

PRE-PURCHASE HOMEOWNERSHIP COUNSELING AND MORTGAGE SEARCH

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Abstract

In the past decade, provision of pre-purchase homeownership education and counseling (HEC) has become a central component of regulators' strategies for protecting low-income consumers in the mortgage market. However, very little is known about HEC's effectiveness. Moreover, existing studies of HEC's impact on participants focus primarily on loan performance. While such studies are directly relevant to lenders, increased public funding for pre-purchase HEC provision requires evaluation with respect to a broader set of outcome measures. In particular, the current subprime crisis raises important questions about the ability of pre-purchase HEC provision to improve consumers' evaluation of alternative mortgage options. This article examines the impact of pre-purchase HEC on mortgage search, finding evidence that that pre-purchase HEC alters participants' mortgage search behaviors.

KEYWORDS: Mortgages; Counseling.

Introduction

Despite sustained growth in the prevalence of pre-purchase homeownership education and counseling (HEC), very little is known about its effectiveness. The absence of empirical evidence is due in part to the wide variation in curriculum, format, and provider types within the HEC industry. At one end of the spectrum, pre-purchase HEC programs emerged through intensive classroom-based programs that coupled classroom instruction with individualized counseling. At the opposite end, providers with limited resources and/or obstacles to delivery have translated the HEC curriculum into home study workbooks, sometimes supplementing these materials with one-on-one counseling over the telephone.

This variation across programs in curriculum and intensity complicates attempts to evaluate the impact of HEC provision, as findings that apply to one type of HEC program cannot be easily extrapolated to the broader industry. Instead, the literature on pre-purchase HEC effectiveness has emerged through studies that examine individual programs or specific market segments. Moreover, the set of existing studies focuses primarily on the default and prepayment behavior of HEC recipients. With the exception of Birkenmaier and Tyuse's (2006) analysis of participants' use of HEC to build credit, the literature does not yet offer evidence with respect to the impact of HEC on alternative outcomes. As a result, the existing body of research offers policymakers few clear conclusions about the optimal role of pre-purchase HEC as a policy tool.

Of particular relevance, the current subprime crisis raises important questions about the ability of pre-purchase HEC provision to improve consumers' evaluation of alternative mortgage options. In response to the subprime foreclosure crisis, much of the policy discussion has centered on the relative potential of alternative policy instruments in improving borrowers' abilities to search for, evaluate, and select a mortgage instrument. More aptly, the discussions surrounding consumer protection increasingly weigh the traditional invocations of financial education and consumer disclosure against more direct regulation and oversight of available mortgage product options. For instance, Barr, Mullainathan, and Shafir (2008) propose that consumers be presented a limited number of standard mortgage products, with 'sticky' opt-out procedures that include increased disclosures and regulatory oversight when non-traditional products are sold.

Given the importance of this debate to future consumer protection regulations, this article examines the impact of pre-purchase HEC completion on the nature and extent of participants' mortgage search behaviors. The analysis is specific to borrowers whose mortgage have been purchased by the Community Advantage Program (CAP), and therefore faces limitations to generalizability. However, the CAP dataset offers a unique opportunity to examine the effectiveness of HEC with respect to mortgage search within this market segment. Moreover, its structure allows the analysis to examine the relative effectiveness of programs based on home study and programs based on classroom instruction.

The Community Advantage Program (CAP) is a secondary market demonstration program that purchases loans originated through the Community Reinvestment Act (CRA) lending activities of prime lenders. As a result, all observed borrowers originated 30-year fixed-rate purchase mortgages originated through the CRA-related lending activities of participating CAP lenders. As a result, the analysis is not able to directly examine participants' search across alternative product characteristics and types of providers. Instead, it focuses on general measures of mortgage search—the number of applications submitted and the information sources used to identify potential lenders.

While discussions of HEC provision regularly allude to its impact on participants' search behaviors, the empirical analysis offers the first evidence with respect to the impact of HEC participation on mortgage search. HEC programs based on classroom instruction are found to impact both the number of mortgage applications submitted and the types of information sources used to find potential lenders. The evidence with respect to HEC programs based on home study is weaker, but remains consistent with the conclusion that HEC provision impacts mortgage search. These findings substantiate claims that HEC provision impacts participants' behavior, underscoring the need for evaluation of HEC with respect to a broader range of policy-relevant outcomes. However, the implied marginal effects with respect to both types of counseling remain relatively small, suggesting that HEC provision alone likely does not provide a sufficient tool for protecting consumers.

Support for Homeownership Education and Counseling

The development of pre-purchase homeownership education and counseling (HEC) programs occurred with support from both government and the financial services industry. Where post-purchase and delinquency counseling programs appeared as early as the 1970s, pre-purchase HEC emerged in the early 1990s as lenders sought to minimize the risk associated with lending to lower-income borrowers. For banks with little previous experience in underserved neighborhoods, reliance on pre-purchase HEC served two functional purposes. First, the HEC providers were often local organizations that could use their community-specific knowledge to market affordable mortgage products. Second, graduation from a HEC program served as an effective screening device, as provider approval offered lenders evidence of an applicant's commitment to homeownership and ability to afford a home (i.e. HEC programs provided lenders with a pool of mortgage-ready loan applicants). In this way, many of the initial HEC programs emerged as bank-provider partnerships that provided intensive classroom instruction and/or counseling.

As the HEC industry developed, federal funding for HEC provision increasingly became available, supplementing the financial support provided by individual lenders. Both the number of HEC providers and the federal support for HEC programs increased markedly during the late 1990s and early 2000s. Where HUD distributed roughly \$12 million per year through the mid-1990s, it dispersed \$18 million in 1999 and \$50 million in 2007. The number of borrowers served by HEC providers similarly increased. By 2004, roughly 800,000 households were expected to receive education or counseling (Hornburg 2004).

This growth of the HEC industry did not monotonically increase the prevalence of a single type of HEC program, but rather was characterized by an increasing diversity of programs and providers. Initially, HEC provision occurred primarily through the bank-provider partnerships discussed previously. These programs delivered content through extensive classroom-based instruction and one-on-one counseling. Individual programs differed in the amount of counseling and the range of topics included in the curriculum, but shared a common reliance on intensive in-person instruction, supplemented with individual counseling on key issues related to identifying an affordable house price and choosing between alternative mortgage products (Mallach 2001; McCarthy and Quercia 2000).

In contrast to this model, the introduction of HEC requirements led to the development of less intensive delivery methods. Concurrent with the establishment of affordable housing service goals for Fannie Mae and Freddie Mac in 1992,¹ both GSEs instituted HEC receipt as a condition of eligibility for several of their affordable mortgage products.² In response, many lenders looked to less time-intensive—and less costly—methods of HEC instruction. In 1993, Fannie Mae approved telephone-based HEC provision. Relatedly, some programs relied exclusively on home study, providing borrowers with workbooks and other educational materials. While both HUD and the GSEs established minimum

¹The Federal Housing Enterprise Financial Safety and Soundness Act of 1992 authorized HUD to set affordable housing service goals for Fannie Mae and Freddie Mac.

²Facing concerns over the relative effectiveness of low-intensity HEC provision, Fannie Mae rescinded its counseling requirement for several affordable mortgage products in the spring of 2006. Freddie Mac followed suit shortly thereafter, although both HUD and the GSEs continued to fund programs that serve voluntary participants. In the wake of increasing foreclosures, both GSEs are again considering the potential role of HEC requirements moving forward.

curricular guidelines under their HEC policies, nearly all providers easily met or exceeded these standards.

The resulting diversity of programs and delivery channels raised questions regarding the relative effectiveness of alternative HEC programs. In particular, programs based on home study and telephone counseling garnered criticisms for providing less intensive instruction. In principle, these programs cover the same substantive material and provide the same services as classroom-based programs. However, home-based programs in practice often required a lower time commitment from participants (Quercia and Spader 2008).

A second concern with the implementation of home-based HEC programs relates to the timing of HEC provision. Where HEC programs are designed to both evaluate a borrower's ability to afford a home and equip the borrower to navigate the home search process, many HEC participants received instruction after a purchase agreement had already been signed. For these borrowers, delivery of HEC occurs after the home search process is completed, limiting the potential benefits of HEC instruction. In practice, this concern relates disproportionately to home study and telephone counseling programs. Roughly 80 percent of borrowers who received telephone-based counseling received this instruction after signing a purchase agreement (McCarthy and Quercia 2000). A related concern is that borrowers completing HEC to meet a lender requirement may also have completed the bulk of their mortgage search prior to HEC participation.

These concerns highlight that the differences between program types extend beyond the nature of the delivery channel to differences in intensity, timing, and substance. In addition to constraining the potential impacts of the HEC program, these differences also complicate the evaluation of alternative program characteristics. The result has been that little empirical research exists to inform curriculum standards or best practices.

Existing Evidence on the Effectiveness of HEC Provision

Despite the dramatic increase in funding and provision of pre-purchase HEC, little is known about the impact of HEC participation on borrower behavior or about the relative effectiveness of alternative curriculums or delivery channels. The experience of the American Homeownership Education and Counseling Institute (AHECI) reflects the obstacles to an industry-wide evaluation of HEC programs and practices. Created by Fannie Mae in 1996, AHECI was charged with the establishment of national curricular guidelines and certification standards. It enjoyed broad support from leading lenders, mortgage companies, non-profits, and community organizations, each of which contributed generously to support the new industry organization. Nevertheless, AHECI's attempts to collect and analyze industry data were eventually abandoned due to the limited and non-uniform nature of available data sources (Hornburg 2004; McGilvray 2000).

The experience of AHECI is instructive in explaining the relative lack of empirical evidence with respect to HEC effectiveness. In place of broad studies of the HEC industry, the literature on pre-purchase HEC programs has emerged through studies that

focus on individual HEC programs or a specific segment of the borrower population. Because pre-purchase HEC programs were initially intended to moderate loan risk for lenders, the existing studies also focus almost exclusively on prepayment and default risk. For instance, Hartarska and Gonzales-Vega (2005) study the impact of HEC completion on the incidence of default among borrowers in an intensive one-on-one counseling program offered by an Ohio bank. Their analysis finds that HEC completion reduces the incidence of default, and also that borrowers completing HEC more optimally exercised their default option.

This result offers tentative evidence that HEC completion impacts default. However, its extrapolation to the broader HEC industry is limited by the intensive nature of the program under study. Interpretation of this finding is also complicated by the reduced effect on default risk found in the longer-term evaluation of this program. For the full study period, Hartarska and Gonzales-Vega (2006) find that HEC completion significantly impacts borrowers' exercise of their default option, but that the impact of HEC completion on the incidence of default weakens.

Hirad and Zorn (2002) similarly study the impact of HEC completion on default risk, using data on the large sample of loans originated through Freddie Mac's Affordable Gold program. The resulting study offers evidence that HEC completion effectively reduces default risk across a much broader range of HEC programs. However, the impact of HEC completion is specific to classroom-based programs, with home study and telephone counseling failing to show a similar impact on default. Taken together, these

studies offer some evidence that classroom-based HEC programs reduce the incidence of default among counseled borrowers. However, they also raise questions regarding the relative effectiveness of less intensive HEC programs.

A second interesting implication of these studies is that HEC completion may undermine the profitability of counseled loans to banks. Where HEC completion appears to create a modest decrease in default risk, it also is shown to impact borrowers' responsiveness to the value of the default option (Hartarska and Gonzalez-Vega 2005). Relatedly, a growing literature suggests that HEC completion may also impact the prepayment behavior of counseled borrowers. Hartarska and Gonzalez-Vega (2006) find that HEC completion is associated with an increased incidence of prepayment. Quercia and Spader (2008) conversely find no impact on the incidence of prepayment, but rather conclude that classroom-based HEC completion improves borrowers' responsiveness to the financial incentive to refinance. While this literature is subject to the same limitations as the default studies, it offers preliminary evidence that HEC completion may alter borrowers' refinancing/prepayment behavior. In this way, it also raises the possibility that the reduced default risk desired by lenders may be offset by other outcomes of HEC provision.

Beyond these examinations of the impact of HEC completion on loan performance, very few studies have examined the value of HEC completion to the participants themselves. The default and prepayment outcomes examined in the previous studies certainly carry implications for borrowers' welfare. However, the benefit of financial education to

individual borrowers likely extends beyond these outcomes. For instance, Birkenmaier and Tyuse (2006) examine the extent to which HEC participants' credit scores improved during the period of HEC instruction.³ Unfortunately, few other studies similarly examine the impact of pre-purchase HEC on alternative outcome measures.

Of particular interest, HEC participation may have increased borrowers' ability to evaluate alternative mortgage products during the recent boom in subprime lending. Where previous studies of the impact of HEC completion on default compare the performance of HEC participants and non-participants conditional on a specific mortgage product, the relevant comparison from the consumer's point of view is to the performance of similar borrowers who chose other product options. In this way, the issue is the impact of HEC provision on the likelihood that a homeownership tenure ends in foreclosure, rather than the impact of HEC provision on the default risk to the lender.

While funding for HEC provision initially came primarily from lenders interested in mitigating default risk, the increasing commitment of public dollars to HEC programs requires a corresponding shift in the definition and scope of the outcome measures examined. The uniform nature of the mortgage products purchased by CAP prevents the type of analysis outlined above. Nonetheless, it offers a unique opportunity to examine the impact of HEC completion on general measures of mortgage search. The resulting analysis is specific to the HEC experiences of CAP borrowers, but adds to the previously discussed literature on pre-purchase HEC programs both by examining the relative

³ Elliehausen and Staten (2007) perform a related analysis with respect to consumer credit counseling services, finding that counseling services resulted in improvements in participants' credit profiles and debt usage.

effectiveness of classroom-based and home-based HEC programs and by focusing on mortgage search.

The Community Advantage Home Loan Secondary Market Program (CAP)

This study examines these questions using data from a unique demonstration program that includes rich data on the HEC participation of a large number of low- and moderate-income homeowners. The Community Advantage Program (CAP) is a secondary market program developed out of a partnership between the Ford Foundation, Fannie Mae, and Self-Help, a leading community development financial institution (CDFI) located in Durham, North Carolina. Under CAP, Self-Help purchases 30-year, fixed-rate mortgages (FRMs) originated through the CRA-related lending activities of participating lenders.⁴ All of the loans are structured as 30-year FRMs, and all were originated to finance home purchase.

The limitation of this sample is that the CAP dataset isolates a single segment of the mortgage market. All borrowers initially selected 30-year purchase mortgages originated through CRA-related lending activities. As a result, the sample is not representative either of the broader mortgage market or of the population of low-income home buyers, and analysis of this dataset must be considered within the context of the CAP program. Despite this limitation, the CAP dataset offers a unique opportunity to examine the

⁴ The Community Reinvestment Act (CRA) establishes an affirmative obligation for banks to meet the credit needs of the communities in which branches are located. In practice, many banks address their CRA obligations through targeted lending programs that market tailored products to lower-income borrowers.

impact of HEC completion on mortgage search within this segment, because the dataset includes both rich measures of mortgage search and a broad range of HEC programs.

The designed purpose for the CAP program is to create a secondary market outlet for CRA loans that contain flexible underwriting characteristics or other features that prevent sale into the traditional secondary market. Many of the loans allow high debt-to-income levels, limited down payments, lack of private mortgage insurance, and/or non-traditional credit history. Additionally, where early experimentation with flexible underwriting allowed the relaxation of only one qualifying requirement, loans in the CAP portfolio are allowed to deviate from multiple underwriting standards. In some cases, lenders developed products intended for sale to Self-Help. In others, Self-Help purchased loans originated through existing lending programs and held in the lender's portfolio.⁵

To qualify for purchase under CAP, the borrower must meet one of three criteria: (1) have income under 80 percent of the area median income (AMI) for the metropolitan area; (2) be a minority with income below 115 percent of AMI; or (3) purchase a home in a high-minority (>30%) or low-income (<80% AMI) census tract and have an income below 115 percent AMI. This mix of income- and location-based requirements gives the participating lenders some flexibility in developing programs to meet the needs of their

⁵This second type of purchasing activity raises the prospect of seasoning bias to the extent that loans in the lender's portfolio that terminated prior to CAP purchase are censored from the analysis sample. For the purposes of this article, the observed seasoning is not anticipated to create non-random missingness with respect to the use of mortgage brokers. Among loans acquired through bulk purchases, the mean seasoning period is less than six months.

individual markets. However, these requirements also impose strict selection rules that isolate a sample of low- and moderate-income borrowers.⁶

For the purposes of analysis, the critical feature of the CAP sample is that the purchasing guidelines remain independent of participation in a homeownership counseling program. While over 40 percent of CAP borrowers received some form of homeownership counseling, the CAP purchasing guidelines do not consider counseling in determining a loan's eligibility. As a result, the set of CAP borrowers who received counseling participated in a wide variety of HEC programs offered by a diverse range of HEC providers across the United States. The HEC experiences of CAP borrowers includes not only a range of provider types—banks, government, non-profit, etc...—but also includes delivery strategies that range from provision of workbooks for home study to intensive one-on-one instruction and counseling.

The resulting sample includes 3,282 fixed-rate purchase mortgages originated by 16 lenders in 43 states between 1999 and 2003. Information on the HEC experiences, loan characteristics, and mortgage search behavior of the associated borrowers is collected from two sources. First, the risk characteristics used to underwrite each mortgage are collected from the loan origination file, with monthly loan payment information provided by the servicer. Second, the CAP evaluation project follows homeowners through the

⁶For a complete discussion of the CAP sampling strategy, see Riley and Ru (2009). This report also compares the sample of CAP homeowners with the set of homeowners in the Current Population Survey (CPS) who meet the CAP purchasing criteria. While CAP loans are concentrated in the South, the CAP sample appears to otherwise be roughly representative of this population on a range of demographic characteristics. The primary exceptions are that CAP homeowners tend to be marginally younger and better educated, although these differences tend to be small.

first years of homeownership, conducting annual surveys that collect information on borrowers' demographics and homeownership experiences. Of particular relevance to this analysis, the baseline wave contains rich information on borrowers' participation in HEC programs prior to home purchase.

Methodology

While the CAP dataset must be considered within the context of the associated demonstration, it contains two characteristics that uniquely allow for analysis of the impact of HEC on mortgage search. First, the CAP dataset contains two sets of measures related to the mortgage search process, including the number of applications submitted by the borrower and the borrower's initial source of information on their lender. The first set of mortgage search measures asks borrowers to self-report whether they applied for a mortgage from any other lenders before applying for the CAP mortgage, along with the number of such applications and whether these applications were accepted, rejected, or pending at the time of origination.⁷ The analysis examines the impact of HEC completion on both the raw measure of whether an additional application was filed and on a constructed measure that removes rejected applications. The second set of measures presents borrowers with various sources of information commonly used to learn about lenders, recording any information sources used by the individual borrower.

Second, the CAP dataset's broad coverage of HEC programs and providers allows for analysis that compares alternative program types. For the purposes of this study, HEC

⁷ Pending applications were reported as 'withdrawn before a decision was made' and were only reported among borrowers with one additional application. Borrowers with multiple additional applications reported only the number of such applications that were rejected.

providers are grouped into programs based on classroom instruction and programs based on home study. In comparing each group to the set of CAP homeowners who did not complete a counseling program, the resulting analyses identify the average impact of each type of program. Considerable variation exists within program type, so these average impacts may overstate or understate the effectiveness of any individual program. Because the CAP program is specific to the CRA-related lending programs of participating lenders, the estimated effects also cannot be readily extrapolated to the broader market. Instead, they represent the average impact of HEC completion among CAP borrowers.

The empirical analyses directly estimate the impact of HEC completion with respect to each of the outcome measures. The estimated equation can be represented as follows:

$$(1) \quad Y_i = H_i\alpha + X_i\beta + \varepsilon_i$$

where H_i includes the indicator variables for participation in classroom- and home-based HEC programs, X_i includes the full set of covariate controls, and Y_i is the outcome variable of interest. Because both outcome measures are dichotomously defined, equation (1) is estimated using logistic regression.

In this simple approach, the primary concern for estimation is the potential for endogenous selection into HEC. For instance, highly-motivated mortgage applicants may pursue homeownership counseling to ensure a successful homeownership tenure. Conversely, higher-risk households may be referred to HEC programs for remedial services. In the CAP dataset, the broad coverage of multiple programs and providers

suggests that both types of selection may be present to some extent. The salient issue for analysis is the strength of any selective effects in determining the outcomes of interest, and the extent to which such selection is addressed by the included covariates.

The vector of included covariates X_i includes the full set of observed loan and borrower characteristics. The set of loan characteristics first controls for underwriting characteristics, including the origination credit score, the origination loan-to-value ratio, and the front-end and back-end ratios. Origination credit scores are separated into the traditional credit quality buckets—less than 580, 580-619, 620-659, 660-719, and 720 plus. Ideally, a similar non-parametric approach might be taken with the loan-to-value measure. However, the values of this variable cluster between 95 and 100 and exhibit relatively little systematic variation, resulting in little added fit from a more precise specification. Lastly, the front-end ratio measure identifies whether the ratio of the monthly mortgage payment to monthly income exceeds the traditional standard of .28, and the back-end ratio measure identifies whether the ratio of total monthly debt obligations to monthly income exceeds the traditional standard of .36.

These underwriting characteristics are supplemented with measures of borrowers' income and home values. The purchase price of the home is included both to account for differences in the relative size of the outstanding debt and differences in borrowers' underlying level of wealth. This measure is then complemented with two indicator variables that adjust for the level of borrower income relative to area median income. Nearly 90 percent of CAP loans qualify under the first purchasing requirement—income

less than 80 percent AMI. The income measures therefore indicate whether income falls below 60 percent AMI and whether income falls between 60 and 80 percent AMI.

The set of covariates additionally includes multiple borrower demographics. This set of measures adjusts first for whether the borrower previously owned a home, as prior experience with a mortgage likely impacts the mortgage search process. Similarly, age and educational achievement are used to control for experience with the financial services system and/or financial savvy. Lastly, indicators for borrower race/ethnicity are included to adjust for differences in information networks, search strategies, and perceptions of financial institutions between minorities and non-minorities. Minority status in the CAP dataset is highly correlated with tract minority composition, so these variables may also capture relative access to financial services across neighborhoods.

The simple approach to estimation implies that these covariates represent the primary approach to addressing any systematic differences between HEC recipients and non-recipients. Valid identification of equation (1) therefore requires that no omitted factors bias the estimated effects of classroom- and home-based HEC receipt. In the empirical analysis, this requirement is directly explored in two ways. First, the impact of HEC completion can also be examined with respect to the presence of a rejected application. To the extent that unobserved differences in credit quality drive the impact of HEC completion on borrowers' application behaviors, systematic differences should also appear in the presence of rejected applications. Second, the robustness of HEC impacts is compared across outcome measures, as the presence of an additional application and the

source of information on lenders reflect divergent aspects of mortgage search. To the extent that HEC completion impacts mortgage search behaviors generally, the effect should appear with respect to both outcomes. The results of these tests are reported and discussed with the empirical analysis.

Empirical Analysis

The analysis dataset contains a total of 3,282 CAP borrowers, of whom 606 borrowers (18%) participated in a classroom-based HEC program and 713 borrowers (22%) participated in a home-based HEC program. Table 1 presents descriptive statistics with respect to this sample. These statistics reinforce the targeted nature of the CAP program, documenting the lower-incomes and relaxed underwriting requirements characteristic of CAP borrowers. CAP borrowers, on average, purchased modest homes, whose values averaged \$85,000. Moreover, the vast majority of the households with CAP mortgages earned less than 80 percent of area median income. Ninety-two percent of borrowers reported household income of less than 80 percent of area median income.

[INSERT TABLE 1 ROUGHLY HERE]

The underwriting characteristics of CAP mortgages shown in Table 1 reflect these low levels of income and wealth. First, the ratio of the monthly mortgage payment to monthly household income (front-end ratio) exceeded the .28 traditional underwriting standard among 41 percent of borrowers. Similarly, more than half of all borrowers exceeded the traditional standard of .36 for the ratio of total monthly debt obligations to

household monthly income (back-end ratio). Borrowers' loan-to-value ratios further reflect the relaxed underwriting standards, as many CAP borrowers received loans with down payment requirements of less than 3 to 5 percent of the purchase price. A substantial proportion of CAP borrowers also held credit scores below the traditional requirements for prime credit. Forty-one percent of borrowers had credit scores below 660 at origination.

The demographic characteristics offer further insight into the population of borrowers served by CAP mortgages. More than half of all borrowers were first-time homeowners, and the mean CAP borrower is 35 years old does not have a college degree. While more than 70 percent of CAP borrowers reported education beyond a high school degree, roughly one in four held a 4-year college degree. Lastly, the race/ethnicity variables show that minorities accounted for 37 percent of CAP borrowers.

Table 2 further describes the CAP sample, describing the characteristics of the HEC programs used by CAP borrowers. Of the 3,282 borrowers in the CAP sample, 1,339 borrowers (41%) participated in some form of a HEC program. Within this group, use of classroom- and home-based HEC programs is relatively evenly distributed. Forty-six percent of HEC participants received classroom instruction, with 27 percent also receiving some amount of individual counseling. In comparison, 54 percent of HEC participants completed programs developed around home study materials, with 31 percent also receiving telephone counseling.

The distribution across provider types is less uniform. Forty-six percent of HEC participants completed a program administered by a bank or lender, most of which were home-based HEC programs. In comparison, 27 percent and 23 percent of HEC participants completed programs administered by government and non-profit providers, respectively. More than two thirds of the programs administered by both of these provider types were structured around classroom instruction. Table 2 also reports borrower satisfaction with their HEC program, showing that more than 85 percent of HEC recipients were either ‘very satisfied’ or ‘somewhat satisfied’ with their program.

[INSERT TABLE 2 ROUGHLY HERE]

The relative intensities of each program type suggest that classroom instruction and individual counseling programs are substantially more intensive than home study and telephone programs (see Table 2). Participants in programs based on classroom instruction invested an average of 7.9 hours in HEC. Borrowers receiving individual counseling invested an additional 3.1 hours, on average. This time investment is substantially greater than the comparable 3.4 hours for home study participants, with an additional 0.6 hours for participants who also received telephone counseling. The increased number of hours committed to classroom-based HEC programs may be partially explained by the larger share of voluntary participants in these programs.⁸

Where 88 percent of home-based HEC participants completed HEC to meet a lender

⁸ The amount of time invested in HEC decreases roughly 10 percent in each category when voluntary participants are excluded. However, the relative intensities of each type of HEC are robust to the exclusion of voluntary participants.

requirement, 66 percent of classroom-based HEC participants faced a similar requirement.

The empirical analyses examine the relative impact of these alternative program types on the mortgage search outcome measures included in the CAP survey. The baseline survey of CAP borrowers collects information on borrowers' mortgage search behaviors and satisfaction with HEC. The primary measure of mortgage search relates to the number of applications the borrower submitted before committing to the originated mortgage.

Respondents are asked to report whether they applied for a mortgage from another lender prior to accepting the CAP mortgage, and how many such applications were submitted.

Of the 3,282 borrowers, 618 (19%) had applied for a mortgage from a competing lender, with 70 percent of these borrowers submitting just one additional application.

In analyzing the impact of HEC with respect to this measure, the primary concern is that the presence of an additional application might represent a previous rejection rather than increased mortgage search. For this reason, the analyses are repeated with respect to the measure of whether the borrower reported a previous rejection, as well as an updated measure of whether an additional application was submitted. Analysis with respect to the previous rejection measure directly examines the potential for a false positive, providing a test of the estimation strategy defined in the methodology section.

The revised measure further examines the robustness of the additional application measure, repeating the analysis once borrowers with a previous rejection are recoded. Of

the 618 borrowers with an additional application, 178 report a previous rejection. Additionally, borrowers with only one additional application report whether that application remained pending. To be conservative, the 57 observed pending applications are also recoded. The resulting measure isolates the presence of an additional accepted application among borrowers with only one additional application. Among borrowers with multiple additional applications, it isolates the presence of additional pending or accepted applications.⁹ The resulting measure identifies 413 borrowers (13%) with an additional application that is not due to a previous rejection.

Table 3 shows the distribution of these measures across HEC categories. The descriptive statistics show that participants in classroom and home study HEC programs are both more likely to submit an additional application and more likely to report a previous rejection. The latter difference with respect to the previous rejection measure is consistent with the noted concerns about the application measure. Nonetheless, HEC participants are also more likely to report an additional application on the revised measure. The multivariate analyses examine each of these differences in greater detail.

The second panel of Table 3 presents the corresponding figures for the second measure of mortgage search, which documents the information sources borrowers used to select lenders. In documenting borrowers' mortgage search behaviors, the CAP survey asks

⁹ The survey instrument unfortunately does not identify whether each additional application was pending for borrowers who reported multiple additional applications (roughly 30 percent of those reporting an additional application). As a result, such applications cannot be recoded. When multiple applications are present, the presence of a rejection and an accepted application are not mutually exclusive, so 37 borrowers are coded to both have a previous rejection and an additional application under the revised measure. The results are robust to excluding or including this subset of borrowers.

borrowers to report how they found the CAP lender. Nearly one third of borrowers had a previous account with the lender. The remaining borrowers are asked a series of questions to identify the various sources of information they used to find a lender.¹⁰ The descriptive statistics show that real estate agents, friends, and family are the most common sources of information.

For classroom-based HEC participants, the homeownership counseling course provides a common source of information. While nearly 15 percent of participants in classroom-based programs reported using the HEC program to find out about lenders, less than one percent of home study participants made similar claims. These figures underscore the differences between intensive classroom-based programs and the provision of home study materials. Where some classroom-based programs may be designed to prepare borrowers for specific lending programs, home study materials likely address more general issues related to mortgage and lender selection. Moreover, many of the home study participants likely receive HEC instruction at the same time that they are selecting lenders and applying for mortgage products. This possibility highlights the importance of the timing of HEC delivery in determining the potential influence of counseling on mortgage search and should be kept in mind in interpreting the empirical results.

[INSERT TABLE 3 ROUGHLY HERE]

Table 4 presents the results of analysis with respect to the set of application measures. The first column presents the results for the inclusive measure of an additional

¹⁰ Values are coded to zero for borrowers with a previous account with the lender.

application, the second column for the previous rejection measure, and the third column for the revised measure of an additional application. The immediate finding from Table 4 is that HEC receipt is associated with greater mortgage search. The estimates for the inclusive measure imply that participants in classroom-based HEC are 37 percent more likely to submit an additional application than non-HEC recipients. For the revised measure, both classroom-based HEC and home-based HEC are associated with a 30 to 35 percent increase in the likelihood that a borrower submits an additional application.

[INSERT TABLE 4 ROUGHLY HERE]

The direct interpretation of these results is further supported by the analysis with respect to the previous rejection measure. Neither classroom-based HEC nor home-based HEC is significantly associated with the likelihood of reporting a previous rejection. Instead, the presence of a previous rejection is determined primarily by the borrower's credit score at origination. This result suggests that the estimated effect of homeownership counseling on borrowers' application behavior is driven by a higher incidence of mortgage search and not by a higher proportion of previous rejections among HEC recipients. Similarly, it fails to offer any empirical evidence that selection into HEC programs biases the estimation results.

In addition to the findings with respect to the impact of HEC, several of the covariates in Table 4 also merit attention. In general, the underwriting characteristics do not show strong influences on the presence of an additional application. For instance, the credit

score measures strongly predict the presence of a previous rejection, but not an additional application. The primary exception is that borrowers whose back-end ratio exceeds .36 are significantly more likely to submit an additional application. Because this effect strengthens once previous rejections are excluded, it is likely not due to the direct impact of underwriting characteristics. Instead, one possible explanation is that borrowers with additional non-mortgage debt may apply experience from other credit markets to the mortgage search process.

The remaining borrower characteristics offer little additional explanatory power. A previous account with the CAP lender greatly reduces mortgage search, reducing the likelihood of both accepted and rejected applications. First time homeowners are also less likely to have a rejected application, an effect that likely reflects a poor homeownership outcome among previous homeowners. Similarly, older applicants are more likely to have a previous rejection, as they may be more likely to have a previous bankruptcy or otherwise turbulent credit history.

An interesting extension of these analyses is to repeat the estimation with respect to the mortgage application measures, examining instead the relative impact of alternative types of providers. Table 5 reports the results of such analyses, replacing the measures of HEC program type with measures of the provider type. Interestingly, programs offered by banks/lenders and by community organizations appear to have the greatest impact on the likelihood that a borrower submits an additional application. Both types of providers carry positive and significant impacts on the revised application measure, increasing the

likelihood of an additional application by 35 to 45 percent.¹¹ This result mitigates concerns that banks may face contradictory incentives in providing mortgage counseling to existing applicants. Instead, when considered together with the positive impact of home study found in Table 4, the results suggest that the provision of counseling may be more important than the type or intensity of the program in impacting borrowers' mortgage search.¹²

[INSERT TABLE 5 ROUGHLY HERE]

The second test of HEC's impact on mortgage search examines the impact of homeownership counseling on the information sources borrowers used to select lenders. Table 6 presents multivariate analyses with respect to the commonly cited information sources presented in Table 3.¹³ Respondents are asked independently whether they used each potential information source, allowing borrowers to report multiple sources of information. For those respondents answering negatively to each of the proposed sources, the other category captures a broad array of information sources that range from the brother of the home seller to a home buyer's fair to listings in the yellow pages.

While no single information source dominates the open-ended responses, a large

¹¹ Borrowers reporting other providers are consistently less likely to report either an additional application or a previous rejection. However, none of the estimates reach significance, so we hesitate to interpret these estimates.

¹² As an additional robustness test, the analyses are repeated separating voluntary participants from required participants in classroom-based programs and required participants in home study-based programs. The results corroborate this interpretation, showing that required participation in home study-based programs carries a significant positive effect that is only slightly weaker than the estimate for voluntary participants.

¹³ Outcomes occurring among less than 1 percent of all borrowers are omitted from analysis. Additionally, the homeownership course outcome is omitted, as non-counseled borrowers by definition did not rely on HEC provision for information on lenders.

proportion of the open-ended responses indicate independent search by the borrower:
“Called around to different banks,” “Went in person from bank to bank,” etc...

[INSERT TABLE 6 ROUGHLY HERE]

Analysis of these outcome measures reveals that HEC completion is associated with a reduced likelihood of relying on real estate agents and personal references to find out about lenders (Table 6). Both types of HEC are associated with an 18-20 percent decrease in the likelihood that a borrower found out about their lender through a real estate agent. Classroom-based HEC is also associated with a reduced likelihood of relying on friends and family, although home-based HEC completion does not show a similar effect.

These findings offer some evidence that HEC completion alters borrowers’ search behaviors, but should be contextualized using the descriptive statistics in Table 3. Nearly 15 percent of classroom participants used the HEC program to select a lender, with 4 percent and 7 percent fewer respondents indicating the use of real estate agents and friends/family, respectively. In contrast, a very small proportion of home study participants used the HEC materials to select a lender, but more than 4 percent fewer indicated the use of a real estate agent in selecting a lender.

These underlying distributions complicate interpretation of the estimates shown in Table 6. Given that 15 percent of classroom-based HEC participants relied on their HEC

program to provide information on potential lenders, the estimates for classroom-based HEC participants appears to reflect the substitution of HEC for real estate agents and family/friends as information sources. In contrast, home-based HEC participants' reduced reliance on real estate agents cannot be similarly explained. Instead, this effect appears to reflect a higher reliance on lenders with which the borrower has a previous account. As a result, the analyses in Table 6 consistently suggest that classroom-based HEC impacts the information sources used to select lenders, but less evidence that home-based HEC carries a similar effect.

The covariate effects in these estimations further offer little evidence to suggest that the use of alternative information sources is systematically determined by the characteristics of the borrower. The primary exception is that the least advantaged set of borrowers appear to rely more frequently on friends/family in selecting lenders. Borrowers in the lowest credit score bucket, borrowers with incomes below 60 percent of area median income, and younger borrowers were all more likely to rely on friends/family for information on potential lenders.

Discussion and Conclusions

This article offers the first examination of the impact of pre-purchase homeownership education and counseling on participants' mortgage search behaviors. The analysis is specific to the set of borrowers in the Community Advantage Program (CAP), which purchases mortgages originated through the CRA-related lending activities of prime lenders. As a result, the nature of the sample prevents broad extrapolation to the impact

of HEC within the broader mortgage market. Nonetheless, the CAP dataset offers a unique opportunity to examine the effectiveness of HEC with respect to mortgage search within this market segment. Moreover, its structure allows the analysis to examine the relative effectiveness of programs based on home study and programs based on classroom instruction.

The empirical analysis suggests that participation in homeownership education and counseling impacts the mortgage search behaviors exhibited by CAP borrowers. Completion of both classroom-based and home-based HEC programs is associated with a 30 percent increase in the likelihood that a borrower submitted an additional mortgage application. Additionally, classroom-based HEC participants were significantly less likely to rely on real estate agents and friends/family to learn about and choose between lenders. The impact of home-based HEC on this second measure of mortgage search behavior is less clear, but remains consistent with the conclusion that HEC provision impacts mortgage search.

When considered together, these findings suggest that HEC programs, particularly those offering some type of direct instruction, both increase the number of mortgage applications submitted and alter the types of information sources used to find potential lenders. This result is suggestive about the impact of HEC programs on mortgage search generally, as these measures reflect relatively different aspects of the mortgage search process. Ideally, the analysis might also examine the impact of HEC completion on borrowers' consideration of non-traditional mortgage characteristics, as well as their

comparison of prime/subprime mortgage products and providers. Unfortunately, the data necessary to perform such an analysis does not yet exist.

In documenting a relationship between pre-purchase HEC and mortgage search, this study instead offers an expanded approach to HEC provision as a policy tool. Where lender-provided HEC programs and the majority of existing research focus on reducing default, HEC participants may benefit equally from HEC's assistance in comparing mortgage providers and products. This revised approach carries direct implications for program development and for future research with respect to pre-purchase HEC.

The findings, however, are less promising with respect to the current public policy debate. Specifically, the magnitude of the estimated effects temper the conclusion that pre-purchase HEC alone is sufficient to protect consumers. Given that roughly 20 percent of CAP borrowers submitted an additional application, a 30 percent increase in the likelihood of submitting an additional application implies an increase of only 6-7 percentage points. Similarly, only 14 percent of classroom-based HEC participants relied on the course to identify a potential lender, compared to the 30 percent who relied on real estate agents. These effects likely pale in comparison to the impact of substantive consumer protections in limiting the prevalence of abusive and/or predatory practices. The challenge for policymakers is to find the mix of consumer protection regulations and financial education programs that best serves the needs of low-income consumers.

Bibliography

- Barr, Michael S., Sendhil Mullainathan, and Eldar Shafir. 2008. Behaviorally Informed Home Mortgage Credit Regulation. In Nicolas P. Retsinas and Eric S. Belsky. *Borrowing to Live: Consumer and Mortgage Credit Revisited* (pp. 170-202). Washington D.C.: Brookings Institution Press.
- Birkenmaier, Julie and Sabrina W. Tyuse. 2006. Does Homeownership Education and Counseling (HEC) Help Credit Scores? *Journal of Social Service Research* 32(2): 81-103.
- Elliehausen, Gregory, E. Christopher Lundquist, and Michael E. Staten. 2007. The Impact of Credit Counseling on Subsequent Borrower Behavior. *Journal of Consumer Affairs* 41(3): 1-28.
- Hartarska, Valentina and Claudio Gonzalez-Vega. 2005. Credit Counseling and Mortgage Termination by Low-Income Households. *Journal of Real Estate Finance and Economics* 30(3), 227-243.
- Hartarska, Valentina and Claudio Gonzalez-Vega. 2006. Evidence on the Effect of Credit-Counseling on Mortgage Loan Default by Low-Income Households. *Journal of Housing Economics* 15(1), 63-79.
- Hirad, Abdighani and Peter M. Zorn. 2002. Prepurchase Homeownership Education and Counseling: A Little Knowledge is a Good Thing. In N.P. Retsinas & E.S. Belsky. *Low-Income Homeownership: Examining the Unexamined Goal* (pp. 146-174). Washington, DC: Brookings Institution Press.
- Hornburg, Steven P. 2004. Strengthening the Case for Homeownership Counseling: Moving Beyond A Little Bit of Knowledge. Joint Center for Housing Studies. Working Paper W04-12.
- Mallach, Alan. 2001. Home Ownership Education and Counseling: Issues in Research and Definition. Federal Reserve Bank of Philadelphia. [www.phil.frb.org/cca/capubs/homeowner.pdf].
- McCarthy, George W. and Roberto G. Quercia. (2000). Bridging the Gap Between Supply and Demand: The Evolution of the Homeownership Education and Counseling Industry (Report No. 00-01). Research Industry for Housing America.
- McGilvray, Margaret. 2000. AHECI—Homeowner Education Counseling Costs and Benefits Study Data Availability Survey Report. Presented at Homeownership Education and Counseling: Creating an Industry to Expand Housing Opportunity. Research Institute for Housing America, April 6th, 2000. Washington D.C.

Riley, Sarah F. and Hong Yu Ru. "Community Advantage Panel Survey Technical Sampling Report: Owners, 2003-2008." Center for Community Capital Working Paper, August 2009.

Roberto G. Quercia and Jonathan S. Spader. 2008. Does Homeownership Counseling Affect the Prepayment and Default Behavior of Affordable Mortgage Borrowers? *Journal of Policy Analysis and Management* 27(2): 304-325.

Table 1: Descriptive Statistics of CAP Borrowers

<i>Variable</i>	<i>Mean</i>
Credit score <580	.05
Credit score 580-619	.11
Credit score 620-659	.25
Credit score 660-719	.34
Credit score 720+	.25
Loan-to-value ratio at origination	.96
Front-end ratio >.28	.41
Back-end ratio >.36	.55
Purchase price	\$85,024
Income <60% AMI	.55
Income 60% to <80% AMI	.37
Previous account with lender	.30
First-time homebuyer	.53
Age	34.8
High-school degree or less	.28
Some post-secondary	.45
4 year college degree	.26
Black	.17
Hispanic	.16
Other race/ethnicity	.03
N	3,282

Table 2: Receipt of HEC with CAP

<i>HEC Variable</i>	<i>Value</i>	<i>Percent of Recipients</i>
<i>Type of HEC:</i>	Classroom Instruction	45.9%
	(+ Individual Counseling)	(27.2%)
	Home Study	54.1%
	(+ Telephone Counseling)	(30.8%)
<i>Type of Provider:</i>	Bank/Lender	46.4%
	Government	16.3%
	Non-profit	24.3%
	Unknown	5.1%
<i>Satisfied with HEC:</i>	Very Satisfied	54.3%
	Somewhat Satisfied	31.8%
	Neither Satisfied Nor Dissatisfied	10.5%
	Somewhat Dissatisfied	2.2%
	Very Dissatisfied	1.2%
		<i>Number of Hours</i>
<i>Type of HEC:</i>	Classroom Instruction	7.9
	(+ Individual Counseling)	(3.1)
	Home Study	3.4
	(+ Telephone Counseling)	(0.6)
		<i>Percent Required</i>
<i>Lender Requirement:</i>	Classroom Instruction	65.7%
	Home Study	87.7%
N		1,319

Table 3: Mortgage and Lender Search.

<i>Variable</i>	<i>No HEC</i>	<i>Classroom</i>	<i>Home Study</i>
<i>Submitted any additional applications?</i>			
Additional application	16.6%	22.8%	21.6%
Previous rejection	4.9%	6.4%	5.9%
Revised application measure	11.1%	14.5%	15.0%
<i>How did you find out about your lender?</i>			
Previous account with lender	29.5%	25.7%	33.9%
Real estate agent	34.0%	29.7%	29.9%
Friends/Family	25.8%	18.5%	26.5%
Some other source	10.1%	12.2%	11.4%
Advertising	3.2%	4.1%	2.1%
Internet	0.5%	0.5%	0.3%
Church	0.3%	1.0%	0.4%
Neighborhood organization	0.3%	1.5%	0.4%
Homeownership course	0.1%	14.7%	0.7%
N	1,963	606	713

Table 4: Homeownership Counseling and Mortgage Search

	Other Application		Rejection		Revised Application	
	Odds Ratio	z	Odds Ratio	z	Odds Ratio	z
Classroom HEC	1.365*	(2.55)	1.060	(0.28)	1.329*	(1.96)
Home study HEC	1.196	(1.54)	0.873	(0.67)	1.356*	(2.26)
Credit score <580	1.206	(0.81)	4.790**	(4.34)	0.762	(0.92)
Credit score 580-619	1.142	(0.78)	2.676**	(3.07)	0.886	(0.60)
Credit score 620-659	1.177	(1.20)	2.694**	(3.55)	0.955	(0.29)
Credit score 660-719	1.171	(1.25)	2.149**	(2.77)	1.010	(0.07)
Loan-to-value ratio at origination	1.009	(1.33)	1.011	(1.01)	1.011	(1.35)
Front-end ratio >.28	1.026	(0.22)	1.006	(0.03)	1.124	(0.88)
Back-end ratio >.36	1.202	(1.93)	1.151	(0.85)	1.308*	(2.37)
Purchase price	1.000	(1.38)	1.000	(1.92)	1.000	(0.86)
Income <60% AMI	0.883	(0.67)	0.856	(0.51)	0.838	(0.78)
Income 60% to <80% AMI	1.017	(0.09)	0.774	(0.88)	1.133	(0.59)
Previous account with lender	0.607**	(4.64)	0.653*	(2.23)	0.606**	(3.91)
First-time homebuyer	0.825*	(1.97)	0.603**	(2.88)	1.029	(0.25)
Some post-secondary	1.049	(0.42)	0.989	(0.06)	1.118	(0.83)
4 year college degree	1.110	(0.78)	0.784	(0.99)	1.162	(0.95)
Age	1.000	(0.01)	1.016*	(2.26)	0.991	(1.58)
Black	1.077	(0.58)	0.849	(0.75)	1.281	(1.65)
Hispanic	0.865	(0.97)	0.903	(0.39)	0.977	(0.13)
Other race/ethnicity	1.055	(0.21)	1.233	(0.53)	1.027	(0.09)
Year fixed effects, F-test	***	15.09	***	15.71	--	9.15

N=3,282

Table 5: Provider Type and Mortgage Search

	Other Application		Rejection		Revised Application	
	Odds Ratio	z	Odds Ratio	z	Odds Ratio	z
Bank/Lender Provider	1.224	(1.70)	1.032	(0.16)	1.353*	(2.19)
Government Provider	1.198	(0.99)	0.936	(0.21)	1.178	(0.74)
Community Organization Provider	1.303	(1.74)	0.791	(0.81)	1.435*	(2.06)
Other Provider	0.492	(1.74)	0.487	(0.98)	0.420	(1.65)
Credit score <580	1.209	(0.82)	4.885**	(4.40)	0.754	(0.96)
Credit score 580-619	1.132	(0.73)	2.666**	(3.06)	0.871	(0.68)
Credit score 620-659	1.176	(1.19)	2.719**	(3.58)	0.949	(0.33)
Credit score 660-719	1.174	(1.27)	2.176**	(2.82)	1.007	(0.05)
Loan-to-value ratio at origination	1.008	(1.24)	1.010	(0.87)	1.011	(1.34)
Front-end ratio >.28	1.041	(0.36)	1.008	(0.04)	1.143	(1.00)
Back-end ratio >.36	1.198	(1.89)	1.149	(0.84)	1.305*	(2.35)
Purchase price	1.000	(1.42)	1.000	(1.89)	1.000	(0.91)
Income <60% AMI	0.891	(0.61)	0.890	(0.38)	0.842	(0.76)
Income 60% to <80% AMI	1.023	(0.13)	0.789	(0.81)	1.144	(0.63)
Previous account with lender	0.598**	(4.76)	0.641*	(2.32)	0.599**	(4.00)
First-time homebuyer	0.831	(1.90)	0.614**	(2.78)	1.030	(0.26)
Some post-secondary	1.046	(0.40)	0.991	(0.05)	1.116	(0.81)
4 year college degree	1.109	(0.77)	0.790	(0.96)	1.161	(0.94)
Age	1.000	(0.00)	1.016*	(2.26)	0.992	(1.56)
Black	1.107	(0.80)	0.882	(0.58)	1.287	(1.69)
Hispanic	0.866	(0.97)	0.918	(0.33)	0.970	(0.18)
Other race/ethnicity	1.048	(0.19)	1.228	(0.52)	1.021	(0.07)
Year fixed effects, F-test	--**	15.6	--**	15.7	--	9.3

N=3,282

Table 6: Homeownership Counseling and Sources of Information on Lenders.

	Real Estate Agent		Friends/Family		Advertising		Other	
Classroom-based HEC	0.803*	(2.05)	0.663**	(3.34)	1.494	(1.57)	1.175	(1.05)
Home study HEC	0.812*	(2.08)	1.052	(0.48)	0.609	(1.63)	1.027	(0.18)
Credit score <580	0.896	(0.55)	1.794**	(2.94)	0.593	(0.83)	1.763*	(2.12)
Credit score 580-619	1.362*	(2.20)	0.841	(1.05)	1.181	(0.45)	1.152	(0.66)
Credit score 620-659	1.297*	(2.35)	1.199	(1.51)	0.878	(0.43)	1.287	(1.50)
Credit score 660-719	1.068	(0.64)	1.143	(1.20)	0.994	(0.02)	1.151	(0.89)
Loan-to-value ratio at origination	1.012*	(2.22)	0.999	(0.13)	0.998	(0.17)	0.996	(0.65)
Front-end ratio >.28	1.014	(0.15)	0.875	(1.30)	0.678	(1.52)	1.024	(0.17)
Back-end ratio >.36	1.164	(1.92)	0.832*	(2.15)	1.194	(0.84)	0.947	(0.46)
Purchase price	1.000	(1.77)	1.000	(1.00)	1.000	(0.36)	1.000	(0.02)
Income <60% AMI	1.021	(0.13)	1.451*	(2.09)	0.611	(1.38)	1.104	(0.42)
Income 60% to <80% AMI	0.976	(0.17)	1.365	(1.84)	0.520	(1.94)	1.099	(0.42)
First-time homebuyer	0.917	(1.07)	0.933	(0.78)	1.149	(0.63)	0.873	(1.12)
Some post-secondary	0.961	(0.44)	0.981	(0.19)	1.013	(0.05)	1.181	(1.18)
4 year college degree	1.019	(0.17)	1.001	(0.01)	1.276	(0.84)	1.058	(0.33)
Age	1.003	(0.72)	0.984**	(3.90)	0.989	(1.01)	1.004	(0.76)
Black	1.116	(1.00)	0.912	(0.73)	0.593	(1.58)	0.874	(0.83)
Hispanic	1.144	(1.17)	1.193	(1.42)	0.898	(0.33)	0.530**	(3.09)
Other race/ethnicity	0.897	(0.51)	1.119	(0.50)	1.690	(1.18)	1.177	(0.56)
Year fixed effects, F-test	--**	17.3	--	5.4	--	6.6	--	4.7

N=3,282