First-Time Homebuyer Counseling and the Mortgage Selection Experience in the United States: Evidence from the National Survey of Mortgage Originations

Robert B. Argento
Lariece M. Brown
Freddie Mac

Sergei Koulayev
Consumer Financial Protection Bureau

Grace Li
Fannie Mae

Marina Myhre
U.S. Department of Housing and Urban Development

Forrest Pafenberg
Saty Patrabansh
Federal Housing Finance Agency

Disclaimer

The views expressed in this article are those of the authors and are not necessarily those of Freddie Mac, the Consumer Financial Protection Bureau, Fannie Mae, the U.S. Department of Housing and Urban Development, or the Federal Housing Finance Agency.

Abstract

The existing literature on homebuyer education and counseling (HEC) often focuses on the evaluation of specific programs, generally using mortgage loan performance as the metric of success. This article 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 article 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 between 2013 and 2016. 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 17 percent of a nationally representative sample of first-time homebuyers reported receiving some form of HEC. In an analysis of early loan performance, we find that while borrowers reporting HEC had higher delinquency rates, these differences decrease and are not statistically significant when controlling for observable differences between those reporting HEC and the group without HEC. Using propensity score matching, we find that first-time homebuyers who reported receiving HEC also reported better mortgage knowledge, more confidence in their ability to explain the mortgage process, and higher level of satisfaction with the mortgage they received.

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. Advocates of HEC promote these programs to better prepare first-time homebuyers for successful homeownership by helping them make good home purchase and mortgage decisions and by improving their financial management skills (DeMarco et al., 2016). Lenders may require HEC for potential homebuyers with more marginal credit characteristics, such as higher loan-to-value (LTV) ratios, to mitigate risk. Therefore, HEC has become a standard part of many government, nonprofit, and industry programs geared toward low- to moderate-income first-time homebuyers on the premise that both homebuyers and society will benefit.

However, there has not been definitive evidence or a consensus on the benefits and cost-effectiveness of HEC. The existing literature on housing education and counseling often focuses on the evaluation of specific programs, generally using mortgage loan performance as the metric of success. The literature shows mixed results on HEC's effectiveness. In addition, 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 article contributes to the literature in two ways. First, it provides evidence about potential benefits of HEC to nonperformance 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 article, we examine the incidence and effectiveness of HEC among the general population of first-time homebuyers who took out a mortgage for home purchases between 2013 and 2016. We use responses from the NSMO, a new survey of a nationally representative sample of new mortgages in the United States. NSMO is a component of the National Mortgage Database® (NMDB).[1]

[1] NSMO and NMDB are described in the guest editors' introduction.

We find that 17 percent of first-time homebuyers reported receiving some form of HEC. In an analysis of early loan performance, we find that while borrowers reporting HEC had higher delinquency rates, these differences decrease and are not statistically significant when controlling for observable differences between the groups. Using propensity score matching to account for selection on observables, we find that first-time homebuyers who reported receiving HEC also reported better mortgage knowledge, more confidence in their ability to explain the mortgage process, and higher level of satisfaction with their mortgage.

Literature

The literature studying the effectiveness of prepurchase HEC is large and diverse; see Myhre and Watson (2017), Mayer and Temkin (2016), and Collins and O'Rourke (2011, 2010) for reviews. Nevertheless, the existing research is limited in several respects. First, nearly every study that we are aware of has focused on measuring counseling effectiveness among participants of a particular lending program.[2] 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 in which participants are recruited from a pool of mortgage applicants from three large national lenders (DeMarco et al., 2016).

Different lending programs have different counseling programs. There is a large variety of prepurchase 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 (nonprofit, government, lender); and (d) whether it is voluntary or mandatory. Typically, a study focuses on a specific counseling program (Agarwal et al., 2014a, 2014b, 2010; Brown, 2016) or by study design (Smith, Hochberg, and Greene, 2014; Carswell, 2009). Few studies span across counseling programs; see the article by Quercia and Spader (2008) for an analysis of the relative effectiveness of various types of counseling; also, see Avila, Nguyen, and Zorn (2013), whose study utilized a large sample of loans not restricted to a specific counseling program.

The selection specifics in 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.

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 nonmortgage 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 body of literature studying the effectiveness of various financial education programs in improving financial literacy and related behaviors. For instance, Collins (2013) examined the impact of a mandatory financial education program

[2] See Avila, Nguyen, and Zorn (2013) for a study of Freddie Mac's Affordable Gold and Home Possible programs and Mayer and Temkin (2016) for NeighborWorks America's programs.

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) suggested that a lack of mortgage shopping may have prevented borrowers from realizing significant price savings. Moulton, Collins, Loibl, and Samak (2013) showed that many borrowers underestimate their total or monthly nonmortgage debt and are overconfident in their ability to pay down their debt, relative to the actual repayment behavior; and Gerardi, Goette, and Meier (2010) linked 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 article addresses both aspects of HEC's effectiveness. Our results apply to the general population of first-time homebuyers who took out a mortgage between 2013 and 2016 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 time period when the loans were originated. In a natural field experiment of a Tennessee prepurchase homebuyer education program in 2002 funded by a HUD housing counseling grant, Brown (2016) found that borrowers who received HEC had a 42-percent reduced chance of foreclosure compared with the control group but no statistically significant difference in default (defined as first incidence of becoming 90 days delinquent). On the other hand, in a randomized field experiment sponsored by the Federal Reserve Bank of Philadelphia, Smith and colleagues (2014) found that one-on-one prepurchase 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 with a control group who only received a 2-hour prepurchase workshop—but no impact on timeliness of mortgage payments, as most borrowers stayed current on their mortgage. Avila, Nguyen, and Zorn (2013) found that the effect of HEC on loan performance was largest among loans originated between 2006 and 2008. Similarly, Mayer and Temkin (2016) found a 30-percent reduction in 90-plus days' delinquency for 2007-vintage loans originated by NeighborWorks. Li and colleagues (2016) analyzed the same program but for post-crisis originations in the period from 2010 to 2012 and found a 14-percent reduction.

Analysis Sample and Outcomes

For this article, we use data from the NSMO survey conducted for a sample of borrowers with mortgages originated in 2013 through 2016. There were 24,847 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 NMDB, we can identify homebuyers as those borrowers who have not had an active mortgage. 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.[4]

[4] For NSMO, we match the survey respondent and the spouse (when one exists) 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 that both have no prior mortgage in the credit file for the loan type to be designated as a first-time homebuyer loan. 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 loan.

NSMO identifies the recipients of HEC by asking, “Did you take a course about homebuying or talk to a housing counselor?” Followup questions ask what delivery mode was used for the homebuying 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. Exhibit 1 summarizes responses to these questions. Among the 3,305 first-time homebuyers that we have identified, 562 reported receiving some form of HEC, which amounts to a rate of 17 percent.[5] 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 who report receiving any kind of HEC, 43 percent report receiving it in a group setting, while 18 percent report a one-on-one counseling interaction, as shown in exhibit 1.[6]

Exhibit 1

Types of Counseling

	Weighted Frequency (%)	Survey Counts
Did you take a course about homebuying or talk to a housing counselor?		
No	83.18	2,743
Yes	16.82	562
How was the homebuying course or counseling provided?		
In Person, One-on-One	18.49	102
In Person, in a Group	43.02	244
Over the Phone	12.39	68
Online	49.89	281
How many hours was the homebuying course or counseling?		
Less Than 3 Hours	43.07	247
3–6 Hours	28.91	166
7–12 Hours	22.75	123
More Than 12 Hours	5.26	26
Overall, how helpful was the homebuying course or counseling?		
Very	55.20	302
Somewhat	37.66	218
Not at All	7.15	42

Notes: Responses do not sum up to 100 percent because categories are not mutually exclusive. Frequencies are adjusted for population weights. Survey counts are unweighted actual responses.
Source: NSMO, 2013–2016

The scope of this analysis is a comparison of the 562 first-time homebuyers reporting HEC with the remaining 2,743 first-time homebuyers who did not report receiving HEC. Substantively, the NSMO does not distinguish between homebuyer education (group classroom instruction about the homebuying 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 homebuying process). For instance, 18 percent of respondents indicated a one-on-one session, which probably corresponds to counseling rather than homebuyer education. It is unclear whether the remaining 82 percent received education, counseling, or both. For instance, those who report group instruction may have also received individual consultation. NSMO does not identify whether

[5] Our definition of a first-time mortgage borrower is the following: (a) no mortgage in the previous credit history; (b) both the borrower and the coborrower, if present, are 55 years of age or younger. This approach results in approximately 36 percent of first-time mortgage borrowers among all borrowers for home purchase in 2013–2016.
[6] Sample weights are used for frequencies, summary means, and the linear probability models. For each survey response, the sample weight is adjusted for non-response by multiplying the sampling weight and the non-response adjustment.

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 online tool that does not meet HUD or NIS standards. For example, the provider could be the lender or mortgage insurance company. Therefore, we chose not to compare groups who self-reported different types of HEC in NSMO to one another.

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 with 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 respondent provides a certain answer to the relevant question, and zero otherwise. The question, "How well could you explain to someone the process of taking out a mortgage?" generates an indicator variable equal to one if the respondent replied "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 weighted sample mean is 41.32 percent, indicating that 41.32 percent of respondents said "very well," as shown in exhibit 2. Among HEC recipients, the share of respondents who said "very well," 48.42 percent is much higher than the 39.89 percent of non-HEC respondents who said they could explain the process of taking out a mortgage "very well". For the complete list of questions and corresponding outcomes, see exhibit 2.[7] Next, we provide a broad overview of the categories of survey questions we analyze and how first-time homebuyers responded to them.

Exhibit 2

Summary Statistics of Responses for Select Questions (1 of 3)

	Weighted Means (%)		
	Sample	**No HEC**	**HEC**
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	33.58	32.81	37.39
The different types of mortgages available	23.66	22.84	27.75
The process of taking out a mortgage	15.59	14.68	20.10
The downpayment needed to qualify for a mortgage	35.99	36.26	34.65
The income needed to qualify for a mortgage	32.20	31.45	35.91
Your credit history or credit score	64.43	63.60	68.57
The money needed at closing	25.20	25.03	26.06
How well could you explain to someone the… (=1 if very well)			
Process of taking out a mortgage	41.32	39.89	48.42
Difference between a fixed- and an adjustable-rate mortgage	55.59	55.01	58.49

[7] The current survey instrument is available at https://www.fhfa.gov/nsmo.

Exhibit 2

Summary Statistics of Responses for Select Questions (2 of 3)

	Weighted Means (%)		
	Sample	**No HEC**	**HEC**
How well could you explain to someone the… (=1 if very well)			
Difference between a prime and a subprime loan	12.44	12.50	12.13
Difference between a mortgage's interest rate and its APR	19.17	19.05	19.76
Amortization of a loan	23.98	24.41	21.86
Consequences of not making required mortgage payments	55.73	54.30	62.81
How many different lenders/brokers did you seriously consider before choosing where to apply for this mortgage? (=1 if more than one lender/broker)			
Seriously considered more than one lender/broker	54.64	54.26	56.52
How many different lenders/brokers did you end up applying to? (=1 if more than one lender/broker)			
Applied to more than one lender/broker	31.71	30.97	35.37
Did you seek input about your closing documents from any of the following people? (=1 if yes, =0 otherwise)			
Lender/mortgage broker	72.92	72.91	73.00
Settlement/closing agent	22.70	22.51	23.65
Real estate agent	60.78	61.13	59.04
Personal attorney	15.83	15.83	15.87
Title insurance agent	17.41	16.69	21.00
Trusted friend or relative who is not a cosigner on the mortgage	44.44	45.01	41.60
Housing counselor	2.45	0.77	10.73
Any of the sources	88.17	87.97	89.17
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)			
Having an established banking relationship	43.98	44.64	40.71
Having a local office or branch nearby	52.04	51.68	53.82
Used previously to get a mortgage	7.69	7.19	10.15
Lender/broker is a personal friend or relative	12.64	12.27	14.42
Recommendation from a friend/relative/co-worker	50.07	50.51	47.90
Recommendation from a real estate agent/home builder	51.44	51.07	53.28
Reputation of the lender/broker	59.12	58.73	61.04
Spoke my primary language, which is not English	9.64	8.89	13.31
Any of non-price factors are important	91.79	91.79	91.84

Exhibit 2

Summary Statistics of Responses for Select Questions (3 of 3)

	Weighted Means (%)		
	Sample	No HEC	HEC
Overall, how satisfied are you that the mortgage you got was the one with the… (=1 if very satisfied)			
Best terms to fit your needs	73.47	73.36	73.59
Lowest interest rate for which you could qualify	68.47	68.61	57.28
Lowest closing costs	56.53	62.05	62.40
Any option = very	84.26	87.47	63.62
Overall, how satisfied are you with the… (=1 if very satisfied)			
Lender or mortgage broker you used	72.94	72.80	73.59
Application process	59.57	60.03	57.28
Loan closing process	61.71	61.58	62.40
Information in the mortgage disclosure documents	61.24	60.75	63.62
Timeliness of mortgage disclosure documents	60.35	60.91	57.61
Settlement agent	65.90	66.07	65.06
Overall satisfied with mortgage process	87.19	86.90	88.64
Did you face any unpleasant surprises at your loan closing? (=1 for "yes")			
Did you face any unpleasant surprises at your loan closing?	16.63	15.50	22.25
Administrative data			
Mortgage interest rate spread at origination greater than 100 BPS	12.93	12.22	16.43
LTV ratio at origination greater than 95 percent	44.24	42.24	54.11
Mortgage debt to income ratio greater than 45 percent	12.57	12.29	13.94
Second lien	2.14	1.43	5.62
Ever 60 days delinquent	3.65	3.12	6.31
Ever 90 days delinquent	2.51	2.19	4.11

BPS = basis points. HEC = homebuyer education and counseling. LTV = loan-to-value.
Note: Sample size is 3,305.
Source: NSMO, 2013–2016.

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 downpayment 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 64 percent of first-time homebuyers responded they were very familiar with their credit history and credit score, only 16 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 the mortgage interest rate and the 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 first-time homebuyers responded that they understood the difference between a fixed- and an adjustable-rate mortgage (56 percent) and the consequences of not making required payments (56 percent). Respondents were least comfortable explaining the differences between prime and subprime loans (12 percent) and the difference between the interest rate and the 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 variables with a value of one if the respondent answered "very important" for any of the non-price factors. A very high percentage, 92 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 with both the process and mortgage terms. For example, close to 68 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?" and by this measure, 55 percent of first-time homebuyers reported that they seriously considered more than one lender or broker. Borrowers were also asked, "How many different lenders/brokers did you end up applying to?". By this second measure, 32 percent indicated that they applied to more than one lender or broker.

Seeking Input About Closing Documents

Eighty-eight 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 (73 percent and 61 percent, respectively). Forty-four 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 underwriting information such as LTV at origination and debt-to-income ratio (DTI), as well as product features such as interest rate, term, and fixed-rate versus adjustable-rate. Between 2013 and 2016, 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.[8] For this reason, we do not include these mortgage features as part of our analysis.

For our analysis, we created indicator variables to represent a mortgage with an LTV at origination greater than 95 percent, a mortgage interest rate spread at origination greater than 100 basis points,[9] a DTI ratio greater than 45 percent, and a second lien present at origination. For the first-time homebuyers in this study, 44 percent have an origination LTV greater than 95 percent, 2 percent are securing second liens with the first mortgage, and 13 percent have the higher DTI and interest-rate spread at origination.[10]

Some mortgage terms, including LTV and DTI, may reflect decisions or circumstances of a household that may predate HEC, such that any association between these terms and reported HEC should be taken with caution. In the more detailed empirical analysis, discussed below, we consider the possibility that these mortgage terms affect the selection into reported HEC as an additional specification. 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.

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 propensity score matching (PSM) to control for the observable borrower characteristics related to which borrowers reported receiving homebuyer education or counseling. PSM controls for observable borrower and loan characteristics.[11] This is an improvement relative to other papers that were limited to detailed information for only borrowers who received counseling. Such papers relied on loan characteristics (Agarwal et al., 2014a, 2014b, 2010) or credit attributes (Mayer and Temkin, 2016; Roll and Moulton, 2016) to address selection.[12] Regardless, PSM is not able to control for unobserved attributes that might affect both counseling choices and mortgage selection, such as job security, mobility, available assets, or funds for a downpayment. 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. Overall, the results of our analysis are best

[8] 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.
[9] A basis point is one-hundredth of a percent.
[10] We have 45 fewer observations associated with DTI because we omit DTI observations that exceed 60 percent. The relevant counts are reported in exhibit 2.
[11] For an explanation of the method, see, for example, Dehejia and Wahba (2002).
[12] See Mayer and Temkin (2016) for a review.

interpreted as correlations or suggestive evidence of the relationship between HEC and aspects of the mortgage selection process, not proof of causal relationships.

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 potentially related to self-reported education or counseling participation. Exhibit 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 to be as representative as possible to the general population of first-time homebuyers. The second column presents the counseling rate among borrowers of a given type which can be compared with the overall counseling rate of 17 percent. From this exhibit, we make the following observations.

- Credit Score: Borrowers with a lower credit score are generally more likely to report HEC participation, with the highest participation rates reported for borrowers with a credit score of 620–639.[13] Among these borrowers, the reported HEC rate is 27 percent.
- Age: Younger borrowers (35 years or younger) are less likely to report HEC participation than older borrowers. The younger borrowers' reported HEC participation rate is 15 percent compared with 21 percent for those 36 to 45 years old.
- Race and Ethnicity: The HEC rate among Blacks is 41 percent, more than twice the average in the sample.
- Education: Borrowers with a college degree have a lower reported HEC rate, at 16 percent, compared with a 24-percent rate among high school graduates.
- 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 26 percent, well above that of higher income groups.
- Marital Status: At 15 percent, married couples have the lowest reported HEC rate, compared with 19 percent for both not-married couples and singles.

Exhibit 3

Types of Borrowers and the Counseling Rate for Each Type (1 of 3)

Covariate	Weighted Percent	
	Frequency	Counseling Rate
Loan Amount		
Less Than $50,000	1.88	21.91
$50,000 to $99,999	16.51	20.38
$100,000 to $149,999	25.65	19.25
$150,000 to $199,999	19.91	15.93
$200,000 to $249,999	12.95	15.72

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

Exhibit 3

Types of Borrowers and the Counseling Rate for Each Type (2 of 3)

Covariate	Weighted Percent	
	Frequency	Counseling Rate
$250,000 to $299,999	8.18	16.91
$300,000 to $349,999	4.45	14.05
$350,000 to $399,999	3.08	10.21
$400,000 or More	7.41	7.84
Credit Score		
Lower Than 620	6.51	19.61
620 to 639	5.36	26.83
640 to 659	8.71	20.98
660 to 679	8.03	21.28
680 to 699	9.18	19.94
700 to 719	10.62	16.17
720 to 739	12.55	14.29
740 or Higher	39.04	13.40
Age at Last Birthday		
35 or Younger	73.81	15.47
36 to 45	18.60	21.32
Older Than 45	7.59	18.93
Race		
White/Caucasian	81.68	15.10
Black/African-American	6.31	40.65
Asian	8.22	13.19
Other	3.79	22.20
Hispanic or Latino		
No	13.08	21.60
Yes	86.92	16.10
Highest Level of Education Achieved		
Some Schooling	1.50	33.27
High School Graduate	8.95	23.99
Technical School	5.30	19.76
Some College	17.06	19.96
College Graduate	41.05	15.75
Postgraduate Studies	26.14	12.46
Income Relied Upon in Underwriting		
Less Than $35,000	8.39	25.72
$35,000 to $49,999	17.61	26.28
$50,000 to $74,999	26.62	19.02
$75,000 to $99,999	20.26	13.01
$100,000 to $174,999	19.74	8.35
$175,000 or More	7.37	9.32

Exhibit 3

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

Covariate	Weighted Percent	
	Frequency	Counseling Rate
Household Type		
Married	52.64	15.10
Not Married but With Partner	16.95	18.77
Single	30.41	18.73
Gender		
Female	44.47	18.63
Male	55.53	15.37
Employment Type		
Employed Full Time	87.78	16.22
Self-Employed	4.90	16.67
Other	7.33	24.20
LTV Ratio at Origination		
95% or Below	55.76	13.84
Greater Than 95%	44.24	20.58
Mortgage DTI Ratio		
45% or Below	87.43	16.51
Greater Than 45%	12.57	18.61
Has Second Lien		
No	97.86	16.22
Yes	2.14	44.22

DTI = debt-to-income. LTV = loan-to-value.
Source: NSMO, 2013–2014

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 specification used in the linear probability model. 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 with the responses of borrowers who did not report HEC using a linear regression model.

[14] We used the k-nearest neighbors method to identify matched observations. The results reported in the table include the 20 nearest neighbors. Additional sensitivity testing was conducted for k=10 and k=15.

In exhibit 4, we present results of a linear probability model of HEC with the variables used in the logistic regression of PSM. Credit score, race, age, education, and income are statistically significant predictors of reported HEC. When other factors, such as income, are controlled for, loan amount, household type, and employment type are not statistically significant in the counseling regression model.

As mentioned earlier, we consider an analysis in which higher LTV, higher DTI, and the presence of a second lien are considered outcome variables and an alternate analysis in which these variables are selection variables used in the logistic model of reporting HEC. The linear probability model of the alternate model is included on the right side of exhibit 4. Having a second lien is a statistically significant predictor of counseling.

Exhibit 4

Weighted Linear Probability Model of HEC Choice (1 of 2)

Control	Without Administrative Data			With Administrative Data		
	Estimate (%)	Standard Error (%)	t-Statistic	Estimate (%)	Standard Error (%)	t-Statistic
Intercept	26.90	7.69	3.50	24.62	7.69	3.20
Loan Amount						
Less Than $50,000 *(Omitted)*	–	–	–	–	–	–
$50,000 to $99,999	0.62	4.89	0.13	0.60	4.91	0.12
$100,000 to $149,999	3.17	4.86	0.65	3.35	4.90	0.68
$150,000 to $199,999	2.84	4.97	0.57	2.86	5.02	0.57
$200,000 to $249,999	4.56	5.12	0.89	5.13	5.17	0.99
$250,000 to $299,999	8.50	5.35	1.59	9.48	5.40	1.75
$300,000 to $349,999	7.05	5.79	1.22	8.14	5.82	1.40
$350,000 to $399,999	5.17	6.18	0.84	5.70	6.20	0.92
$400,000 or More	3.04	5.75	0.53	3.39	5.80	0.58
Credit Score						
Lower Than 620 *(Omitted)*	–	–	–	–	–	–
620 to 639	9.12**	3.71	2.46	9.36**	3.68	2.54
640 to 659	4.01	3.30	1.21	4.03	3.29	1.22
660 to 679	5.22	3.37	1.55	4.67	3.36	1.39
680 to 699	4.55	3.27	1.39	4.37	3.27	1.34
700 to 719	1.02	3.20	0.32	1.20	3.18	0.38
720 to 739	1.55	3.14	0.49	1.49	3.14	0.47
740 or Higher	1.97	2.81	0.70	2.39	2.85	0.84
Age at Last Birthday						
35 or Younger *(Omitted)*	–	–	–	–	–	–
36 to 45	4.16**	1.71	2.43	4.31**	1.71	2.53
Over 45	1.05	2.47	0.43	1.26	2.45	0.51

Exhibit 4

Weighted Linear Probability Model of HEC Choice (2 of 2)

Control	Without Administrative Data			With Administrative Data		
	Estimate (%)	Standard Error (%)	t-Statistic	Estimate (%)	Standard Error (%)	t-Statistic
Race						
White/Caucasian *(Omitted)*	–	–	–	–	–	–
Black or African-American	23.64***	2.69	8.79	23.40***	2.69	8.71
Asian	1.85	2.47	0.75	2.41	2.47	0.97
Other	6.79**	3.34	2.03	6.73**	3.33	2.02
Hispanic or Latino						
Yes	–	–	–	–	–	–
No	2.68	1.95	1.37	2.71	1.96	1.38
Highest Level of Education Achieved						
Some Schooling	–	–	–	–	–	–
High School Graduate	– 6.70	5.66	– 1.18	– 7.78	5.62	– 1.38
Technical School	– 8.60	5.95	– 1.44	– 8.42	5.91	– 1.42
Some College	– 10.19*	5.50	– 1.85	– 10.24*	5.47	– 1.87
College Graduate	– 10.54*	5.45	– 1.93	– 10.35*	5.41	– 1.91
Postgraduate Studies	– 11.60**	5.56	– 2.09	– 11.65**	5.52	– 2.11
Income Relied Upon in Underwriting						
Under $35,000 *(Omitted)*	–	–	–	–	–	–
$35,000 to $49,999	0.80	2.71	0.30	1.83	2.74	0.67
$50,000 to $74,999	– 6.27**	2.70	– 2.32	– 5.34*	2.73	– 1.95
$75,000 to $99,999	– 12.20***	2.97	– 4.11	– 11.07***	3.00	– 3.69
$100,000 to $174,999	– 17.25***	3.19	– 5.41	– 16.63***	3.23	– 5.14
$175,000 or More	– 14.71***	4.17	– 3.53	– 15.65***	4.23	– 3.70
Household Type						
Married *(Omitted)*	–	–	–	–	–	–
Not Married but With Partner	2.96*	1.80	1.65	2.93*	1.79	1.64
Not Married, No Partner	– 1.26	1.57	– 0.80	– 1.06	1.57	– 0.68
Gender						
Female *(Omitted)*	–	–	–	–	–	–
Male	– 2.12	1.32	– 1.60	– 2.13	1.32	– 1.61
Employment Type						
Employed Full Time *(Omitted)*	–	–	–	–	–	–
Self-Employed	0.95	2.98	0.32	2.04	2.97	0.69
Other	3.54	2.52	1.40	3.64	2.54	1.43
LTV Ratio at Origination						
95% or Below *(Omitted)*	–	–	–	–	–	–
Greater than 95%	–	–	–	1.55	1.50	1.04
Mortgage DTI Ratio						
45% or Below *(Omitted)*	–	–	–	–	–	–
Greater Than 45%	–	–	–	– 2.67	2.00	– 1.34
Has Second Lien						
No *(Omitted)*	–	–	–	–	–	–
Yes	–	–	–	29.04***	4.38	6.63

– = not applicable. DTI = debt-to-income. LTV = loan-to-value.
** p<0.05, ** p<0.01, *** p<0.001*
Source: NSMO, 2013–2016.

Empirical Results

The NSMO survey responses are used to explore the relationship between reported participation in HEC and aspects of the mortgage shopping and 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, seeking input on closing documents, and the post-origination loan performance.

For each response or mortgage attribute, we estimate OLS and PSM models.[15] Exhibits 5 and 6 present the results from all regressions. Exhibit 5 includes the results when higher LTV, higher DTI, and the presence of a second lien are considered outcome variables, and exhibit 6 includes an alternate analysis where these variables are considered as potential selection variables for reported HEC. We report the estimate of the HEC coefficient, multiplied by 100, with standard errors. 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 exhibit presents the sample average of the response or attribute variable.

In every case in which a significant result is found, all models report similar magnitude. Using the numbers reported for the PSM model in exhibit 6, highlights of the results include the following:

1. Borrowers who reported receiving HEC also reported large positive and statistically significant differences in financial knowledge regarding available mortgage interest rates, the different types of mortgages available, and their credit history or credit score. Holding other characteristics constant, borrowers reporting HEC were 9-percentage points more likely to report that they could explain the process of taking out a mortgage (with the population average of 41.32 percent) and 7-percentage points more likely to report they could explain the consequences of not making required mortgage payments (with the population average of 55.73 percent).

2. Borrowers who reported receiving HEC were 9-percentage points more likely to consult a housing counselor about their closing documents than were average first-time homebuyers (with a population average of 2.45 percent). 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.

3. Borrowers were generally satisfied with at least one aspect of the mortgage they received, at 84.26 percent. Yet, borrowers who reported receiving HEC were 4-percentage points more likely to report being satisfied with their mortgage.

4. A somewhat surprising result is that borrowers who reported HEC were 5-percentage points more likely to report facing "unpleasant surprises" at the loan closing. It is not clear if the first-time homebuyers who reported HEC had more challenging closing processes or were more inclined to carefully review their loan estimates and closing documents.

[14] The PSM regression includes weights based on the number of observations in each group of matched respondents.

Exhibit 5

Estimates of the Relationship Between Reported HEC and the Outcome of Interest (1 of 2)

	Mean (%)	OLS			PSM		
		Coefficient (%)		Standard Error (%)	Coefficient (%)		Standard Error (%)
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	33.58	7.46	***	2.48	4.68	**	2.37
The different types of mortgages available	23.66	5.36	**	2.31	4.77	**	2.18
The process of taking out a mortgage	15.59	3.76	*	2.02	3.19		1.98
The downpayment needed to qualify for a mortgage	35.99	– 0.21		2.46	– 0.35		2.40
The income needed to qualify for a mortgage	32.20	4.56	*	2.48	3.55		2.40
Your credit history or credit score	64.43	6.95	***	2.41	5.77	**	2.36
The money needed at closing	25.20	– 0.83		2.27	– 1.87		2.23
How well could you explain to someone the… (=1 if very well)							
Process of taking out a mortgage	41.32	9.93	***	2.58	9.03	***	2.49
Difference between a fixed and an adjustable-rate mortgage	55.59	7.71	***	2.48	5.79	**	2.49
Difference between a prime and subprime loan	12.44	1.94		1.63	2.06		1.57
Difference between a mortgage's interest rate and its APR	19.17	2.84		2.01	2.84		2.02
Amortization of a loan	23.98	2.65		2.06	3.60	*	2.05
Consequences of not making required mortgage payments	55.73	9.37	***	2.49	6.20	**	2.45
How many different lenders/brokers did you seriously consider before choosing where to apply for this mortgage? (=1 if more than one lender/broker)							
Seriously considered more than one lender/broker	54.64	4.94	*	2.58	3.00		2.49
How many different lenders/brokers did you end up applying to? (=1 if more than one lender/broker)							
Applied to more than one lender/broker	31.71	3.77		2.47	3.99	*	2.41
Did you seek input about your closing documents from any of the following people? (=1 if yes, =0 otherwise)							
Lender/mortgage broker	72.92	1.72		2.27	1.39		2.28
Settlement/closing agent	22.70	1.01		2.17	3.12		2.15
Real estate agent	60.78	– 1.83		2.56	– 0.11		2.44
Personal attorney	15.83	1.04		1.93	-0.68		1.89
Title insurance agent	17.41	3.88	*	2.11	2.83		2.03
Trusted friend or relative who is not a cosigner on the mortgage	44.44	– 1.13		2.56	0.25		2.45
Housing counselor	2.45	9.05	***	1.46	8.91	***	1.34
Any of the sources	88.17	2.52		1.65	1.90		1.61

Exhibit 5

Estimates of the Relationship Between Reported HEC and the Outcome of Interest (2 of 2)

	Mean (%)	OLS			PSM		
		Coefficient (%)		Standard Error (%)	Coefficient (%)		Standard Error (%)
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)							
Having an established banking relationship	43.98	– 5.70		2.55	– 5.10		2.48
Having a local office or branch nearby	52.04	2.02		2.62	2.13		2.51
Used previously to get a mortgage	7.69	1.71		1.52	1.15		1.52
Lender/broker is a personal friend or relative	12.64	1.92		1.76	3.84	**	1.69
Recommendation from a friend/relative/ coworker	50.07	-0.94		2.61	– 1.08		2.49
Recommendation from a real estate agent/ home builder	51.44	2.05		2.57	3.38		2.50
Reputation of the lender/broker	59.12	3.24		2.55	4.32	*	2.46
Spoke my primary language, which is not English	9.64	1.77		1.66	1.61		1.67
Any of non-price factors are important	91.79	0.31		1.37	– 1.55		1.43
Overall, how satisfied are you that the mortgage you got was the one with the… (=1 if very satisfied)							
Best terms to fit your needs	73.47	0.82		2.33	1.40		2.23
Lowest interest rate for which you could qualify	68.47	0.04		2.41	0.10		2.37
Lowest closing costs	56.53	3.32		2.51	4.43	*	2.44
Any option = very	84.26	4.27	**	1.74	3.52	**	1.77
Overall, how satisfied are you with the… (=1 if very satisfied)							
Lender or mortgage broker you used	72.94	0.96		2.29	0.69		2.22
Application process	59.57	– 3.16		2.60	– 1.39		2.47
Loan closing process	61.71	0.50		2.56	0.66		2.42
Information in the mortgage disclosure documents	61.24	2.22		2.55	2.19		2.41
Timeliness of mortgage disclosure documents	60.35	– 3.12		2.61	– 1.62		2.47
Settlement agent	65.90	– 2.53		2.48	– 1.17		2.39
Overall satisfied with mortgage process	87.19	2.16		1.61	1.83		1.67
Did you face any unpleasant surprises at your loan closing? (=1 for "yes")							
Did you face any unpleasant surprises at your loan closing	16.63	5.83	***	2.11	5.50	***	2.05
Administrative data							
Mortgage interest rate spread at origination greater than 100 BPS	12.93	2.38		1.73	2.77		2.05
LTV at origination greater than 95%	44.24	1.44		2.34	0.51		2.50
Mortgage DTI ratio greater than 45%	12.57	– 2.09		1.67	– 1.30		1.86
Second lien	2.14	4.56	***	1.18	4.36	***	0.95
Ever 60 days delinquent	3.65	1.41		1.23	0.59		1.20
Ever 90 days delinquent	2.51	0.91		1.05	0.53		1.00

BPS = basis points. DTI = debt-to-income. LTV = loan-to-value. OLS = ordinary least squares. PSM = propensity score matching.
** p<0.05, ** p<0.01, *** p<0.001*
Note: Sample size is 3,305 for OLS and 3,134 for PSM.
Source: NSMO, 2013–2016.

Exhibit 6

Estimates of the Relationship Between Reported HEC and the Outcome of Interest with Selection on LTV, DTI, and Second Lien (1 of 2)

	Mean (%)	OLS			PSM		
		Coefficient (%)		Standard Error (%)	Coefficient (%)		Standard Error (%)
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	33.58	7.74	***	2.53	5.20	**	2.41
The different types of mortgages available	23.66	6.25	***	2.35	4.78	**	2.21
The process of taking out a mortgage	15.59	4.26	**	2.06	3.89	*	1.99
The downpayment needed to qualify for a mortgage	35.99	0.38		2.48	– 0.44		2.44
The income needed to qualify for a mortgage	32.20	5.12	**	2.52	3.36		2.45
Your credit history or credit score	64.43	7.14	***	2.43	5.68	**	2.41
The money needed at closing	25.20	– 0.25		2.31	– 0.83		2.26
How well could you explain to someone the… (=1 if very well)							
Process of taking out a mortgage	41.32	10.17	***	2.61	8.77	***	2.53
Difference between a fixed and an adjustable-rate mortgage	55.59	7.82	***	2.51	4.80	*	2.54
Difference between a prime and subprime loan	12.44	2.03		1.67	2.27		1.63
Difference between a mortgage's interest rate and its APR	19.17	3.26		2.06	3.05		2.05
Amortization of a loan	23.98	2.48		2.10	3.40		2.10
Consequences of not making required mortgage payments	55.73	9.26	***	2.52	6.88	***	2.51
How many different lenders/brokers did you seriously consider before choosing where to apply for this mortgage? (=1 if more than one lender/broker)							
Seriously considered more than one lender/broker	54.64	5.17	**	2.61	2.08		2.54
How many different lenders/brokers did you end up applying to? (=1 if more than one lender/broker)							
Applied to more than one lender/broker	31.71	4.62	*	2.49	3.47		2.47
Did you seek input about your closing documents from any of the following people? (=1 if yes, =0 otherwise)							
Lender/mortgage broker	72.92	2.47		2.26	1.72		2.32
Settlement/closing agent	22.70	0.50		2.19	3.31		2.17
Real estate agent	60.78	– 2.03		2.59	0.25		2.49
Personal attorney	15.83	1.46		1.94	– 0.55		1.97
Title insurance agent	17.41	3.60	*	2.13	2.80		2.08
Trusted friend or relative who is not a cosigner on the mortgage	44.44	– 1.50		2.58	0.51		2.50
Housing counselor	2.45	9.33	***	1.50	9.29	***	1.35
Any of the sources	88.17	2.83	*	1.60	2.25		1.64

Exhibit 6

Estimates of the Relationship Between Reported HEC and the Outcome of Interest with Selection on LTV, DTI, and Second Lien (2 of 2)

	Mean (%)	OLS			PSM		
		Coefficient (%)		Standard Error (%)	Coefficient (%)		Standard Error (%)
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)							
Having an established banking relationship	43.98	– 4.64		2.57	– 1.99		2.53
Having a local office or branch nearby	52.04	2.18		2.65	2.14		2.56
Used previously to get a mortgage	7.69	1.71		1.55	1.00		1.57
Lender/broker is a personal friend or relative	12.64	2.09		1.78	3.25	*	1.77
Recommendation from a friend/relative/ coworker	50.07	– 1.24		2.64	– 2.59		2.55
Recommendation from a real estate agent/ home builder	51.44	1.12		2.60	2.11		2.56
Reputation of the lender/broker	59.12	3.22		2.58	4.39	*	2.52
Spoke my primary language, which is not English	9.64	1.76		1.67	1.97		1.67
Any of non-price factors are important	91.79	0.47		1.37	– 0.86		1.49
Overall, how satisfied are you that the mortgage you got was the one with the… (=1 if very satisfied)							
Best terms to fit your needs	73.47	0.81		2.36	1.91		2.28
Lowest interest rate for which you could qualify	68.47	0.51		2.44	0.26		2.41
Lowest closing costs	56.53	2.89		2.54	5.08	**	2.50
Any option = very	84.26	4.39	**	1.77	3.49	*	1.82
Overall, how satisfied are you with the… (=1 if very satisfied)							
Lender or mortgage broker you used	72.94	1.72		2.29	0.78		2.28
Application process	59.57	– 2.65		2.61	– 1.30		2.52
Loan closing process	61.71	0.60		2.59	1.05		2.47
Information in the mortgage disclosure documents	61.24	2.35		2.57	1.97		2.46
Timeliness of mortgage disclosure documents	60.35	– 2.92		2.63	– 2.02		2.52
Settlement agent	65.90	– 2.71		2.51	– 0.03		2.46
Overall satisfied with mortgage process	87.19	2.33		1.61	1.73		1.70
Did you face any unpleasant surprises at your loan closing? (=1 for "yes")							
Did you face any unpleasant surprises at your loan closing	16.63	5.24	**	2.15	4.90	**	2.09
Administrative data							
Mortgage interest rate spread at origination greater than 100 BPS	12.93	2.81		1.76	2.28		2.10
Ever 60 days delinquent	3.65	1.20		1.21	0.82		1.20
Ever 90 days delinquent	2.51	0.73		1.01	0.66		1.04

BPS = basis points. DTI = debt-to-income. HEC = homebuyer education and counseling. LTV = loan-to-value. OLS = ordinary least squares. PSM = propensity score matching.
** p<0.05, ** p<0.01, *** p<0.001*
Note: Sample size is 3,260 for OLS and 3,012 for PSM.
Source: NSMO, 2013–2016.

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 origination. For loan originations to first-time homebuyers, this delinquency rate is 3.65 percent. We consider the full payment history available for any given origination, resulting in comparatively longer performance timelines for earlier originations. Without controls, the difference in the delinquency rate between those reporting HEC and those not reporting HEC is 3.19 percentage points, 6.31 percent compared with 3.12 percent, as shown in exhibit 2. In both the OLS and PSM modeling frameworks, the performance gap between the reported HEC and non-HEC group decreases when controlling for observable differences between the groups. The difference between HEC recipients and other first-time homebuyers is not statistically significant. Our finding of no effect is in line with Smith, Hochberg, and Greene (2014).

It may be tempting to conclude that counseling does not matter for first-time homebuyers. However, we should recognize that selection into counseling or reported HEC is not by random assignment. In fact, the reported HEC group may not have been eligible for a mortgage without completing some form of HEC. The reported HEC group was selected because they were determined to be a potentially higher risk than even observably similar non-HEC group members. This is consistent with the higher rates of counseling observed among the traditionally riskier borrower characteristics in exhibit 3.

Although 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 overestimate 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 respondents' 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 (2011, 2010) 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.

Conclusion

HEC is believed to improve the homebuying process for potential homebuyers. Although 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. Moreover, first-time homebuyers who reported receiving HEC had a higher level of satisfaction with their mortgage. The results around loan performance, as measured by delinquencies, are less conclusive. Subsequent analyses could continue to monitor mortgages reported in the NMDB and NSMO data for patterns during different economic conditions.

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 postpurchase (and thus post-HEC) state of knowledge or the prepurchase state of knowledge. Future research should employ methods to distinguish between the pre-HEC and post-HEC states of knowledge. 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 and after counseling, with an aim of identifying the effect of HEC on within-person changes in financial distress.

Acknowledgments

The authors thank Robert B. Avery, Xian Fang Bak, Ron Borzekowski, Daniel E. Coates, Thomas Daula, Samuel Frumkin, Ian H. Keith, Michael LaCour-Little, Gen Melford, David Sanchez, Susan Singer, Rebecca Sullivan, Cynthia Waldron, Stacey Walker, and Peter Zorn for providing comments and Julia Nguyen for assisting with data. Grace Li was a senior economist for Fannie Mae at the time this article was written.

Authors

Robert B. Argento is a quantitative analytics senior at Freddie Mac.

Lariece M. Brown is a quantitative analytics director at Freddie Mac.

Sergei Koulayev is an economist at the Consumer Financial Protection Bureau.

Grace Li is a statistical quantitative senior at SunTrust Investment Services.

Marina Myhre is a social science analyst at the U.S. Department of Housing and Urban Development.

Forrest Pafenberg is a former supervisory economist at the Federal Housing Finance Agency.

Saty Patrabansh is the manager of the National Mortgage Database Program at the Federal Housing Finance Agency.

References

Agarwal, Sumit, Gene Amromin, Itzhak Ben-David, Souphala Chomsisengphet, and Douglas D. Evanoff. 2014a. The Effectiveness of Mandatory Mortgage Counseling: Can One Dissuade Borrowers from Choosing Risky Mortgages? NBER Working Paper No. 19920. Cambridge, MA: National Bureau of Economic Research.

———. 2014b. "Predatory Lending and the Subprime Crisis." *Journal of Financial Economics* 113 (1): 29–52.

———. 2010. "Learning to Cope: Voluntary Financial Education Programs and the Housing Crisis," *American Economic Review: Papers and Proceedings* 100 (2): 495–500.

Alexandrov, Alexei, and Sergei Koulayev. 2017. No Shopping in the U.S. Mortgage Market: Direct and Strategic Effects of Providing Information. Working paper 2017-01. Washington, DC: Consumer Financial Protection Bureau Office of Research.

Avila, Gabriela, Hoa Nguyen, and Peter Zorn. 2013. The Benefits of Pre-Purchase Homeownership Counseling. Working paper (April). Tysons Corner, VA: Freddie Mac.

Brown, Scott R. 2016. "The Influence of Homebuyer Education on Default and Foreclosure Risk: A Natural Experiment," *Journal of Policy Analysis and Management* 35 (1): 145–172.

Carswell, Andrew T. 2009. "Does Housing Counseling Change Consumer Financial Behaviors? Evidence from Philadelphia," *Journal of Family and Economic Issues* 30 (4): 339–356.

Collins, J. Michael 2013. "The Impacts of Mandatory Financial Education: Evidence from a Randomized Field Study," *Journal of Economic Behavior & Organization* 95: 146–158.

Collins, J. Michael, and Collin M. O'Rourke. 2011. Homeownership Education and Counseling: Do We Know What Works? Research Institute for Housing America Research Paper No. 1102.

———. 2010. "Financial Education and Counseling—Still Holding Promise," *Journal of Consumer Affairs* 44 (3): 483–498.

DeMarco, Donna, Nichole Fiore, Debbie Gruenstein Bocian, Shawn Moulton, Laura Peck, and Abt Associates Inc. 2016. *The First-Time Homebuyer Education and Counseling Demonstration: Early Insights*. Washington, DC: U.S. Department of Housing and Urban Development Office of Policy Development and Research. https://www.huduser.gov/portal/sites/default/files/pdf/First-Time-Home-Buyers.pdf.

Gerardi, Kristopher, Lorenz Goette, and Stephan Meier. 2010. Financial Literacy and Subprime Mortgage Delinquency: Evidence from a Survey Matched to Administrative Data. Working paper 2010-10. Atlanta, GA: Federal Reserve Bank of Atlanta.

Li, Wei, Bing Bai, Laurie Goodman, and Jun Zhu. 2016. *NeighborWorks America's Homeownership Education and Counseling: Who Receives It and Is It Effective?* Research report. Washington, DC:

Urban Institute. http://www.urban.org/sites/default/files/publication/84476/2000950-NeighborWorks-America's-Homeownership-Education-and-Counseling-Who-Receives-It-and-Is-It-Effective.pdf.

Lusardi, Annamaria, and Olivia S. Mitchell. 2014. "The Economic Importance of Financial Literacy: Theory and Evidence," *Journal of Economic Literature*, 52 (1): 5–44.

———. 2011. "Financial Literacy and Retirement Planning in the United States," *Journal of Pension Economics & Finance* 10 (4): 509–525.

Mayer, Neil S., and Kenneth Temkin. 2016. "Prepurchase Counseling Effects on Mortgage Performance: Empirical Analysis of NeighborWorks® America's Experience," *Cityscape* 18 (2): 73–98.

Moulton, Stephanie, J. Michael Collins, Cäzilia Loibl, and Anya Samak. 2015. "Effects of Monitoring on Mortgage Delinquency: Evidence From a Randomized Field Study," *Journal of Policy Analysis and Management* 34 (1): 184–207.

Myhre, Marina L., and Nicole Elsasser Watson. 2017. *Housing Counseling Works*. Washington, DC: U.S. Department of Housing and Urban Development Office of Policy Development and Research. https://www.huduser.gov/portal/sites/default/files/pdf/Housing-Counseling-Works.pdf.

Quercia, Roberto G., and Jonathan 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.

Roll, Stephen, and Stephanie Moulton. 2016. The Impact of Credit Counseling on Consumer Outcomes: Evidence from a National Demonstration Program. Washington, DC: Federal Deposit Insurance Corporation. http://gflec.org/wp-content/uploads/2016/04/Roll-Stephen-and-Moulton-Stephanie-The-Impact-of-Credit-Counseling-on-Consumer-Outcomes.pdf.

Smith, Marvin M., Daniel Hochberg, and William H. Greene. 2014. *The Effectiveness of Pre-Purchase Homeownership Counseling and Financial Management Skills*. Philadelphia, PA: Federal Reserve Bank of Philadelphia.

Spader, Jonathan, and Roberto G. Quercia. 2009. *Pre-purchase Homeownership Counseling and Mortgage Search*. Working paper. Chapel Hill, NC: UNC Center for Community Capital.

Turnham, Jennifer, and Anna Jefferson. 2012. *Pre-Purchase Counseling Outcome Study: Research Brief Housing Counseling Outcome Evaluation*. Research brief. Washington, DC: U.S. Department of Housing and Urban Development. https://www.huduser.gov/publications/pdf/pre_purchase_counseling.pdf.