking homebuyer education. This lag in the implementation of the HBE program, is also reflected in the loan cohort descriptive data in Table 3 as well, through the one-year jump in participation from 10% to 39%. A more detailed analysis revealed that no borrowers in the Great Start program who had loans originated prior to July 2002 took homebuyer education, likely due to some disorganization at program start-up.

Also, this cohort had a particularly high foreclosure rate (15.2%), so there is still high variance on the dependent variable. Thus, assuming that receipt of homebuyer education was not due to systematic differences among borrowers during the start-up phase of the program, this particular cohort is a strong choice for examining the effects of homebuyer education, as the confounding effects of the loan subsidy and other program factors are effectively controlled and issues with selection bias are prevented as individuals were required to participate as the resources became available. Thus, the group of borrowers who did not receive homebuyer education in the start-up phase of the loan program provides a relatively strong comparison group to those who received required homebuyer education later in the year, particularly due to there being no systematic reason these people were excluded from homebuyer education other than program availability. However, the main drawback is that the sample size for this loan cohort is somewhat small (730 loans) compared to later loan cohorts.

Table 3

Descriptives by Year of Loan Origination

Year	2002	2003	2004	2005	2006
Loans Originated	2,553	2,180	2,081	2,396	3,162
Foreclosed (%)	9.9%	7.5%	7.0%	5.7%	4.9%
Prepayment (%)	46.5%	35.5%	27.2%	16.9%	12.0%
Active (%)	43.6%	57.0%	65.7%	77.4%	83.0%
Troubled Prepayment %	25.3%	20.5%	14.7%	9.1%	5.9%
Troubled Prepay of % Prepaid	54.6%	57.6%	53.8%	54.1%	49.2%
Troubled Prepay:Foreclosed	2.55	2.72	2.09	1.60	1.20
Underwriting and Mortgage Characteristics					
Mean Credit Score[1]					
No Credit Score	9.2%	7.9%	6.9%	7.8%	11.7%
Credit Score <600	12.5%	10.0%	11.3%	8.5%	8.7%
Credit Score 600-659	29.3%	29.9%	32.1%	32.2%	27.1%
Credit Score >660	49.0%	52.2%	49.7%	51.5%	52.5%
Mean LTV	98.3	98.4	97.9	97.8	97.5
LTV 78% or less	1.5%	1.2%	2.2%	3.0%	4.5%
LTV 78.01-96.99%	8.0%	6.5%	10.3%	11.6%	12.7%
LTV 97-100%	81.5%	86.2%	80.6%	73.5%	69.4%
LTV > 100%	9.1%	6.1%	6.9%	11.8%	13.4%
% Making Down Payment	40.5%	30.6%	31.8%	30.2%	40.3%
Average Interest Rate	6.13	5.47	5.67	5.41	5.81
Monthly Payment	$500.62	$503.30	$538.99	$564.01	$614.81
Acquisition Cost	$83,791	$90,589	$95,153	$102,677	$107,639
Borrower Characteristics					
HBE, percent					
Of HBE, Voluntary %	0%	1%	7%	14%	18%
Of HBE, Required %	100%	99%	93%	86%	82%
Age	31.8	31.2	31.3	31.2	31.3
Gender (% Male)	58.9%	55.6%	56.6%	58.1%	58.2%
Number in Household	2.04	1.96	2.01	2.02	1.99
Race					
White	76.3%	79.3%	79.3%	79.8%	80.6%
Black	19.9%	17.2%	17.0%	17.2%	15.9%
Hispanic	2.0%	1.8%	2.6%	1.9%	1.8%
Other	2.0%	1.7%	1.1%	1.1%	1.7%
Family Status					
Married	30.3%	30.3%	33.9%	32.2%	33.1%
Single	50.0%	55.4%	49.3%	50.9%	52.6%
Single Parent	19.4%	14.3%	16.5%	16.8%	14.1%
Other	0.4%	0.0%	0.2%	0.1%	0.2%

[1]Of those who had a reported credit score

To examine the degree of similarity of borrower and mortgage characteristics in each comparison group (between those who took homebuyer education and those who did not), a series of t-tests and chi-square tests were performed for each subset, with the results displayed in Table 4. For the Great Rate comparison group, statistically significant differences were found on all variables except foreclosure and pre-payment rates, age, insurance amount, gender, and bankruptcy. In terms of substantive differences, the most notable findings were that, of borrowers with credit scores, those with homebuyer education on average had a credit score that was 19 points lower compared to the no

Table 4a

T-Tests for No HBE v. Voluntary HBE Within Great Rate Program, 2005-2006

Variable	No HBE	Voluntary HBE	Difference		95% CI (Lower)	95% CI (Upper)
Foreclosed	0.044	0.045	-0.001		-0.024	0.045
Pre-paid	0.111	0.092	0.019		-0.013	0.092
Credit Score[1]	688	669	19	****	11.66	26.22
LTV	97.09	96.02	1.07	**	0.29	1.84
Mortgage Amt	$104,311	$98,153	$6,158	****	$3,180	$9,134
Acqusition Cost	$107,789	$102,041	$5,748	***	$2,804	$8,693
Age	31.1	32.0	-0.9		-2.0	0.32
Down Payment	$3,553	$2,136	$1,417	****	$721	$2,114
% making DP	0.500	0.314	0.186	****	0.133	0.238
Interest Rate	5.32	5.33	-0.01		-0.038	0.030
Monthly Payment	$581.20	$547.12	$34.08	****	$17.21	$50.95
Insurance	$45.50	$47.37	-$1.87		-$4.12	$0.31
Property Tax	$74.89	$82.01	-$7.12	****	-$11.43	-$2.81
Gender (Male)	0.590	0.462	0.128	****	0.071	0.182
Number in Household	1.94	2.13	-0.19	**	-0.33	-0.04
Sample Size	3379	337				

Chi-Square Tests	X^2	df				
Race	138.32****	3				
Property Type	4.03	4				

Significance: * .05, **.01, ***.001, **** <.0001
[1]Of those who had a reported credit score

Table 4b

T-Tests for No HBE v. Required HBE Within Great Start Program, 2002

Variable	No HBE	Required HBE	Difference		95% CI (Lower)	95% CI (Upper)
Foreclosed	0.176	0.106	0.070	**	0.018	0.106
Pre-paid	0.554	0.492	0.062		-0.014	0.139
Credit Score[1]	652	652	0		-8.53	9.54
LTV	98.8	98.8	0		-0.06	0.15
Mortgage Amt	$79,848	$81,967	-$2,119		-$4,925	$688
Acqusition Cost	$80,825	$83,174	-$2,349		-$5,175	$475
Age	31.9	32.4	-0.5		-2.1	1.2
Down Payment	$110	$23	$88	***	$37	$138
% making DP	0.065	0.016	0.049	***	0.022	0.076
Interest Rate	6.93	6.59	0.34		0.312	0.375
Monthly Payment	$527.74	$523.22	$4.52		-$13.63	$22.68
Insurance	$29.40	$31.56	-$2.16	*	-$3.91	-$0.41
Property Tax	$65.27	$70.10	-$4.83	*	-$9.29	$0.36
Gender (Male)	0.565	0.563	0.002		-0.074	0.078
Number in Household	2.12	2.15	-0.03		-0.21	0.17 E
Sample Size	478	252				

Chi-Square Test	X^2	df				
Race	3.08	3				

Significance: * .05, **.01, ***.001, ****<.0001
[1]Of those who had a reported credit score

any financial assistance received (with half of those without HBE making a down payment versus 31% of those with HBE), and on average those who took HBE paid $34 less per month on their home. The chi-square test for race was significant at the .0001 level. African Americans were more likely to take homebuyer education, with 22.2% receiving HBE versus 6.6% of whites receiving HBE. The high p-value for the chi-square test for property type indicated that there was not a significant difference in the types of property purchased by those who took HBE and those who did not.

The Great Start groups were largely similar, with the only significant variables other than foreclosure being down payment, insurance, and property tax. Prior to any controls, the required HBE group had a foreclosure rate 7.0% below those without HBE, a sizeable difference. Those without HBE were somewhat more likely to have made an additional down payment, with 6.5%. of those who took HBE making an additional down payment versus 1.6% of those who took HBE. Those who did not take HBE paid a minimal amount less in insurance and property tax ($2.16 and $4.83 respectively). The chi-square test for race was non-significant. Property type was dropped as a variable from this analysis since the counts in non-single family property types were too small to be able to produce reliable estimates.

CHAPTER V

RESULTS

Descriptive Analysis

The primary purpose of this study is examining the effects of homebuyer

education on foreclosure, so the focus of this section will be on issues relating to

foreclosure. However, the model used examines both foreclosure and prepayment risk, so

information on prepayment is included as appropriate but is not discussed in detail. Table

5 describes loan outcomes by both the loan origination cohort and by loan program type.

In terms of the proportions of loans originated by program type, a slight U-shape appears

in contrasting Great Start and Great Rate loans, with Great Start's popularity surging in

2003 (keeping in mind that the program was introduced in early 2002) and gradually

tapering off in the following years. The high foreclosure rates for the 2002 Great Start

loan cohort are also notable, as they are twice the foreclosure rate of Great Rate loans for

the same year. These loans were generally made to a higher credit risk population, as the

Great Start loans had an average credit score that was consistently 24-26 points lower

than Great Rate loans. However, the ratio of foreclosure rates between the two program

narrows as time goes on despite the gap in credit scores remaining generally the same,

indicating that differences in credit scores may not be the sole source of the differential in

foreclosure rates. The higher foreclosure rates for the 2002 Great Start cohort may also be

Table 5

Outcomes and Underwriting Characteristics by Program Type and Loan Cohort

Year	2002	2003	2004	2005	2006	Total
Loans Originated	2,553	2,180	2,081	2,396	3,162	12,372
Great Start	730	948	856	881	961	4,376
Great Rate	1,823	1,232	1,225	1,515	2,201	7,996
% Loans Originated						
Great Start	28.6%	43.5%	41.1%	36.8%	30.4%	35.4%
Great Rate	71.4%	56.5%	58.9%	63.2%	69.6%	64.6%
% Foreclosed						
Great Start	15.2%	9.3%	8.3%	7.5%	6.7%	9.1%
Great Rate	7.8%	6.2%	6.1%	4.7%	4.2%	5.7%
% Prepaid						
Great Start	53.4%	37.8%	31.8%	21.8%	19.4%	31.9%
Great Rate	43.7%	33.8%	24.1%	14.1%	8.8%	23.9%
% Active						
Great Start	31.4%	53.0%	59.9%	70.7%	74.0%	58.9%
Great Rate	48.5%	60.1%	69.8%	81.3%	87.0%	70.3%
% Troubled Prepayment						
Great Start	31.8%	21.8%	18.6%	11.6%	10.0%	18.2%
Great Rate	22.8%	19.4%	11.9%	7.7%	4.1%	12.6%
Troubled Prepayment as % of Prepaid						
Great Start	59.5%	57.8%	58.5%	53.1%	51.6%	56.9%
Great Rate	52.1%	57.5%	49.5%	54.9%	46.9%	52.7%
% Troubled End						
Great Start	47.0%	31.1%	26.9%	19.1%	16.6%	27.3%
Great Rate	30.6%	25.6%	18.0%	12.4%	8.3%	18.3%
Credit Score[1]						Average
Great Start	652	661	655	661	661	660
Great Rate	678	685	680	683	688	689
LTV						
Great Start	98.7	98.8	98.8	98.8	98.9	98.8
Great Rate	98.0	98.1	97.3	97.3	96.8	97.4
Average Interest Rate (%)						
Great Start	6.813	6.035	6.241	6.030	6.500	6.324
Great Rate	5.862	5.029	5.278	5.047	5.512	5.346

[1]Of those who had a reported credit score

influenced by program start-up effects, particularly in the delayed implementation of the

homebuyer education requirement, which will be explored further in the multivariate

analysis.

Table 6

Loan Outcomes and Loan Trouble

	All	Great Rate No HBE	Great Rate HBE, Vol.	Great Start No HBE	Great Start HBE, Req.
	Mean (*SD*)	Mean (*SD*)	Mean (*SD*)	Mean (*SD*)	Mean (*SD*)
Loan Outcome					
Active	0.663	0.845	0.864	0.270	0.402
Foreclosure	0.069	0.044	0.045	0.176	0.106
Prepayment	0.268	0.111	0.092	0.554	0.492
Troubled Prepayment	0.146	0.056	0.053	0.320	0.311
Troubled Prepayment as % of Prepayment	0.545	0.505	0.576	0.578	0.632
Troubled End	0.215	0.100	0.098	0.496	0.417
Time To Foreclosure (Months)	38.9 (18.5)	30.7 (10.7)	29.7 (10.0)	40.6 (21.0)	52.9 (19.9)
Time to Prepayment	37.8 (18.4)	28.5 (12.0)	29.7 (12.0)	34.1 (19.6)	35.7 (20.7)
Time To Troubled Prepayment	37.5 (18.2)	28.7 (11.9)	29.7 (11.5)	35.1 (20.6)	37.2 (20.4)
Time to Troubled End	38.0 (18.3)	29.6 (11.4)	29.7 (10.7)	37.1 (37.1)	41.2 (21.4)
Delinquency (Highest Level)					
Never Delinquent	0.491	0.618	0.504	0.288	0.256
30 days	0.244	0.185	0.199	0.299	0.335
60 days	0.070	0.058	0.092	0.090	0.102
90+ days	0.200	0.146	0.208	0.326	0.307
Delinquency Episodes per Loan	1.44 (2.32)	0.92 (1.67)	1.12 (1.72)	2.11 (2.83)	2.48 (2.92)
(If have at least 1 Episode)	2.32 (2.56)	2.46 (1.90)	2.30 (1.84)	2.97 (2.97)	3.38 (2.93)
# Delinquency Episodes Cured	1.17 (2.18)	0.76 (1.51)	0.91 (1.55)	1.64 (2.76)	2.07 (2.88)

One other notable trend is that troubled prepayments, defined as a prepayment occurring while the borrower is one or more months delinquent on their mortgage, are a relatively frequent occurrence, as troubled prepayments comprised an average of 57% of prepayments from 2002-2006. The fact that this ratio has been declining for more recent

Table 7a

Annual Foreclosures by Origination Year

Loan Cohort	Not Foreclosed	Foreclosure Year							Total
		2003	2004	2005	2006	2007	2008	2009	
2002	2,301	25	51	54	43	25	21	35	254
2003	2,016	0	15	31	42	23	20	33	164
2004	1,935	NA	1	16	37	31	24	37	146
2005	2,259	NA	NA	0	25	34	28	50	137
2006	3,006	NA	NA	NA	1	22	52	81	156
Total	11,517	25	67	101	148	135	145	236	857

Table 7b

Annual Foreclosures by Homebuyer Education,
Great Rate Loans Originated 2005-2006

	Not Foreclosed	Foreclosure Year							Total
		2003	2004	2005	2006	2007	2008	2009	
No HBE, 2005	1307	NA	NA	0	9	16	14	24	63
HBE, 2005	137	NA	NA	0	2	2	2	2	8
									71
Total	1444	NA	NA	0	11	18	16	26	
No HBE, 2006	1924	NA	NA	NA	0	11	29	45	85
HBE, 2006	185	NA	NA	NA	0	0	4	3	7
Total	2109	NA	NA	NA	0	11	33	48	92

Table 7c

Annual Foreclosures by Homebuyer Education,
Great Start Loans Originated in 2002

	Not Foreclosed	Foreclosure Year							Total
		2003	2004	2005	2006	2007	2008	2009	
No HBE	394	11	25	21	10	5	4	8	84
HBE	225	1	4	1	5	8	5	3	27
Total	619	12	29	22	15	13	9	11	111

loan cohorts may reflect the increasing difficulty of selling homes due to the housing market bubble collapsing and reduced lending levels by banks decreasing borrowers' ability to refinance their loans, even in the currently favorable interest rate

The average time to foreclosure for the overall sample of loans was 39 months, which is longer than most other studies to date. This is likely a function of two elements. First, this sample likely has a higher average loan quality than other studies of low-income lending, particularly of studies focusing on subprime mortgages, as over half of the loans in this sample are prime mortgages. It is assumed that mortgages made to high risk individuals would be more likely to get into trouble earlier than high quality loans. However, this phenomenon is also partially a function of shifts in the housing market and economy. One can see a twin-peaked effect for earlier loan cohorts in Table 7a, whereby their peak foreclosure year initially occurred 24-36 months after origination but then had a resurgence in 2009, as the effects of the recession and extended unemployment began to take their toll, which would also extend the average time to foreclosure, had their peak foreclosure years occur in 2009 (with 2004 being a second peak), and foreclosures across all cohorts rose in 2009 from 2008. Prior to the 2005 loan cohort, foreclosures peaked at 3 years after origination, which again was somewhat longer than other studies which found the default hazard peaking between 18 and 24 months (i.e., Hartarska & Gonzalez-Vega, 2006; Quercia & Spader, 2008; Quercia, Stegman, & Davis, 2007).

Another notable pattern in time to foreclosure is how much the homebuyer education and non-homebuyer education groups differed on time to foreclosure in the Great Start group. Part of the difference is accounted for by the fact that borrowers who took homebuyer education in this cohort did not begin taking it until after the program

had already been in existence for 7 months, but even after accounting for this, the homebuyer education group still had a 5 month longer average time to foreclosure. Combined with a much higher proportion of the homebuyer education loans still being active 7 years later (40% v. 27%), these findings suggest a positive effect of homebuyer education on mortgage outcomes for this cohort.

In light of this, it is interesting that a comparison of the highest level of delinquency shows very little between the homebuyer education and no homebuyer education groups given their divergence on terminal loan outcomes. In contrast, the Great Rate comparison groups differ little on outcomes and time to foreclosure but have fairly different delinquency patterns, with those taking homebuyer education being more likely to have been 90 days or more delinquent at least once. These discrepancies between intermediate financial trouble and terminal loan outcomes also cast doubt on the utility of using 90 day delinquency as an estimator of loan outcomes.

Results of the Multinomial Logit Models

Table 8 contains the means and standard deviations for the variables used in the multinomial regression models, first considering all of the loans in the sample from 2002-2006 and then for the Great Rate 2005-2006 cohort and for the Great Start 2002 cohort. Tables 9 and 10 present the results of the two multinomial logistic regression models. The primary focus of this analysis is on foreclosure, but the coefficients of homebuyer education and control variables are included for prepayment as well, recognizing it as an alternative outcome.

Table 8

Descriptive Statistics of Model Variables

Variable	GR & GS Loans, 2002-2006 Mean	SD	Great Rate Loans, 2005-2006 Mean	SD	Great Start Loans, 2002 Mean	SD
Homebuyer Education	0.33		0.09		0.35	
Voluntary	0.03		*(All Voluntary)*			
Required	0.29				*(All Required)*	
Underwriting Characteristics						
LTV	98.0	5.35	97.0	7.36	98.8	0.75
LTV<78	0.04		0.06		0.00	
LTV 78-96.9	0.10		0.18		0.04	
LTV 97-100	0.77		0.58		0.94	
LTV>100	0.10		0.19		0.03	
Credit Score*	673	66.0	686	62.0	652	57.2
No Credit Score	0.09		0.10		0.09	
Score < 600	0.10		0.07		0.16	
Score 600-659	0.30		0.26		0.36	
Score > 660	0.51		0.57		0.38	
% with DP**	0.352		0.413		0.048	
Property Type						
Single Family	0.871		0.838		0.893	
Condo/Townhouse	0.049		0.061		0.048	
PUD/Zero Line Lot	0.065		0.082		0.048	
Multifamily	0.004		0.005		0.003	
Manufactured	0.012		0.014		0.008	
Monthly Payment	$549.04	$152.75	$578.11	$162.11	$526.76	$118.76
Insurance	$39.95	$16.51	$45.63	$17.29	$30.14	$11.18
Property Tax	$73.21	$34.07	$75.54	$36.53	$66.90	$27.93
Borrower Characteristics						
Age	31.36	10.23	31.76	10.58	31.95	10.68
Race						
White	0.79		0.82		0.729	
Black	0.17		0.15		0.244	
Hispanic	0.02		0.02		0.012	
Other	0.02		0.02		0.015	
Gender (% Male)	0.58		0.58		0.56	
Number in Household	2.00	1.16	1.96	1.15	2.13	1.23
Loan Age (Months)	51.4	20.18	41.86	9.4	52.50	29.17
Sample Size	12,372		3,716		730	

[1]For borrowers with a credit score

[2]Made down payment above any down payment assistance received

The coefficients represent the logits of foreclosure and prepayment respectively compared to the loan being active, with the Exp(B) column representing the coefficients as odds ratios, which compare the odds of foreclosure and prepayment to the odds of the loan being active as of October 15th, 2009. The first multinomial logit model compared those who took homebuyer education voluntarily and those who did not within THDA's Great Rate program (which offers a fixed rate loan and no down payment assistance from THDA). The results, shown in Table 9, indicate that homebuyer education had a strong effect on reducing the probability of foreclosure, as the odds of foreclosure were only 50.5% as high for those who took homebuyer education as for those who did not. The positive coefficient for the quadratic loan age term indicated that the probability of foreclosure was still rising for these loans at the cutoff date. Given the growth in unemployment rates in 2008 and 2009, the growth in long-term unemployment, and the still relatively young age of these loans, this finding is not particularly surprising.

However, it does differ from previous studies that found the default hazard tending to decrease after 2 years, which would have been reflected with a negative coefficient on the squared loan term. The coefficients for the control variables associated with mortgage and property factors were largely in the expected directions from previous research, with a lower credit score, and a higher initial LTV being associated with increased likelihood of foreclosure. Making a down payment (after counting any outside down payment assistance) was also associated with a moderate reduction in the probability of foreclosure. Increased property taxes had a moderate effect on reducing the likelihood of foreclosure, but this relationship is likely indicative of homebuyers with greater savings and incomes who can afford more expensive homes with higher property

taxes being less likely to foreclose. The direction of the coefficients for property type are consistent with Quercia, Stegman, and Davis' (2007) findings that multifamily, manufactured, and modular housing are associated with an increased likelihood of foreclosure while condos and town homes are associated with lower likelihood of foreclosure. However, the effect sizes in this study for manufactured, modular, and multifamily housing differ substantially, in part due to the sample for this study having much lower proportions of these types housing. Additionally, the highly compact Planned Unit Development (PUD) and Zero-line lot properties, a high density single family form of housing not seen in previous studies, are associated with a lower likelihood of foreclosure.

In terms of borrower characteristics, the coefficients were also mostly in the expected direction based on past foreclosure studies. While age was not statistically significant, the negative coefficient is consistent with previous findings that older risk of foreclosure compared to white borrowers. Hispanic and Other minorities (with Other primarily representing Asian borrowers) were associated with a reduced likelihood of foreclosure, though the effect sizes should be viewed with caution due to the small number of borrowers in these category. Larger households were more likely to foreclose, consistent with findings of a foreclosure study by Delgadillo and Gallagher (2006). Gender was not found to be a significant predictor of foreclosure.

Table 9

Probability of Foreclosure and Prepayment, Multinomial Logit Model
Homebuyer Education v. No Homebuyer Education, Great Rate 2005 & 2006 Originations

	Foreclosed				Prepayment			
	Coef.		SE	Exp(B)	Coef.		SE	Exp(B)
(Intercept)	27.901	****	0.006	1.31E+12	37.736	****	0.007	2.45E+16
Homebuyer Education	-0.704	****	0.149	0.495	-0.202		0.223	0.817
No Credit Score	1.273	****	0.151	3.571	0.220		0.220	1.246
Credit Score < 600	0.023		0.207	1.023	-1.125	****	0.189	0.325
Credit Score 600-659	0.790	****	0.201	2.203	-0.001		0.195	0.999
LTV	0.040	****	0.013	1.041	-0.005		0.011	0.995
Down Payment	-0.410	**	0.228	0.664	0.397	****	0.185	1.488
Condo/Townhouse	-0.900	****	0.048	0.406	0.857	****	0.313	2.356
PUD/Zero Line Lot	-0.422	****	0.087	0.656	0.279		0.279	1.321
Multifamily (2-4 units)	2.261	****	0.006	9.597	0.244	****	0.006	1.277
Manufactured/Modular	0.402	***	0.020	1.495	-0.559	****	0.017	0.572
Monthly Payment	-0.034		0.083	0.967	-0.022		0.068	0.979
Insurance	0.008		0.006	1.008	-0.006		0.005	0.994
Property Tax	-0.007	**	0.004	0.993	0.000		0.003	1.000
Age	-0.007		0.011	0.993	-0.049	****	0.010	0.952
Black	0.426	***	0.228	1.531	-1.538	****	0.153	0.215
Hispanic	-0.843	***	0.007	0.430	-2.019	****	0.007	0.133
Other	-10.745	***	0.000	0.000	0.294	****	0.015	1.341
Gender (Male)	0.064		0.222	1.066	-0.076		0.178	0.927
Number in Household	0.183	***	0.087	1.201	0.000		0.084	1.000
Loan Orig 2006	-5.344	***	0.112	0.005	-5.915	****	0.123	0.003
Loan Age (Months)	-1.091	***	0.067	0.336	-1.215	****	0.059	0.297
Loan Age (Squared)	0.007	***	0.001	1.007	0.009	****	0.001	1.009

AIC: 1,819
Sample size (loans): 3,176
Significance: * .05, **.01, *** <.001,

Source: THDA and author calculations.

Note: Omitted categories are No HBE, Credit Score 660 or greater, No personal downpayment,
  Single Family Housing, White, and Female. Monthly Payment in $100s.
  LTV= Loan to Value Ratio, SE= Standard Error, PUD= Planned Unit Development

Table 10

Probability of Foreclosure and Prepayment, Multinomial Logit Model
Homebuyer Education v. No Homebuyer Education, 2002 Great Start Originations

	Foreclosed				Prepayment			
	Coef.		SE	Exp(B)	Coef.		SE	Exp(B)
(Intercept)	-21.260	****	0.000	0.000	-13.346	****	0.000	0.000
Homebuyer Education	-3.495	****	0.127	0.030	-3.046	****	0.130	0.048
No Credit Score	-4.756	****	0.018	0.009	-5.685	****	0.018	0.003
Credit Score < 600	1.178	****	0.057	3.249	0.339	****	0.058	1.404
Credit Score 600-659	0.910	****	0.090	2.484	0.589	****	0.091	1.802
LTV	0.939	****	0.032	2.556	0.879	****	0.032	2.408
Monthly Payment	-0.131	****	0.058	0.877	0.118	****	0.059	1.125
Insurance	-0.002		0.033	0.998	-0.018		0.033	0.982
Property Tax	-0.014		0.012	0.986	-0.010		0.012	0.990
Gender (Male)	2.322	****	0.104	10.195	1.908	****	0.106	6.739
Black	-1.075	****	0.057	0.341	-2.069	****	0.057	0.126
Age	-0.004		0.034	0.996	-0.003		0.033	0.997
Number in Household	-0.548	****	0.048	0.578	-0.599	****	0.049	0.550
Loan Age (Months)	-1.006	****	0.018	0.366	-1.040	****	0.019	0.354
Loan Age (Squared)	0.002	****	0.001	1.002	0.002	****	0.001	1.002

AIC: 616

Sample size (loans): 730

Significance: * .05, **.01, ***.001, ****<.0001

Source: THDA and author calculations.

Note: Omitted categories are No HBE, Credit Score 660 or greater, White, and Female
LTV= Loan to Value Ratio, SE= Standard Error

The results of second hypothesis of whether required homebuyer education in the beginnings of the Great Start program in 2002 resulted in reduced likelihood of foreclosure are shown in Table 10. As expected from the t-test results, homebuyer education had a strong significant effect on reducing the probability of foreclosure, with the odds of foreclosure for those who took homebuyer education being 97% lower than those who did not, controlling for the other factors in the model. The significant variables and the direction of the effects of the mortgage and origination variables on foreclosure were mostly similar to the Great Rate model. One main

difference was that in this model, being in the lowest credit score category was significant and was strongly associated with a higher probability of foreclosure, as a borrower with a credit score of less than 600 had 3.25 times the odds of a borrower with a credit score of 660 or higher of having their loan end in foreclosure, controlling for all other factors. This model also reflected progressively higher risk for lower categories of credit score.

As in the Great Rate model, a higher LTV at origination for the Great Start cohort was associated with a higher likelihood of foreclosure, but the effect is much larger here. It should be noted, however, that the Great Start cohort has much less variation in LTV relative to the 2005-2006 Great Rate cohort (with standard deviations of .75 and 7.36 respectively). Caution should be used in comparing these two effect sizes and with extrapolating with the Great Start LTV coefficient. Both higher monthly payments and higher property taxes were still associated with lower foreclosure rates, though both insurance and property tax were non-significant. In contrast to the Great Rate model, higher monthly payments were a significant predictor of reduced foreclosure risk in the Great Start model. However, the underlying reason behind this effect is plausibly similar to the reason for the property tax effect seen in the Great Rate loans—this relationship is likely indicative of homebuyers with greater savings and incomes who can afford more expensive homes having higher monthly payments and being less likely to foreclose.

The gender and race variables differed substantially from the Great Rate model. While gender was not significant in the Great Rate model, it was highly significant in the Great Start model and being male was strongly associated with an increase in the risk of foreclosure. In terms of race, the coefficient and effect size flipped for black borrowers,

with black borrowers being much less likely to foreclose than white borrowers. This may in part be due to differences in demographics between the two programs. Table 8 indicates that the Great Start sample had a higher proportion of black borrowers, but roughly the same proportion of male borrowers.

CHAPTER VI

DISCUSSION

Conclusions

      Consistent with the findings of the two previous studies on homebuyer education and foreclosure, homebuyer education was shown to substantially reduce the likelihood of foreclosure both in the case of a required homebuyer education program and in the case of voluntary participation in homebuyer education. This study is also the first study of homebuyer education to incorporate loan data that includes the effects of the housing bubble collapse. Previous studies of the effects of homebuyer education on foreclosure have not included data from periods of significant economic distress in which the effectiveness of homebuyer education is put more strongly to the test. Thus the finding that homebuyer education has had a mitigating effect on foreclosure during a period of severe economic stress and a housing market decline, after controlling for underwriting and borrower differences, particularly stands out.

      The finding that making a down payment above the level of assistance received is associated with 34% lower odds of foreclosure relative to those who did not in the Great Rate cohort does raise some questions about why this would be the case. On one hand, making a higher level of down payment is likely an indicator of having a higher initial level of savings, but the level of down payments above assistance received was generally low, with an average of $3,553 for those without homebuyer education and $2,136 for

51

those with homebuyer education in the Great Rate program. From the perspective of options theory, equity is equity, but there is also the potential that there is a psychological difference in the sense of having a greater "stake" in ownership from having put more of one's own money into one's home versus receiving equity in the form of a grant. Additionally, with the higher interest rate on the down payment assistance loans, the buyers with lower initial savings also accumulate equity more slowly in their amortization, further increasing the probability of foreclosure.

Limitations

While this study was able to utilize relatively strong comparison groups for a non-experimental study, particularly with the 2002 Great Start group, in the absence of random selection into homebuyer education, the extent to which unobservable factors, such as borrower motivation or previous financial knowledge, biased the estimates of the effect of homebuyer education is unclear. Second, this study implicitly assumed that the borrowers who took homebuyer education received the full eight hours of instruction and could not control for variables such as instructor quality and fidelity to the curriculum. However, receiving less than the full number of hours or sub par quality of instruction would bias the effects of HBE downward and thus would not account for the positive effects observed. This study was also unable to measure whether homebuyer education was received prior to finding a home or not, so it is unclear whether homebuyer education is actually influencing the home and mortgage selection process. Third, the smaller sample size for the 2002 Great Start cohort limited the number of factors that could be included in the model without comprising statistical power, and created mild problems with heteroskedasticity as having more categories with low counts boosted the influence

of those categories. Fourth, there was no indication as to whether borrowers received some form of post-purchase counseling or whether pre-purchased education influenced help-seeking behavior if they experienced trouble in meeting their mortgage payments. Finally, THDA loans tend to be safer and more closely monitored than the loans in the subprime mortgage databases utilized in other foreclosure studies, which may limit the degree to which the results of this study can be generalized to lower quality loan pools.

Implications and Directions for Future Research

The results from this study raise several interesting questions and expose areas where further theoretical development and empirical work are needed. First, the strong effect of gender for the Great Start program and its non-significance in the Great Rate analysis, as well as equivocal findings of its importance in the literature beg for a development of a better understanding of the conditions under which gender of the borrower plays a significant role in the outcome and potentially how it interfaces with other categories. Similarly, this study found that property type significantly affected the likelihood of foreclosure, but there is not a clear understanding in the default literature as to why borrowers who purchase multifamily, mobile, and manufactured housing are more likely to foreclose and why condominium and town home owners tend to be much less likely to foreclose relative to owners of single family housing.

Quercia and Wachter (1996) note that most homebuyer education providers use screening mechanisms to choose participants from people who respond to their outreach efforts, making it difficult (or perhaps even irrelevant) to try to generalize to a hypothetical population of potential homebuyers at large. The screening and referral elements that precede the receipt of homebuyer education are also not well understood,

but may significantly influence the level of effectiveness of homebuyer education. On a related issue, whether a provider of homebuyer education charges for the service or not may also be important to consider in terms of how paying for a class might affect motivation to learn and whether similar quality is found between fee-charging and non-fee charging organizations.

Quercia and Wachter (1996) outline a potential methodology for conducting a randomized experimental study, which seems to be long overdue, given that it has been almost 15 years since their methodological article was published and given the high relevance of homebuyer education to housing policy. Yet one key obstacle to a national-level evaluation of homebuyer education is the lack of standardization of course content, delivery methods, and duration of the classes among other things. If a major push on the national level, potentially through the power HUD wields in distributing funds for homebuyer education grants, were made toward the standardization and regulation of curriculum, duration, and delivery methods, the groundwork would then be in place for a rigorous national-level evaluation of homebuyer education.

However, researchers also should carefully consider whether a homebuyer education program meets certain assumptions regarding its operations before embarking on an experimental trial. An experimental study may still fail to truly estimate the effects of homebuyer education if it ignores elements of how homebuyer education is currently functioning in practice. One key assumption, implicit in Quercia and Wachter's (1996) proposed research design, is that potential homebuyers are seeking education prior to having found a home. As mentioned in the literature review, no research has been done to date on whether homebuyer education is influencing the home selection and mortgage

selection process. In fact, research findings that many counselees had already signed purchase and sales agreements prior to taking homebuyer education indicate this part of homebuyer education may be irrelevant in many cases and highlights the potential challenges of attempting such a study. McCarthy and Quercia (2000) found that 24% of households in 1998 had already completed a purchase and sale agreement prior to taking HBE. However, a more complex picture emerges as they also found an interaction between the percentage having already completed a purchase agreement and the size of the counseling agency (potentially confounded with delivery method as many larger providers exclusively used telephone-based counseling). The few large HBE providers reported having over 70% of counselees signing purchase agreements prior to beginning the program (with many of these providers primarily offering telephone-based counseling). However, for the majority of HBE providers, less than 10% of those counseled had signed purchase agreements.

A personal conversation with a homebuyer education industry insider suggests that the many homebuyers are still seeking out pre-purchase homebuyer education late in the search process, particularly when the education is a requirement for a subsidy program. However, this insider also indicated a notable rise in people seeking out HBE prior to beginning the home search process in the wake of the housing market downturn. Intuitively, it seems that proper selection of a home would have a significant influence in the end result of the mortgage. If a purchase agreement has already been made prior to receiving homebuyer education, it raises significant questions about the degree of influence homebuyer education is having on the homeowner. Yet, even if this component is missing, notable effects on mortgage outcomes could still be seen if the financial

education component influences financial behaviors, such as budgeting and saving. However, this then raises the question of the degree to which each these elements—home selection, mortgage selection, and borrower financial behaviors—affects mortgage outcomes.

Additionally, research on several other linkages in the causal model is currently absent. First, there is a dearth of research on program fidelity. That is, are providers of homebuyer education, especially in classroom settings, adhering to the curriculum elements? Are those being educated actually acquiring knowledge? Also, no research has been done to date on the link between the knowledge of home maintenance provided in many homebuyer education programs and actual home maintenance behaviors. A potentially interesting vein of research would be the degree to which home maintenance levels, a key factor in maintaining home value and thus a potential indirect link to the likelihood of strategic foreclosure, can be predicted by personal, financial, mortgage, and geographic factors, as well as whether homebuyer education is influencing maintenance of home value over time. If costs of home maintenance are not being built into cash flow assumptions used in the budgeting elements of homebuyer education, it is possible that borrowers may be unable to afford maintaining a home and would be better off renting.

Considering the extent to which pre-purchase education is being promoted as a solution to foreclosure problems, further rigorous research on homebuyer education is necessary. The ideal scenario would be to have a large provider of homebuyer education partner with banks or a state housing finance agency to design a randomized, forward-looking study in order to solve the twin problems of siloed data and selection bias. Additionally, a rigorous study would also ideally include a follow-up survey 12-18

months after the education is received akin to Shelton and Hill's (1995) budgeting and financial behavior index to assess whether the financial education component of homebuyer education is generating long-term behavioral change. Such a survey could also be used as a reminder to borrowers of post-purchase services offered by counseling agencies, which could be especially timely and relevant given the consistent finding that default hazards tend to peak at 12-24 months after loan origination. An outreach effort of this nature could also help address the common borrower misconception discovered in Saegert, Justa, and Winkel's (2005) focus group study that borrowers do not realize that they can go back to counseling agencies after their pre-purchase education if they fall into financial trouble.

The present study provides evidence to support the notion that homebuyer education is an effective risk-reduction tool, but while homebuyer education may reduce risk, it does not eliminate it. In looking at the longitudinal data, the Great Start program consistently had higher foreclosure rates than the Great Rate program for every loan cohort. There are a number of factors why this could be the case that were controlled for in the regression model, but the absolute gap in foreclosure rates should at least give one pause to consider the degree to which homebuyer education reduces risk in an absolute sense. Is it acceptable to have a loan program with a foreclosure rate consistently two percentage points higher than the baseline program? What are the individual and social costs of relaxed underwriting standards and to what degree can homebuyer education be expected to mitigate these risks? This study helps inform this question by giving a better sense of the magnitude of the effects homebuyer education can reasonably be expected to have. With these considerations in mind, homebuyer education has several qualities that

will likely continue to broaden its use as an intervention—relatively low costs, intuitive program logic, and bipartisan political acceptability. However, while homebuyer education must be seen as an important piece of the solution in addressing the larger systemic issues that imploded the US housing market and it should not be used as a way of avoiding having to address these broader problems. To be sure, having a more financially literate and knowledgeable citizenry is a noble goal and though it may not be *the* solution in and of itself to the problems that led to the foreclosure crisis, when executed well, homebuyer education can play an important role in fostering good stewardship of resources, responsible and informed use of credit, and sustainable homeownership.

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