Playing Hide and Seek: How Lenders Respond to Borrower Protection

Youssef Benzarti*

UCSB and NBER

Abstract

This paper uses the universe of mortgage contracts to estimate the response of high-interest lenders to borrower protection regulations aimed at simplifying and making loan terms more transparent. Using a quasi-experimental design, I find that lenders substantially reduce interest rates – by an average of 10% – in order to avoid being subject to borrower protection, without reducing amounts lent or the number of loans approved. This finding implies that a substantial number of high-interest lenders prefer to issue obfuscatory mortgage contracts with lower interest rates rather than more transparent and regulated mortgages with higher interest rates.

JEL Classification: D91, G18, G21, H10.
Keywords: mortgage regulation, borrower protections, high-interest mortgages.

Getting a mortgage is one of the most daunting financial transactions people engage in during their lifetime. Mortgages represent a large financial commitment, impose substantial financial risk, and can be extremely complex. Yet, 60% of US homes currently carry a mortgage. Moreover, housing is the main form of wealth accumulation in the US and given the rise in wealth inequality documented by Saez & Zucman (2016), access to mortgages for low-wealth households can help reduce the wealth gap.[1] Because mortgages are so complex and important to US households, the US government has imposed borrower protection clauses aimed at disclosing certain important information and banning certain predatory lending terms. Following the Great Recession, borrower protection in the mortgage market has received renewed attention, leading to the 2010 passage of the Dodd-Frank Act and the 2011 creation of the Consumer Financial Protection Bureau (CFPB).

Nevertheless, such protection is still controversial. A classic pro-market argument against consumer protection is that predatory lenders offering contracts with shrouded attributes (e.g., hidden fees or high penalties) aimed at taking advantage of consumers should be competed away in well-functioning markets by "transparent lenders." These lenders would educate borrowers on the obfuscating terms that predatory lenders include in their mortgage contracts and steer them away from contracts with shrouded attributes (see Shapiro (1995)). In this case, consumer protection would be unnecessary since market forces would drive away predatory lending. However, Gabaix & Laibson (2006) question this argument by showing that as long as there are sufficiently many inattentive borrowers and even if markets are perfectly competitive, predatory lenders can survive competition and even thrive. In this case, consumer protection could be desirable since it would prevent predatory lenders from taking advantage of consumer inattention or lack of sophistication.

In this paper, I tackle this question by exploring how lenders respond to regulation aimed at protecting high-interest borrowers. In theory, if none of the lenders are predatory lenders, and if the regulations are not too bureaucratically burdensome, then they should be indifferent to additional regulation aimed at informing consumers and banning hidden fees and high penalties. If instead a

---

[1]"U.S. Census Bureau, 2017 American Community Survey 1-Year Estimates" Mortgage Status, Owner-Occupied Housing Units. Accessed August 29th, 2019.

substantial portion of lenders take advantage of consumers, they may be willing to bear substantial costs in order to avoid becoming subject to additional borrower protection regulation. Using a quasi-experimental design, I provide evidence consistent with the latter hypothesis.

My empirical strategy uses the introduction of additional borrower protections triggered by the implementation of the Dodd-Frank Act. In January 2014, the CFPB implemented Dodd-Frank's 2013 Home Ownership and Equity Protection Act (HOEPA) Rule, which applies mainly to high-interest mortgages and imposes additional borrower protections aimed at better informing borrowers of the mortgage terms they are contracting and banning certain hidden fees, penalties and obfuscatory practices.

These regulations were imposed on loans with interest rate spreads above 6.5% for loan amounts in excess of $50,000, and above 8.5% for loan amounts smaller than $50,000. Interest rate spreads are defined as the difference between the interest rate charged on a loan and the average interest rate charged on a similar loan issued to prime borrowers (borrowers with very good credit histories). I use these interest rate spread thresholds to investigate the response of mortgages to the passage of these regulations. First, I compare the pre- and post-reform distributions of mortgages at and above the two thresholds. This allows me to assess how many of the loans are reclassified from above to below the thresholds. In essence, this is a difference-in-bunching approach, similar to the identification strategy implemented by Best et al. (forthcoming), and is immune to the criticisms of Blomquist & Newey (2017). Second, I use a more traditional difference-in-differences (DD) approach by comparing outcomes of interest for treated loans and control loans before and after the reform.

The response is stark, as after the regulations' implementation in 2014, I observe a large and rapid decline in the number of mortgages above the thresholds. This decline is compensated by a large increase in the number of mortgages at and just below the thresholds. There is a large excess mass in the distribution of mortgages at the thresholds and a substantial missing mass above them. Had this reform resulted in a drop in the supply of mortgages rather than a simple reclassification of mortgages from above to below the thresholds, I would have observed a drop in the total number of

mortgages affected by the reform. Instead, I observe that the number of mortgages just below and above the two HOEPA cutoffs is constant pre- and post-reform, implying that the reform, in spite of the reduction in interest rates, has no negative supply effects and instead results in a reduction in interest rates aimed at avoiding the regulation. Moreover, I observe no reduction in average loan amounts. Therefore, the total supply of credit is not reduced via this intensive margin either.

The consequence of both the extensive and intensive margins being unaffected is that the borrower protections do not appear to reduce the total supply of credit. Instead mortgages are being reclassified into lower-interest loans which are not subject to the additional transparency requirements. As a consequence, the average interest rate per loan for these high-interest mortgages decreases by a little more than 10% ($\simeq$ 1 percentage point of interest). Since African American, Hispanic, and low-income borrowers are over-represented within the population of high-interest borrowers, these three demographic groups are more affected by this interest rate reduction.

Four points are worth emphasizing regarding my interpretation of these results. First, in theory, the response I estimate could be driven by borrowers rather than lenders. As borrowers receive more information about mortgage contracts, they decide to contract lower-interest mortgages. However, this explanation is unlikely because it would not result in bunching at the cutoffs: there is no reason for better-informed borrowers to demand mortgage contracts with interest rates just below the cutoffs. Instead, the evidence seems more consistent with lenders reducing interest rates just enough so as to avoid the HOEPA regulation.

A second possible but unlikely interpretation of these results is that lenders are reducing their APR below the cutoffs not to avoid borrower protections per se but to avoid the bureaucratic cost of implementing the new HOEPA regulations. This is unlikely because all lenders, irrespective of whether they issue HOEPA loans or not, are now subject to this bureaucratic cost. According to the CFPB guide to complying with the 2013 HOEPA Rule intended for banks: "Even if your organization does not originate high-cost loans, you will need to update your systems and processes which execute the HOEPA coverage tests to ensure compliance with the criteria as defined in this

rule."[2] Therefore reducing APRs below the thresholds would not mitigate the costs of complying with the new HOEPA regulation.[3]

Third, one may argue that the response I estimate is due to lenders misreporting the interest they actually charge to borrowers to avoid being subject to HOEPA regulations. This is unlikely for several reasons: (1) banks can face criminal charges if they forge documents related to mortgage contracts, and (2) this data is routinely audited by the CFPB, which ensures that the reported information corresponds to the actual contract issued, and given that the CFPB implemented the regulation, one can reasonably expect that they would audit banks that bunch below the threshold to ensure that they are not avoiding the regulation by misreporting. Overall, the expected cost of misreporting APRs is likely to greatly exceed the forgone profits of simply charging lower APRs. However, even if banks were engaging in fraudulent misreporting, this would even further reinforce the message of this paper, which is that lenders go to great lengths in order to avoid borrower protection clauses.

Fourth and last, note that I do not observe all the terms of a given mortgage contract, in particular I do not observe hidden fees or penalties. This means that, in principle, lenders could be redesigning their contracts by decreasing interest rates and compensating for this loss by creating new fees or penalties, which would be consistent with the model of Heidhues et al. (2017). This is possible and further reinforces the idea that banks profit from hidden prices more than from APRs. And while, in principle, the 2013 HOEPA regulation seems to increase welfare via a decrease in interest rates, it might not be the case if lenders are increasing hidden fees and penalties to compensate for the decrease in interest rates.

These findings are important for the following reasons: First, ensuring that borrowers are fully informed about the contracts they sign when committing to a mortgage is of imminent policy relevance. Presumably, borrowers signing contracts they did not really understand is part of what led to the subprime mortgage expansion and then collapse and later to the Great Recession. Design-

---

[2] See Section 6 (page 30) of the guide, which can be found here: link.

[3] In addition, given that high-interest borrowers are likely to be very inelastic, a standard incidence model would predict that any cost increase would be passed through to the APR, while instead I estimate a decrease in APRs.

ing regulation that can better inform borrowers and shape simpler and more transparent mortgage contracts could help avert a repeat of this situation.

Second, while the number of borrowers I consider is relatively small compared to the total number of borrowers in the US, the population I focus on is an at-risk population of particular policy interest. High-interest mortgages are more likely to be contracted by low-income individuals and minorities, who are also at a higher risk of being financially constrained and more prone to be the target of predatory lending practices. On average, African Americans are 2.2 times and Hispanics 1.6 times more likely to contract these mortgages.[4] In addition, these mortgages mostly attract low-income borrowers: the average income of high-interest borrowers is half that of non-high-interest borrowers.

Third, all of the contracts I consider are for the purchase of a primary dwelling, and defaulting on these mortgages can have serious consequences for families in the above-mentioned populations. At the same time, high-interest borrowers are also the ones who are the most likely to benefit from additional credit since they are the most likely to be credit constrained. As Saez & Zucman (2016) have documented, low-income individuals are accumulating relatively less and less wealth. And since housing is the main vehicle of wealth accumulation in the US, where housing wealth constitutes almost two-thirds of the median household's total wealth (Iacoviello (2011)), having safe access to mortgages can help reduce the wealth gap.

Fourth and last, with the rise in behavioral economics and the recognition that individuals do not always act in their own best interest, there has been interest in designing and implementing soft interventions aimed at nudging individuals toward the "right" choice. One such intervention is requiring firms to disclose additional information in an intelligible and informative way. These findings can inform policy makers as to how lenders respond to such interventions.

This paper is related to three main literatures. First, it is related to a theoretical literature in behavioral economics analyzing the market effects of hidden prices.[5] While the consensus was

---

[4]See Appendix Table A.1.

[5]More generally, this paper is related to a literature in behavioral economics that explores how firms interact with mistakes in consumer decisions (see DellaVigna & Malmendier (2006), Eliaz & Spiegler (2006), Grubb (2009), Heidhues & Kőszegi (2008), Heidhues et al. (2016), Heidhues & Kőszegi (2017), Heidhues et al. (2017), Murooka

that hidden prices and shrouded attributes should disappear in a perfectly competitive market, Gabaix & Laibson (2006) challenged this idea by showing that if enough consumers underweight hidden prices firms will not educate them and shrouded attributes and hidden prices will persist. This underweighting of hidden prices could be driven by several biases, including a focusing and salience bias as shown in Bordalo et al. (2012) and Kőszegi & Szeidl (2012). It could also be due to a form of time inconsistency: Heidhues & Kőszegi (2010) show that some consumers' preference for immediate gratification can lead lenders to issue predatory loans aimed at taking advantage of this preference. This paper offers a test and supporting evidence of these theories by estimating the response of firms to regulations where they are given the choice of either abiding by the added borrower protections or avoiding them by cutting interest rates. I find that firms predominantly avoid these regulations, resulting in large interest rate cuts, which is consistent with lenders profiting from hidden prices.

Second, this paper contributes to a literature that analyzes regulations in credit markets. For example, Agarwal et al. (2014) compellingly show that when credit card fees were capped, as a consequence of the CARD Act, consumers ended up saving substantial amounts of money because banks did not compensate for the loss of fees by increasing interest rates or reducing the supply of credit. This paper contributes to this literature in two ways: (1) by focusing on the response of lenders to borrower protection regulations and its implication regarding how much they value hidden prices, and (2) by considering another market of imminent policy relevance where consumer protections can have important implications. This paper is also related to DeFusco et al. (Forthcoming), who show that the Dodd-Frank's "ability to repay" rule resulted in an increase in interest rates and a large decrease in the quantity of loans subject to this regulation. While related, our findings are different since I estimate a decrease in interest rates due to the regulation and a substitution away from regulated loans that has no substantial effect on the net quantity of loans supplied. These differences in findings highlight the fact that different regulations targeting different populations can have dramatically different effects.

(2013).)

6

Third, this paper is also related to an empirical literature exploring the effects of disclosure and simplification on consumer behavior. Allcott & Taubinsky (2015), for example, estimate the demand effect of informing consumers on the savings they can derive from buying more energy-efficient lightbulbs. Duarte & Hastings (2012) provide compelling empirical evidence that in the Mexican market for retirement financing, where regulations to simplify disclosure can prompt fund managers to game the system by offering more expensive funds that appear cheaper because of the simplified disclosure, investors choose a dominated investment option.

1 Data and Institutional Setting

1.1 Data

I use the Home Mortgage Disclosure Act (HMDA) data, which is an annual registry of all US mortgage applications and approval decisions dating back to 1980. The dataset contains detailed information on mortgage contracts, including their date of issuance, the branch and bank issuing them, the interest rate spread (defined below), the amount sought, and whether the loan is approved and if not what reasons caused the loan application to be denied.[6] The dataset also contains detailed demographics on the borrower, including race, ethnicity, gender, and income, and the zip code where the dwelling is being purchased.

The variation I use in this paper is based on the interest rate spread of a given mortgage, which is defined as the difference between the APR (annual percentage rate) of the mortgage and the average APR on prime mortgages (mortgages issued to borrowers with very good credit histories) of a comparable type offered when the mortgage application is submitted.[7] Note that the interest rate spread is directly reported in the HMDA dataset and that the only way a lender can adjust the interest rate spread in order to target the 6.5% and 8.5% cutoffs is to change the interest rate itself. Note that the only data restriction I make is that I only consider loans that are approved and discard

---

[6]Only approved loans are included in the dataset for loans subject to HOEPA regulations.

[7]To ensure that mortgages are of comparable types, the CFPB differentiates between fixed versus variable mortgages, type of amortization, lock-in date, fixed term versus variable term, and reverse mortgages.

any loan applications that are denied or withdrawn.

Appendix Table A.1 provides some summary statistics and compares high- versus low-interest borrowers. High-interest borrowers earn substantially less than low-interest borrowers – 50% less, on average, and are also much more likely to be African American, Hispanic, and female. While they only represent a small portion of the total mortgage market, high-interest borrowers are of particular interest because they represent a high-risk population.

1.2 Institutional Setting

On January 31, 2013, in implementing the 2010 Dodd-Frank Act, the CFPB issued the 2013 HOEPA Rule, which affected high-interest home purchase loans. The new rule was implemented in January 2014. Under this rule, a home purchase loan is subject to additional borrower protection clauses (detailed below) if this loan satisfies at least one of the following conditions:

1. The interest rate spread exceeds 6.5% for loan amounts in excess of or equal to $50,000.

2. The interest rate spread exceeds 8.5% for loan amounts smaller than $50,000.

3. The loan has fees and points exceeding one of these two thresholds:

   - 5% of the total loan amount for loan amounts greater than or equal to $20,000, or

   - 8% of the total loan amount or $1,000 (whichever is less) for a loan amount less than $20,000.

4. The loan has prepayment penalties that exceed 2% of the amount prepaid.

In this paper, I focus on the variation triggered by the 6.5% and 8.5% interest rate spread thresholds. I cannot estimate the effect of the thresholds based on points, fees and penalties because I do not observe them in the dataset. If loans are subject to HOEPA coverage then they must abide by the following four categories of borrower protection clauses:

1. Disclose the following: (1) inform the borrower that the loan will not be effective until the account is open, (2) explain the consequences of default, and (3) disclose the loan terms (APR, amount borrowed, and monthly payment).

2. Applicants are required to meet with a counselor approved by the Housing and Urban Development Agency (HUD) before the loan can be approved. The counseling fee can be paid by the lender or the borrower (either up front or financed by the loan). Note that the counselor cannot be affiliated with or employed by the lender.

3. The following loan terms are banned: (1) balloon payments, which require, in addition to the regular monthly payments, one larger payment (generally more than double the monthly payments) at the end of the loan; and (2) due-on-demand features, which allow the lender to require immediate repayment of the entirety of the loan without requiring a reason.

4. In addition, these loans are subject to the following restrictions on points and fees: (1) fees to modify a mortgage contract are banned, (2) late fees are capped to 4% and cannot be pyramided, (3) fees for generating payoff statements, which are statements that show the remaining balance needed to close the loan, are banned, and (4) points and fees cannot be financed by the loan being approved.[8]

All of these conditions are aimed at limiting hidden fees and at ensuring that borrowers are informed of the features of the loan they are contracting. Note that lenders are explicitly forbidden from restructuring a loan to avoid the HOEPA regulations – by splitting a loan into two, for example.

2   Identification Strategy

I implement two different identification strategies. First, I use a difference-in-bunching strategy similar to Best et al. (forthcoming), which allows me to estimate how the supply of mortgages responds to the 6.5% and 8.5% HOEPA cutoffs, and in particular whether after implementation of the rule lenders continue to issue the types of loans it covers in the same number as before.

---

[8]Points are fees paid to the lender in order to reduce the interest rate. Fee pyramiding describes the following practice: a homeowner (1) misses the deadline for a payment; (2) is charged a late fee; (3) makes all monthly payments on time after that one month of being late, but does not pay the late fee; and (4) the mortgage company keeps charging a late fee on all the payments made on time.

Second, I use a standard DD strategy to estimate the response of different outcomes of interest to the reform. In the following section, I explain how I implement each of them.

2.1 Difference-in-Bunching Approach

I compare the distribution of interest rate spread around the two thresholds I use for identification before and after the reform. The standard bunching approach, as implemented in Saez (2010), Chetty et al. (2011), and Kleven & Waseem (2013), assumes that distributions are generally smooth, and if there is excess mass at a policy threshold, it must be due to behavioral responses to the policy. One can then use a smoothed distribution as a counterfactual to estimate the size of the excess mass and the corresponding behavioral response. The difference-in-bunching approach, implemented in Best et al. (forthcoming) and used in this paper, relaxes the smoothness assumption and uses the pre-reform distributions as a counterfactual instead of the smoothed distribution. This approach has the advantage of requiring fewer assumptions on the counterfactual distribution and is robust to the criticisms of Blomquist & Newey (2017). It is similar in spirit to a DD strategy whereby the pre-reform difference in densities just above and just below the threshold are compared to the same difference post reform. Practically, I compare the difference in density in a given bin before and after the reform. The main identification assumption is that the distributions would have looked similar before and after 2014 had there been no change in 2014. Similarly to a DD identification strategy, this can be checked by ensuring that the pre-reform distributions are similar. I implement this test and discuss it in Section 3. Formally, I estimate the following difference:

$$\hat{c}_i = c_i^{post} - c_i^{pre}, \tag{1}$$

where c_i^{post} is the number of mortgages in bin i after the 2014 change, c_i^{pre} the number of mortgages in bin i before the 2014 change and $\hat{c}_i$ the difference between the two and I use bootstrap to get the standard errors of the difference. This approach allows me to estimate the change in the number of mortgages per bin of interest rate spread before and after the introduction of the 6.5% and 8.5% interest spread thresholds. Note that I define the start of the bunching (excess mass) area

10

as as the first bin i such that $\hat{c}_i$ is statistically significantly different from zero at the 5% level and denote it by $\underline{c}$.

In principle, I could also implement the standard bunching approach, but my approach has the advantage of not requiring assumptions over the shape of the counterfactual distribution, since the pre-reform distribution can be used as a counterfactual.

2.2 Difference-in-Differences Approach

In order to estimate the effect of the reform on average loan outcomes, I compare the difference in loans above and below the thresholds before and after the reform. Formally, I implement the following specification:

$$Y_{i,t} = \alpha_0 + \alpha_1 Above_i + \alpha_2 Post_t + \alpha_3 (Above_i * Post_t) + \varepsilon_{i,t}, \tag{2}$$

where Y is the outcome variable of interest for a given loan i, and t is years. *Above* is a dummy variable equal to 1 for loans with interest rate spreads greater or equal to $\underline{c}$ (as defined above), and equal to 0 otherwise. *Post* refers to the period after the reform (from 2014 onward). I cluster standard errors at the lender level.

The main identification assumption for this approach is that absent the reform, outcomes would have evolved in a similar pattern. A common test of this assumption is to ensure that the trends are parallel prior to the reform. I implement this test and discuss it in Section 3.

For mortgages with loan amounts in excess of $50,000, the area where bunching starts, i.e., $\underline{c}$ is equal to 5.75% and for loan amounts less than $50,000, it is equal to 7.75%, as shown in Figures 2.

11

3 Results

Response to the Thresholds   Figure 1 shows the distributions of loans by bin of interest rate spread around the 6.5% and 8.5% HOEPA thresholds.[9] Notice that there is no excess mass at 6.5% and 8.5% in years 2010 to 2013, when the two HOEPA thresholds did not exist, as shown in Figures 1a and 1b. As the thresholds are introduced in 2014, an excess mass appears just below the 6.5% and 8.5% thresholds and grows bigger in later years, as shown in Figures 1c and 1d. The response is large, affecting loans with interest rate spreads above the cutoffs, implying that lenders prefer cutting interest rates by several percentage points rather than being subject to additional borrower protections.

These figures provide non-parametric evidence of the fact that lenders respond to the policy discontinuity by decreasing the number of loans above the thresholds and increasing them just below the thresholds. Figures 2 plot the difference between the 2013 and 2014 and 2017 distributions for the 6.5% and 8.5% cutoffs, with the corresponding 95% confidence intervals based on bootstrapped standard errors.[10] The figure shows that the differences close to the cutoffs are statistically significantly different from zero.

Figures 3a and 3b show the pre- and post-reform number of loans just below and above the two HOEPA thresholds. These figures show that the bins that are 1.5 to 1 interest points below the threshold are not affected by the reform, whereas the ones that are less than 1 point below the threshold experience a large increase immediately after the threshold is introduced at the expense of loans that are above the thresholds, which decrease discontinuously in 2014. In addition, these figures show that the overall supply of loans is not substantially negatively affected by the reform. This is important because many of the arguments against borrower protection assert that such regulations will end up hurting consumers by cutting the supply of loans, an effect that does not appear to be at play here, undermining such arguments.

In principle, the total credit issued could also be affected by a decrease in the loan amounts via

---

[9]Appendix Figures A.1, A.2, A.3 and A.4 show the distributions for years 2010 to 2017 separately for each year and for mortgages with amounts lent above and below the $50,000 cutoff.

[10]The difference between 2013 and 2015 and 2016 are included in Appendix Figures A.5 and A.6.

an intensive margin response – by decreasing amounts lent per loan. However, Appendix Figure A.8 shows that the total credit issued for loans in the neighborhood of the HOEPA threshold has not substantially changed at the time of the reform.

As the number of loans below the threshold increases below and decreases above the threshold, average interest rates should decrease. Figures 3c and 3d plot the average interest rate for loans just below and above the two HOEPA thresholds. These figures show a decrease in interest rates, which is confirmed in Table 1, which shows the result of estimating equation (2) on interest rates. I estimate a 0.6 percentage point decrease (loans greater than $50,000) and 0.93 percentage point decrease (loans smaller than $50,000) in average interest rates for loans issued just below and above the cutoffs. This implies substantial savings for borrowers. Given that the average loan amount is $80,000 for loans in excess of $50,000 and $29,000 for loans smaller than $50,000, and assuming a loan term of 30 years, this amounts to interest payment savings over the entire loan of $21,000 for the former and $8,236 for the latter. Given the size of the population affected by these loans, the aggregate interest savings amount to approximately $500 million for a majority low-income population.

Overall, this implies that the reform resulted in a decrease in average interest rates, with no substantial negative supply effects. Assuming that the goal of this policy was to provide additional borrower protection rather than decrease interest rates, these effects appear to be unintended consequences of the policy intervention. Rather than offering additional borrower protections, lenders are avoiding them by forgoing profits from interest rates, which would imply that the profits they derive from hidden prices are likely high.

Entry and Exit of Lenders   Presumably, if the high-interest mortgage market is competitive and lenders are forced to decrease interest rates, we should observe some lenders exiting the market. If instead, lenders are charging substantial markups on interest rates, they would be able to withstand a decrease in interest rates.

Testing for whether lenders exit the high-interest mortgage market is not straightforward be-

cause banks do not tend to specialize in high-interest loans as shown in Figures 4c and 4d which plot the distribution of high-interest loans as a percentage of total loans issued by a given bank before and after the HOEPA threshold is introduced. While there is an excess mass at zero, implying that some banks never issue high-interest mortgages, there is no spike around 1, implying that no banks specialize in high-interest mortgages. These figures show that the proportion of high-interest loans in a given bank's portfolio of loans decreases sharply after the HOEPA threshold is introduced. Figures 4a and 4b, which compare the number of banks issuing loans above the HOEPA thresholds to just below them, show that the number of lenders issuing loans above the cutoffs drops discontinuously when the cutoffs are introduced, which could be consistent with these lenders exiting the lending market altogether or simply not issuing anymore loans above the interest rate spread cutoffs.

4 Implications and Alternative Explanations

4.1 Implications

Lenders are averse to borrower protections. As shown in Figures 3c and 3d, lenders actively reduce interest rates in order to approve mortgages that are just below the HOEPA cutoffs. This implies that they are willing to trade off profits from higher interest rates in exchange for laxer borrower protections. This is a revealed-preference argument that lenders value lax borrower protections possibly because it makes it easier for them to profit from borrowers' inattention to hidden fees, penalties, and shrouded attributes in general. This also suggests, at least for high-interest loans, that a non-trivial portion of lenders' profits are generated by fees and penalties rather than the interest rates they charge.

Borrower protection does not appear to reduce the supply of high-interest loans. Since average loan amounts and the number of loans approved do not decrease following the introduction of the 6.5% and 8.5% HOEPA thresholds, as shown in Figures 3a and 3b, it is reasonable to claim

that this type of protection does not reduce the supply of high-interest loans. This is particularly important because critics of consumer protections argue that they can end up harming consumers by imposing additional burdens on suppliers which can lead them to reduce the total supply of credit, which does not appear to be the case here.

Are borrowers better off after the reform?   After the reform, borrowers receive lower interest rates – on average 0.6 to 0.9 percentage points lower – and do not suffer any meaningful credit supply cuts. Therefore, ceteris paribus, they should be better off. However, it is possible that lenders compensate for the decrease in interest rates with higher hidden fees and penalties, as long as they do not exceed certain thresholds set by the 2013 HOEPA Rule as that would trigger HOEPA coverage (see Section 1.2). Therefore, the welfare implications of the reform for consumers is ambiguous: on the one hand they benefit from lower interest rates, but on the other hand they could be paying higher fees and penalties.

4.2   Alternative Explanations

Administrative costs.   The main alternative explanation to lenders avoiding borrower protections because they want to keep charging hidden fees and using hidden prices is that they want to avoid the regulations because they impose administrative costs on them. If the administrative costs of offering loans subject to HOEPA coverage exceed the profits lenders realize from being able to charge higher interest rates, it is conceivable that some lenders will reduce interest rates in order to avoid these costs.

This explanation is unlikely for two reasons. First, if borrowers are less elastic than lenders, which is likely to be the case for high-interest loans, a simple incidence model would predict that the additional administrative costs of HOEPA regulations would be passed through to borrowers via an increase in interest rates, instead I observe a decrease in interest rates. Second, and more important, all lenders, irrespective of whether they issue loans subject to HOEPA coverage or not, are now subject to the administrative costs of complying with the HOEPA regulations. This is

clearly stated in the guidelines issued by CFPB to lenders and can found on Section 6 (page 30) of the guide.[11]

Misreporting. Could lenders be fraudulently misreporting interest rates in order to avoid HOEPA coverage? While I do not have evidence in support of or against this, it seems reasonably unlikely that lenders would engage in such behavior for the following reasons: (1) banks can face criminal charges if they forge documents related to mortgage contracts, and (2) this data is routinely audited by the CFPB, which ensures that the information reported corresponds to the actual contract issued, and given that the CFPB implemented the regulation, one can reasonably expect that they would audit banks that bunch below the threshold. Overall, the expected cost of misreporting APRs is likely to greatly exceed the profits forgone by simply charging lower APRs, especially given that there are very few banks that specialize in HOEPA loans exclusively (see Figures 4c and 4d.). However, even if banks were to engage in fraudulent misreporting, this would even further reinforce the message of this paper, which is that lenders can go to great lengths – in this case, committing perjury and facing criminal charges – in order to avoid implementing borrower protection clauses.

Demand response. Part of the goal of the 2013 HOEPA regulations is to inform borrowers who contract loans above the two cutoffs of the loan terms. Could it be that once borrowers are better informed, they request lower interest rates? While possible in principle, the evidence from Figure 1 does not seem to fit this explanation well. In particular, if this is the case, it is unclear why newly informed borrowers would request loans that are exactly at the threshold. A more plausible demand-driven explanation is that once informed, borrowers would request lower fees and penalties but not necessarily lower APRs, since fees and penalties are made more salient by the 2013 HOEPA regulation, whereas APRs were always disclosed.

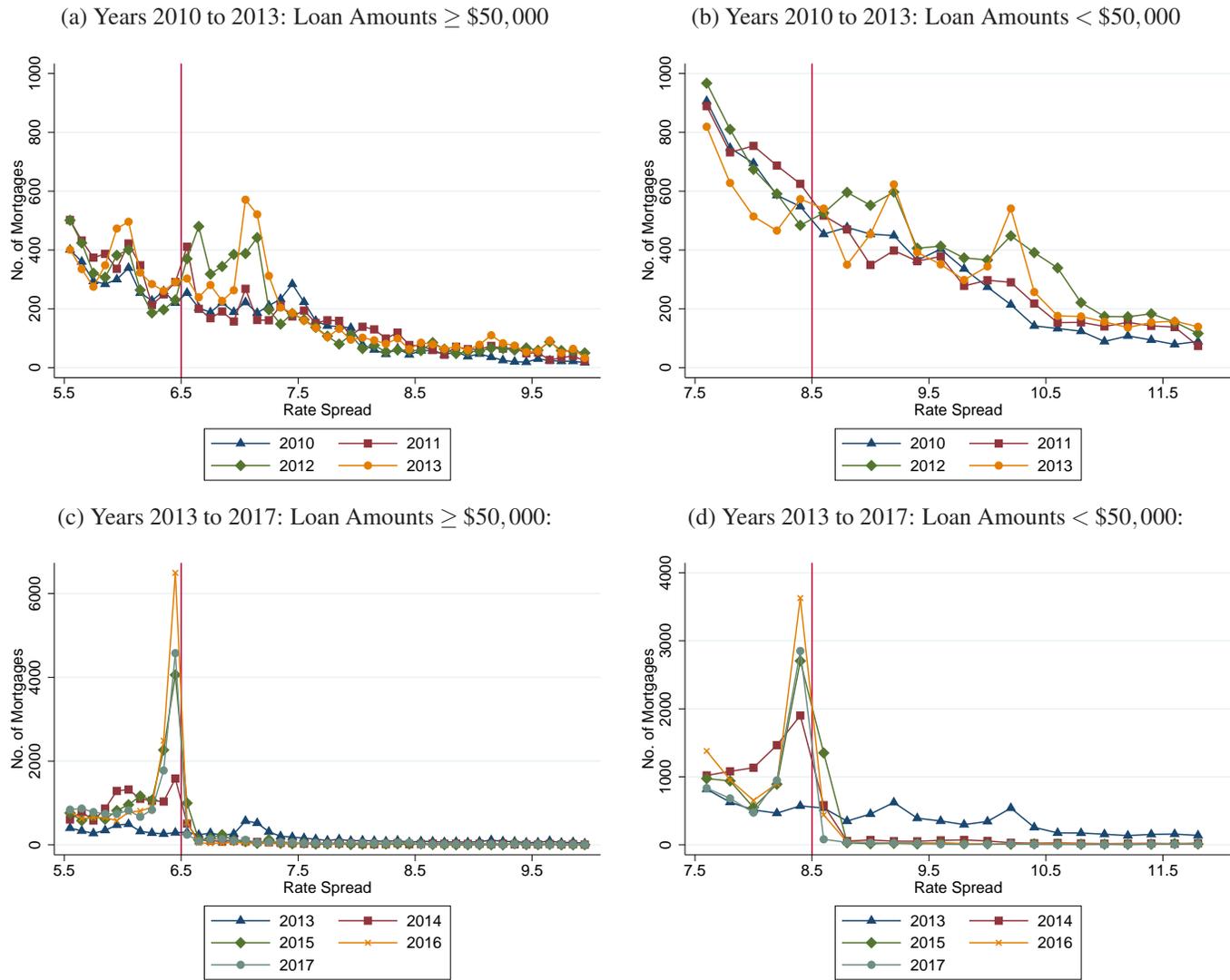
[11]The guide can be found here: link.

5 Conclusion

Consumer protection is controversial. On the one hand, advocates of "laissez-faire" believe that, as long as markets function properly, consumer protection is unnecessary. On the other hand, advances in behavioral economics suggest otherwise: if consumers are inattentive, predatory firms can thrive. In this paper, I show that lenders are willing to forgo profits from higher interest rates in order to avoid consumer protection, which I argue is consistent with the latter hypothesis.

References

Agarwal, Sumit, Souphala Chomsisengphet, Neale Mahoney & Johannes Stroebel. 2014. Regulating Consumer Financial Products: Evidence From Credit Cards. *The Quarterly Journal of Economics* 130(1). 111–164.

Allcott, Hunt & Dmitry Taubinsky. 2015. Evaluating Behaviorally Motivated Policy: Experimental Evidence From The Lightbulb Market. *American Economic Review* 105(8). 2501–38.

Best, Michael Carlos, James Cloyne, Ethan Ilzetzki & Henrik Kleven. forthcoming. Estimating The Elasticity Of Intertemporal Substitution Using Mortgage Notches. The Review of Economic Studies, forthcoming.

Blomquist, Sören & Whitney Newey. 2017. The Bunching Estimator Cannot Identify The Taxable Income Elasticity. Working paper National Bureau of Economic Research.

Bordalo, Pedro, Nicola Gennaioli & Andrei Shleifer. 2012. Salience Theory Of Choice Under Risk. *The Quarterly Journal of Economics* 127(3). 1243–1285.

Chetty, Raj, John N Friedman, Tore Olsen & Luigi Pistaferri. 2011. Adjustment Costs, Firm Responses, and Micro vs. Macro Labor Supply Elasticities: Evidence From Danish Tax Records. *The Quarterly Journal ff Economics* 126(2). 749–804.

DeFusco, Anthony, Stephanie Johnson & John Mondragon. Forthcoming. Regulating household leverage. The Review of Economic Studies.

DeFusco, Anthony A & Andrew Paciorek. 2017. The interest rate elasticity of mortgage demand: Evidence from bunching at the conforming loan limit. *American Economic Journal: Economic Policy* 9(1). 210–40.

DellaVigna, Stefano & Ulrike Malmendier. 2006. Paying Not To Go To The Gym. *American Economic Review* 96(3). 694–719.

Duarte, Fabian & Justine S Hastings. 2012. Fettered Consumers And Sophisticated Firms: Evidence From Mexico's Privatized Social Security Market. Working paper National Bureau of Economic Research.

Eliaz, Kfir & Ran Spiegler. 2006. Contracting with Diversely Naive Agents. *The Review of Economic Studies* 73(3). 689–714.

Gabaix, Xavier & David Laibson. 2006. Shrouded Attributes, Consumer Myopia, And Information Suppression In Competitive Markets. *The Quarterly Journal of Economics* 121(2). 505–540.

Grubb, Michael D. 2009. Selling to Overconfident Consumers. *American Economic Review* 99(5). 1770–1807.

Heidhues, Paul & Botond Kőszegi. 2008. Competition and Price Variation When Consumers Are Loss Averse. *American Economic Review* 98(4). 1245–68.

Heidhues, Paul & Botond Kőszegi. 2010. Exploiting Naivete About Self-Control In the Credit Market. *American Economic Review* 100(5). 2279–2303.

Heidhues, Paul & Botond Kőszegi. 2017. Naivete-Based Discrimination. *The Quarterly Journal of Economics* 132(2). 1019–1054.

Heidhues, Paul, Botond Kőszegi & Takeshi Murooka. 2016. Inferior Products and Profitable Deception. *The Review of Economic Studies* 84(1). 323–356.

Heidhues, Paul, Botond Kőszegi & Takeshi Murooka. 2017. Exploitative Innovation. *American Economic Journal: Microeconomics* 8(1). 1–23.

Iacoviello, Matteo M. 2011. Housing Wealth and Consumption. *FRB International Finance Discussion Paper* (1027).

Kleven, Henrik J & Mazhar Waseem. 2013. Using Notches to Uncover Optimization Frictions and Structural Elasticities: Theory and Evidence From Pakistan. *The Quarterly Journal of Economics* 128(2). 669–723.

Kőszegi, Botond & Adam Szeidl. 2012. A Model of Focusing in Economic Choice. *The Quarterly Journal of Economics* 128(1). 53–104.

Murooka, Takeshi. 2013. Deception Under Competitive Intermediation. Working paper.

Saez, Emmanuel. 2010. Do Taxpayers Bunch at Kink Points? *American economic Journal: economic policy* 2(3). 180–212.

Saez, Emmanuel & Gabriel Zucman. 2016. Wealth Inequality In the United States Since 1913: Evidence from Capitalized Income Tax Data. *The Quarterly Journal of Economics* 131(2). 519–578.

Shapiro, Carl. 1995. Aftermarkets and Consumer Welfare: Making Sense of Kodak. *Antitrust Law Journal* 63(2). 483–511.

Skiba, Paige Marta & Jeremy Tobacman. 2008. Payday Loans, Uncertainty and Discounting: Explaining Patterns of Borrowing, Repayment, And Default. *Vanderbilt Law and Economics Research Paper* (08-33).

Figure 1: Pre- and Post-Reform Distributions of Loans By Interest Rate Spread

(a) Years 2010 to 2013: Loan Amounts ≥ $50,000

(b) Years 2010 to 2013: Loan Amounts < $50,000

(c) Years 2013 to 2017: Loan Amounts ≥ $50,000:

(d) Years 2013 to 2017: Loan Amounts < $50,000:

Notes: These figures plot the distribution of mortgages by interest rate spread before and after the 2014 introduction of the HOEPA cutoffs. The vertical red line represents the 6.5% and 8.5% HOEPA cutoffs. The bin size is 0.1 for mortgages with loan amounts ≥ $50,000 and 0.2 for mortgages with loan amounts < $50,000.

Figure 2: Short- and Long-Run Difference in Pre- and Post-Reform Distributions

(a) 2014-2013: Loan Amounts≥$50,000
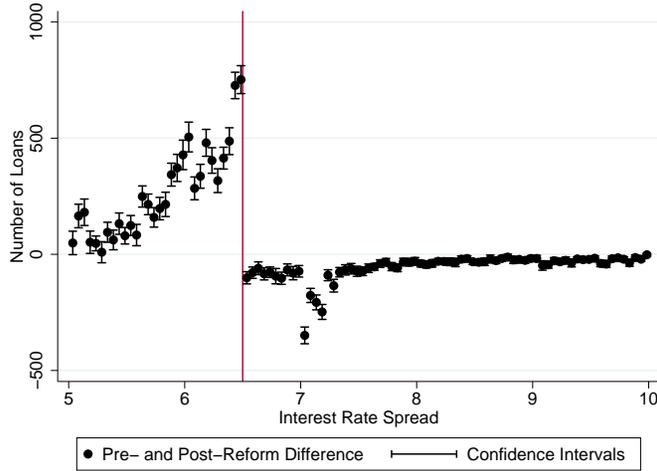
(b) 2017-2013: Loan Amounts≥$50,000
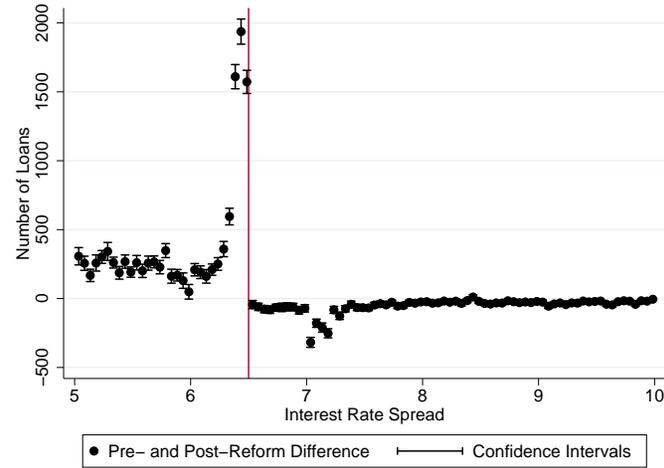
(c) 2014-2013: Loan Amounts<$50,000
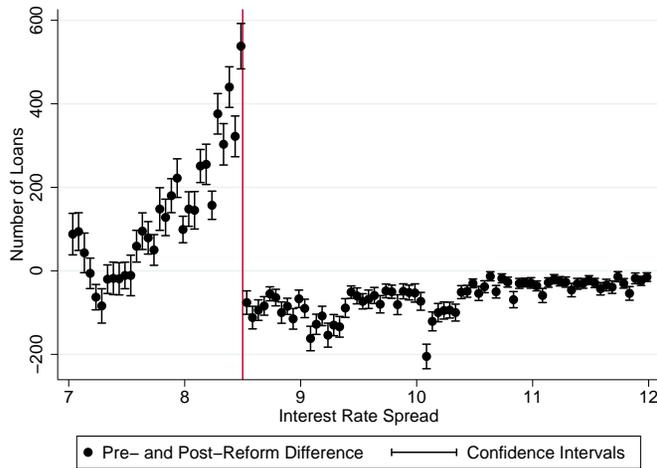
(d) 2017-2013: Loan Amounts<$50,000
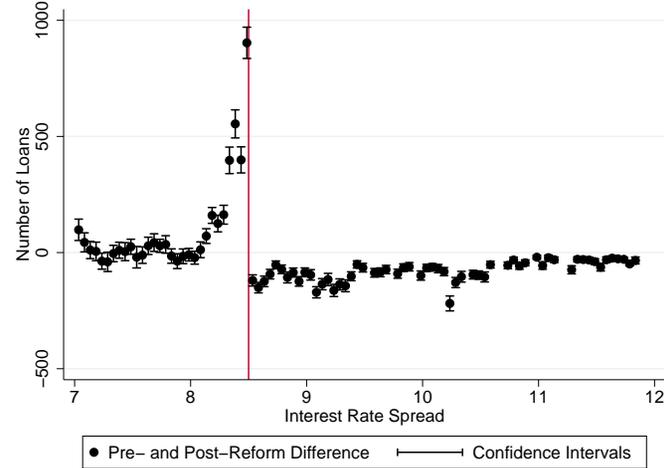
Notes: These figures plot the difference in the pre- and post-reform distributions around the two HOEPA cutoffs. Figures 2a and 2b compare 2013 to 2014 and 2013 to 2017 for the 6.5% interest rate spread cutoff. Figures 2c and 2d compare 2013 to 2014 and 2013 to 2017 for the 8.5% interest rate spread cutoff. The red vertical line represents the HOEPA cutoff and the bin size is 0.05. The bars represent the corresponding 95% confidence intervals.

Figure 3: Number of Loans and Average Interest Rates Over Time

(a) Number of Loans: Loan Amounts ≥$50,000

(b) Number of Loans: Loan Amounts <$50,000

(c) Interest Rate Spread: Loans ≥$50,000

(d) Interest Rate Spread: Loans <$50,000
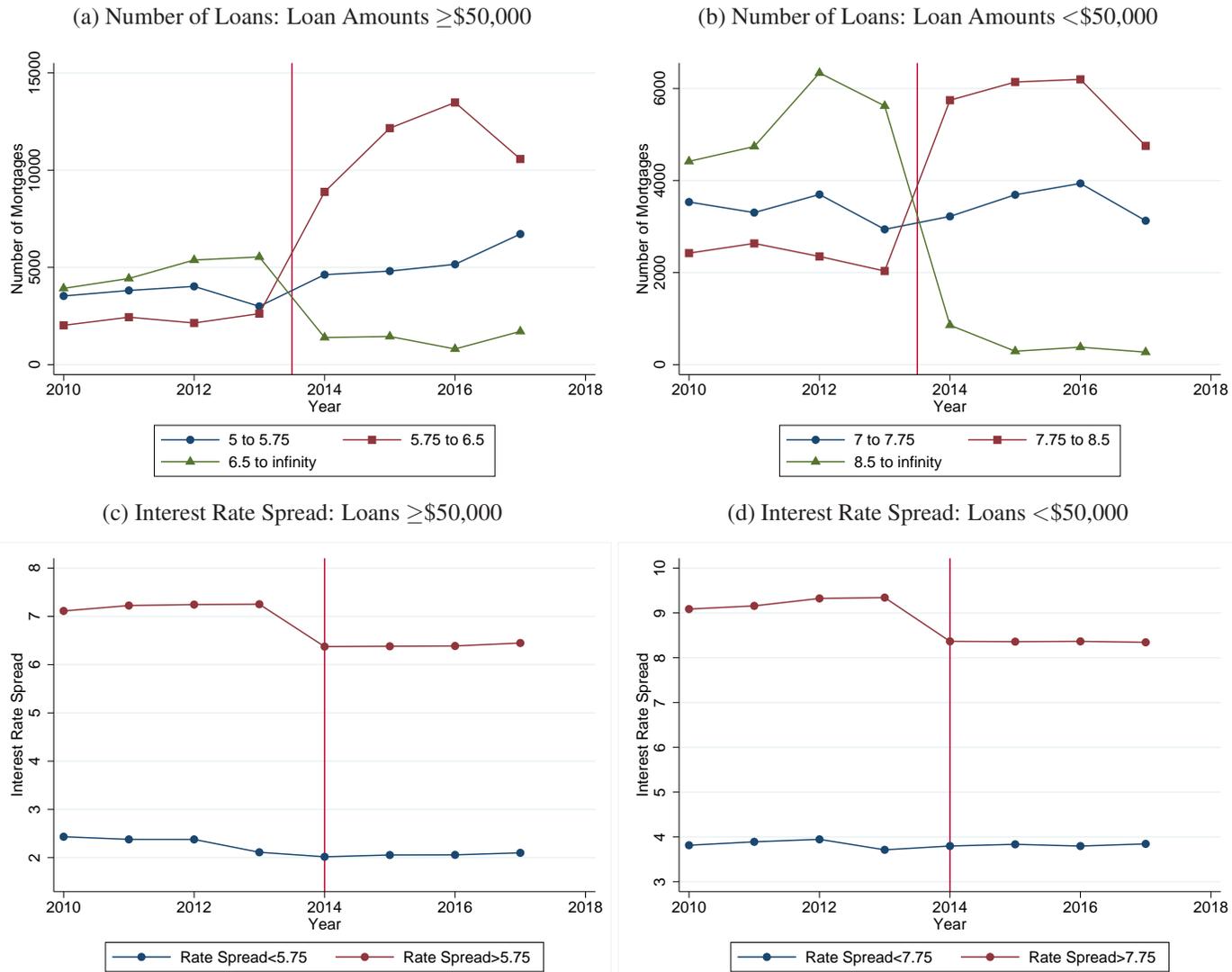
Notes: Figures 3a and 3b plot the number of loans approved over time in the neighborhood of the two HOEPA thresholds. Figures 3c and 3d plot the average interest rates over time for loans just below and above the two HOEPA cutoffs compared to all other loans. Note that I do not use a lower bound on interest rates for the control group because it would otherwise artificially bound the series (as shown in Appendix Figure A.7).

Figure 4: Entry and Exit of Lenders As a Response to the HOEPA Regulation

(a) Number of High-Interest Lenders Around the 6.5% Cutoff   (b) Number of High-Interest Lenders Around the 8.5% Cutoff
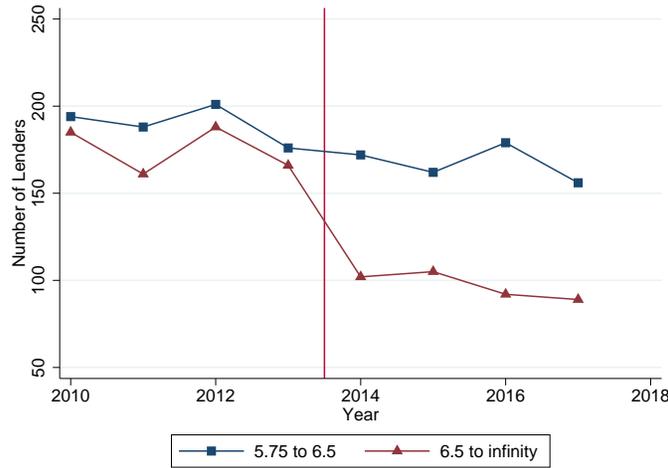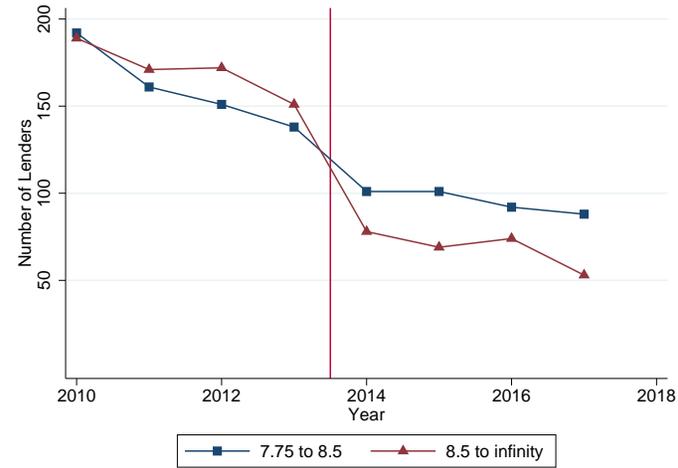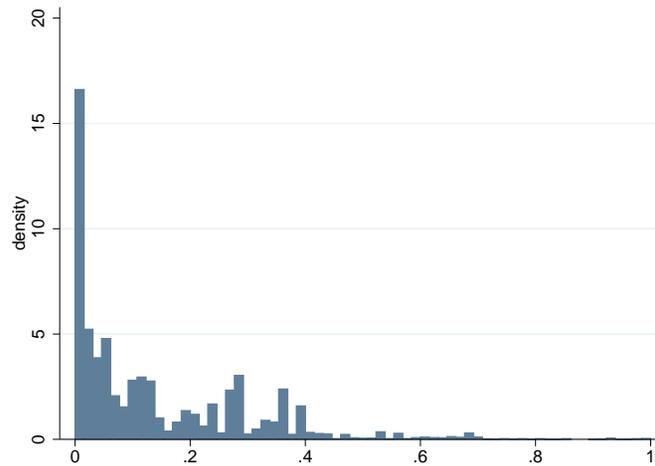
(c) Pre-Reform Distribution of the Percentage of HOEPA Loans by Lender   (d) Post-Reform Distribution of the Percentage of HOEPA Loans by Lender
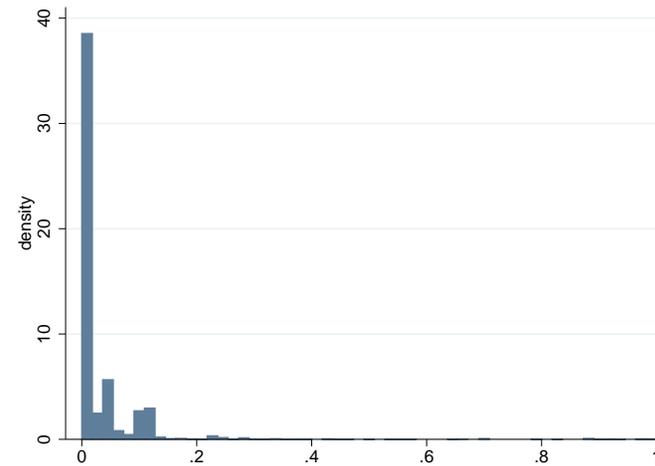
Notes: Figures 4a and 4b compare the number of lenders who issue loans above the HOEPA cutoff compared to just below the cutoff, for each of the two HOEPA cutoffs. These distributions do not include lenders who do not issue any HOEPA loans. (See Appendix Figure A.9 for the distributions that include these lenders). Figures 4c and 4d plot the distribution of the percentage of HOEPA loans in a given lender's total portfolio of loans for pre- and post-reform years, respectively.

Table 1: Effect of the Reform on Interest Rates and Loan Amounts

	Loan Amount $\geq \$50,000$		Loan Amount $< \$50,000$	
	Rate Spread	Loan Amount	Rate Spread	Loan Amount
After×Treat	-0.60	-7.71	-0.93	1.32
	(0.15)	(8.54)	(0.23)	(0.75)
Treat	4.94	-71.0	5.49	-1.94
	(0.091)	(5.19)	(0.14)	(1.72)
After	-0.23	22.3	-0.026	1.82
	(0.033)	(2.91)	(0.13)	(0.42)
Constant	2.29	151.5	3.84	29.4
	(0.045)	(2.41)	(0.13)	(0.37)
R^2	0.52	0.0064	0.45	0.0077
Observations	2,473,899	2,473,721	595,451	595,451

Notes: This table reports the results of estimation equation (2). Standard errors are clustered at the lender level and are in parentheses.

A   APPENDIX: FOR ONLINE PUBLICATION

Table A.1: Summary Statistics

	Low-Interest Loans	High-Interest Loans	Difference
Income ($1,000)	113.9	60.6	53.3
	(0.023)	(0.14)	(0.32)
N	50,748,360	261,306	
Proportion African American	4.65%	10.3%	-5.65%
	(0.0000284)	(0.0005892)	(0.0004103)
N	55,005,012	266,201	
Proportion Hispanic	7.25%	11.90%	-4.65%
	(0.000035)	(0.0006275)	(0.0005044)
N	55005012	266,201	
Proportion Female	25.83%	34.01%	-8.18%
	(0.000059)	(0.0009182)	(0.0008508)
N	55,005,012	266,201	

Notes: This table shows summary statistics for low- versus high-interest borrowers. Standard errors are in parentheses.

Figure A.1: Pre-Reform Distributions for Loan Amounts $\geq \$50,000$
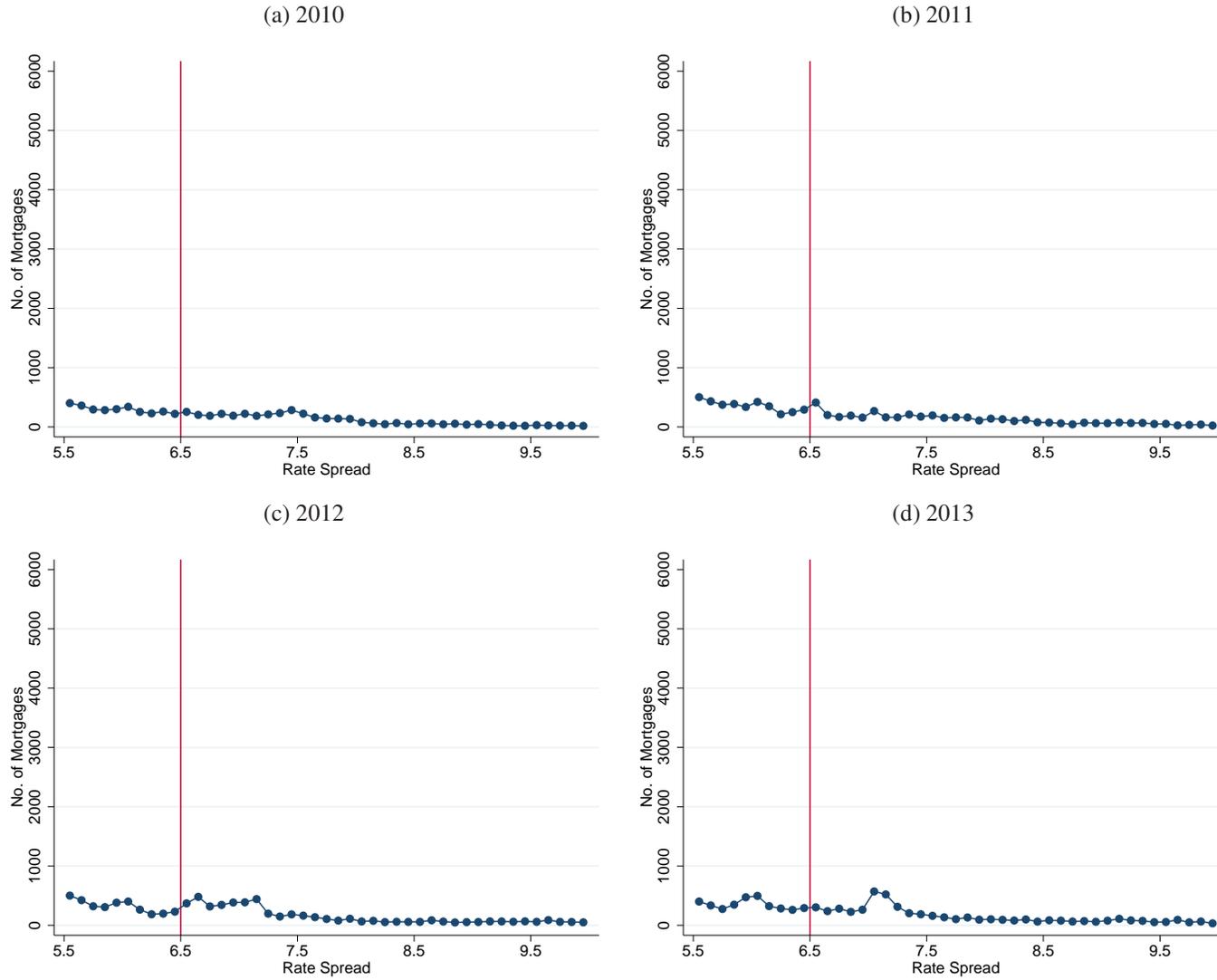
(a) 2010

(b) 2011

(c) 2012

(d) 2013

Notes: These figures plot the distribution of loans with interest rate spreads $\geq 5.5\%$ for loan amounts $\geq \$50,000$ in 2010, 2011, 2012, and 2013. The red vertical line marks the 6.5% HOEPA cutoff introduced in 2014. The bin size used is 0.1.

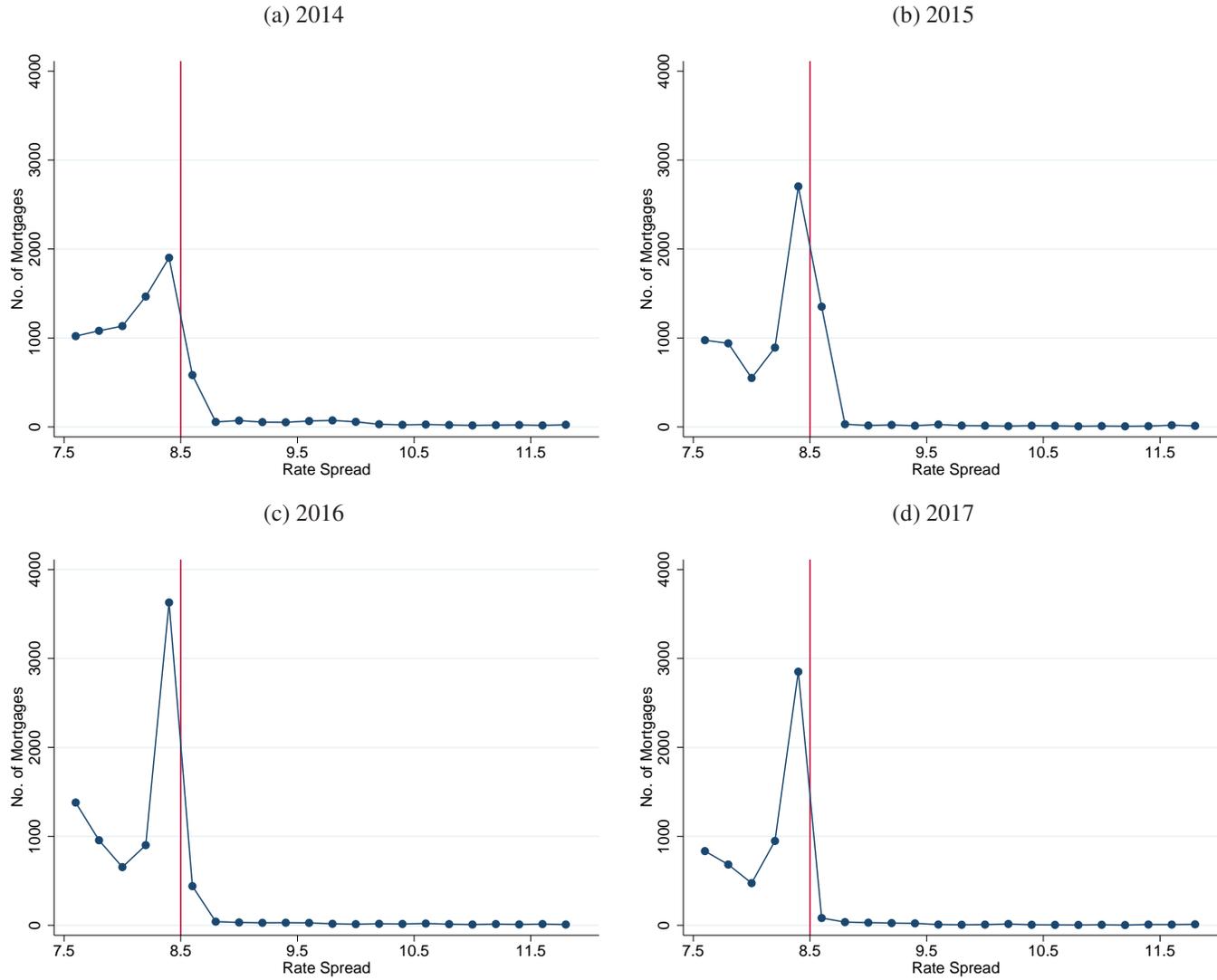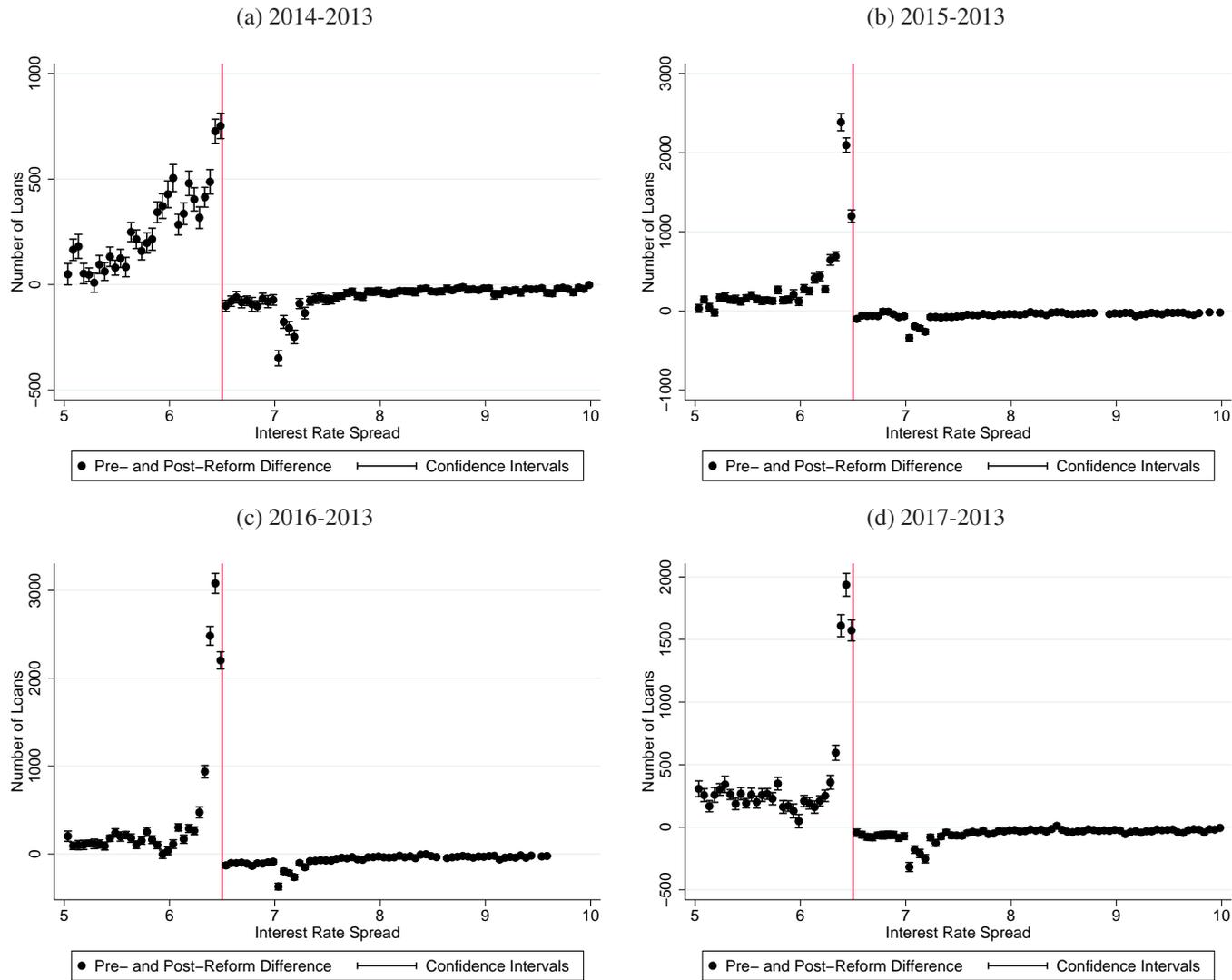## Figure A.2: Post-Reform Distributions for Loan Amounts $\geq \$50,000$
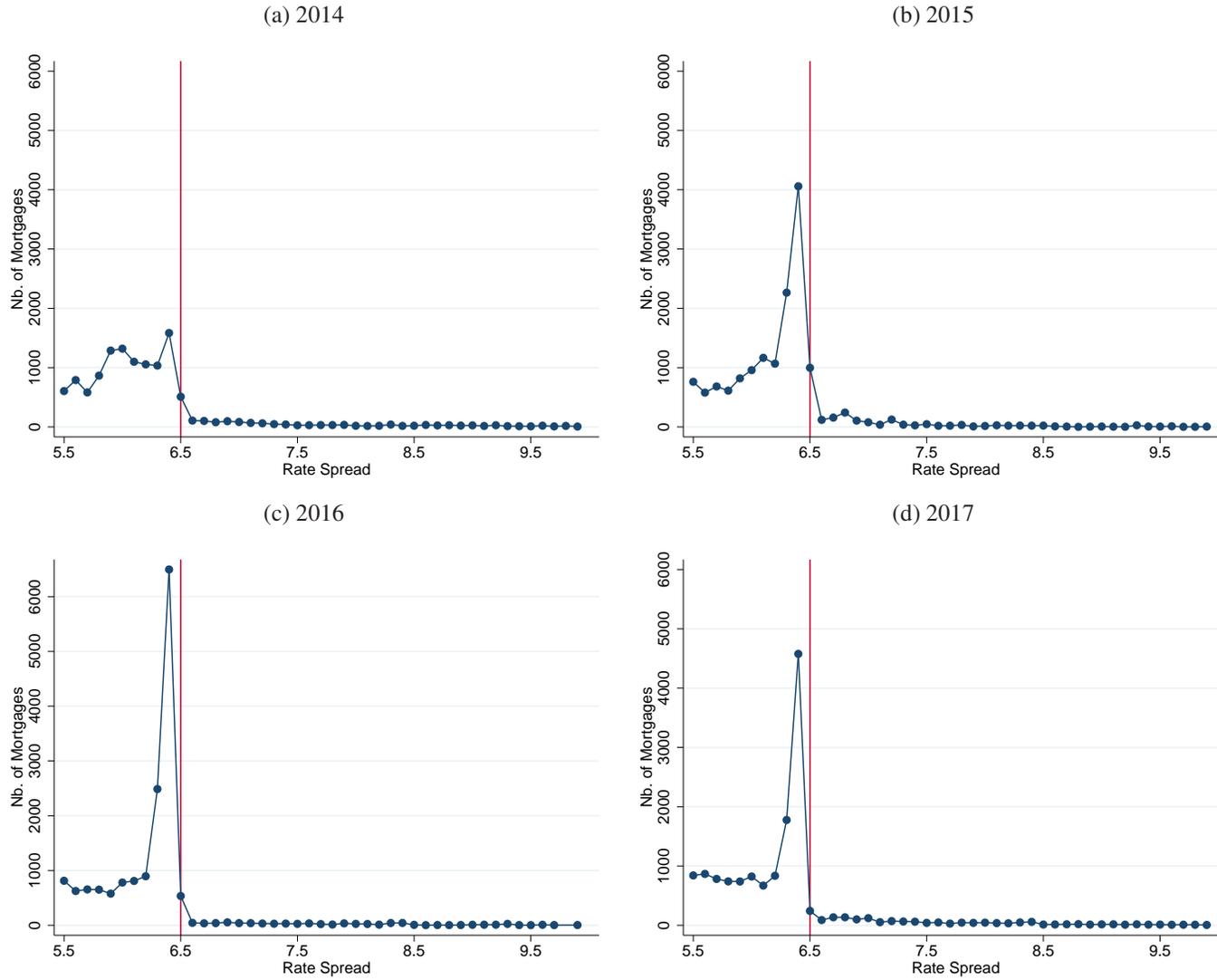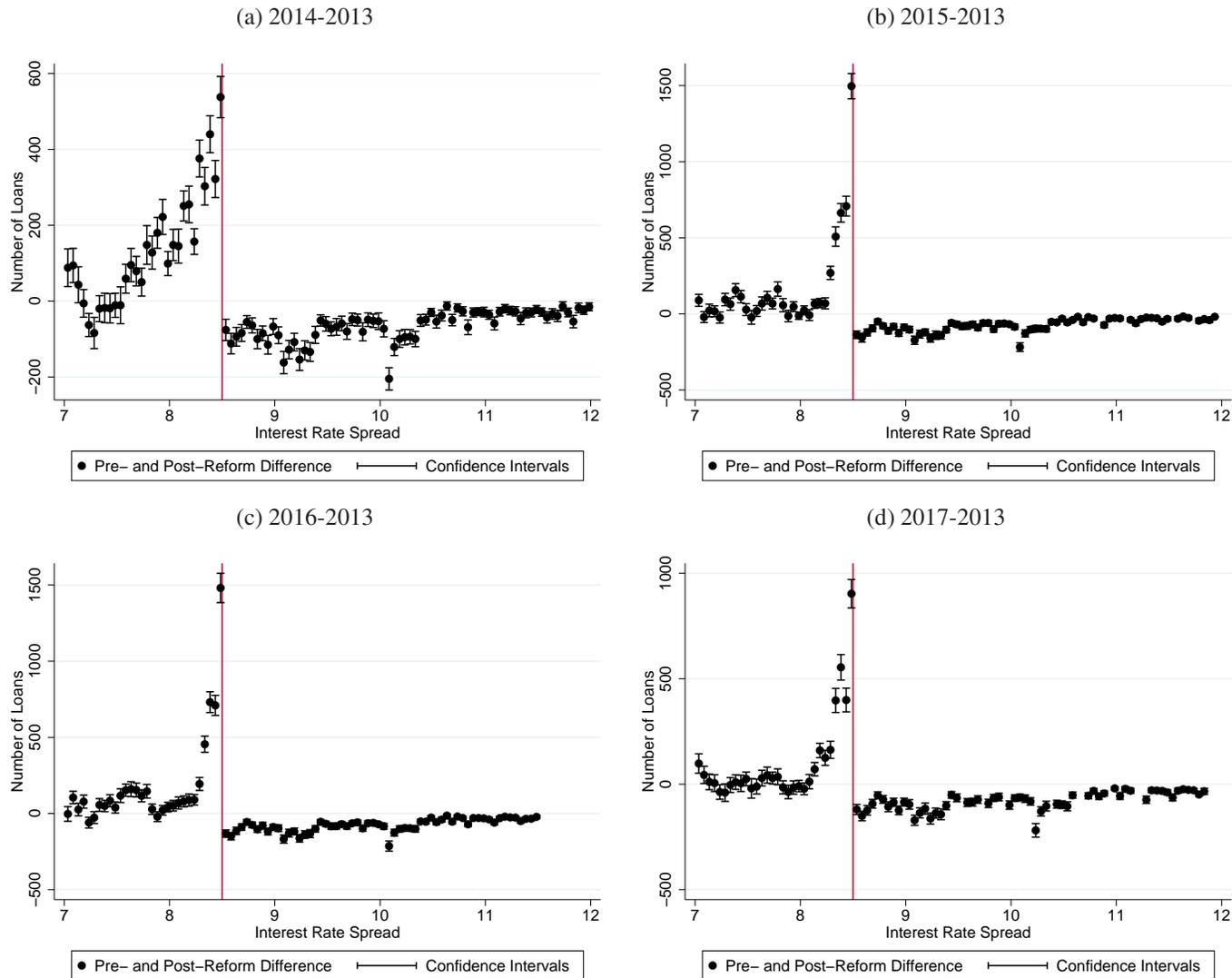
(a) 2014

(b) 2015

(c) 2016

(d) 2017

Notes: These figures plot the distribution of loans with interest rate spreads $\geq 5.5\%$ for loan amounts $\geq \$50,000$ in 2014, 2015, 2016, and 2017. The red vertical line marks the 6.5% HOEPA cutoff introduced in 2014. The bin size used is 0.1.

Figure A.3: Pre-Reform Distributions for Loan Amounts $< \$50,000$
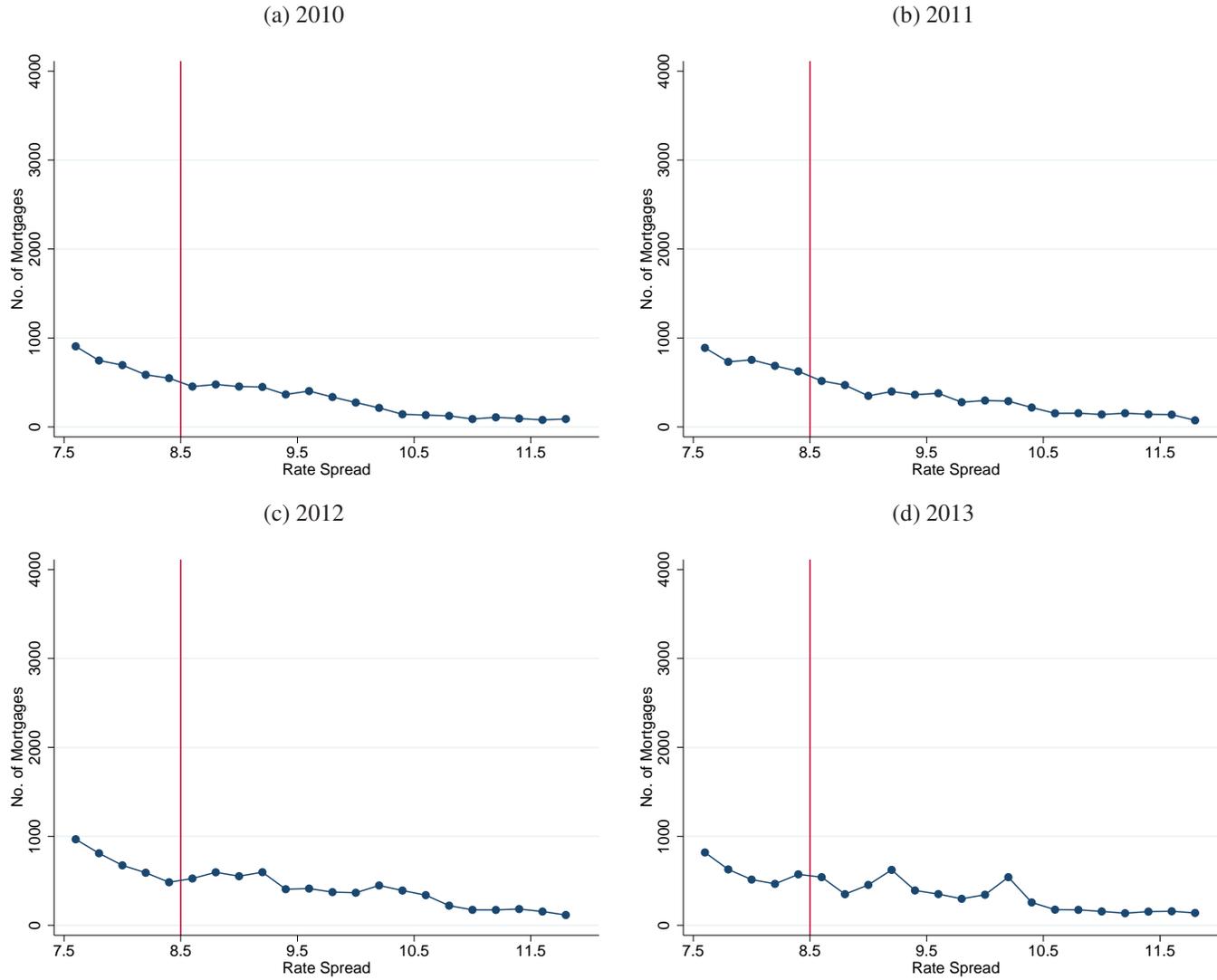
(a) 2010

(b) 2011

(c) 2012

(d) 2013

Notes: These figures plot the distribution of loans with interest rate spreads $\geq 7.5\%$ for loan amounts $< \$50,000$ in 2010, 2011, 2012, and 2013. The red vertical line marks the 8.5% HOEPA cutoff introduced in 2014. The bin size used is 0.2.

Figure A.4: Post-Reform Distributions for Loan Amounts $< \$50,000$

(a) 2014

(b) 2015

(c) 2016

(d) 2017

Notes: These figures plot the distribution of loans with interest rate spreads $\geq 7.5\%$ for loan amounts $< \$50,000$ in 2014, 2015, 2016, and 2017. The red vertical line marks the 8.5% HOEPA cutoff introduced in 2014. The bin size used is 0.2.

Figure A.5: Difference in Pre- and Post-Reform Distributions: Loan Amounts≥$50,000

(a) 2014-2013

(b) 2015-2013

(c) 2016-2013

(d) 2017-2013

Notes: These figures plot the difference in the pre- and post-reform distributions around the 6.5% HOEPA cutoff, comparing 2013 to 2014 (Figure A.5a), 2015 (Figure A.5b), 2016 (Figure A.5c) and 2017 (Figure A.5d). The red vertical line represents the 6.5% cutoff and the bin size is 0.05. The bars represent the 95% confidence intervals.

Figure A.6: Difference in Pre- and Post-Reform Distributions: Loan Amounts<$50,000

(a) 2014-2013

(b) 2015-2013

(c) 2016-2013

(d) 2017-2013

Notes: These figures plot the difference in the pre- and post-reform distributions around the 8.5% HOEPA cutoff, comparing 2013 to 2014 (Figure A.6a), 2015 (Figure A.6b), 2016 (Figure A.6c) and 2017 (Figure A.6d). The red vertical line represents the 8.5% cutoff and the bin size is 0.05. The bars represent the 95% confidence intervals.

Figure A.7: Average Interest Rate by Year with Lower Bound on Control Group

(a) interest-rate spread: Loans≥$50,000
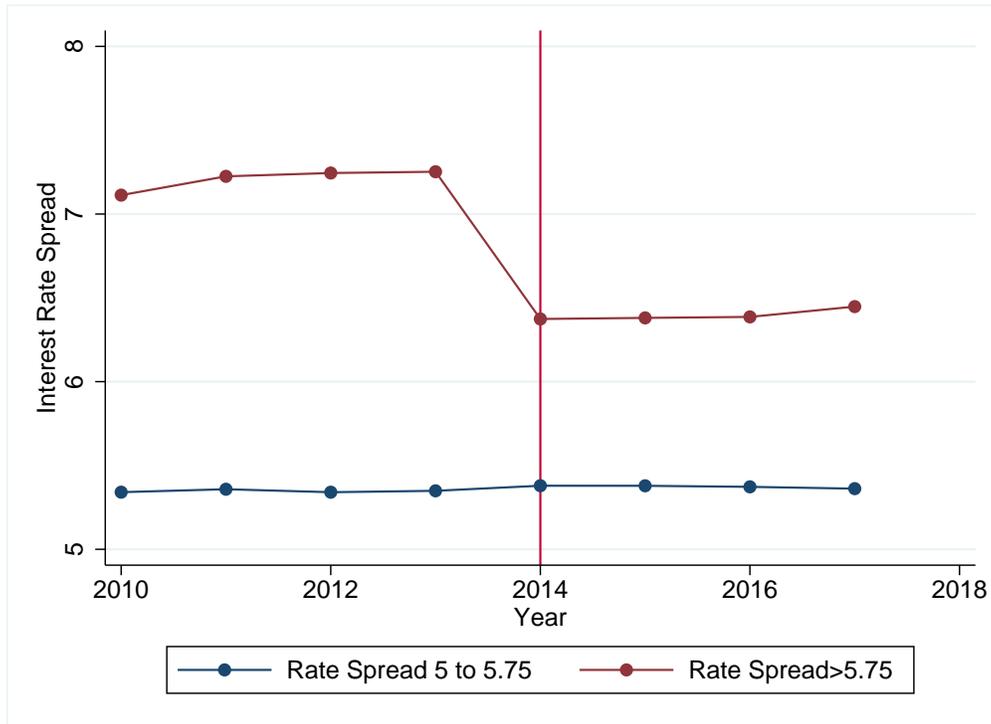
(b) interest-rate spread: Loans<$50,000
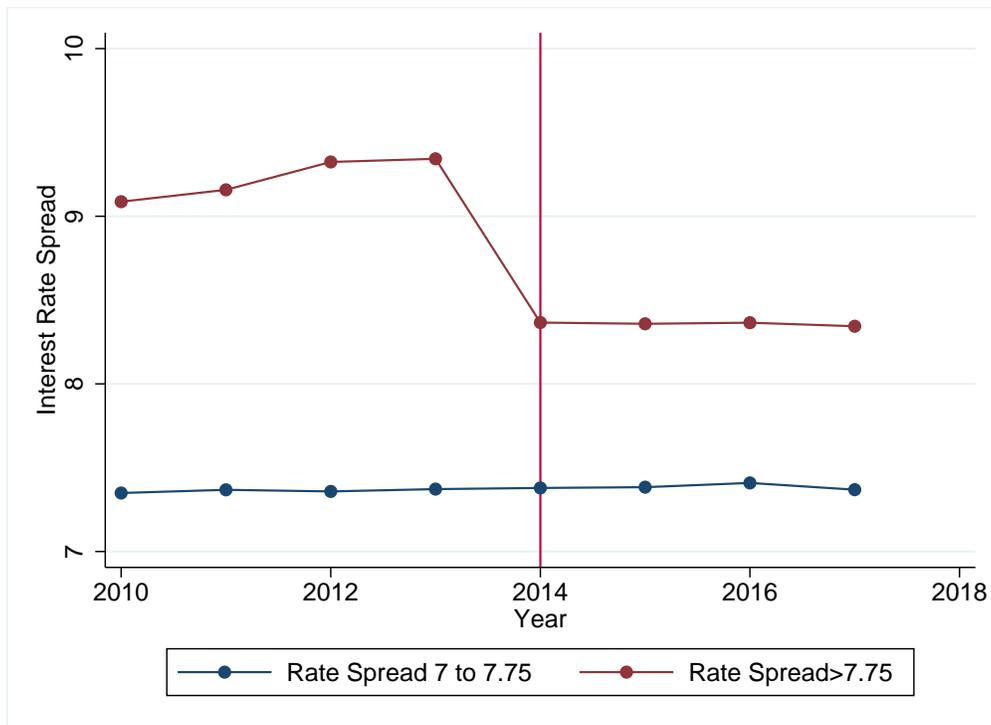
Notes: These figures plot the average interest rates over time for loans just below and above the threshold compared to all other loans. Note that the control group is defined as loans with interest-rate spreads ranging from 5 to 5.75% for the 6.5% HOEPA threshold and 7 to 7.75% for the 8.5% threshold.

Figure A.8: Total Credit

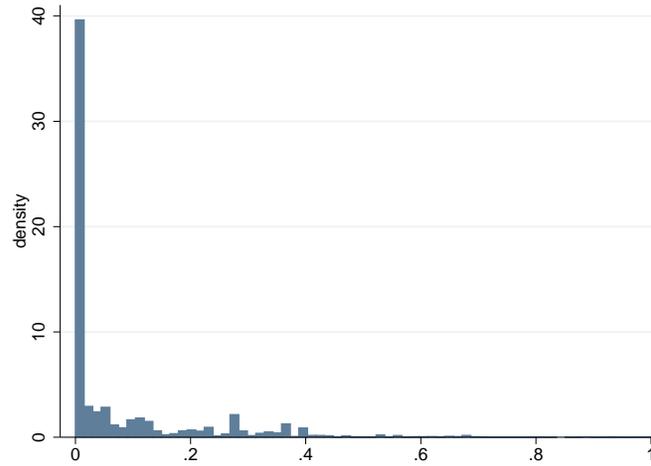### (a) Total Credit: Loans≥$50,000
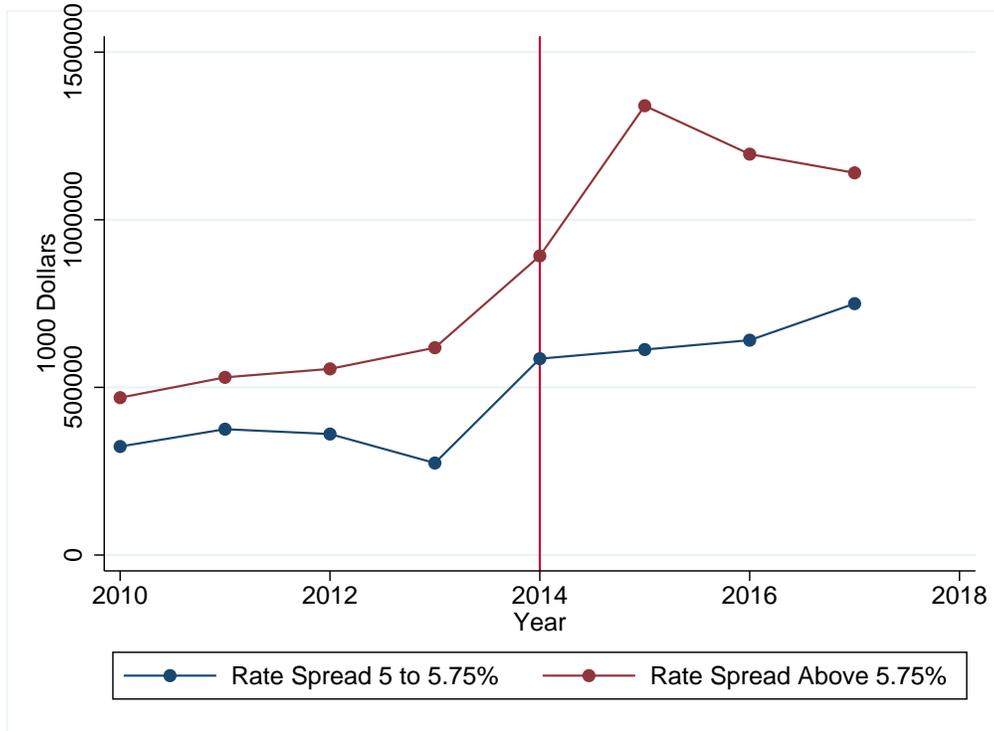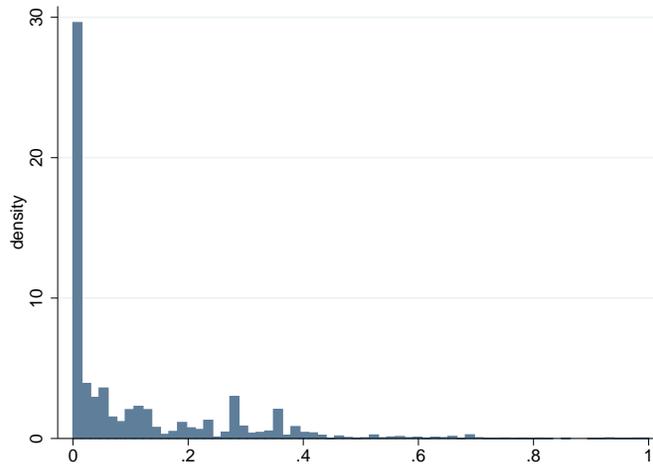

(b) Total Credit: Loans<$50,000
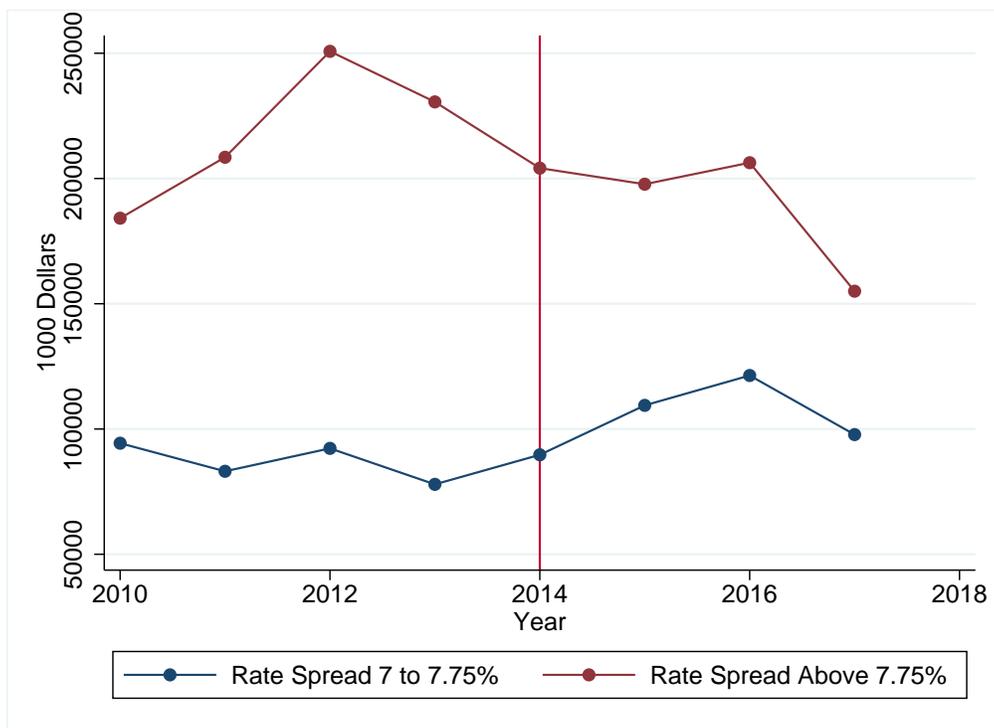
Notes: These figures plot the total credit approved for loans in the manipulated area close to the HOEPA cutoff compared to those that are just below this area.

Figure A.9: Distribution of the Percentage of HOEPA Loans in a Given Lender's Portfolio of Loans
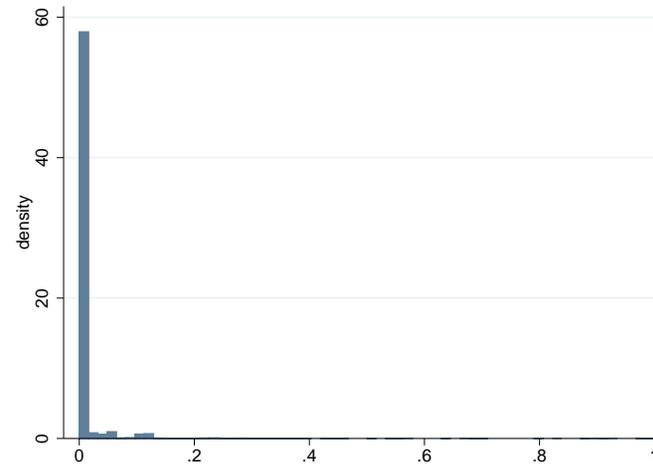
(a) All Years

(b) Pre-Reform Years

(c) Post-Reform Years

Notes: These figures plot the distribution of the percentage of HOEPA loans in a given lenders total portfolio of loans. Figure A.9a plots it for all years, A.9b for pre-reform years and A.9c for post-reform years. These distributions include lenders who do not issue any HOEPA loans.