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First-Time Homebuyer Counseling and the Mortgage Selection Experience in the United States

Evidence from the National Survey of Mortgage Originations

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The views expressed in this paper are those of the authors and are not necessarily those of [1]Freddie Mac, the [2]Consumer Financial Protection Bureau, [3]Fannie Mae, [4]the U.S. Department of Housing and Urban Development, or the [5]Federal Housing Finance Agency.

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Abstract

The existing literature on homebuyer education and counseling (HEC) consists almost exclusively of evaluations of specific programs, generally using mortgage loan performance as the metric of success. This paper contributes to the literature in two ways. First, it provides evidence on the benefits of HEC to mortgage borrowers in aspects other than mortgage performance. Second, the paper evaluates HEC in general, not just one specific program. It does so by drawing from a nationally representative sample of all first-time homebuyers in the United States who took out a mortgage in 2013 and 2014. The study data comes from the National Survey of Mortgage Originations (NSMO), a new survey co-sponsored by the Federal Housing Finance Agency (FHFA) and the Consumer Financial Protection Bureau (CFPB). We find that 14 percent of a nationally representative sample of first-time homebuyers reported receiving some form of HEC. Using two different matching estimation techniques (propensity score and coarsened exact matching) and ordinary least squares, we find that first-time homebuyers who reported receiving HEC also reported better mortgage knowledge, higher incidence of comparing final costs to the Good Faith Estimate (GFE), higher incidence of selecting a mortgage based on cost, and higher level of satisfaction with mortgage terms and the mortgage process.

1. Introduction

Homebuyer education and counseling (HEC) is often viewed as a strategy for achieving sustainable homeownership, particularly among low- to moderate-income households, and as such, an important aspect of providing access to sustainable mortgage credit. HEC's advocates promote HEC as a way to help prepare first-time homebuyers for successful homeownership by helping them make good home purchase and mortgage decisions and by improving their financial management skills.[1] Therefore, HEC has become a standard part of many government, non-profit, and industry programs geared towards low- to moderate-income first-time homebuyers on the premise that both homebuyers and society as a whole will benefit.

However, there has not been definitive evidence or consensus on the benefits and cost-effectiveness of HEC. The existing literature on housing education and counseling consists almost exclusively of evaluations of specific programs, generally using mortgage loan performance as the metric of success. The literature shows mixed results on HEC's effectiveness. Additionally, the question of whether borrowers benefit in other ways from HEC even when mortgage performance in the short term may not be improved is largely unaddressed. This paper contributes to the literature in two ways. First, it provides evidence about potential benefits of HEC to non-performance aspects such as mortgage knowledge and satisfaction with the mortgage terms and the mortgage process. Second, it uses a new nationally representative sample of first-time homebuyers rather than focusing on a specific program.

In this paper, we examine the incidence and effectiveness of HEC among the general population of first-time homebuyers who took out a mortgage for home purchases in 2013 and 2014. We use responses from the National Survey of Mortgage Originations (NSMO), a new survey of a nationally representative sample of new mortgages in the United States. NSMO is conducted quarterly by the Federal Housing Finance Agency (FHFA) and the Consumer Financial Protection Bureau (CFPB) and collects rich information on the expectations, knowledge, experience, and loan terms of mortgage borrowers. NSMO is a component of the National Mortgage Database (NMDB®).

We find that 14 percent of first-time homebuyers reported receiving some form of HEC. Using two different matching estimation techniques (propensity score and coarsened exact matching), we find that first-time homebuyers who reported receiving HEC also reported better mortgage knowledge, higher incidence of comparing final costs to the Good Faith Estimate (GFE),[2] higher incidence of selecting a mortgage based on cost, and higher level of satisfaction with mortgage terms and the mortgage process.

2. Literature

The literature studying the effectiveness of pre-purchase HEC is large and diverse; see Myhre and Watson (2017), Mayer and Temkin (2016), and Collins and O'Rourke (2010, 2011) for reviews. Nevertheless, the existing research is limited in several respects.

[1] See DeMarco et al. (2016).

[2] The period of originations for the mortgage loans linked to survey responses, 2013-2014, pre-dates the CFPB's changes to Regulation Z.

First, nearly every study that we are aware of has focused on measuring counseling effectiveness among participants of a particular lending program (see, for example, Avila, Nguyen, Zorn (2013) for a study of Freddie Mac's Affordable Gold and Home Possible programs; Mayer and Temkin (2016) for NeighborWorks America's programs). An important exception is "The First-Time Homebuyer Education and Counseling Demonstration" study currently being conducted by the U.S. Department of Housing and Urban Development (HUD). This is a large-scale randomized experiment where participants are recruited from a pool of mortgage applicants from three large national lenders (see DeMarco et al. (2016) for early results).

Different lending programs have different counseling programs. There is a large variety of pre-purchase counseling programs, which differ by: (a) mode of delivery (individual counseling, classroom instruction, telephone instruction, home study); (b) program duration and content; (c) who delivers the instruction (non-profit, government, lender); and (d) whether it is a voluntary or mandatory.[3] Typically, a study focuses on a specific counseling program, as dictated by the lending program (see Agarwal et al. (2010, 2014), Brown (2016)) or by study design (Smith, Hochberg and Greene (2014), Carswell (2009)). There are few studies that span across counseling programs; see Quercia and Spader (2008) for an analysis of relative effectiveness of various types of counseling; also, see Avila, Nguyen, Zorn (2013) who utilize a large sample of loans not restricted to a specific counseling program.

The specifics of selection into the lending program and the specifics of the counseling program can make it difficult to generalize results of a given study. Therefore, we believe there is a need for evidence about the effectiveness of HEC that spans across lending programs and modes of instruction.

Second, the existing studies of HEC have exclusively focused on the goal of home purchase or on the debt repayment behavior (mortgage delinquency and default, credit score, repayment of non-mortgage debt). Little evidence exists on the impact of HEC on borrower's mortgage knowledge and behaviors related to mortgage choice, such as mortgage shopping. The HUD experiment is the first attempt in this direction, and early results point to improvements in financial literacy and a "greater appreciation for communication with lenders" (DeMarco et al., 2016).

However, beyond the HEC context, there is a large literature studying the effectiveness of various financial education programs in improving financial literacy and related behaviors. For instance, Collins (2013) examines the impact of a mandatory financial education program on very low-income households, finding improvements in self-reported behaviors. Broadly, low levels of financial literacy have been linked to suboptimal financial behaviors (see review by Lusardi and Mitchell (2014)). In the mortgage context, Alexandrov and Koulayev (2017) suggest that a lack of mortgage shopping may have prevented borrowers from realizing significant price savings. Moulton, Loibl, Samak, and Collins (2013) show that many borrowers under-estimate their total or monthly non-mortgage debt, and are overconfident in their own ability to pay down their debt, relative to the actual repayment behavior; and, Gerardi, Goette,

[3] For more information, see the 2008 HUD report "The State of the Housing Counseling Industry," which covers 1,800 HUD-approved counseling programs, as of 2007. See also Turnham, and Jefferson (2012) for more detailed description of the subset of counseled subjects.

and Meier (2010) link low financial literacy to delinquencies on subprime mortgage loans. Thus, there is a need to study the effectiveness of HEC as a specific type of financial education, in addition to its role in default risk management.

This paper addresses both of these aspects of HEC's effectiveness. Our results apply to general population of first-time homebuyers who took out a mortgage in 2013-2014, and are not specific to a particular lending or counseling program. We explore a variety of outcomes beyond debt repayment, such as self-reported mortgage knowledge, shopping, mortgage selection, satisfaction with the mortgage process and the use of government mandated mortgage disclosures.

Finally, we point out that results measuring the effect of HEC on loan performance vary greatly across studies. Part of the difference in results across studies may be related to the period when the loans were originated. In a natural field experiment of a Tennessee pre-purchase homebuyer education program in 2002 funded by an HUD housing counseling grant, Brown (2016) found that borrowers who received HEC had a 42 percent reduced chance of foreclosure compared to the control group, but there was no statistically significant difference in default (defined as first incidence of becoming 90 days delinquent). On the other hands, in a randomized field experiment sponsored by the Federal Reserve Bank of Philadelphia, Smith, Hochberg, Greene (2014) found that one-on-one pre-purchase counseling conducted by a HUD-approved housing counseling agency in 2007 had positive long-term effects on credit score and debt levels of participants compared to a control group who only received a two-hour pre-purchase workshop, but no impact on timeliness of mortgage payments as most borrowers stayed current on their mortgage. Avila, Nguyen, Zorn (2013) found that the effect of HEC on loan performance was largest among loans originated in the 2006 to 2008 time period. Similarly, Mayer and Temkin (2016) find a 30 percent reduction in 90 plus days delinquency for 2007 vintage loans originated by NeighborWorks. Li, Bai, Goodman, Zhu (2016) analyze the same program, but for post-crisis originations in the 2010 to 2012 time period, and find a 14 percent reduction.

3. National Survey of Mortgage Originations

For the analysis, we use responses from the National Survey of Mortgage Originations (NSMO). The NSMO is a quarterly survey conducted by FHFA and CFPB as part of the National Mortgage Database (NMDB®) project.[4] The NMDB® project is a multi-year project jointly undertaken by FHFA and CFPB. The project is designed to provide comprehensive information about the U.S. mortgage market based on a 5 percent random sample of residential mortgages. The project has three primary components: (1) the National Mortgage Database; (2) the quarterly National Survey of Mortgage Originations (NSMO); and (3) the annual American Survey of Mortgage Borrowers (ASMB).

The core data in the NMDB® are drawn from a random 1-in-20 sample of all closed-end first-lien mortgage files outstanding at any time between January 1998 and December 2016 in the files of Experian, one of the three nationwide credit reporting agencies.[5]

[4] Detailed documentation about NMDB® and the related surveys is available in a series of technical documents at https://www.fhfa.gov/PolicyProgramsResearch/Programs/Pages/National-Mortgage-Database.aspx.

[5] Experian was chosen through an open, competitive procurement process to assist in creating the NMDB®. The use of a sample, rather than the universe of all mortgages, substantially reduces the privacy risk associated with any data

A random 1-in-20 sample of mortgages newly reported to Experian is added to the NMDB® each quarter. Mortgages are followed until they terminate through prepayment (including refinancing), foreclosure, or maturity. Information from credit reporting agency files on each borrower associated with the mortgages in the NMDB® sample are collected from at least one year prior to origination to one year after termination of the mortgage. The information on borrowers and loans is de-identified and does not include any direct identifying information such as borrower name, address, or Social Security number.

The NSMO survey is designed to complement the NMDB® by providing information, particularly related to mortgage shopping, that is not available in the database. The survey is voluntary, and its target universe is newly originated closed-end first-lien residential mortgages and their associated borrowers. To achieve this objective, the NSMO draws its sample from mortgages that are part of the NMDB®. Beginning with loans originated in 2013, a simple random sample of about 6,000 loans per quarter is drawn for the NSMO from loans newly added to the NMDB®.

4. Analysis Sample and Outcomes

For this report, we use the NSMO conducted for a sample of borrowers with mortgages originated in 2013 and 2014. There were 12,341 respondents to this survey for these origination years. We focus specifically on first-time homebuyers to identify those with less experience in the mortgage process relative to repeat borrowers. Given the detailed administrative and credit data available in the NMDB®, we can identify homebuyers who have not had an active mortgage in the past seven years. We also restrict our analysis to homebuyers younger than 55 years to increase the likelihood that the analysis is focused on first-time buyers instead of those who paid off an earlier mortgage.[6]

The NSMO identifies the recipients of HEC by asking "Did you take a course about home-buying or talk to a housing counselor?" Follow-up questions ask what delivery mode was used for the home-buying course or housing counseling (in-person, one-on-one; in-person, group; over the phone; or online), how long the course or counseling lasted, and whether it was helpful. Table 1 summarizes responses to these questions. Among 1,686 first-time homebuyers that we have identified, 235 reported receiving some form of HEC, which amounts to a rate of 14 percent.[7] This is itself a novel finding; there is currently no reliable estimate of the percentage of recent mortgage borrowers who receive some form of HEC. Among those first-time homebuyers

collection. By contrast, a universal registry presents challenges for privacy since it is known that a particular loan must be in the dataset. However, for a 1-in-20 sample like the NMDB®, the odds are 95 out of 100 that a particular loan is not in in the database.

[6] For NSMO, we match the survey respondent and the spouse (when they exist) to the borrowers in the credit file. At least one of them must be the borrower on the mortgage. If both are borrowers, we require both have no prior mortgage in the credit file (generally in the past 7 years) for the loan type to be designated as a first-time homebuyer. If only one is the borrower, we require that that person has no prior mortgage in the credit file for the loan type to be designated as first-time homebuyer.

[7] Our definition of a first-time mortgage borrower is the following: a) no mortgage in the previous credit history; b) both borrower, and the co-borrower, if present, are 55 years of age or younger. This approach results in approximately 30 percent of first-time mortgage borrowers among all borrowers for home purchase in 2013-2014.

who report receiving any kind of HEC, 45 percent report receiving it in a group setting, while 22 percent report a one on one counseling interaction (see Table 1).

In this analysis, these 235 first-time homebuyers reporting HEC are compared to the remaining 1,451 first-time homebuyers who did not report receiving HEC. Due to a relatively low number of observations, we do not attempt to separately estimate the effects of various types of HEC; we may do so as more data becomes available. Substantively, the NSMO does not distinguish between homebuyer education (group classroom instruction about the home buying process) and homebuyer counseling (individual, one-on-one sessions with a housing counselor that are tailored to a client's financial situation and stage in the home buying process). For instance, 22 percent of respondents indicated a one-on-one session, which probably corresponds to counseling rather than homebuyer education. However, it is unclear whether the remaining 78 percent received education, counseling, or both. For instance, those who report group instruction may have also received individual consultation. Additionally, NSMO does not identify whether the provider of homebuyer education or counseling meets HUD or National Industry Standards (NIS). In fact, the reported counseling could involve a for-profit organization or an on-line tool that does not meet HUD or NIS standards. For example, the provider could be the lender or mortgage insurance company.

The NSMO survey focuses on borrower experiences when obtaining a mortgage. We identify a broad set of questions, related to mortgage knowledge and mortgage related behaviors. For each question, we compare the responses of first-time homebuyers who reported receiving HEC to those who did not report receiving HEC, while controlling for the set of relevant borrower covariates. We believe the observed differences in responses are informative of how HEC may have affected the underlying mortgage knowledge and mortgage related behaviors. For this reason, we label these responses as "outcomes."

Each outcome is an indicator variable equal to one if the respondents provides a certain answer to the relevant question, and zero otherwise. For example, the question "How well could you explain to someone the process of taking out the mortgage?" generates an indicator variable equal to one if the respondent said "very well" and zero otherwise. The mean of the outcome variable represents the share of respondents who provided a particular answer; for the question above, the mean is 39.5, which indicates that 39.5 percent of respondents said "very well" (see Table 2). Among HEC recipients, the share of respondents who said "very well," 50.2 is much higher than the average. For the complete list of questions and corresponding outcomes, see Table 2.[8] Below, we provide a broad overview of the categories of survey questions we analyze.

Knowledge of Mortgage Process

Respondents were asked how familiar they were with their credit score, the current level of interest rates, available mortgage types, the mortgage process in general, and the amount of down payment needed when applying for mortgages when they began the process of getting this mortgage. For each item, we compare the response of "very familiar" to the responses "somewhat" or "not at all." While 63 percent of respondents stated they were very familiar with

[8] The current survey instrument is available at https://www.fhfa.gov/PolicyProgramsResearch/Programs/Pages/National-Survey-of-Mortgage-Originations.aspx

their credit history and credit score, only 18 percent reported high familiarity with the process of taking out a mortgage.

Another survey question asked how well the respondent could explain to others the process of taking out a mortgage, the difference between a fixed and adjustable-rate mortgage, the difference between then mortgage interest rate and annual percentage rate (APR), and the consequences of not making required mortgage payments. We compare the self-reported "very well" to "somewhat" or "not at all" responses. Most respondents stated that they understood the difference between a fixed- and an adjustable-rate mortgage (57 percent) and the consequences of not making required payments (56 percent). Respondents were least comfortable explaining the differences between prime and subprime loans (13 percent) and the difference between the interest rate and APR (19 percent).

Assigned Importance to Non-Price Factors

Respondents were asked if lender attributes—such as lender reputation, the lender's online presence, whether the lender has a branch nearby, and whether the lender can speak the borrower's language—were important or very important when choosing the lender. These attributes are normative, non-price criteria. We create a combined indicator equal to one if at least one attribute was deemed very important. We created additional variables with a value of one if the respondent answered "very important" for each of the non-price factors. A very high percentage, 88 percent of first-time homebuyers, indicated that at least one non-price attribute was "very important." This suggests that their mortgage choice might not have been guided by mortgage cost alone.

Satisfaction with Mortgage Process and Mortgage Terms

The survey contains a variety of questions that focus on a borrower's satisfaction with the mortgage experience, beginning with the application process and ending with mortgage terms. Generally, borrowers are satisfied both with the process and mortgage terms. For example, close to 70 percent of respondents report being satisfied with the interest rate on the mortgage.

Mortgage Shopping

Shopping behavior is measured two ways. First, the respondent is asked "how many lenders/brokers did you seriously consider before taking out this mortgage." By this measure, 56 percent of first-time homebuyers reported that they seriously considered more than one lender or broker. Borrowers were also asked whether they completed more than one application to search for better loan terms. By this second measure, 23 percent indicated that shopping was the primary motivation for multiple applications.

Reviewing the Good Faith Estimate

Survey participants were asked if they compared the final loan costs to the final GFE they received from the lender. Sixty-seven percent of borrowers reported comparing the final loan cost to the GFE.

Seeking Input about Closing Documents

Eighty-five percent of respondents reported they sought input about closing documents from at least one source, with the lender and real estate agent being the most popular sources (69 percent and 59 percent, respectively). Forty-five percent asked for input from a friend or relative.

Mortgage Terms

Using survey responses and the mortgage administrative data linked to the survey, we can observe the characteristics associated with the mortgages selected by the borrower. Available information includes the interest rate, loan-to-value ratio (LTV) at origination, payment to income ratio, and if an adjustable-rate or other product features were selected. During 2013 and 2014, the mortgage market was relatively homogeneous, with only a small fraction of loans having "special" mortgage features, such as a balloon payment, prepayment penalty, or interest-only payments.[9] For this reason, we do not include these mortgage features as part of our analysis. The first-time homebuyers in this study have a mean LTV of 89 percent, with 7 percent obtaining adjustable-rate mortgages and 2 percent securing second liens with the first mortgage.

Some mortgage terms, including LTV and payment to income ratio, may reflect decisions or circumstances of a household that may pre-date HEC, such that any association between these terms and reported HEC should be taken with caution. This is particularly true if borrowers participated in HEC to qualify for a specific mortgage program. Again, we are not able to confirm the exact nature, timing, or entity associated with the counseling.

5. Empirical Strategy

For each outcome discussed above, we examine the empirical relationship between the incidence of that outcome among survey respondents and the self-reported HEC, controlling for relevant borrower characteristics. Because the borrowers in our analysis were not randomly assigned to receive HEC, we employ several empirical strategies to control for the observable borrower characteristics related to which borrowers reported receiving homebuyer education or counseling. We implement three empirical strategies: (1) ordinary least squares regression (OLS), (2) propensity score matching (PSM), and (3) coarsened exact matching (CEM).[10] These methods take different approaches to considering the observable characteristics that may be related to who selects HEC. However, none of them control for unobserved attributes that might affect both counseling choices and mortgage selection, such as job security, mobility, available assets or funds for a down payment. Further, borrowers may select into HEC based on pre-HEC levels of mortgage knowledge, in a way that is not fully captured by the included covariates.

[9] Note that only first-lien residential mortgages are in the NSMO sample, and second liens such as Home Equity Lines of Credit (HELOC) are not captured.

[10] The matching approach was also used by Smith, Hochberg and Greene (2014). In their study as well as in ours, the detailed respondent information was, by design, available for both treated and non-treated subjects. This approach is an improvement relative to other papers that used matching estimators, where the detailed information was only available for borrowers who received counseling; in these papers, matching relied on loan characteristics (Agarwal et al. (2010, 2014)) or Experian credit fields (Mayer and Temkin (2016), Roll and Moulton (2016)). See Mayer and Temkin (2016) for a review.

Overall, the results of our analysis are best interpreted as suggestive evidence of the relationship between HEC and aspects of the mortgage selection process.

We begin by summarizing how borrowers who reported HEC differ from those who reported that they did not participate in HEC. We have identified several borrower characteristics that are predetermined and related to self-reported education or counseling participation. Table 3 presents the breakdown of first-time homebuyers by borrower characteristics. The first column presents the frequency of a borrower type, adjusted for population weight in order to achieve representativeness across first-time homebuyers. The second column presents the counseling rate among borrowers of a given type which can be compared to the overall counseling rate of 14 percent. From this table, we make the following observations.

- Credit Score: Borrowers with a lower credit score are more likely to report HEC participation, with the highest participation rates reported for borrowers with a credit score of 620-639. [11] Among these borrowers, the HEC rate was twice the average, at 28 percent.

- Age: Younger borrowers (35 years or less) are 3 percentage points less likely to report HEC participation than older (>35 years old) borrowers.

- Race: The HEC rate among blacks is 30.6 percent, more than twice the average in the sample.

- Education: Borrowers with a high school degree or some college report a 16.9 percent HEC rate, as compared to 12.4 percent rate among those borrowers with college degree or higher.

- Household Income: Household income shows a strong relationship with HEC rate. Households with less than $50,000 in combined yearly income exhibit HEC rates of approximately 20 percent, well above higher income groups.

- Marital Status: On average, singles have a similar HEC rate to couples. However, gender matters: single females have the highest counseling rate at 18.5 percent.

- Number of Wage Earners: Single earner households are four to five percentage points more likely to report HEC than a two-earner household.

Ordinary Least Squares (OLS)

The OLS regression analysis specifies a linear probability regression of a particular outcome on the set of borrower characteristics summarized above. By including these variables, we control for selection into HEC along age, marital status, income, education, etc. However, this method may not be sufficient given large differences between the sample of HEC respondents and the sample of respondents who did not indicate taking up HEC. For example, the sample of non-

[11] The credit score in the data is VantageScore 3.0.

HEC respondents contains borrowers with high levels of income and/or high levels of education. To the extent that such borrowers never take up HEC, their inclusion in the OLS regression produces biased estimates.

The other two methods, CEM and PSM, deal with this issue by matching a HEC respondent with a set of observationally similar non-HEC respondents. While the specifics of matching methods vary, both CEM and PSM rely on identifying the set of borrower covariates that are best predictors of self-reported HEC use. In Table 5, we present results of a linear probability model of HEC use. Credit score, race, and income are statistically significant predictors of counseling. When other factors such as income are controlled for, the relationship between having a college degree and the reported HEC rate becomes small and statistically significant. Similarly, age, household type, and number of wage earners are not statistically significant in the counseling regression model.

Coarsened Exact Matching (CEM)

CEM is a relatively new method for improving the estimation of causal effects by reducing imbalances between treated and control groups. [12] In contrast to PSM, CEM balances the sample by matching based on pre-counseling covariates instead of matching based on the likelihood of reporting counseling. For CEM, we again consider pre-mortgage demographic and financial characteristics to match a HEC respondent to one or more non-HEC respondents. An exact matching method would ensure that the HEC respondent has the same values for each characteristic (e.g., age, gender, and education) as the non-HEC borrower. As this is generally not feasible or practical, values of the covariates are "coarsened" or specified in broader categories. Then, HEC respondents are matched to non-HEC respondents when they have the same categorical values or are within the same specified range for the characteristic. For example, an exact matching method may require all matched respondents to have the same number of years of education, while CEM could allow for a match if both borrowers have a college degree. The groups of matched borrowers can now be directly compared as they have similar values for the factors that are predictive of selection into HEC. Once the matched sample is formed, borrower responses are compared using a linear regression model. The CEM regression model includes an indicator variable for reported HEC and controls for borrower characteristics, with appropriate weights.

To implement the CEM procedure, we consider the set of borrower characteristics listed in Table 3. However, upon further review of the relationship between self-reported HEC and the borrower characteristics, some categories of a variable are collapsed. For instance, there are six categories of income; however, a meaningful change in HEC rate is found only for households with income above $50,000 a year. Similarly, there are five categories of race; however, black households are associated with the largest difference in reported HEC rate for this NMSO sample. Therefore, we create coarsened versions of the variables that measure borrower type and use them instead of the original data in the CEM matching procedure. This strategy makes it easier to find a HEC borrower match. The downside of the coarsening, of course, is the loss of information that may limit our ability to control for selection into the HEC group.

[12] An interested reader will find more details on this webpage: https://gking.harvard.edu/cem

Table 5 presents our coarsening variables, as well as the population frequencies and reported HEC rates among coarsened categories of borrowers. The CEM method matches HEC and non-HEC observations into a combination of buckets or strata. For example, a counseling respondent who is a black single female with a credit score less than 720, earning less than $50,000 a year, with a college degree (or above), is matched with one or more non-counseling respondents with the same characteristics.

Based on coarsened covariates, the matching algorithm divides the sample into 196 strata (groups of observations) such that all borrowers in a group share the same values of coarsened covariates. Out of the 235 respondents who reported HEC, we find a match for 214 respondents, leaving 21 respondents unmatched. Out of the 1,451 respondents who did not report HEC, we could find a match for 1,134 respondents, leaving 317 respondents unmatched. Table 6 details the characteristics of respondents for whom we did not find a match: they include respondents with high credit scores, young borrowers, predominantly white, and high income. Non-matched respondents were not used in the estimation of the CEM model.

Propensity Score Matching (PSM)

PSM is a matching method where borrowers are grouped based on their predicted (rather than actual) propensity to take up counseling, or "propensity score."[13] To implement PSM we first estimate a logistic regression model of the likelihood that a borrower reports participating in HEC. The specification of this regression mirrors the linear probability model reported in Table 4. Based on the estimates of the logistic regression, the propensity score is computed for each observation in the sample. Borrowers reporting HEC are then matched to non-HEC borrowers with similar values for the probability of reporting HEC.[14] Within each matched group, the survey responses of those reporting HEC are compared to the responses of borrowers who did not report HEC using a linear regression model. Contrary to CEM, with the propensity score matching, we retain all observations. With PSM, finding a match is less of an issue than under the coarsened exact match methodology because the match is only on one dimension, the propensity for receiving HEC.

6. Empirical Results

The NSMO survey responses are used to explore the relationship between reported participation in homebuyer education or counseling and aspects of the mortgage selection process. The categories we investigate include knowledge of the mortgage process, importance associated with non-price lender attributes, satisfaction with the mortgage process, number of lenders considered, review of the GFE, seeking input on closing documents, and the mortgage product selected.

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[13] For an explanation of the method, see for example, Dehejia, Rajeev H., and Sadek Wahba. "Propensity score-matching methods for non-experimental causal studies." Review of Economics and statistics 84.1 (2002): 151-161.

[14] The interval of possible probability values, [0,1], is divided into sub-intervals. Observations whose predicted probability of reporting counseling are in the same sub interval are considered similar and grouped for PSM. The equally-spaced sub intervals are defined so that we do not reject the null hypothesis that the means of each characteristic is the same for the HEC and non-HEC group.

For each response or mortgage attribute, we estimate three models: OLS, PSM and CEM. Each model includes a dummy variable for reported HEC as an explanatory variable, in addition to sets of indicator variables for each borrower characteristic.[15] Table 7 presents the results from all regressions. We report the estimate of the HEC coefficient, multiplied by 100, with standard errors in parentheses. Because all outcomes are indicator variables, the interpretation of the coefficient is the percentage point change in the response of interest. To help assess the economic magnitude of the change, the first column of the table presents the sample average of the response or attribute variable.

In every case where a significant result is found, all models report similar magnitude. Highlights of the results include:

1. Borrowers who reported receiving HEC also reported large improvements in financial knowledge in the following categories: types of mortgages available; process of taking out a mortgage; and the difference between interest rate and APR. For instance, borrowers reporting HEC were 10 percentage points more likely to report that they could explain the process of taking out a mortgage, and 5 to 6 percentage points more likely to report they could explain the difference between interest rate and APR.

2. Borrowers who reported receiving HEC were more likely, on the order of 6 to 8 percentage points, to compare final closing costs to the GFE.

3. Borrowers who reported receiving HEC were 9 to 10 percentage points more likely to consult a housing counselor about their closing documents than were average first-time homebuyers. This is a non-trivial result because a counseling course does not necessarily include an individual consultation, as it may have been in a group setting or online.

4. Borrowers who reported receiving HEC were 5 to 6 percentage points more likely to report being satisfied with their mortgage terms and 4 percentage points more likely to report being satisfied with the mortgage process.

5. Homebuyers who reported receiving HEC also reported a greater likelihood of selecting a mortgage based on costs. Borrowers who did not report receiving HEC were about 6 percentage points more likely to indicate that at least one of the listed non-price attributes was important in the lender selection decision.

6. Counseling respondents were more likely to have a mortgage with a higher LTV. It is unclear, however, whether this is an outcome of counseling or if this reflects the individual borrower's financial position prior to HEC.

[15] The OLS regression includes population weights for the survey respondents. The PSM and CEM regressions include weights based on the number of observations in each group of matched respondents.

7. We do not find any significant association between reported HEC and mortgage shopping. Borrowers reporting HEC had similar responses to non-HEC borrowers about the number of lenders they considered.[16]

While encouraging, these results, particularly those with respect to mortgage knowledge, should be interpreted with caution, for two reasons.

First, the outcomes on mortgage knowledge are self-reported, and it has been found that consumers, in some instances, may over-estimate their actual financial literacy (Lusardi and Mitchell, 2011). For instance, counseling may make consumers more confident in their knowledge, as opposed to actually improving it. Further research is needed linking receipt of HEC to actual, rather than self-reported, knowledge. As noted earlier, early results by DeMarco et al. (2016) of the ongoing HUD experiment indicate a modest positive effect of HEC on respondent's performance in a four-question financial literacy test.

Second, consumers may select into HEC along dimensions related to mortgage knowledge. For instance, one plausible hypothesis is that borrowers who feel less confident in their mortgage knowledge would be more likely to use HEC, as they stand to gain more from this type of education. It is worth emphasizing that our results reject this hypothesis. Almost all the coefficients for the relationship between HEC and self-reported mortgage knowledge are positive, even if not all are statistically significant. As pointed out by Collins and O'Rourke (2010, 2011) at the time of their review, the literature was inconclusive as to which direction the selection would operate. Our results point in the direction of positive selection.

We also analyze whether HEC had any effect on early loan performance. We measure loan performance as ever being 60 or more days delinquent since the origination (a 3- to 4-year window in our data). Among all 1,686 first time mortgage borrowers, only 31 were delinquent by this measure, seven of them among HEC recipients. Since the difference between HEC recipients and other first-time homebuyers is not statistically significant, we do not find any effect of HEC on early loan performance.[17] Our finding of no effect is in line with Smith, Hochberg, Greene (2014).

7. Limitation

A key limitation of this survey in identifying the effect of HEC on mortgage knowledge is that we are unable to determine whether the responses on the survey reflect the post-purchase (and thus post-HEC) state of knowledge, or the pre-purchase state of knowledge. Future research should employ methods to distinguish between the pre-HEC and post-HEC states of knowledge and by examining within-person changes in knowledge, one may be able to eliminate most if not all concerns related to selection into HEC that may be related to mortgage knowledge. An example of this approach is Carswell (2009): measures of financial distress were obtained before

[16] This is in contrast to Spader and Quercia (2009), who find that classroom-based HEC was associated with increased shopping among participants of an affordable lending program.
[17] Such low levels of delinquency do not allow us to reject the null hypothesis of no effect of HEC on loan performance.

and after counseling, with an aim of identifying the effect of HEC on within-person changes in financial distress.

8. Conclusion

Homebuyer education and counseling (HEC) is believed to improve the home buying process for potential homebuyers. While we did not administer a mortgage literacy assessment, we do find evidence consistent with improved familiarity and confidence with the mortgage process and related terminology. We also find evidence that first-time homebuyers who report receiving homebuyer education or counseling also report greater likelihood of selecting a mortgage based on cost, as borrowers who did not report receiving HEC are more likely to consider non-price characteristics of a lender to be an important factor in their choice of mortgage. We also find that a higher number of borrowers who report receiving HEC compare final closing costs to the GFE, an exercise that is necessary to catch any last-minute changes (most often fee increases) to their mortgage terms. These factors suggest that HEC may be positively related to spurring participants to review mortgage loan offers more closely. Moreover, first-time homebuyer who reported receiving HEC had a higher level of satisfaction with both the mortgage process and mortgage terms.

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Table 1. Types of Counseling

	Frequency	Count	N. Obs
Q28. Did you take a course about home-buying or talk to a housing counselor?			
No	86.1%	1451	1,686
Yes	14.0%	235	1,686
Q 29. How was the home-buying course or counseling provided?			
One on one	22%	47	235
Group	45%	111	235
On the phone	13%	30	235
Online	43%	102	235
Q30. How many hours was the home-buying course or counseling?			
Less than 3 hours	45%	110	235
3-6 hours	28%	66	235
7-12 hours	23%	54	235
More than 12 hours	3%	5	235
Q31. Overall, how helpful was the home-buying course or counseling?			
Very	52%	116	235
Somewhat	42%	100	235
Not at all	6%	19	235

Source: National Survey of Mortgage Originations (NSMO), 2013-2014.
Notes: Frequencies are adjusted for population weights. For Q29, responses do not sum up to 100% because categories are not mutually exclusive.

Table 2. Summary Statistics of Responses for Select Questions

Responses related to knowledge of mortgage process, shopping and vetting deals				
	Mean	**No HEC**	**HEC**	**N. Obs.**
Q4. When you began the process of getting your mortgage, how familiar were you (and any cosigners) with each of the following? (=1 if Very familiar)				
The mortgage interest rates available at that time	36.30%	36.00%	38.30%	1,686
The different types of mortgages available	23.40%	22.10%	31.70%	1,686
The process of taking out a mortgage	18.10%	17.30%	23.00%	1,686
The down payment needed to qualify for a mortgage	36.70%	36.80%	36.00%	1,686
The income needed to qualify for a mortgage	33.80%	33.10%	38.20%	1,686
Your credit history or credit score	63.10%	62.50%	67.10%	1,686
The money needed at closing	27.20%	27.00%	28.50%	1,686
Q56.How well could you explain to someone the… (=1 if Very well)				
Process of taking out a mortgage	39.50%	37.80%	50.20%	1,686
Difference between a fixed- and an adjustable-rate mortgage	56.80%	55.90%	62.20%	1,686
Difference between a prime and subprime loan	12.80%	12.40%	15.60%	1,686
Difference between a mortgage's interest rate and its APR	19.20%	18.50%	23.20%	1,686
Amortization of a loan	24.10%	23.80%	25.90%	1,686
Consequences of not making required mortgage payments	55.80%	55.10%	60.20%	1,686
Q10. How many different lenders/brokers did you seriously consider before choosing where to apply for this mortgage?(=1 if more than one lender/broker)				
More than one lender	56.10%	55.80%	57.80%	1,686
Q12. Did you apply to more than one lender/broker for any of the following reasons?(=1 if searching for better loan terms)				
Searching for better loan terms	22.80%	22.40%	25.60%	1,686
Q49. Did you compare the final loan costs to the final Good Faith Estimate you received from your lender?				
Yes	67.50%	66.90%	71.30%	1686

Responses related to seeking input from others				
	Mean	**No HEC**	**HEC**	**N. Obs.**
Q51. Did you seek input about your closing documents from any of the following people? (=1 if yes, =0 otherwise)				
Lender/broker	69.40%	69.70%	67.80%	1,686
Settlement agent	18.30%	18.00%	19.70%	1,686
Real estate agent	58.90%	58.60%	61.10%	1,686
Personal attorney	20.10%	20.20%	19.00%	1,686
Title agent	17.00%	16.20%	22.00%	1,686
Trusted friend or relative who is not a co-signer on the mortgage	43.00%	43.20%	41.60%	1,686
Housing counselor	2.00%	0.60%	10.30%	1,686
Any of the sources	85.50%	85.10%	87.90%	1,686

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Table 2. Summary Statistics of Responses for Select Questions (Continued)

Responses related to non-price preferences				
	Mean	**No HEC**	**HEC**	**N. Obs.**
Q13. How important were each of the following in choosing the lender/broker you used for the mortgage you took out? (=1 if Important or Very Important)				
Any of the listed factors is important or very important	84.60%	85.20%	81.20%	1,686
Having an established banking relationship	36.90%	37.00%	36.20%	1,686
Having a local office or branch nearby	40.80%	40.40%	43.70%	1,686
Used previously to get a mortgage	4.60%	4.70%	3.90%	1,686
Lender/broker is a personal friend or relative	9.40%	9.10%	11.40%	1,686
Lender/broker operates online	21.10%	21.50%	18.50%	1,686
Recommendation from a friend/relative/co-worker	16.80%	16.50%	18.80%	1,686
Recommendation from a real estate agent/home builder	37.50%	38.50%	31.10%	1,686
Reputation of the lender/broker	38.20%	38.90%	33.70%	1,686
Spoke my primary language, which is not English	5.00%	4.40%	8.60%	1,686
Responses related to satisfaction with the mortgage process				
	Mean	**No HEC**	**HEC**	**N. Obs.**
Q26. Overall, how satisfied are you that the mortgage you got was the one with the… (=1 if Very satisfied)				
Any option = very	83.70%	82.80%	89.40%	1,686
Best terms to fit your needs	74.60%	74.20%	77.30%	1,686
Lowest interest rate for which you could qualify	68.70%	68.60%	69.20%	1,686
Lowest closing costs	56.60%	55.40%	64.00%	1,686
Q27. Overall, how satisfied are you with the… (=1 if Very satisfied)				
Overall satisfied with mortgage process	87.00%	86.30%	90.90%	1,686
Lender/broker you used	73.50%	72.70%	78.70%	1,686
Application process	59.70%	58.90%	64.90%	1,686
Loan closing process	60.30%	59.90%	62.70%	1,686
Information in mortgage disclosure documents	59.80%	59.20%	63.80%	1,686
Timeliness of mortgage disclosure documents	59.80%	60.10%	58.50%	1,686
Settlement agent	66.00%	65.80%	67.40%	1,686
Q52. Did you face any unpleasant "surprises" at your loan closing?				
Yes	16.20%	16.40%	14.90%	1,686
Characteristics of the mortgage obtained				
	Mean	**No HEC**	**HEC**	**N. Obs.**
Administrative Data				
Interest rate minus APOR spread	0.20%	0.20%	0.20%	1,686
LTV at origination	89.40%	89.10%	91.70%	1,686
Payment to income ratio	23.70%	23.50%	25.10%	1,686
Adjustable rate	7.20%	7.50%	5.70%	1,576
Second lien	2.40%	1.80%	6.10%	1,686

Source: National Survey of Mortgage Originations (NSMO), 2013-2014.

Table 3. Types of Borrowers and the Counseling Rate for Each Type

Covariate		Frequency	Counseling Rate
Credit Score			
	Lower than 620	5.7%	15.4%
	620 to 639	5.2%	27.7%
	640 to 659	8.3%	13.1%
	660 to 679	9.2%	17.1%
	680 to 699	9.0%	17.6%
	700 to 719	10.3%	15.7%
	720 to 739	12.4%	10.4%
	740 or Higher	40.0%	11.3%
Age			
	35 or Younger	73.0%	13.1%
	36 to 45	18.5%	16.4%
	46 to 55	8.5%	16.1%
Race			
	Non-Hispanic White	68.5%	12.5%
	Hispanic White	10.6%	16.4%
	Asian	9.9%	13.1%
	Mixed and Other	3.7%	4.2%
	Black	7.3%	30.6%
Education			
	Some School	2.0%	18.6%
	High School	8.0%	17.4%
	Technical School	5.1%	12.8%
	Partial College	18.9%	17.6%
	College Degree	39.4%	13.3%
	Postgraduate	26.6%	11.1%
Income			
	Less than $35,000	9.7%	19.7%
	$35,000 to $49,999	18.8%	20.1%
	$50,000 to $74,999	26.5%	17.4%
	$75,000 to $99,999	18.3%	10.3%
	$100,000 to $174,999	20.7%	7.0%
	$175,000 or More	6.0%	5.4%
Household Type			
	Couple, Married	53.8%	11.8%
	Couple, With Partner	17.6%	15.7%
	Single Male	14.4%	15.3%
	Single Female	14.2%	18.5%

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Table 3. Types of Borrowers and the Counseling Rate for Each Type (Continued)

Covariate		Frequency	Counseling Rate
Employment			
	Full-Time, Couple, Both	41.0%	11.1%
	Full-Time, Couple, One	28.1%	15.5%
	Full-Time, Single	26.3%	17.2%
	Not Full-Time, Couple, Neither	2.3%	8.9%
	Not Full-Time, Single	2.3%	12.8%

Source: National Survey of Mortgage Originations (NSMO), 2013-2014.

Table 4. Linear Probability Model of HEC Choice

	Beta	SE
Credit Score=Lower than 620	-0.167**	(0.0567)
Credit Score=620 to 639	0	omitted
Credit Score=640 to 659	-0.127*	(0.0516)
Credit Score=660 to 679	-0.0997*	(0.0500)
Credit Score=680 to 699	-0.0958	(0.0492)
Credit Score=700 to 719	-0.124*	(0.0485)
Credit Score=720 to 739	-0.119*	(0.0472)
Credit Score=740 or Higher	-0.121**	(0.0432)
Age=35 or Younger	-0.00192	(0.0293)
Age=36 to 45	0.0300	(0.0330)
Age=46 to 55	0	omitted
Race=Non-Hispanic White	0.0841	(0.0438)
Race=Hispanic White	0.0983	(0.0503)
Race=Asian	0.116*	(0.0513)
Race=Black	0.248***	(0.0521)
Race=Mixed and Other	0	omitted
Education=Some School	0.109	(0.0755)
Education=High School	0.0424	(0.0488)
Education=Technical School	0	omitted
Education=Partial College	0.0421	(0.0428)
Education=College Degree	0.0366	(0.0407)
Education=Postgraduate	0.0398	(0.0423)
Income=Less than $35,000	0.140**	(0.0466)
Income=$35,000 to $49,999	0.162***	(0.0401)
Income=$50,000 to $74,999	0.131***	(0.0379)
Income=$75,000 to $99,999	0.0577	(0.0378)
Income=$100,000 to $174,999	0.0308	(0.0368)
Income=$175,000 or More	0	omitted
Household Type=Couple, Married	-0.00391	(0.0778)
Household Type=Couple, With Partner	0.0181	(0.0804)
Household Type=Single Male	0	omitted
Household Type=Single Female	0.0501	(0.0316)
Employment=Full-Time, Couple, Both	0.0433	(0.0554)
Employment=Full-Time, Couple, One	0.0758	(0.0556)
Employment=Full-Time, Single	0.0393	(0.0576)
Employment=Not Full-Time, Couple, Neither	0	omitted
Employment=Not Full-Time, Single	0	omitted
Observations	1686	

Source: National Survey of Mortgage Originations (NSMO), 2013-2014.
Notes: Standard errors in parentheses. * p<0.05, ** p<0.01, *** p<0.001

Table 5. Coarsening Strategy

	Original Covariates	Frequency of Original Covariates	Coarsened Covariates	Frequency of Coarsened Covariates	Counseling Rate Among Coarsened Covariates
Credit Score					
	Lower than 620	5.7%	<720	47.6%	17.0%
	620 to 639	5.2%			
	640 to 659	8.3%			
	660 to 679	9.2%			
	680 to 699	9.0%			
	700 to 719	10.3%			
	720 to 739	12.4%	>=720	52.4%	11.8%
	740 or Higher	40.0%			
Age					
	35 or Younger	73.0%	35 or Younger	73.0%	12.8%
	36 to 45	18.5%	36 to 45	18.5%	17.0%
	46 to 55	8.5%	46 to 55	8.5%	16.0%
Race					
	Non-Hispanic White	68.5%	Non-Black	92.7%	12.5%
	Hispanic White	10.6%			
	Asian	9.9%			
	Mixed and Other	3.7%			
	Black	7.3%	Black	7.3%	31.8%
Education					
	Some School	2.0%	No College	34.0%	16.9%
	High School	8.0%			
	Technical School	5.1%			
	Partial College	18.9%			
	College Degree	39.4%	College or Postgrad	66.0%	12.5%
	Postgraduate	26.6%			
Income					
	Less than $35,000	9.7%	<$50k	28.5%	21.2%
	$35,000 to $49,999	18.8%			
	$50,000 to $74,999	26.5%	$50k- $99k	44.8%	14.4%
	$75,000 to $99,999	18.3%			
	$100,000 to $174,999	20.7%	>=$100k	26.7%	6.1%
	$175,000 or More	6.0%			

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Table 5. Coarsening Strategy (Continued)

	Original Covariates	Frequency of Original Covariates	Coarsened Covariates	Frequency of Coarsened Covariates	Counseling Rate Among Coarsened Covariates
Household Type					
	Couple, Married	53.8%			
	Couple, With Partner	17.6%			
	Single Male	14.4%	Couple, Two Earners	41.0%	10.1%
	Single Female	14.2%	Couple, One Earner	30.4%	15.7%
Employment			Single Male	14.4%	14.0%
	Full-Time, Couple, Both	41.0%	Single Female	14.2%	21.2%
	Full-Time, Couple, One	28.1%			
	Full-Time, Single	26.3%			
	Not Full-Time, Couple, Neither	2.3%			
	Not Full-Time, Single	2.3%			

Source: National Survey of Mortgage Originations (NSMO), 2013-2014.

Table 6. Characteristics of Borrowers Who Were Not Matched, By Counseling Status

	No HEC	HEC
Credit Score		
Lower than 620	14	0
620 to 639	14	3
640 to 659	11	2
660 to 679	28	4
680 to 699	27	5
700 to 719	33	2
720 to 739	44	2
740 or Higher	146	3
Age		
35 or Younger	142	7
36 to 45	94	10
46 to 55	81	4
Race		
Non-Hispanic White	200	2
Hispanic White	26	0
Asian	24	0
Black	56	19
Mixed and Other	11	0
Education		
Some School	9	1
High School	34	3
Technical School	25	1
Partial College	80	6
College Degree	88	6
Postgraduate	81	4
Household income		
Less than $35,000	29	3
$35,000 to $49,999	52	5
$50,000 to $74,999	58	8
$75,000 to $99,999	42	3
$100,000 to $174,999	102	2
$175,000 or More	34	0
Household type		
Couple, Married	149	6
Couple, With Partner	39	1
Single Male	72	3
Single Female	57	11

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Table 6. Characteristics of Borrowers Who Were Not Matched, By Counseling Status (Continued)

	No HEC	HEC
Employment		
Full-Time, Couple, Both	88	3
Full-Time, Couple, One	87	4
Full-Time, Single	118	14
Not Full-Time, Couple, Neither	13	0
Not Full-Time, Single	11	0
All	317	21

Source: National Survey of Mortgage Originations (NSMO), 2013-2014.
Note: Reported are counts of observations in a given category.

Table 7. Estimates of the Relationship Between Reported HEC and the Outcome of Interest

	Mean	OLS		Propensity Score Matching		Coarsened Exact Matching	
Responses Related to Knowledge of Mortgage Process, Shopping and Vetting Offers							
When you began the process of getting your mortgage, how familiar were you (and any cosigners) with each of the following? (=1 if very familiar)							
The mortgage interest rates available at that time	36.30%	3.22	(3.47)	2.82	(3.69)	1.24	(3.56)
The different types of mortgages available	23.40%	8.26***	(3.11)	9.67***	(3.43)	5.79*	(3.12)
The process of taking out a mortgage	18.10%	3.08	(2.74)	5.31*	(3.05)	2.38	(2.78)
The down payment needed to qualify for a mortgage	36.70%	0.07	(3.48)	0.58	(3.63)	-1.68	(3.57)
The income needed to qualify for a mortgage	33.80%	3.72	(3.43)	3.40	(3.67)	1.80	(3.52)
Your credit history or credit score	63.10%	3.57	(3.50)	4.69	(3.72)	1.14	(3.61)
The money needed at closing	27.20%	-1.48	(3.17)	-0.88	(3.41)	-2.39	(3.26)
How well could you explain to someone the… (=1 if very well)							
Process of taking out a mortgage	39.50%	12.39***	(3.50)	10.76***	(3.73)	9.93***	(3.60)
Difference between a fixed- and an adjustable-rate mortgage	56.80%	6.49*	(3.55)	6.26*	(3.74)	2.11	(3.70)
Difference between a prime and subprime loan	12.80%	5.10**	(2.38)	5.01*	(2.56)	1.83	(2.38)
Difference between a mortgage's interest rate and its APR	19.20%	6.00**	(2.81)	6.36**	(3.19)	5.61**	(2.72)
Amortization of a loan	24.10%	3.83	(3.08)	4.87	(3.27)	1.68	(3.09)
Consequences of not making required mortgage payments	55.80%	3.64	(3.61)	2.20	(3.74)	1.64	(3.69)
How many different lenders/brokers did you seriously consider before choosing where to apply for this mortgage? (=1 if more than one lender/broker)							
More than one lender	56.10%	4.40	(3.59)	3.59	(3.68)	3.85	(3.70)
Did you apply to more than one lender/broker for any of the following reasons?							
Searching for better loan terms	22.80%	2.72	(3.10)	1.67	(3.39)	3.12	(3.16)
Did you compare the final loan costs to the final Good Faith Estimate you received from your lender?							
Yes	67.50%	8.03**	(3.33)	7.63**	(3.50)	6.43*	(3.53)
Responses Related to Seeking Input from Others							
Did you seek input about your closing documents from any of the following people? (=1 if yes, =0 otherwise)							
Lender/broker	69.40%	-2.75	(3.33)	-1.08	(3.69)	-1.20	(3.56)
Settlement agent	18.30%	2.15	(2.83)	3.17	(2.94)	4.12	(2.81)
Real estate agent	58.90%	1.46	(3.56)	-1.25	(3.59)	0.10	(3.65)
Personal attorney	20.10%	0.25	(2.93)	0.73	(2.94)	0.22	(2.92)
Title agent	17.00%	4.64*	(2.73)	4.58	(2.87)	4.18	(2.80)
Trusted friend or relative who is not a co-signer on the mortgage	43.00%	2.28	(3.53)	-0.81	(3.81)	-0.02	(3.70)
Housing counselor	2.00%	9.62***	(0.96)	10.12***	(2.04)	9.76***	(1.03)
Any of the sources	85.50%	2.10	(2.56)	1.58	(2.70)	1.35	(2.74)

(Continued on the next page)

Table 7. Estimates of the Relationship Between Reported HEC and the Outcome of Interest (Continued)

	Mean	OLS		Propensity Score Matching		Coarsened Exact Matching	
Responses Related to Non-Price Preferences							
How important were each of the following in choosing the lender/broker you used for the mortgage you took out? (=1 if important or very important)							
Any of the listed factors important or very important	84.60%	-4.44*	(2.62)	-6.65**	(2.84)	-6.82***	(2.61)
Having an established banking relationship	36.90%	-3.65	(3.50)	-2.76	(3.57)	-3.44	(3.58)
Having a local office or branch nearby	40.80%	2.03	(3.54)	0.39	(3.74)	2.43	(3.65)
Used previously to get a mortgage	4.60%	-1.20	(1.51)	-0.72	(1.51)	-0.73	(1.60)
Lender/broker is a personal friend or relative	9.40%	2.17	(2.12)	3.24	(2.15)	2.86	(2.01)
Lender/broker operates online	21.10%	-3.64	(2.97)	-2.20	(2.95)	-3.31	(2.93)
Recommendation from a friend/relative/co-worker	16.80%	-0.75	(2.70)	0.09	(2.82)	-1.10	(2.79)
Recommendation from a real estate agent/home builder	37.50%	-7.97**	(3.51)	-8.84**	(3.67)	-6.41*	(3.59)
Reputation of the lender/broker	38.20%	-4.97	(3.54)	-6.09*	(3.60)	-6.36*	(3.62)
Spoke my primary language, which is not English	5.00%	3.64**	(1.52)	4.35**	(1.98)	4.52***	(1.63)
Responses Related to Satisfaction with the Mortgage Process							
Overall, how satisfied are you that the mortgage you got was the one with the… (=1 if very satisfied)							
Any option = very	83.70%	6.66**	(2.65)	6.31**	(2.60)	5.27*	(2.77)
Best terms to fit your needs	74.60%	5.56*	(3.12)	5.85*	(3.15)	4.98	(3.29)
Lowest interest rate for which you could qualify	68.70%	1.00	(3.34)	0.62	(3.46)	1.05	(3.48)
Lowest closing costs	56.60%	5.97*	(3.53)	5.17	(3.72)	4.62	(3.68)
Overall, how satisfied are you with the… (=1 if very satisfied)							
Overall satisfied with mortgage process	87.00%	4.16*	(2.44)	4.05*	(2.33)	4.09	(2.56)
Lender/broker you used	73.50%	4.48	(3.19)	4.15	(3.18)	4.24	(3.29)
Application process	59.70%	3.79	(3.56)	5.38	(3.75)	6.61*	(3.68)
Loan closing process	60.30%	1.85	(3.55)	3.61	(3.81)	5.88	(3.67)
Information in mortgage disclosure documents	59.80%	2.93	(3.54)	3.17	(3.60)	2.15	(3.66)
Timeliness of mortgage disclosure documents	59.80%	-1.09	(3.55)	0.67	(3.69)	1.08	(3.68)
Settlement agent	66.00%	-0.82	(3.43)	-0.03	(3.48)	-0.32	(3.54)
Did you face any unpleasant "surprises" at your loan closing?							
Yes	16.20%	1.09	(2.64)	0.99	(2.80)	-2.19	(2.79)
Characteristics of the Mortgage Obtained							
Administrative data							
Interest rate minus APOR spread	0.20%	0.02	(0.04)	0.05	(0.04)	0.06	(0.05)
LTV at origination	89.40%	1.51*	(0.91)	0.72	(0.85)	1.38	(0.99)
Payment to income ratio	23.70%	0.24	(0.64)	-0.34	(0.72)	0.40	(0.77)
Adjustable rate	7.20%	-1.12	(1.90)	-0.25	(1.71)	-0.27	(1.80)
Second lien	2.40%	4.77***	(1.12)	5.10***	(1.65)	4.20***	(1.06)

Source: National Survey of Mortgage Originations (NSMO), 2013-2014.

Notes: All coefficients are interpreted as percentage point change in the response of interest between respondents that reported receiving HEC and those that didn't, controlling for covariates. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.