

# The Effectiveness of Mandatory Mortgage Counseling: Can One Dissuade Borrowers from Choosing Risky Mortgages?

Sumit Agarwal<sup>a</sup>  
Gene Amromin<sup>b</sup>  
Itzhak Ben-David<sup>c</sup>  
Souphala Chomsisengphet<sup>d</sup>  
Douglas D. Evanoff<sup>b</sup>

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## ABSTRACT

We explore the effects of mandatory third-party review of mortgage contracts on consumer choice—including the terms and demand for mortgage credit. Our study is based on a legislative pilot carried out by the State of Illinois in a selected set of zip codes in 2006. Mortgage applicants with low FICO scores were required to attend loan reviews by financial counselors. Applicants with high FICO scores had to attend counseling only if they chose “risky mortgages.” We find that low-FICO applicants for whom counselor review was mandatory did not materially change their contract choice. Conversely, applicants who could avoid counseling by choosing less risky mortgages did so. Ironically, the ultimate goals of the legislation (e.g., better loan terms for borrowers) were only achieved among the population that was *not* counseled. We also find significant adjustments in lender behavior as a result of the counseling program.

**Keywords:** Financial counseling, subprime crisis, predatory lending, household finance

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**Contact author:** Itzhak Ben-David, Fisher College of Business, The Ohio State University, [bendavid@fisher.osu.edu](mailto:bendavid@fisher.osu.edu)

<sup>a</sup> National University of Singapore

<sup>b</sup> Federal Reserve Bank of Chicago

<sup>c</sup> Fisher College of Business, The Ohio State University, and NBER

<sup>d</sup> Office of the Comptroller of the Currency

## 1. Introduction

In the wake of the subprime mortgage crisis, policymakers have been urged to increase their intervention in credit markets—see, for example, Sheila Bair’s (2007) testimony to the House Financial Services Committee. In particular, the leading policy initiatives include tightening oversight of lenders (Federal Truth in Lending Act, Regulation Z) and providing mandatory financial counseling to borrowers (President Obama’s Homeownership Affordability and Stability Plan of 2009). Although it has been shown that these programs may disrupt market activity (Bates and Van Zandt, 2007; Agarwal et al., 2013), their effects on mortgage choice and their effectiveness in reducing mortgage repayment problems are still debated.

In this paper, we study the effects of a legislative mandate for third-party review of mortgage contracts implemented in a pilot program in Cook County, Illinois, on mortgage choice. The program required “low-credit-quality” applicants and applicants for “risky” mortgage products to submit their loan offers from state-licensed lenders for review by financial counselors. Similar to most regulatory initiatives, the mandate created numerous conflicting incentives for all parties—lenders, borrowers, and external reviewers. However, the empirical setting of this legislative experiment offers a number of unique opportunities to disentangle those effects. As described in greater detail below, the fact that the pilot applied only in certain areas at certain times, only to certain combinations of borrowers and mortgage contracts, and only to a specific set of lenders allows us to parse out the effects of incentives and education on mortgage choice. The study draws on detailed loan-level data from public and proprietary sources, as well as data provided by one of the largest counseling agencies.

The pilot program that we analyze was initiated in September 2006, and was restricted to mortgages originated by state-licensed lenders and secured by properties in ten contiguous zip codes on the South Side of Chicago. The program required mortgage applicants with FICO credit scores below 621 to attend a loan review session with a counselor certified by the U.S. Department of Housing and Urban Development (HUD) irrespective of their mortgage choice. Applicants with higher FICO scores had to attend a loan review session *only* if they chose “risky

mortgages” (as defined by the statute). The mandate required lenders to pay the \$300 counseling fee. Following a loan review, a counselor provided nonbinding recommendations regarding the affordability of the loan, its riskiness, and its pricing. Both lenders and counselors had to record loan details and recommendations in a state-administered database. The counseling requirement was tightly monitored through the Cook County Recorder of Deeds: mortgages in the pilot area could not be recorded unless borrowers provided a certificate of counseling or exemption. The pilot program was originally intended to last for four years, but bowing to pressure from community groups and mortgage brokers, it was discontinued in January 2007. Overall, over 1,200 mortgage applicants were counseled within a 20-week period.

Our empirical analysis utilizes a classic difference-in-differences approach that contrasts changes in choices and outcomes in the treated sample with those in a control sample. Since borrowers may respond to regulation in various ways, we pay particular attention to endogenous selection of agents out of treatment, conditioning the analysis on lenders that remained active in the pilot area.

The heterogeneity in mandate applicability *within* pilot zip codes allows us to sharpen the identification of treatment effects further. In particular, we highlight the differences in treatment effects on borrowers who could not avoid counseling and those who could. Finally, we exploit differences in incentives of state-regulated and exempt lenders to actively steer borrowers from risky products and, as a result, from counselor review. This allows us to differentiate between borrowers acting on acquired information and lenders/borrowers responding to the threat of external review.

The legislation resulted in substantial reduction in lending activity. The lenders that remained in the treated zip codes continued offering “risky mortgages” to prospective clients. However, we show that borrowers’ choices changed substantially, as those who could avoid counseling by selecting less risky products did so. Put differently, the designation of certain contracts as triggers for counseling concentrated such contracts in borrower populations *exempt* from the counseling requirement. The designation of a mortgage type as being “risky” could

arguably signal the undesirability of that type to borrowers throughout the county. Yet, we find that avoidance of risky contracts was concentrated in treated zip codes, in which their choice was linked to tangible costs from counseling.

Overall, our results suggest that borrowers view counseling as a burden: applicants altered their mortgage choice to avoid counseling, shopping for additional quotes declined, and the pilot itself was halted because of pressure from community interest groups. Somewhat surprisingly, the legislation does not appear to have modified mortgage choice for those borrowers who actually attended the counseling sessions.

Our paper contributes to the literature studying the role of financial counseling and, more broadly, financial education in enabling more informed choices by households. Evidence from mortgage market research suggest that households may borrow too much at high rates without realizing future consequences (Agarwal et al., 2007) or may have a hard time recalling the terms of their mortgage contracts (Bucks and Pence, 2008). Moore (2003) and Lusardi and Tufano (2009) find that respondents with poor financial literacy are more likely to have high-cost mortgages. There is consensus that household financial literacy is inadequate and that the mistakes resulting from this inadequacy have serious negative consequences for borrowers. However, there is less agreement on whether long-term financial education, short-term counseling, or regulation that seeks to correct behavioral biases are effective at addressing this issue.<sup>1</sup> Collins and O'Rourke (2009) review the recent literature on this subject. In our previous work (Agarwal et al., 2013) we used this experiment to test the effects of predatory lending on borrower default. The pilot program resulted in an exit of small lenders with predatory characteristics and brought greater scrutiny to the lending process. Our results show that the exit of such lenders led to lower default rates within the treated group. The current study contributes to the literature from a different angle. Here the focus is squarely on the actions of borrowers

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<sup>1</sup> For instance, Bernheim, Garrett, and Maki (2001) and Cole and Shastri (2008) study the effect of high school financial education programs and reach opposite conclusions. Barr, Mullainathan, and Shafir (2008) argue that information disclosure and product restrictions are insufficient to prevent bad mortgage choices and provide an extensive outline of designing mortgage regulation to correct known behavioral biases. Agarwal et al. (2010) evaluate the effects of a long-term voluntary financial education program aimed at prospective homebuyers.

within the pilot area – and on which aspect of the program (incentives or information) meant to discourage take up of risky mortgage contracts worked and which did not?

The rest of the paper proceeds as follows. In Section 2, we describe the counseling mandate in detail. Next, we summarize the data and outline our methodology in Section 3. Then, we detail the mandate’s effect on mortgage market activity in Section 4 focusing on specific channels for borrower and lender responses. We discuss policy implications of our findings in the final section.

## **2. Illinois Predatory Lending Database Pilot Program (HB 4050)**

### **2.1. Description of the Pilot Program**

The Illinois legislature passed a 2005 bill designed to curb predatory lending. Although the state had a number of anti-predatory provisions in place, they were based on loan characteristics, in line with prevailing practices elsewhere in the country. Some political leaders in Illinois became concerned about the ease with which the trigger criteria for anti-predatory programs could be avoided by creative loan packaging. For example, when regulators targeted balloon mortgages, lenders began to push adjustable-rate mortgages (ARMs) with short, fixed-rate periods and steep rate reset slopes (the so-called 2/28 and 3/27 hybrid ARMs).<sup>2</sup> Thus, the legislature began to shift the focus from regulating loan issuers to educating borrowers.

To that effect, the legislation sponsored by the Illinois House Speaker Michael Madigan mandated counselor review of mortgage offers for “high-risk borrowers,” defined as applicants with sufficiently low credit scores or sufficiently risky product choices. The legislation set the FICO score threshold for mandatory counseling at 620, with an additional provision that borrowers with FICO scores in the 621–650 range be subject to counseling *if* they chose certain high-risk mortgage products. Such mortgages included interest-only loans, loans with interest rate adjustments within three years, loans underwritten on the basis of stated income (low-

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<sup>2</sup> For a detailed analysis of the impact of the state anti-predatory lending laws on the type of mortgage products used in the market, see Bostic et al. (2008).

documentation loans), and repeat refinancings within a 12-month period. Regardless of the borrowers' FICO scores, they were required to submit to counseling if they took out loans that allowed negative amortization, had prepayment penalties, or had closing costs in excess of 5%. Illinois legislators were quite optimistic about the potential for the program, which was modeled on a 1970s Federal Housing Administration (FHA) program (Merrick, 2007).

The program was meant to run as a four-year pilot in select parts of Cook County, which covers the metropolitan Chicago area, after which its coverage could be expanded. In spite of vocal opposition from community-based groups and affected lenders, Illinois politicians clamored to have their districts included in the pilot (Merrick, 2007). This choice on the part of the politicians looked particularly ironic in retrospect, given the eventual response of their constituents in the pilot areas. In the end, the bill (titled HB 4050) was passed on the last day of the 2005 legislative session.

HB 4050 mandated that each of the affected borrowers attend a counseling session with one of the HUD-certified counseling agencies. The determination of the need for such a session was made on the day of the application, and the borrower had 10 days to contact the agency to schedule it. During the one- to two-hour session, the counselor was supposed to discuss the terms of the specific offer for a home purchase loan or refinancing and explain their meaning and consequences to the prospective borrower. The goal was not to advise borrowers about the best mortgage option in the sense of Campbell and Cocco (2003), but rather to caution the borrower against common pitfalls. In addition, the counselor verified the loan application information about the *borrower* (e.g., income and expenses). Afterward, the counselor recorded loan-related information from the session such as whether the fees were thought to be excessive, the interest rate was in excess of the market rate, the borrower understood the terms of the transaction and/or could afford the loan, etc., in a state-administered database.

Both the interview and the independent collection of data on borrower income and expenses allowed the counselor to form an assessment of a borrower's creditworthiness that potentially went beyond what was conveyed by the lender. Effectively, the counselor was able to

elicit private information that was not necessarily used by the lender to make approval and/or pricing decisions and to furnish it to state regulators. The potential for this information to be formally documented may well have induced lenders to screen better prior to referring approved applications to counseling for the fear of a regulatory response (e.g., license revocation) or legal response (e.g., class action lawsuits). It should be noted that none of the counseling recommendations were binding in the sense that borrowers could *always* choose to proceed with the loan offer at hand.

A report by the non-profit coalition Housing Action Illinois (2007) summarized the counselors' assessment of HB 4050. During the pilot, 41 HUD-certified counselors reviewed loan offers for approximately 1,200 borrowers. Indications of fraud were found in 9% of the cases.<sup>3</sup> Counselors advised about half of the borrowers that they could not afford the loan or were on the cusp of not being able to do so. For 22% of the borrowers, loan rates were found to be more than 300 basis points above the market rate. Counselors also found a discrepancy between the loan documentation and the verbal description of the mortgage for 9% of the borrowers. Alarming, the vast majority of borrowers with adjustable-rate loan offers did not understand that their mortgage payment was not fixed over the life of the loan.

HB 4050 stipulated that the \$300 cost of the session be borne by the mortgage lender, not the borrower.<sup>4</sup> However, even if lenders did bear the cost of the counseling sessions, HB 4050 still imposed other time and psychological costs on borrowers. Additionally, by lengthening the expected time until closing, HB 4050 could force borrowers to pay for longer credit lock periods, again raising loan costs.

HB 4050 imposed a substantial compliance burden on lenders as well. In addition to the cost of counseling (assuming it was not recovered through other loan charges), lenders had to

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<sup>3</sup> For a literature review and analysis of the existence of mortgage fraud see Ben-David (2011).

<sup>4</sup> There is substantial anecdotal evidence that brokers and lenders attempted to pass the \$300 counseling fee to borrowers in the form of higher closing costs or administrative charges (Bates and Van Zandt, 2007, and personal communication with a number of mortgage counselors).

make sure that the certification requirements of HB 4050 were fully implemented.<sup>5</sup> Otherwise, lenders could potentially lose the right to foreclose on the property. Finally, lenders reportedly feared losing some of their ability to steer borrowers toward high-margin products.

As mentioned earlier, only loans offered by state-licensed mortgage lenders were subject to the requirements of HB 4050, as the state lacks legal authority to regulate any federally chartered institutions and generally exempts such institutions and state-chartered banks from mortgage licensing. However, much of the lending in disadvantaged neighborhoods has been done through state-licensed mortgage bankers that presented themselves as a local and nimble alternative to the more traditional bank lenders.<sup>6</sup> As a result, HB 4050 was expected to increase the regulatory burden on institutions that were providing credit in the selected pilot areas. Many observers voiced concerns about the possibility that the legislation could result in credit rationing, negatively affecting housing values in the selected zip codes.

The geographical focus of the legislation differed substantially from typical regulatory approaches that required counseling for certain loan types (Bates and Van Zandt, 2007). This feature of the legislation generated considerable opposition from community activists and residents and prompted several lawsuits. Since the selected pilot areas were overwhelmingly populated by Hispanic and African-American residents (82%), the selection prompted heated accusations of discriminatory intent on the part of lawmakers. As mortgage bankers threatened to withdraw from the pilot zip codes en masse and as the tide of concerns about subprime mortgages began to rise, the opposition to HB 4050 reached fever pitch.<sup>7</sup> The pilot program was suspended indefinitely on January 17, 2007, after only 20 weeks of operation.

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<sup>5</sup> Under HB 4050, title companies did not receive a “safe harbor” provision for “good faith compliance with the law.” As a result, any clerical errors at any point in the loan application process could potentially invalidate the title, resulting in the loss of the lender’s right to foreclose on a nonperforming loan. According to the Cook County Recorder of Deeds, even federally regulated lenders had to procure a certificate of *exemption* from HB 4050 to obtain a clean title. Consequently, *all* lenders were affected to at least some degree by the legislation.

<sup>6</sup> Using the Home Mortgage Disclosure Act (HMDA) data described in Section 3, we estimate that state-licensed mortgage bankers accounted for 64% of mortgage loan originations in HB 4050 zip codes during 2005.

<sup>7</sup> The record of a public hearing held on November 27, 2006, provides a good illustration of the acrimony surrounding HB 4050 (it is available at [www.idfpr.com/newsr/s/032107HB4050PublicMeeting112706.pdf](http://www.idfpr.com/newsr/s/032107HB4050PublicMeeting112706.pdf)).



## **2.2. How Was the Pilot Program Area Selected?**

HB 4050 required the Illinois Department of Financial and Professional Regulation (IDFPR), the state regulatory body, to specify a pilot area on the basis of “the high rate of foreclosure on residential home mortgages that is primarily the result of predatory lending practices.” In February 2006, IDFPR announced the pilot area, comprising 10 contiguous zip codes in southwest Chicago (the solid shaded areas in Figure 1).<sup>8</sup> Four of these zip codes were in Illinois House Speaker Madigan’s district.

Table 1 presents key demographic and mortgage characteristics for the pilot area and the rest of the City of Chicago. We obtain our mortgage data from the First American CoreLogic LoanPerformance database on securitized nonprime mortgages (henceforth, the LP data, which are described in greater detail below). As can be seen in Panel B of the table, IDFPR’s decision at the time was based on the fact that these zip codes had substantially higher loan delinquency and default rates (Column (1)) compared with the rest of the city (Column (3)). The pilot zip codes are also predominantly populated by minorities and have much higher rates of unemployment and poverty (Panel A). A simple comparison of population counts and the total number of loans (Panel A) and FICO scores (Panel B) strongly suggests that the HB 4050 area had a disproportional share of subprime and Alt-A mortgages.

## **3. Data and Selection of Control Groups**

### **3.1. Data sources**

This study combines a number of complementary data sources covering the calendar years 2005–2007. First, we rely on data collected under the Home Mortgage Disclosure Act (HMDA), which includes information on mortgage applications, rejection rates, etc., to examine elements of credit supply and demand. When possible, we augment that information with loan

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<sup>8</sup> The HB 4050 zip codes are: 60620, 60621, 60623, 60628, 60629, 60632, 60636, 60638, 60643, and 60652.

application and counseling data collected by HB 4050 counselors. We use information from HUD and hand-collected data to differentiate between lenders who specialize in prime and subprime loans, as well as between lenders licensed by Illinois and those exempt from licensing. The legislation was likely to most acutely affect state-licensed subprime lenders; thus, we use this list to refine our analysis. We also use the HMDA data to evaluate how HB 4050 affected the credit supply along the extensive margin, identifying lenders that left the market altogether. Finally, we use U.S. Census and Internal Revenue Service (IRS) data to control for income and population composition at the zip code level.

We also use the LP data to assess the effect of HB 4050 on the composition and performance of mortgages originated in the treated zip codes. This loan-level database covered over 90% of securitized subprime mortgages as of 2006, and it includes detailed borrower and loan information, such as FICO scores<sup>9</sup>, debt-service-to-income (DTI) ratios, and loan-to-value (LTV) ratios, as well as mortgage terms, including maturity, product type (e.g., fixed- or adjustable-rate mortgage), interest rate, and interest rate spread. It also provides information on whether a given loan has a prepayment penalty, allows negative amortization, or had full documentation in underwriting. These and other characteristics of the LP data are summarized in Table 1, Panel C. FICO scores are used by lenders to assess borrower creditworthiness and set appropriate loan terms. FICO scores also allow us to determine which borrowers in the treated zip codes were automatically or conditionally subject to loan counseling (see the discussion in Section 2.1 for details).

Finally, we received a sample of counseling data from one of the agencies that provided counseling services during the period when HB 4050 was in effect. This data set is part of the state sponsored database constructed under the HB 4050 legislation and includes rather detailed information on original mortgage offers reviewed in 191 counseling sessions. We matched these

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<sup>9</sup> The FICO score is intended to measure a borrower's creditworthiness. Scores range from 300 to 850 with scores above 800 considered very good and scores below 620 considered poor. As reported on the Fair Isaac Corporation website ([www.myfico.com](http://www.myfico.com)), in June 2009 borrowers with FICO scores above 760 were able to take out 30-year fixed-rate mortgages at interest rates that were 160 basis points lower, on average, than those available for borrowers with scores in the 620–639 range. See Rosen (2011).

data to the Cook County Recorder of Deeds and LP data to identify which mortgages were originated and on what terms. We use these counseling data in additional analysis to gauge the direct effect of counseling on mortgage choice.

### **3.2. Constructing a Zip-Code-Based Control Group Sample**

As discussed in Section 2.2, the selection of treated zip codes was driven by their characteristics as well as political considerations. In fact, the chosen set of pilot zip codes is far from unique in satisfying HB 4050 selection guidelines. We use this fact in constructing our control group that is meant to resemble the HB 4050 zip codes in terms of their pre-treatment socioeconomic characteristics and housing market conditions. Such areas could plausibly be expected to experience the same changes in outcome variables as the HB 4050 zip codes in the absence of intervention. To construct our control group, we move beyond the univariate metric of foreclosure rates, as required by the legislation, to a set of measures identifying economically disadvantaged inner-city neighborhoods.

In particular, we use 2005 IRS zip-code-level income statistics, the 2000 U.S. Census shares of minority population, shares of the population living below the poverty level, and the unemployment rate to identify zip codes within the City of Chicago limits that have the smallest geometric distance from the HB 4050 zip codes. The resulting 12-zip-code area has approximately the same number of residents as the treatment area and is summarized in Column (2), Panel A of Table 1. The statistics in Panel B of Table 1 indicate that the control group's zip codes are similar to the treated area in terms of their high default and delinquency rates, low borrower FICO scores, and disproportionate reliance on subprime mortgage products.<sup>10</sup> Based on the spirit and the letter of the stated legislative guidelines, we conclude that the areas in our

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<sup>10</sup> In an earlier version of the paper, we used the reverse sequence for constructing the control sample. That is, we built up the set of control zip codes by minimizing the distance in observed *mortgage characteristics* in the pre-HB 4050 LP data. Afterward we checked for similarity on socioeconomic characteristics of treatment and control areas. All of the reported results reported below are robust to the definition of the control area and are available upon request.

control group (shown by the striped area in Figure 1) could have plausibly been selected for HB 4050 treatment.<sup>11</sup>

### **3.3. Constructing a Synthetic Sample (Matched Sample)**

To further establish the empirical robustness of our analysis, we construct a synthetic HB 4050-like ‘area’ in the spirit of Abadie and Gardeazabal (2003).<sup>12</sup> Rather than choosing a similar but untreated set of zip codes, we build a comparison sample loan by loan, matching each based on observable loan characteristics. Specifically, for each loan issued in the HB 4050 zip codes, we look for the loan most similar to it that was originated in the same month elsewhere within the City of Chicago. Our metric for similarity is the geometric distance in terms of standardized values of the borrower’s FICO score, the loan’s DTI and LTV ratios, the log of home value, and the loan’s intended purpose (purchase or refinancing). When a loan is matched to an HB 4050-area loan, we remove it from the set of potential matches and repeat the process for the next HB 4050-area loan. The resulting synthetic HB 4050-like ‘area’ comprises observations from 42 out of 43 non-HB 4050 Chicago zip codes. Not surprisingly, more than 50% of the observations in this synthetic sample come from the 12 control zip codes that we identified on the basis of their socioeconomic characteristics.

In the subsequent analysis, we will refer to the comparable zip codes and the synthetic area counterfactuals as the control sample and the matched sample, respectively.

### **3.4. Design of Tests: Micro-Level Analysis**

Our empirical analysis is designed to exploit cross-sectional and temporal variation in a difference-in-differences framework. Specifically, our tests measure the difference in response of

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<sup>11</sup> The control area includes the following zip codes: 60609, 60617, 60619, 60624, 60633, 60637, 60639, 60644, 60649, 60651, 60655, and 60827.

<sup>12</sup> It would be ideal to look at transactions that lie on either side of the border between HB 4050 and control zip codes to tease out the effect of the counseling mandate. Unfortunately, the LP data do not contain street addresses.

a number of variables (such as contract choice) as a function of whether the loan was originated in a zip code subject to HB 4050. As in a classic difference-in-differences analysis, our regressions include both time controls and cross-sectional controls. For example, when we study whether borrowers who attend counseling sessions altered their mortgage choices, we compare the choice of risky products by borrowers who were forced to attend counseling sessions under HB 4050 and the choice by those with similar characteristics in the control areas.

Our basic regression specifications have the following form:

$$(1) \quad Response_{ijt} = \alpha + \beta Treatment_{jt} + \gamma Time\ dummies_t + \delta Zip\ code\ dummies_j + \theta Controls_{ijt} + \varepsilon_{ijt},$$

where  $Response_{ijt}$  is the loan-level response variable, such as contract choice of loan  $i$  originated at time  $t$  in zip  $j$ ;  $Treatment_{jt}$  is a dummy variable that receives the value of 1 if zip code  $j$  is subject to mandatory counseling in month  $t$  and 0 otherwise;  $Time$  and  $Zip\ code\ dummies$  capture fixed time and location effects; and  $\varepsilon_{ijt}$  is a well behaved error term. We cluster errors at the zip code level in all regressions.<sup>13</sup> For each loan, the response is evaluated at only one point in time (e.g., interest rate at origination). Thus, our data set is made up of a series of monthly cross-sections. The set of controls varies with the underlying data source, but it includes variables such as the LTV ratio at origination, borrower FICO score, and loan interest rate.

### 3.5. Addressing Endogenous Selection Out of Treatment

In our empirical analysis, we need to make sure that differences vis-à-vis the control group are due to treatment and not changes in lender or borrower composition. This is done primarily through the choice of comparison groups and by controlling for observable borrower characteristics.<sup>14</sup>

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<sup>13</sup> Clustering allows for an arbitrary covariance structure of error terms over time within each zip code and thus adjusts standard error estimates for serial correlation, potentially correcting a serious inference problem (Bertrand, Duflo, and Mullainathan, 2004). Depending on the sample, there are 22 or 53 zip codes in our regressions.

<sup>14</sup> We are also rather comfortable that the FICO scores are indeed indicative of borrower quality in that they cannot be manipulated in the short term; see Keys, et al. (2010).

We address the problem of lender selection by estimating two sets of regressions: those conducted on loans originated by all lenders, and on those originated by lenders that remained active in the HB 4050 zip codes during the treatment period. We call the latter the “Active Lenders” sample. To be considered an active lender in a given geographic area, a HMDA reporting institution must originate an average of at least one loan per week over a given five-month period, with at least one origination in every month.<sup>15</sup> This ‘Active Lender’ sample holds the population of lenders constant, allowing for the identification of treatment effects unrelated to changes in lender composition.

We deal with borrower selection in two ways. Our more direct method accounts for changes in borrower population by controlling for a number of key observable variables such as FICO score and LTV ratio. In addition, our second control sample—the synthetic matched sample—shuts down the effects of entry and exit (at least based on observables) as it is based on a loan-by-loan matching. That is, for each mortgage originated in the treated zip codes before, during, or after the treatment period, we find a matched mortgage based on FICO score, mortgage size, and leverage. The advantage of this method is that it forces the control sample to mirror changes in these observables in the treatment sample.

### **3.6. Dealing with Non-Random Treatment Sample Choice**

An additional potential complication lies in the quasi-experimental design of our analysis. In particular, the set of HB 4050 zip codes is patently non-random, as it concentrates on low-income neighborhoods in which foreclosure rates were high at the outset. The problem with analyzing such zip codes is that there is a possibility that they have different resilience to economic shocks unrelated to treatment. For example, it is possible that mortgage choice was

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<sup>15</sup> The five-month period is chosen to match the duration of HB 4050. None of the patterns depend on the choice of the threshold level or geographic area. The “every month” condition is intended to eliminate lenders that withdraw from HB 4050 zip codes during the fall of 2006 after working off their backlog of earlier applications. We have nine state-licensed subprime lenders funding loans and filing HMDA reports that satisfy this definition. According to the Housing Action Illinois (2007) report, these lenders were represented by more than 300 mortgage brokers.

more sensitive to economic conditions in low-income areas and more sensitive to the general decline in house prices following the market peak around November 2006.

We offer two solutions for this treatment zip code selection concern. First, we use the design of the pilot project and separate the effect of treatment across low-, mid-, and high-FICO-score groups. Recall that all of the low-FICO borrowers (those with FICO scores  $< 620$ ) were subject to counseling, while the mid-FICO (those with scores in the 621–650 range) and the high-FICO borrowers (those with scores  $> 650$ ) were counseled conditional on their mortgage contract choice. This approach retains the structure of standard difference-in-differences analysis while also exploiting the within-zip-code heterogeneity in treatment.<sup>16</sup> We further interact time dummies with the log of the average income of a zip code, as reported annually by the IRS. This allows the effects of unobservable shocks to vary with the level of economic resources available to households in each particular zip code, further alleviating some of the selection concerns.<sup>17</sup>

The regression specification that we therefore estimate is:

$$\begin{aligned}
 (2) \text{ Response}_{ijt} = & \alpha + \beta_1 (\text{Treatment}_{jt} \times \text{Low-FICO}_{ijt}) + \beta_2 (\text{Treatment}_{jt} \times \text{Mid-FICO}_{ijt}) \\
 & + \beta_3 (\text{Treatment}_{jt} \times \text{High-FICO}_{ijt}) + \\
 & + \gamma (\text{Time dummies}_t) + \delta (\text{Zip code dummies}_j) + \\
 & + \eta (\text{Time dummies}_t \times \log \text{IRS income}_{jt}) + \theta \text{Controls}_{ijt} + \varepsilon_{ijt}.
 \end{aligned}$$

In all of our analysis we are evaluating the characteristics of securitized subprime and Alt-A mortgages contained in the LP data.

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<sup>16</sup> The FICO-score-only partitioning of borrowers in treated zip codes has the advantage of being based on a characteristic that is exogenous to the treatment regime. As shown in Section 4, the mandate caused a sizable move away from mortgage contracts that triggered counseling for mid- and high-FICO-score borrowers.

<sup>17</sup> For robustness, we also evaluate a specification with a full set of time and zip code interactions. In this case, identification derives strictly from within-zip-code variation across borrower categories at a point in time. The main results remain qualitatively the same.

#### **4. Mortgage Counseling and Contract Choice**

The design of the HB 4050 program allows for an interesting inspection of the effects of both information and incentives on borrower decisions.<sup>18</sup> First, to investigate the effects of *information* provided in counseling sessions, we exploit the fact that low-FICO applicants (those with FICO scores below 621) had no choice but to attend counseling. Thus, we can test the effects of mandated counseling on mortgage contract selection by comparing the borrowing choices of this group under the mandate with the borrowing choices made in the pre-HB 4050 period or by a similar group in the control zip codes.

Second, we explore the effects of *incentives* by examining the contract choices of mid- and high-FICO applicants. These applicants could eschew counseling by avoiding mortgages that were specified as risky by the legislation. Again, we compare the change in mortgage choices over time and relative to those of similar groups in control zip codes. By segmenting our sample and accounting for different counseling requirements across product choice, we are able to distinguish between the effects of new information from the counseling process and new incentives resulting from restrictions in the law.

##### **4.1. Multivariate Evidence on Borrower Contract Choice**

From interviews with a number of counselors involved with HB 4050, we know that borrowers were typically warned about the risks associated with hybrid ARM loans or loans carrying prepayment penalties. If the information effect is at work, we would expect counseled low-FICO borrowers to shift away from such products.

However, information pertaining to broad product choices was provided not only through counseling sessions, but also by the mere designation of certain products as risky (i.e., their

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<sup>18</sup> Our purpose here is to evaluate adjustments in consumer choice resulting from the HB 4050 program. However, Agarwal et al. (2013) also found there was significant reaction by mortgage lenders, which swiftly withdrew credit availability in the affected markets. Thus, mortgage supply was also significantly affected by the new program. Table 3A provides summary statistics on lender participation in mortgage lending in treatment and control areas.



selection triggered counseling). These designations were known to everyone in the state and may have constituted a credible signal to potential borrowers to avoid such mortgage products. If this signaling effect is at work, we would expect the incidence of risky product choices to decline for all borrowers in both the treated and control samples. If the signal was salient only in the affected areas, we would expect the incidence of risky product choices to decline for *all* FICO groups in the treated zip codes.

That said, product choice may have been affected by the borrowers' desire to avoid costly counseling sessions. In this case, members of a given FICO group would avoid products that trigger counseling for *their* particular group. That is, we would expect fewer interest-only loans by mid-FICO households, but not for high-FICO households. Similarly, we would expect both mid- and high-FICO households (but not low-FICO ones) to choose fewer negative amortization loans and mortgages with a prepayment penalty.

Table 2 presents the results of difference-in-differences regressions of borrower contract choice, as outlined in equation (2). These regressions control for the borrower's FICO score, house value, LTV ratio, property type, and refinancing status, and they include a set of zip code and month dummies, as well as time dummies interacted with the log of the average income of a zip code.

The first set of regressions focuses on choices that subject *only* the mid-FICO borrowers to counseling—namely, choices to take out hybrid ARMs, interest-only loans, and low-documentation (low-doc) loans. These choices are labeled as Category I Risk Products. Similarly, Category II Risk Products denotes choices that trigger counseling for both mid- and high-FICO borrowers—loans with prepayment penalty, negative amortization or closing costs exceeding 5% of the loan size. For either product category, we find little evidence consistent with the information-driven effects. In particular, we find no statistical evidence that low-FICO

borrowers in the treatment areas pulled back from either category of risky products from lenders that remained active during the pilot period (Columns (3)-(4) and (7)-(8) of Table 2).<sup>19</sup>

The estimates are also inconsistent with the signaling effect of risky product designation, which would be manifested in either no significant difference-in-differences estimates or in significant differences across *all* FICO groups. Instead, we find that changes in contract choice are closely associated with FICO-group-specific triggers for counseling sessions. In particular, mid-FICO borrowers in treated areas have a much lower propensity to choose Category I products than those in the control areas. Looking at the constant set of lenders (Active Lenders), we estimate a decrease of 6 to 7 percentage points in the propensity to choose Category I loans for the treated group, relative to that for the control group. However, high-FICO borrowers in treated areas are not any more likely to shy away from these products, which do *not* trigger the counseling requirement for them. Although taking a Category II loan leads to counseling for all borrowers, only high-FICO borrowers in HB 4050 zip codes reduce their use of such products

On net, the evidence on product choice is consistent with the hypothesis that the counseling requirement constituted a costly burden that was aggressively avoided by those borrowers who were not automatically subject to it. The law led to a change in the product mix (whether initiated by borrowers or lenders) by the mere threat of counseling and not, apparently, by the content of that counseling.

#### **4.2. Lender Response and Contract Menu Options**

One could argue that the evidence presented above is consistent with lenders simply removing products that trigger counseling from their menu of choices. Because lenders tend not to specialize in either mid- or high-FICO borrowers, the FICO-group-specific pattern of changes casts some doubt on this hypothesis. Nevertheless, we can also conduct a direct test of mortgage

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<sup>19</sup> A contrast of  $HB\ 4050 \times Low\ FICO$  coefficients between Columns (1)–(2) and (3)–(4) in Table 2 suggests that changes in contract choice of treated low-FICO borrowers derived largely from the exit of lenders that made such risky loans.

menu options of lenders that remained active in HB 4050 areas. The results are summarized in Table 3, Panel B.

The table looks at the population of active lenders and reports the fraction that offered products deemed “risky” by the legislation. A lender is considered to have a certain product type on its menu if it originated at least 20 such loans over a given five-month period, with at least one origination in every month. The main finding is that while the share of lenders willing to offer interest-only mortgages or hybrid ARMs in HB 4050 areas declined a bit during the mandate period, a strong majority (89%) retained such products on their menus. Yet, the likelihood of originating such loans declined markedly, as shown in Table 2.<sup>20</sup>

However, the legislation did appear to influence the availability of one subset of mortgages—low-doc loans. Table 4 repeats the analysis of Section 4.1, concentrating exclusively on low-doc loans. We find a substantially lower likelihood of low-doc mortgages for both low- and mid-FICO treated borrowers. Even though low-FICO borrowers were subject to counseling regardless of contract choice, lenders appear to have lost much of their appetite for low-doc loans because applicants had to bring income and asset documentation to the meeting with the counselor.<sup>21</sup> The fact that this information was entered into the state-administered database potentially subjected lenders to legal risk and further decreased the appeal of low-doc loan underwriting. A similar effect may have been in play for the mid-FICO borrowers.

### **4.3. Mortgage Terms**

An additional way to evaluate the hypothesis that loan review provided actionable information to borrowers is through an analysis of the mortgage terms. According to Housing

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<sup>20</sup> Panel B of Table 3 also shows that Risk Category II loans (loans with negative amortization, prepayment penalties or high closing costs) were pitched primarily to high quality borrowers served by lenders exempt from state licensing requirements.

<sup>21</sup> Comparing Columns (1)–(2) and (3)–(4) of Table 4 indicates that some of the decline in the take-up of low-doc loans by low-FICO borrowers is due to the exit of lenders that offered many of these loans in the pre-HB 4050 period.

Action Illinois (2007), counselors commonly observed that applicants took on too much debt at high interest rates. One would thus expect that treated borrowers were advised to reduce their leverage and negotiate better loan terms.<sup>22</sup> If such information translated into greater borrower bargaining power, one would expect lower LTV ratios and interest rates among counseled borrowers.

Panel A of Table 5 presents evidence of changes in some of the key contract terms of loans originated during the treatment period. For each dependent variable, we estimate the difference-in-differences specification in equation (2) for the samples described earlier. We find a marginally significant decrease in the LTV ratio for the low-FICO borrowers (Columns (1)-(2)).<sup>23</sup> These relative improvements translate to a decrease in debt levels of about \$1,500 for an average borrower. Turning to interest rate spreads, we find no identifiable effects of HB 4050 when the sample is restricted to lenders that remained active during the treatment period (Columns (5)-(6)).<sup>24</sup> For the broader sample (Columns (3)-(4)), it is the mid- and high-FICO groups that show statistically significant, if small, improvements in spreads. This suggests that lenders that exited HB 4050 areas were charging higher interest spreads than those that remained active.

In Panel B of Table 5, we explore measures of loan affordability by looking at the debt-service-to-income ratio that captures borrowers' ability to service their loan obligation (Columns (1)-(2)) and the ratio of the annual mortgage payment to the original loan size (Columns (3)-(6)). For either of these measures, we fail to detect any effect of the treatment on the low-FICO-score population. Somewhat surprisingly, we find slightly higher mortgage payments for mid- and high-FICO-score borrowers in the HB 4050 areas. However, the magnitude of the estimated effect is very small, never exceeding 20 basis points.

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<sup>22</sup> However, being able to negotiate less leverage would only be possible if the borrower had resources to put a larger down payment down.

<sup>23</sup> Note that for LTV and DTI ratio regressions, we do not present matched sample results because LTV and DTI ratios were used in the matching.

<sup>24</sup> For ARMs, the LP data provide the relevant data. For fixed-rate mortgages, loan spread is calculated as the difference between the contract interest rate and the rate of the matching-maturity Treasury.

#### **4.4. Direct Evidence for the Effects of Counseling Advice**

In an attempt to further evaluate the potential informational effect of counselor loan review, we turn to an analysis of the actual counselor recommendations. At this point in the origination process, the avoidance of counseling sessions through contract choice or market exit is irrelevant. Instead, we can evaluate the correspondence between counselor suggestions and subsequent borrower actions. To do so, we obtained detailed counseling session data from one of the agencies providing services under HB 4050. For each of the 191 sessions, we compared the original loan offer terms (as recorded by the counseling agency) to mortgage details in the LP data set.<sup>25</sup> The top panel of Table 6 presents a breakdown of these mortgage offers organized by counselor recommendation.

We find that about 19% of the initial mortgage offers were abandoned by the borrowers, with the rejection rates substantially higher among borrowers who were told that their loans were either “unaffordable” or “fraudulent.” The majority of the reviewed offers that proceeded to closing (101 out of 155) received a “no issues” entry, indicating that the counselor had no concerns about the loan’s affordability, the borrower’s understanding of the terms, or the original offer’s disclosures. Yet, about half of these “no issues” loans were modified after counseling, with slightly over 40% of renegotiated loans resulting in lower monthly payments. Loans deemed “unaffordable” or “fraudulent” were renegotiated at a similar rate, but a substantially higher fraction of such renegotiations yielded lower monthly payments. Similarly, loans with above-market rates were typically modified following counseling, resulting in lower monthly payments.

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<sup>25</sup> To match counseling records with those in the LP database, we first use the property address and counseling date to obtain the amount of originated loan in the Illinois Recorder of Deeds database. If there is no record of a mortgage transaction in the month following the counseling session, the loan offer is considered to have been abandoned. For matched properties, we use the Illinois Recorder of Deeds data set values on loan amount and loan recording dates, along with the agency’s data on the counseling date and applicant’s FICO score, to find a matching loan in the LP data.

We next conduct a more formal analysis of borrower's response to counselor recommendations. The Probit regression results presented in Panel B of Table 6 confirm that counselor recommendations were systematically related to loan and borrower characteristics. For example, we found the debt-service-to-income ratio (DTI) and initial interest rate to be strongly associated with a greater likelihood of the "unaffordable" classification. Similarly, a "no issues" assessment was much less likely for loans deemed as risky or for borrowers with high DTI ratios.

Looking more closely into the specifics of renegotiated problem loans highlights some of the complexities in establishing a direct mapping between counseling recommendations and the eventual loan choice. Some contract changes appear incongruous with the recommendation. For example, some unaffordable loans were renegotiated to loans with shorter amortization periods or longer resets. These changes may have made the loans less risky, but they also likely made them less affordable at the time of origination. Although counselors commonly recommended fixed-rate mortgages as the best means to lessen the risk of mortgage obligations, few borrowers switched away from their original ARM offers. In fact, as many borrowers went from fixed-rate mortgages to ARMs as changed from ARMs to fixed-rate contracts. Among those renegotiating their ARM deals, extending reset periods (by switching from, say, 2/28 to 3/27 loans) was also nearly as common as shortening the terms. Thus, it may not be surprising that, on average, counseling did not appear to significantly change the debt burden and interest costs of originated mortgages.

An open question then is whether the evidence in this small sample of treated borrowers is consistent with direct information effects of counseling. On the one hand, we find higher borrower rejection rates of fraudulent loans and a prevalence of lower payments for renegotiated unaffordable loans. On the other hand, about half of all problematic loans that were eventually originated did so without *any* changes. Moreover, if we assume that recorded recommendations reflect relevant information provided by counselors, the fact that many loan changes do not seem to align with such recommendations weakens the hypothesis that information has a direct positive effect on subsequent borrower actions.

#### 4.5. Borrower Rejection of Loan Offers

HB 4050 required additional counseling sessions for each mortgage offer from a new lender or a renegotiated offer from the original lender that worsened the initial terms. Hence, if counseling is regarded as more of a burden than a source of valuable information, we would anticipate fewer rejections of loan offers to counseled borrowers—regardless of the counselor’s recommendation. Conversely, if counseling is informative, we would expect to see a spike in rejections by better informed borrowers if they cannot favorably renegotiate their loan terms.

Table 7 presents a test of these hypotheses, using HMDA application data.<sup>26</sup> The regressions are run at the loan level, with borrower rejection of a loan offer as the dependent variable. The table shows that in the sample of active lenders, rates of mortgage rejection by borrowers *did not increase* during the HB 4050 period either among prime or subprime lenders. In fact, borrower rejection rates actually declined during the HB 4050 period by about 5 percentage points in the full sample of subprime lenders (Columns (1)-(2)), again suggesting a difference between lenders that exited the market and those that remained active.

This finding is rather remarkable given that the majority of the counseled were advised that they could not afford the loan and/or that they should seek alternative mortgage offers. Since we find little evidence of significant improvement in loan terms after counseling (e.g., narrower loan spreads as shown in Table 5), a likely explanation for the lack of change in the rejection rate is that borrowers preferred to accept the offer at hand and not to return for further counseling with offers from alternative lenders.<sup>27</sup>

In the process of collecting data on the actual counseling recommendations, we noticed that many sessions, especially those involving cash-out refinance loans, took place only a few days prior to scheduled closings. In such cases, rejecting an offer would mean a significant delay in obtaining funds that may have been critical in satisfying a borrower’s other obligations. For

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<sup>26</sup> These are loans in HMDA classified as “approved, but not taken.”

<sup>27</sup> This result also allays concerns that counselors’ incentives led them to convince borrowers to reject loans, ultimately leading to low origination volumes.

such borrowers, the attendant costs associated with searching for an alternative loan likely far outweighed the expected benefits of new offers.

In sum, our analysis in Section 4 contains only marginal evidence for the beneficial effects of information obtained in counseling sessions. Although debt burdens improve somewhat for counseled borrowers, the economic magnitude of these effects is fairly small. Flat borrower loan rejection rates, the inability of counseled borrowers to negotiate lower loan spreads, and the short time span between the loan review sessions and the scheduled closings all suggest limited bargaining power on the part of borrowers. In contrast, the pattern of changes in product choices is broadly consistent with borrowers' (and lenders') desire to avoid oversight when possible.

## **5. Conclusion**

Regulators are considering the use of policy tools such as mandated financial counseling and increased oversight of lenders in the wake of the housing market crisis.<sup>28</sup> Both strategies limit free contracting between borrowers and lenders. As such, they are likely to shrink access to credit markets, particularly for the financially disadvantaged segments of society.

In this paper, we evaluate the impact of one such policy tool: a mortgage market counseling program implemented in Chicago in 2006. The program combined lender oversight and counseling of high-risk borrowers, with both aspects of the program being administered through HUD-certified financial counseling agencies. The pilot program's design allows us to

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<sup>28</sup> In 2009, President Obama announced a proposal to create a new Consumer Financial Protection Bureau to safeguard consumers from unfair, deceptive, and abusive practices in financial markets. Included in this was an educational function that was to consider increasing consumer access to financial counseling. On July 21, 2010, the Dodd–Frank Wall Street Reform and Consumer Protection Act became law and introduced the new Bureau, which, among other things, was to provide information and educational programs to financial consumers, assist borrowers during the mortgage application process, and consider the potential benefits of counseling in the mortgage application process—for example, see Consumer Financial Protection Bureau (2013). The entirety of the Dodd–Frank Act (Public Law 111–203) is available at [www.gpo.gov/fdsys/pkg/PLAW-111publ203/pdf/PLAW-111publ203.pdf](http://www.gpo.gov/fdsys/pkg/PLAW-111publ203/pdf/PLAW-111publ203.pdf). For a discussion of the Dodd–Frank Act and the role of the new Bureau, see Evanoff and Moeller (2013).



disentangle the effects of the informational content of counseling from those of lender oversight and compliance costs.

We present two main results. First, we find that mortgage applicants responded to incentives to attend (or, rather, avoid) counseling, but were less influenced by information provided by counselors. Borrowers often altered their mortgage contract choice to minimize interaction with counselors. Specifically, those borrowers who could eschew counseling by choosing less risky products did so. However, those who went through a counseling session did not appear, on average, to follow the counselor's advice, and seemed to have only limited bargaining power in renegotiations. They tended not to walk away from the original offer following counseling, nor to reapply for a different mortgage; either of which would have required another counseling session.<sup>29</sup>

Second, the legislation had material effects on the market composition of both lenders and borrowers, as well as on borrower and lender behavior. Apparently, incentives matter. As indicated above, borrowers adjusted their borrowing to avoid having to be subject to counseling. Similarly, as shown in our earlier work (Agarwal et al., 2013) lenders with predatory characteristics exited the market to avoid the potential scrutiny from both regulators and the marketplace. This finding is reinforced by the fact that lenders relatively quickly returned to the market once the counseling requirement was rescinded.

Our results suggest several policy recommendations. First, blunt policy interventions can lead to severe market disruptions. Indeed, the details of policy design matter a great deal. For instance, offering "safe harbor" provisions would likely have mitigated lender exit, while requiring counseling sessions to take place prior to scheduling a closing would likely have improved borrower bargaining power. Third, one-off counseling sessions late in the mortgage origination process may be suboptimal. They may be perceived as a burden by borrowers, who

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<sup>29</sup> In ongoing work, we are evaluating the effects of the follow-up program that expanded the counseling requirement on the basis of product choice to the entirety of Cook County. This will allow us to address the questions of external validity of the pilot study.

would then either stay away from the market altogether or switch to mortgages that do not require such counseling. At that point, borrowers may overweight the current costs of counseling and overly discount future benefits stemming from more informed contract choice, à la Laibson (1997). Fourth, gains from the informational content of counseling are tempered by the limited negotiating power of borrowers. It is likely that even after the counseling session, mortgage applicants are not in a position to effectively negotiate with mortgage brokers. Instead, the brokers may attempt to steer borrowers between products, without generating any real improvement in loan terms. Finally, in spite of our findings that lenders and borrowers attempt to avoid regulatory constraints via contract choice and decisions to exit the affected markets, such regulation may be somewhat effective in that the mere presence of the regulator in the marketplace seems to have a significant effect on the quality of originated mortgages.

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**Table 1. Summary Statistics****Panel A: Construction of a Control Sample on the Basis of Pre-Treatment Socioeconomic Characteristics** (based on 2005 IRS and 2000 Census data)

	HB 4050 zip codes (10 zip codes)	Control ZIP codes (12 zip codes)	all non-HB4050 Chicago zip codes (43 zip codes)
Total population	729,980	713,155	2,181,267
Total number of 2005 tax returns	259,884	244,326	888,354
Share of minority households*	0.813	0.863	0.505
Share of households below poverty level*	0.200	0.245	0.174
Average taxable income in 2005 <sup>#</sup>	\$31,579	\$30,844	\$56,976
Share of households with income < \$50,000 in 2005	0.823	0.837	0.720
Unemployment rate (2000 Census)*	0.141	0.151	0.101

\* population-weighted averages

<sup>#</sup> weighted by number of 2005 IRS tax returns**Panel B: Pre-Treatment Mortgage and Borrower Characteristics of HB 4050 and Control Zip Codes** (Loan Performance data, January 2005 - December 2005)

	HB 4050 zip codes (n=15,216)	Control ZIP codes (n=12,925)	all non-HB4050 Chicago zip codes (n=28,060)
Share defaulting within 18 months (x 100)	14.01	13.69	9.06
FICO	627.68	628.64	648.77
LTV (%)	84.14	82.92	81.85
Debt Service-to-Income (%)	39.94	40.28	40.20
log(Valuation)	12.12	12.22	12.47

**Panel C: Key Variable Means in Loan Performance Data (1/2005-12/2007)**

	1/2005-8/2006			9/2006-12/2007		
	HB 4050 Zip Codes n = 24,014	Control Sample n = 20,686	Matched Sample n = 24,014	HB 4050 Zip Codes n = 2,802	Control Sample n = 4,445	Matched Sample n = 2,802
Share defaulting within 18 months (x 100)	17.36	17.29	15.03	21.66	25.47	20.92
Fraction of low-FICO Borrowers	44.14	44.21	40.69	35.58	42.32	36.54
Fraction of mid-FICO Borrowers	19.93	19.57	20.79	20.91	20.13	20.74
Fraction of high-FICO Borrowers	35.93	36.22	38.52	43.50	37.55	42.73
FICO score	629.66	629.92	634.19	641.19	632.39	639.90
Share of Risky Products Category I	88.39	88.43	91.36	81.66	84.52	86.23
Share of Risky Products Category II	20.34	20.10	18.05	13.20	15.84	15.15
Share of low-documentation loans (x 100)	44.66	45.62	49.94	46.57	48.03	51.90
Loan Margin (%)	4.69	4.70	4.77	4.33	4.57	4.54
Annual Mortgage Payment/Loan Size (%)	8.55	8.49	8.34	8.66	8.58	8.42
Loan-to-Value (%)	84.20	83.01	83.91	83.32	82.67	83.66
Debt-Service-to-Income (%)	40.46	40.85	41.07	40.32	41.28	41.02
log(House Value (\$))	12.15	12.23	12.33	12.29	12.37	12.32

**Table 2. Mortgage Product Choice** (Source: LoanPerformance)

The table examines the effects of counseling on mortgage contract choice. The table reports results using OLS regression to test for changes in choice of contracts deemed risky by HB 4050. Risk Products Category I refers to mortgages that subject *only* the mid-FICO borrowers to counseling (hybrid ARMs, low-doc and interest-only loans, and properties refinanced within 12 months). Risk Products Category II denotes contracts that trigger counseling for both mid- and high-FICO borrowers (loans with prepayment penalties, negative amortization or high closing costs). The list of controls includes measures of borrower's FICO score, house value, LTV, property type, and refinancing status, as well as a number of time and location fixed effects. All standard errors are clustered at the zip code level. \*, \*\*, \*\*\* denote statistical significance at the 10%, 5%, and 1% level, respectively.

	I(Risky Products: Category I) x 100				I(Risky Products: Category II) x 100			
	Control	Matched	Control	Matched	Control	Matched	Control	Matched
			Active	Active			Active	Active
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HB 4050 x Low FICO	-2.90** (1.36)	-3.04** (1.44)	-2.04 (1.59)	-1.36 (1.56)	-0.40 (1.79)	-1.91 (1.86)	-1.67 (1.79)	-2.31 (1.85)
HB 4050 x Mid FICO	-5.28*** (1.27)	-5.07*** (1.24)	-6.67*** (1.44)	-5.80*** (1.28)	-0.15 (1.27)	-1.57 (1.42)	-1.04 (1.14)	-1.47 (1.22)
HB 4050 x High FICO	0.37 (1.15)	0.87 (1.20)	-0.99 (1.31)	0.39 (1.27)	-3.95*** (1.34)	-5.76*** (1.44)	-4.37*** (1.26)	-5.17*** (1.30)
Borrower Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Contract Terms Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Property Type Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE, Zip Code FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE * log(Avg Income)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	55,600	57,619	40,041	41,891	55,600	57,619	40,041	41,891
Adj. R <sup>2</sup>	0.20	0.19	0.20	0.19	0.03	0.03	0.05	0.06

### Table 3. Effects of HB 4050 on Credit Supply

The table summarizes the number (Panel A) and characteristics (Panel B) of lenders in the HB 4050 and in the zip code-based control sample.

#### Panel A: Supply of Credit – Total number of active lenders (Source: HMDA)

	State-Licensed Lenders		All Other Lenders	
	Specializing in Subprime loans			
	HB 4050	Control	HB 4050	Control
Before HB 4050 (9/05 - 8/06)	31	30	83	76
During HB 4050 (9/06 - 1/07)	9	23	56	65
After HB 4050 (2/07 - 6/07)	13	15	66	66

#### Panel B: Contract Choice Menu Under the Mandate (Source: LoanPerformance)

Share of lenders originating Risk Category I or Risk Category II loans (definitions provided in Table 2)

	State-Licensed Lenders		All Other Lenders	
	Specializing in Subprime loans			
	HB 4050	Control	HB 4050	Control
Before HB 4050 (9/05 - 8/06)	1.00/0.18	0.93/0.14	1.00/1.00	1.00/0.67
During HB 4050 (9/06 - 1/07)	0.89/0.06	0.86/0.18	1.00/0.50	1.00/0.75
After HB 4050 (2/07 - 6/07)	0.96/0.13	0.95/0.11	1.00/0.75	1.00/0.75

\* Shares are taken with respect to the total number of active lenders in Panel A present in LoanPerformance data

**Table 4. Availability of Low-Doc Loans (Source: LoanPerformance)**

The table presents results using an OLS framework to examine the likelihood of taking low-doc loans in HB 4050 treatment zip codes. All standard errors are clustered at the zip code level. \*, \*\*, \*\*\* denote statistical significance at the 10%, 5%, and 1% level, respectively.

	I(Low Doc) x 100			
	Control	Matched	Control	Matched
	(1)	(2)	Active	Active
HB 4050 x Low FICO	-5.48*** (1.76)	-7.55*** (1.99)	-4.03** (1.89)	-5.23** (2.04)
HB 4050 x Mid FICO	-7.26*** (2.24)	-8.61*** (2.27)	-7.17*** (2.41)	-8.03*** (2.48)
HB 4050 x High FICO	0.72 (1.36)	1.98 (1.43)	1.12 (1.58)	3.26* (1.71)
Borrower Controls	Yes	Yes	Yes	Yes
Contract Terms Controls	Yes	Yes	Yes	Yes
Property Type Controls	Yes	Yes	Yes	Yes
Month FE, Zip Code FE	Yes	Yes	Yes	Yes
Month FE * log(Avg Income)	Yes	Yes	Yes	Yes
Observations	55600	57619	40041	40425
Adj. R <sup>2</sup>	0.20	0.18	0.20	0.18



**Table 5. Effects of HB 4050 on Mortgage Leverage and Interest Rate Spread**

The table presents results from an examination of the effects of the mandate on key mortgage terms. Panel A presents results using OLS regression to test whether leverage and loan margin are different for the population with mandatory counseling. Panel B examines proxies for mortgage affordability. The set of controls not shown in the table include: borrower characteristics (FICO score and FICO score ranges, investor and second mortgage flags); contract terms (LTV (only for margin and mortgage payment regressions) and log of appraised value); and property type (flags for single family residence, townhouse, or condominium). All standard errors are clustered at the zip code level. \*, \*\*, \*\*\* denote statistical significance at the 10%, 5%, and 1% level, respectively.

**Panel A: Key Mortgage Terms** (Source: LoanPerformance)

	Loan-to-Value (%)		Loan Margin (bp)			
	Control	Control Active	Control	Matched	Control Active	Matched Active
	(1)	(2)	(3)	(4)	(5)	(6)
HB 4050 x Low FICO	-0.75*	-0.81*	-7.64**	-2.49	-3.06	5.10
	(0.41)	(0.42)	(3.01)	(3.35)	(3.16)	(3.16)
HB 4050 x Mid FICO	-0.12	-0.24	-13.53***	-11.37***	-4.71	0.22
	(0.37)	(0.38)	(4.04)	(3.75)	(4.64)	(3.95)
HB 4050 x High FICO	-0.02	0.13	-16.92***	-15.55***	-5.60	-2.87
	(0.37)	(0.41)	(4.23)	(4.20)	(4.32)	(4.45)
Borrower Controls	Yes	Yes	Yes	Yes	Yes	Yes
Contract Controls	Yes	Yes	Yes	Yes	Yes	Yes
Property Type Controls	Yes	Yes	Yes	Yes	Yes	Yes
Month FE, Zip Code FE	Yes	Yes	Yes	Yes	Yes	Yes
Month FE * log(Avg Income)	Yes	Yes	Yes	Yes	Yes	Yes
Observations	55,600	40,041	55,600	57,619	40,041	40,425
Adj. R <sup>2</sup>	0.26	0.26	0.22	0.21	0.22	0.21

**Panel B: Mortgage Affordability** (Source: LoanPerformance)

	Debt-Service-to- Income (%)		Annual Mortgage Payment (%)			
	Control	Control Active	Control	Matched	Control Active	Matched Active
	(1)	(2)	(3)	(4)	(5)	(6)
HB 4050 x Low FICO	-0.49	-0.31	0.04	0.08	0.02	0.02
	(0.41)	(0.42)	(0.05)	(0.05)	(0.05)	(0.05)
HB 4050 x Mid FICO	-0.34	-0.41	0.13*	0.16**	0.13*	0.13*
	(0.71)	(0.74)	(0.06)	(0.07)	(0.07)	(0.08)
HB 4050 x High FICO	-0.05	0.07	0.07**	0.17***	0.06*	0.12***
	(0.40)	(0.38)	(0.03)	(0.03)	(0.03)	(0.03)
Borrower Controls	Yes	Yes	Yes	Yes	Yes	Yes
Contract Controls	Yes	Yes	Yes	Yes	Yes	Yes
Property Type Controls	Yes	Yes	Yes	Yes	Yes	Yes
Month FE, Zip Code FE	Yes	Yes	Yes	Yes	Yes	Yes
Month FE * log(Avg Income)	Yes	Yes	Yes	Yes	Yes	Yes
Observations	40,024	26,604	55,600	57,619	40,041	40,425
Adj. R <sup>2</sup>	0.07	0.08	0.22	0.24	0.22	0.23

**Table 6. Effects of Counseling on Borrower Behavior**

The table examines the effects of counseling on borrower propensity to renegotiate or reject loan offers. The data used is provided by a counseling agency. The top panel of the table compares pre-counseling and post-counseling mortgage characteristics. The bottom panel presents marginal effects from Probit regressions of counselor recommendations on key borrower and loan characteristics.

**Panel A: Summary of Recommendations**

	Total Sessions	Counselor recommendation			
		No issues	Cannot afford or close to it	Indicia of fraud	Loan above market rate / Seek another bid
<b>Data summary</b>					
Number of counseling sessions	191	117	39	25	10
Loans not pursued after counseling	36	17	10	8	1
<i>memo: abandoned loans re-originated after HB 4050</i>	14	7	3	4	0
Share of loans not pursued after counseling	19%	15%	26%	32%	10%
Loans originated after counseling	155	101	28	17	9
Total matched originations	148	96	27	17	8
<b>Comparison of loan terms before and after counseling sessions</b>					
No changes at all	73	49	14	8	2
Loans with changes post counseling	75	47	13	9	6
(percent with changes)		49%	48%	53%	75%
Lower monthly payments		20	10	5	5
(percent of all changed loans)		43%	77%	56%	83%
Switch from ARM to fixed		8	5	4	1
(percent of all changed loans)		17%	38%	44%	17%
Switch from fixed to ARM		12	3	1	2
(percent of all changed loans)		26%	23%	11%	33%
Lower interest rate		23	11	5	5
(percent of all changed loans)		49%	85%	56%	83%

**Panel B: Recommendations and Loan/Borrower Characteristics**

	Counselor recommendation (0/1)	
	No issues	Unaffordable
"Risky mortgage" flag	-0.259*** (0.082)	0.017 (0.060)
Debt-to-Income ratio (DTI)	-0.025*** (0.005)	0.010*** (0.002)
Loan-to-Value ratio (LTV)	0.001 (0.002)	-0.002 (0.001)
Initial interest rate	0.001 (0.030)	0.047** (0.020)
FICO score	0.000 (0.000)	-0.000 (0.000)
log(Mortgage)	0.246* (0.137)	0.021 (0.071)
Observations	191	191
Pseudo R <sup>2</sup>	0.32	0.23

**Table 7. Loan Offers Rejected by Borrowers**

This table provides OLS results from evaluating whether borrowers in HB 4050 treatment zip codes are more likely to have rejected loan offers. All standard errors are clustered at the zip code level. \*, \*\*, \*\*\* denote statistical significance at the 10%, 5%, and 1% level, respectively.

	Dependent: I(Applicant Rejects Offer) x 100							
	State-Licensed Lenders (Subprime)				All Other Lenders			
	Control	Matched	Control	Matched	Control	Matched	Control	Matched
	(1)	(2)	Active	Active	(5)	(6)	Active	Active
HB 4050	-5.38*** (0.68)	-4.75*** (0.73)	-0.85 (0.77)	-0.43 (1.00)	-1.68** (0.60)	-0.98 (0.65)	0.17 (0.72)	0.04 (0.69)
log(Mortgage)	0.64* (0.36)	0.35 (0.38)	0.03 (0.56)	-0.28 (0.52)	2.54*** (0.35)	2.20*** (0.29)	2.16*** (0.25)	1.89*** (0.24)
log(Income)	2.44*** (0.29)	2.79*** (0.30)	1.01*** (0.22)	0.54* (0.28)	1.00*** (0.17)	0.64*** (0.16)	0.04 (0.19)	-0.22 (0.18)
Month FE, Zip Code FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE * log(Income)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	158,307	168,789	56,900	61,929	236,007	269,138	155,002	179,842
Adj. R <sup>2</sup>	0.02	0.01	0.04	0.04	0.01	0.01	0.01	0.01

**Figure 1. HB 4050 Treatment and Control Zip Codes**

This figure maps the HB 4050 treatment area (shaded) and the control zip codes (striped). As described in Section 3.3, we construct the 12–zip code control area to resemble the treatment area in regard to pre-treatment socioeconomic characteristics and housing market conditions. The socioeconomic variables used for selection include 2005 Internal Revenue Service (IRS) zip code–level income statistics and information from the 2000 Census about shares of minority population and those living below the poverty level as well as the unemployment rate. Housing market metrics include default rates on mortgages originated in 2005, as well as zip code–level means of FICO scores, LTV and DTI ratios, and housing values. All of the control zip codes lie within the City of Chicago limits. The 12-zip control area has approximately the same number of residents as the treatment area.

