Fraud Litigation and FHA Mortgage Lending[*]

Erik J. Mayer [†]   Billy Y. Xu [‡]   Lawrence Zhao [§]

August 30, 2023

We study the impact of recent increases in mortgage lenders' litigation risk on borrowers. In the last decade, the U.S. Department of Justice brought suits against many of the largest lenders in the FHA mortgage market, alleging fraud under the False Claims Act. These suits led to over \$5.4 billion in settlements and caused targeted banks and their peers to precipitously exit the FHA market. A combination of difference-in-differences and triple differences tests exploiting geographic variation in exposure to exiting banks show a 19% reduction in aggregate FHA lending in heavily affected areas. Smaller non-bank lenders with higher historical misconduct rates partially filled the void in the FHA market, highlighting potential unintended consequences of aggressive consumer financial protection litigation.

[†]Wisconsin School of Business, University of Wisconsin-Madison, erik.mayer@wisc.edu
[‡]Simon Business School, University of Rochester, billy.y.xu@rochester.edu
[§]Rawls College of Business, Texas Tech University, lawrence.zhao@ttu.edu

1. Introduction

In the wake of the 2008 financial crisis, policymakers faced substantial pressure from the public, the media, and academics to punish lenders who had engaged in dubious mortgage lending practices.[1] This pressure was particularly strong in the segment of the market where mortgages are insured by taxpayers through the Federal Housing Administration (FHA). In 2012, the Department of Justice (DOJ) began a major effort to bring litigation against mortgage lenders for alleged fraud in FHA originations. The lawsuits were brought under the False Claims Act, a Civil War era statute designed to prevent fraud against the Federal Government that was not typically used in mortgage lending. The increase in litigation risk and ensuing settlements were unprecedented. In this paper, we examine the effects of these legal actions on the supply of credit in the FHA mortgage market, which tends to serve lower-income and often first-time home buyers.

We start by collecting all of the DOJ's settlements with FHA mortgage lenders under the False Claims Act. We document that the DOJ settled with 35 lenders from 2012 to 2019, with fines totaling over $5.4 billion. The number of settlements rose between 2012 and 2016 and then declined as the political environment shifted.[2] We uncover a striking pattern: DOJ cases were almost entirely concentrated among the very largest FHA lenders (those in the top 5% of FHA volume), despite the fact that we do not find disproportionately higher misconduct rates among loan officers at these lenders.

We examine the response of lenders that face increased litigation risk in a regression setting. Our first exercise utilizes a difference-in-differences design at the county-lender-year level. We define litigated mortgage lenders and their peers (i.e., those in the top 5% of FHA volume) as treated because of the potential sobering effect of punishment on unpunished peers (D'Acunto et al. (2019)). We then compare the mortgage origination

---

[1]Typical fraudulent activities include misreporting of appraisal values, second-lien status, owner-occupancy status, income, and assets by borrowers and lenders. See Griffin (2021) for a review.

[2]During the congressional hearing, Ben Carson, the secretary of the Department of Housing and Urban Development (HUD) newly appointed in 2017, acknowledged that consumers had "fewer appropriate choices" and indicated that the HUD is "addressing that problem."

activity of treated lenders to that of other lenders in the FHA mortgage market, before and after the 2012 increase in DOJ litigation. Our test includes county-year and lender fixed effects to account for changes in demographics and local economic conditions, as well as unobserved lender heterogeneity. The results show that large banks with franchise value at risk reduced their FHA mortgage lending by more than half. In contrast, the largest shadow banks did not substantially reduce their lending in the FHA market.

Despite the strength of the difference-in-differences design, one might worry that treated lenders could be differentially affected by broader shifts in the mortgage market or operate in areas that exhibit different economic trends. Therefore, we implement a triple-difference design that uses conventional mortgage originations of treated and control lenders to enhance our counterfactuals and account for any trends not related to FHA litigation. The triple-difference results confirm our findings that large banks significantly reduced their FHA lending following the increase in litigation risk in 2012.

Although striking, the net impact of large bank exits on consumers' access to FHA mortgage credit is unclear. On the one hand, large banks play a vital role in the FHA market by originating nearly forty percent of FHA loans prior to 2012. On the other hand, smaller banks and shadow banks could fill in the gaps left by large banks. Ultimately, this is an empirical question.

Our main analysis examines the impact of legal actions against large mortgage lenders on consumers' access to mortgage credit. For identification, we exploit heterogeneity in county exposure to big banks and bank affiliates that were subject to increased litigation risk under the False Claims Act. Specifically, we define exposure as the 2010 market share of banks and bank affiliates that are in the top 5% in terms of FHA volume. We implement difference-in-differences tests at the county-year level to measure changes in aggregate FHA mortgage lending between counties where big FHA-participating banks had high ex ante market shares and counties where these banks had low ex ante market shares. Our primary results suggest that a one-standard-deviation increase in a county's exposure to big banks

and bank affiliates in 2010 corresponds to a 4.27% decline in total FHA lending in 2012 and onward.

The key underlying identification assumption in our empirical design is that FHA mortgage lending in counties with high and low exposure to big FHA banks would have trended similarly in the absence of legal actions under the False Claims Act. Some potential violations of the assumption include aggregate trends induced by other regulatory and legal pressures faced by lenders in the mortgage market in the post-financial crisis era and the endogeneity of bank branch locations and credit allocation decisions.

We present two pieces of evidence supporting the parallel trends assumption. First, we show that the level of FHA mortgages in high- and low-exposure counties moved together prior to the legal actions under the False Claims Act and only began to diverge in 2012. Second, we estimate a triple-difference model that includes conventional mortgages as an additional control group. Because only FHA-insured lending was subject to the False Claims Act, we use differential changes in conventional mortgage credit in high- and low-exposure counties as a proxy for across-county changes in aggregate mortgage market conditions. Estimates from the triple-difference specification are nearly identical to the baseline difference-in-differences results. These results suggest that our findings are not driven by alternative trends in the broader mortgage market.

The stated intention of the DOJ's legal actions was to combat perceived mortgage fraud. While we observe a decrease in access to FHA mortgage credit among high-exposure counties, it is possible that consumers benefited from an improvement in the average quality of lenders after those that allegedly engaged in mortgage fraud were punished. However, we find that consumers in high-exposure counties experienced a relative decrease in the average quality of loan officers at FHA lenders in the post-period. For a given county, a one-standard-deviation increase in the ex ante market share of big FHA-participating banks corresponds to a 9% increase in the likelihood of working with a loan officer with misconduct records in the post

3

period. Our results suggest that small shadow banks with a history of dubious mortgage lending practices partially filled in the gaps left by the exiting big banks.

Low-income borrowers and minority groups are disproportionately reliant on FHA mortgage loans. Next, we investigate whether there are differential impacts across racial groups. Our findings indicate that big banks pulled back lending equally, meaning that households of all racial and ethnic groups experienced the same credit tightening in percentage terms in the FHA market. However, the same percentage decline has different implications for white and minority households due to the difference in their reliance on the FHA market prior to the pullback. Black and Hispanic households rely on FHA mortgages twice as much as white households. In other words, the adverse effects on access to mortgage credit faced by minority borrowers were approximately twice as severe as those faced by white borrowers. We found that a one-standard-deviation increase in a county's exposure to FHA lending from big banks and bank affiliates corresponds to a decrease of 0.01 loans per 1,000 and $2.67 mortgage credit per capita among white borrowers. In contrast, a one-standard-deviation increase in exposure corresponds to a decrease of 0.04 loans per 1,000 and $50.05 mortgage credit per capita among minority borrowers. These results highlight the significant disparities in the impacts of credit tightening in the FHA market, with minority borrowers experiencing much greater reductions in the level of mortgage credit availability than their white counterparts.

We contribute to the literature on mortgage fraud, which is widely considered one of the main causes of the 2008 financial crisis.[3] Previous studies show evidence of widespread mortgage fraud related to misrepresentations of borrower income (Jiang et al. (2014), Ambrose et al. (2016), Mian and Sufi (2017)), borrower assets (Garmaise (2015)), appraisals (Ben-David (2011), Griffin and Maturana (2016)), and second liens and owner-occupancy status (Piskorski et al. (2015), Griffin and Maturana (2016)). Lenders either directly engaged in misrepresentations or knowingly neglected misrepresentations by the borrowers. As

---

[3]See Griffin (2021) for a survey of the literature.

a result, regulators and policymakers have pursued legal actions against mortgage lenders and implemented new rules to combat alleged fraud in the mortgage market. Although fines are generally thought to be an efficient form of punishment (Becker (1968)), we document that in this case the penalties and litigation risk were sufficiently large that they drove firms out of the market leading to societal costs in the form of a reduction in the quantity and quality of services available to consumers. More importantly, low-income borrowers and minority groups disproportionately bear the societal costs due to their high reliance on the FHA market, highlighting the unintended consequences of the legal penalties.

Our paper also adds to the broad literature evaluating the effects of policy responses to the financial crisis and Great Recession. Gete and Reher (2018) show that exposure to regulatory shocks caused a contraction of mortgage supply and subsequently increased housing rents, decreased homeownership rates, and increased rental supply. DeFusco et al. (2020) show that credit markets respond to policy constraints on household leverage by raising prices and exiting the regulated portion of the market. Similarly, we find that large lenders responded to the increased litigation risk by exiting the FHA market altogether, resulting in a reduction in the quantity and quality of services available to consumers. D'Acunto and Rossi (2022) show that the overall number, size, and approval rate of small and medium-sized loans have been decreasing over time, relative to large loans, especially among the largest lenders. Importantly they argue that the supply of credit drives these trends, and regulation-based channels are consistent with their findings. We point to a specific regulatory burden that dramatically limits the supply of FHA mortgages, which are typically smaller in size. As such, our findings are consistent with the documented regressive redistribution of mortgage credit after the financial crisis.

2. Litigation Risk in the FHA Mortgage Market

This section provides general information about Federal Housing Administration (FHA) mortgages and discusses the litigation risks faced by lenders in this market. Established

under the U.S. Department of Housing and Urban Development (HUD) by the National Housing Act of 1934, the FHA operates the largest government mortgage insurance program. This program insures mortgages made by private lenders for single-family properties, multifamily rental properties, hospitals, and residential care facilities. FHA mortgage insurance protects lenders against losses when a property owner defaults on their mortgage, which reduces lenders' exposure to credit risks and improves credit supply. One of the main goals of the FHA is to facilitate access to affordable mortgage credit for low- and moderate-income and first-time homebuyers in the United States by guaranteeing loans with small down payments (high LTVs) to borrowers with relatively low credit scores.

FHA loans play a crucial role in the mortgage market in the United States. Figure 1 Panel A shows the annual share of FHA mortgage origination with respect to conventional loans and other loan types between 2009 and 2017. Over the sample period, FHA loans consistently represent over 20% of the mortgage market. In Panel B, the share of mortgage loans originated in 2010 for different income deciles is shown. It indicates that for applicants with below-median income, FHA loans accounted for over 50% of the mortgage market, underscoring their significance in the market segment where credit is most needed. Moreover, racial minorities rely heavily on the FHA market for their mortgage needs.[4]

[Insert Figure 1]

To be eligible for FHA insurance, the mortgage must be originated by a lender that has been approved by the FHA, and the mortgage and the borrower must meet certain criteria.[5] Qualified lenders participating in the FHA's direct endorsement program have the authority to deem mortgages eligible for FHA insurance and close loans without prior FHA approval.[6]

---

[4]See Figure A.1 for the share of FHA mortgage origination with respect to other loan types across different racial groups.

[5]To qualify for an FHA-insured loan, applicants must meet several requirements. The minimum credit score required by the FHA is 500, and the prospective mortgage payment should not exceed 31% of the gross effective monthly income. Compared to most conventional mortgages, FHA-insured loans require a lower down payment of 3.5% in cash. There is no income limit for borrowers seeking FHA-insured loans. However, the maximum mortgage amount for FHA-insured mortgages is limited by law and varies by geography.

[6]See the terms and conditions in 24 CFR 203.3.

These delegated lenders must certify annually and for each loan originated that they comply with all relevant FHA lending guidelines and HUD rules regarding underwriting procedures and quality control plans.

The Department of Justice (DOJ) asserts that any violation of HUD rules in connection with the submission of a claim for FHA insurance constitutes a false claim, as defined in the False Claims Act, thereby giving rise to legal actions against FHA lenders. More specifically, the False Claims Act (FCA) of 1863, a federal statute enacted in response to defense contractor fraud during the American Civil War, enables the DOJ to pursue a civil penalty of three times the amount of damages plus a fixed penalty of $5,000 to $10,000 per claim against allegedly fraudulent lenders.[7] In 2011, the DOJ and the HUD filed a lawsuit against Deutsche Bank for FCA violations, marking the beginning of a series of investigations targeting mortgage lenders for allegedly fraudulent FHA-insured mortgage claims. In particular, the agencies alleged that mortgage lenders knowingly originated and underwrote non-compliant mortgage loans submitted for insurance coverage and guarantees by the FHA, thus falsifying their compliance certifications.[8]

There is limited public information available regarding the institutions targeted by the DOJ for violating the FCA. To identify lenders that were investigated, audited, or sued by the DOJ for alleged fraudulent activity in the FHA-insured mortgage market between 2006 and 2021, we utilized sources such as the DOJ News Archive, Nexis Uni, and Google search. Section A.1 in the Appendix provides detailed information on our search process. Table 1 presents a list of lenders that settled with the DOJ/HUD for FHA-related investigations and lawsuits under the FCA. Our search identified 35 lenders under investigation, with settlements totaling roughly $5.4 billion.

[Insert Table 1]

---

[7] See 31 U.S. Code § 3729.

[8] For example, see the Memorandum on Deutsche Bank Settlement.

Figure 2 Panels A and B display the annual frequency and corresponding settlement amounts of alleged fraudulent FHA mortgage cases by the settlement year. The figures indicate that FHA-related FCA cases were infrequent and relatively minor between 2007 and 2011. However, settlements for these cases began in 2012, with aggressive use of the FCA continuing until 2017.

[Insert Figure 2]

The use of the FCA in the mortgage market has raised concerns about the potential litigation risks imposed on participating lenders. One major issue is the lack of clarity on what constitutes a material error or false claim, leaving lenders vulnerable to investigation and litigation. Additionally, the FCA allows the DOJ to determine a lender's total liability by extrapolating the defect rate from a small sample of default loans, which may not be representative of the actual defect rate across all loans originated.[9] This exacerbates the uncertainty faced by lenders, who may face treble damage penalties that can be financially devastating. Settlements for FCA violations can be extremely costly for lenders, such as the $614 million settlement paid by JPMorgan Chase. In a letter to shareholders in 2016, Jamie Dimon, the Chairman and CEO of JPMorgan Chase, noted that FCA settlements "wiped out a decade of FHA profitability," making FHA lending "risky and cost prohibitive for many banks." As a result, JPMorgan Chase scaled back their participation in the FHA lending program in favor of less burdensome lending programs.

The escalation in FHA-related FCA cases has led to the withdrawal of many well-capitalized lenders from FHA lending, including many banks and credit unions statutorily required to help meet the credit needs of the communities in which they do business. As a result, some lawmakers believe that the use of the False Claims Act in these cases is excessive. In a 2017 House Financial Services Committee hearing, Representative Zeldin noted the "improper use of the False Claims Act to impose outrageous penalties against lenders'

---

[9]For example, the total liability of Deutsche Bank was estimated based on a sample of 21 default loans for which the FHA paid a claim, see the Memorandum on Deutsche Bank Settlement.

immaterial defects." Representative Zeldin pointed out that "many lenders have left the FHA program, and those that have stayed in the program [became] more costly for the borrowers who can least afford it." During the congressional hearing, Ben Carson, the secretary of HUD newly appointed in 2017, acknowledged that the consumers had "fewer appropriate choices" and indicated that the HUD is "addressing that problem." In 2019, the DOJ and HUD signed an inter-agency memorandum, which made it clear that FHA requirements would be enforced primarily through HUD's administrative proceedings, effectively ending the use of the False Claims Act in FHA-related cases.

3. Data

Our study draws on two primary data sources: the public database of the Home Mortgage Disclosure Act (HMDA) and the Nationwide Mortgage Licensing System. To enrich our analysis, we also incorporate data on county-level demographic and economic features obtained from various sources, including the U.S. Census Bureau's American Community Survey, Federal Housing Finance Agency, Bureau of Labor Statistics, and a major credit bureau's U.S. credit records. We provide comprehensive descriptions of all the variables employed in our research in the Appendix.

3.1. HMDA Data

The Home Mortgage Disclosure Act (HMDA) mandates that almost all mortgage lenders report comprehensive information on loan applications received, as well as their decisions regarding each application's origination. Only lenders that are very small or exclusively rural are exempt from HMDA reporting. As HMDA covers over 90% of all originated mortgages, it is the most comprehensive source of data on mortgage applications in the United States (Bhutta et al. (2017)).[10] The data encompass a wide range of variables, such as borrower

---

[10]As of 2019, any depository institution must report to the HMDA database if it has: (i) at least one branch or office in a metropolitan statistical area (MSA), (ii) at least $46 million in assets, and (iii) originated at least 25 mortgages in each of the previous two years. Non-depository institutions must report data if they

income, race, and ethnicity, loan size, purpose (purchase, refinance, or home improvement), type (conventional or government-insured), priority (first or second lien), presence of co-applicants, and property location by census tract.

3.2. Nationwide Mortgage Licensing System Data

The Secure and Fair Enforcement for Mortgage Licensing Act of 2008 (SAFE Act) was designed to enhance consumer protection and reduce fraud in the mortgage market.[11] The SAFE Act requires all residential mortgage loan originators, or loan officers, to be either state-licensed or federally registered. Loan officers working for federally insured depository institutions or their subsidiaries must be federally registered, while loan officers at non-bank mortgage companies must be state licensed. Importantly for our study, the SAFE Act mandates that all loan officer licenses and registrations be recorded in the Nationwide Mortgage Licensing System (NMLS).[12] As of 2012, all state and federal regulators had integrated their licensing/registration with the NMLS, making it a comprehensive registry of mortgage lenders and their loan officers.

We obtain access to the NMLS Consumer Access[SM] data through a collaborative agreement with the State Regulatory Registry, which is a subsidiary of the Conference of State Bank Supervisors.[13] The dataset contains historical snapshots of loan officer files, including information on licenses, registrations, and other filings, as of the end of each calendar year from 2012 to 2019. It is worth noting that the Consumer Financial Protection Bureau's (CFPB's) Regulation G mandates loan officers to disclose information about certain disciplinary, enforcement, and other actions taken against them.[14] We aggregate the disciplinary actions at the lender-year level to create a panel of lender misconduct rates.

---

have a branch/office in an MSA (or receive at least five applications from MSAs) and originated at least 25 mortgages in each of the previous two years.

[11]See https://www.hud.gov/sites/documents/DOC_19673.PDF.

[12]The NMLS was created in 2008 by the Conference of State Bank Supervisors (CSBS) and the American Association of Residential Mortgage Regulators (AARMR), see https://nationwidelicensingsystem.org.

[13]For additional information on NMLS Consumer Access[SM], see https://nmlsconsumeraccess.org.

[14]See the CFPB's Communication on Disciplinary Actions for additional information.

3.3. Screening and Merging Data

For our primary county-level analysis, we restrict our HMDA panel data to first-lien home purchase loan applications and originations from 2009 to 2017 that are owner-occupied as principal one-to-four family dwellings. The final HMDA sample includes loans from approximately 9,214 lenders operating in the mortgage lending market across over 3,000 counties. We then combine the HMDA sample with the lender-level misconduct rate obtained from the NMLS loan officer data.

We begin by aggregating the data at the county-year level and then merge it with a panel of demographic and economic characteristics from various sources, including the U.S. Census Bureau's American Community Survey, Federal Housing Finance Agency, Bureau of Labor Statistics, and a major credit bureau's U.S. credit records. The panel includes variables such as unemployment rate, poverty rate, median income, population, fraction of minority population, fraction of population with a Bachelor's degree, house price index, and average credit score. We focus our analysis on a county-year panel from 2009 to 2017 covering 2,663 U.S. counties. Table 2 presents the summary statistics for the final dataset.

[Insert Table 2]

The average county in our dataset has approximately 404 FHA mortgage applications and originates 286 FHA loans annually, resulting in 1.6 FHA loans per 1,000 people and a per capita loan amount of $236. By contrast, the same county records 781 conventional mortgage applications and originates 573 conventional loans per year, translating to 3.5 FHA loans per 1,000 people and a per capita loan amount of $652.

4. Methodology and Results

4.1. FHA Lending and Large Lenders

In this section, we examine the impact of the DOJ's litigation efforts on lenders' FHA mortgage applications and originations. In Panel A of Figure 3, we sort FHA lenders by

their total FHA lending dollar volume in 2010 and, for each ventile bin, we tabulate the number of lenders that were investigated by the DOJ and ultimately settled during the period from 2008-2019. We find that the investigated lenders were predominantly the largest FHA lenders. Specifically, 25 out of 35 investigated lenders had total FHA originations in the top fifth percentile of FHA lending volume in 2010. However, our analysis suggests that there is no significant relationship between the lender's lending volume and the prevalence of loan officers with misconduct records (see Panel B of Figure 3). Although legal documents indicate that the DOJ accused lenders of originating fraudulent FHA loans, our results do not suggest that large FHA lenders had disproportionately more loan officers with misconduct records.

[Insert Figure 3]

There is anecdotal evidence suggesting that the increased litigation risk to lenders in the FHA market may have led them to drastically reduce their lending to FHA borrowers. For example, Mr. Dimon, the chairman and CEO of JPMorgan Chase, noted in 2016 that False Claims Act settlements had prompted JPMorgan Chase to scale back its participation in the FHA lending program "in favor of less burdensome lending programs."[15] In Panel A of Figure 4, we present a graph showing the total number of FHA applications (for home purchases) received by JPMorgan Chase from 2009-2017. The bank received a complaint relating to the False Claims Act in January 2013, which coincides with the time when the total FHA applications received by the bank began declining. By February 2014, JPMorgan Chase had paid $614 million in relevant settlements, and by 2016 the bank had received almost no FHA applications, suggesting that bank had largely cut its supply of credit in the FHA market.

Direct experience of a peer's punishment may have a sobering effect on the behaviors of non-punished peers (D'Acunto et al. (2019)). Peers of investigated lenders, albeit not directly exposed to the investigations, may anticipate the increase in litigation risks and

---

[15]JPMorgan Chase & Co. Chairman and CEO Letter to Shareholders, 2016.

behave differently. Consistent with the hypothesis, in Panel B of Figure 4, we observe that FHA applications received by big banks (and bank affiliates) and other lenders (e.g., small banks and non-banks) followed similar trends during 2009-2011. However, beginning in early 2012, when the first wave of large False Claims Act settlements occurred, the trends in FHA applications received by these two groups of lenders started to diverge. We conclude that big banks and bank affiliates began to cut FHA lending in 2012 when the threat of significant litigation costs became credible for these lenders.

[Insert Figure 4]

We estimate the impact of the DOJ's litigation efforts on FHA lending among large lenders and their peers using a regression framework. We assume that the first wave of large False Claims Act settlements in 2012 represents the beginning of increased litigation risk in the FHA market for big lenders. To estimate the effect, we employ a lender-county-year panel data of mortgage applications and originations and implement a difference-in-differences design:

$$Y_{i,c,t} = \beta \ Top \ 5\% \ Lender_i \times Post_t + \delta_i + \gamma_{c,t} + \varepsilon_{i,c,t}. \tag{1}$$

Subscripts i, c, and t represent the lender, county, and year, respectively. The outcome variable, *Number of Loans* denoted by $Y_{i,c,t}$, measures the total count of FHA mortgage originations in a given county-lender-year. *Top 5% Lender* is an indicator variable that equals one if the lender's FHA lending in 2010 was in the top fifth percentile of all FHA-participating lenders in 2010 and zero otherwise. The variable *Post* is an indicator that equals one if the year is 2012 or after and zero otherwise. Lender and county-year fixed effects are represented by δ_i and $\gamma_{c,t}$, respectively. The inclusion of county-year fixed effects accounts for changes in local economic conditions that may affect lending. We double-cluster standard errors at the lender and county levels. We report the results in Table 3.

[Insert Table 3]

In column 1 of Panel A, we show that FHA lending by the top fifth percentile lenders declined by an average of 3.544 loans per county (112% of the unconditional 2010 mean). In columns 2 and 3, we investigate whether this effect was due to changes in FHA lending among large banks and bank affiliates or among large non-banks. Column 2 restricts the sample to only banks and bank affiliates, while column 3 restricts the sample to only non-bank lenders. Our findings suggest that the decrease in FHA lending among big lenders was primarily driven by the decline in lending from large banks and bank affiliates. Large non-bank lenders, however, did not exhibit signs of decreased FHA lending.

To rule out the alternative explanation that large FHA banks and bank-affiliated lenders were cutting mortgage lending in general due to changes in the aggregate banking environment, we introduce additional control groups in a triple-difference design similar to Gete and Reher (2021). Specifically, we use the conventional mortgage market as a counterfactual for the FHA mortgage market. Our identification exploits variation between top fifth percentile FHA lenders (treated lenders) versus smaller FHA lenders, FHA (treated loans) versus conventional loans, and the periods before and after the shock. The triple-difference model is specified as:

$$
\begin{aligned}
Y_{i,c,t,m} = {} & \beta_1 \; Top \; 5\% \; Lender_i \times Post_t \times FHA_m + \beta_2 \; Top \; 5\% \; Lender_i \times Post_t \\
& + \beta_3 \; Top \; 5\% \; Lender_i \times FHA_m + \beta_4 Post_t \times FHA_m + \beta_5 FHA_m \quad (2) \\
& + \delta_i + \gamma_{c,t} + \varepsilon_{i,c,t,m}.
\end{aligned}
$$

Subscripts i, c, t, and m denote the lender, county, year, and type of mortgage market (FHA versus conventional), respectively. $Y_{i,c,t,m}$ represents the outcome variable, *Number of Loans*, which measures the total count of FHA or conventional mortgage originations in a given county-lender-year observation. *Top 5% Lender* is an indicator variable that takes the value of one if the lender's FHA lending in 2010 was in the top fifth percentile of all FHA-participating lenders in 2010, and zero otherwise. *Post* is an indicator variable that takes the value of one if the year is 2012 or after, and zero otherwise. *FHA* is an indicator variable that takes the value of one for the FHA mortgage market, and zero otherwise. δ_i

and $\gamma_{c,t}$ are lender and county-year fixed effects, respectively. We double-cluster standard errors at the lender and county levels. We report the results in Panel B of Table 3.

In column 1 of Panel B, we show that FHA lending by the top fifth percentile lenders relatively declined by an average of 4.979 loans per county, similar to what we find in the difference-in-differences design. Columns 2 and 3 provide additional evidence of a more significant decrease in FHA lending among large banks and bank affiliates compared to large non-bank lenders. Specifically, using conventional mortgages as a counterfactual, column 3 confirms a decline of 3.924 loans per county in FHA originations among large non-bank lenders. However, the decline is relatively modest when compared to the decline of 7.08 loans per county among large banks and bank affiliates.

We run multiple robustness tests to reassure the validity of our results. The outcome variable, the total count of FHA mortgage originations in a given county-lender-year, is potentially skewed with a mass at zero, for which Cohn et al. (2022) recommend estimating a Poisson regression. Table A.2 presents the results estimated by Poisson regressions, and the results are overall consistent with those of Table 3. In Table A.3, we provide an alternative analysis by examining changes in FHA lending among the lenders that were directly exposed to litigation or the threat of litigation from the DOJ.

4.2. County Exposure to Big Banks

In this section, we estimate heterogeneous changes in FHA lending across counties that vary in their pre-period exposure to big banks. We define big banks as banks or bank-affiliated lenders with FHA lending in 2010 that were in the top fifth percentile of all FHA-participating lenders in 2010. We implement a difference-in-differences specification:

$$Y_{c,t} = \beta_1 Exposure_c \times Post_t + \beta_2 Controls_{c,t-1} + \delta_c + \gamma_t + \varepsilon_{c,t}. \tag{3}$$

Subscripts c and t denote the county and year, respectively. $Y_{c,t}$ represents outcome variables measuring FHA lending at the county-year level. *Exposure* is the dollar volume of

FHA lending by big banks as a fraction of the dollar volume of all FHA lending in a county in 2010. *Post* is an indicator variable that takes the value of one if the year is 2012 or after, and zero otherwise. Controls represents one period lagged county-year-level control variables, including county population, median household income, poverty rate, unemployment rate, education levels, presence of minorities, change in house prices, and average individual credit scores. δ_c and γ_t are county and year fixed effects, respectively. We cluster standard errors at the county level.

We construct three outcome variables that measure county-level FHA lending. *ln(Volume)* is defined as the natural logarithm of one plus the dollar volume of loan originations in a county. *Volume per Capita* is defined as the total dollar volume of loan originations per capita in a county. *Loans per 1,000* is defined as the total count of loan originations per 1,000 people in a county. We run Equation 3 for each of the outcome variables in Panel A of Table 4. Column 1 shows that a one-standard-deviation increase in a county's exposure to FHA lending from big banks and bank affiliates in 2010 corresponds to a 4.27% decline in total FHA lending after 2011. This result is consistent with those of columns 2 and 3 in which we normalize county-level FHA lending by county population. We document a $6.38 per capita decrease, or a 0.03 loan per 1,000 people decrease, in total FHA lending in a county for a one-standard-deviation increase in the exposure variable.

[Insert Table 4]

The key underlying identification assumption in our empirical design is that FHA mortgage lending in counties with high and low exposure to big FHA banks would have trended similarly in the absence of legal actions under the False Claims Act. Potential violations of the assumption include different unobserved local economic trends in the post-financial crisis era and the endogeneity of bank branch locations and credit allocation decisions. Although we cannot directly test this assumption empirically, we show several pieces of evidence supporting its validity. First, in Figure A.2, we plot a map displaying the variation of our big bank exposure variable across counties. As shown in the figure, there does not seem to be a

noticeable pattern regarding the geographic distribution of high-exposure counties. Next, we show that the level of FHA mortgages in high- and low-exposure counties had similar trends prior to the DOJ's legal actions under the False Claims Act. In particular, we examine the dynamics of FHA lending in high- and low-exposure counties through a series of regressions in which we interact the exposure variable with year indicator variables. Figure 5 plots the coefficients and confidence intervals of the interacted terms. As shown in the figure, FHA lending activities in high- and low-exposure counties were largely unaffected by the counties' exposure to big banks prior to the increase in litigation risks for lenders in the FHA market. However, after 2012, counties with high exposure to big banks began to see a decline in FHA lending relative to low-exposure counties. In a placebo test, Figure 6 examines the dynamics of conventional mortgage lending activities in high- and low-exposure counties and does not indicate similar time trends, consistent with the notion that conventional mortgages should not be affected by risks associated with the FHA market. Moreover, there is no evidence of diverging local economic trends in high- and low-exposure counties with respect to the conventional mortgage market.

To further mitigate concerns that high- and low-exposure counties may be experiencing different, unobserved economic trends that are not captured by our control variables, we implement a triple-difference design using the conventional mortgage market as an additional control group. Because only FHA-insured lending was subject to the False Claims Act, we use differential changes in conventional mortgage credit in high- and low-exposure counties as a proxy for across-county changes in aggregate mortgage market conditions. Specifically, we use the following specification:

$$
\begin{aligned}
Y_{c,m,t} = {} & \beta_1 Exposure_c \times Post_t \times FHA_m + \beta_2 Exposure_c \times Post_t \\
& + \beta_3 Exposure_c \times FHA_m + \beta_4 Post_t \times FHA_m + \beta_5 FHA_m \\
& + \beta_6 \cdot X_{c,t-1} + \delta_c + \gamma_t + \varepsilon_{c,m,t}.
\end{aligned}
\tag{4}
$$

Subscripts c, m, and t denote the county, type of mortgage market, and year, respectively. $Y_{c,m,t}$ represents outcome variables measuring FHA and conventional mortgage lending at

the county-year level. We run Equation 4 and report the results in Panel B of Table 4. Overall, we find that the results in the difference-in-differences tests are robust under the triple-difference tests.

Our previous findings have shown that big banks facing increased litigation risks have tightened FHA mortgage credit, leading to an overall reduction in lending at the county level. However, it's worth examining the roles of small banks and shadow banks in this reduction. To answer this question, we looked at the county-level lending activities for mortgages originated by big banks and non-big banks. Tables A.4 and A.5 replicate Table 4, calculating the outcome variables for big banks and non-big banks, respectively.

Our analysis reveals that a one-standard-deviation increase in a county's exposure to litigation risks in the FHA market corresponds to a decrease of \$13.58 per capita, or a 0.11 loan per 1,000 people decrease, in big banks' FHA lending in a county. In contrast, non-big banks saw an increase of \$7.26 per capita, or a 0.09 loan per 1,000 people increase, in FHA lending for the same increase in the exposure variable. It appears that small banks and shadow banks, who were less subject to increased litigation risks, partially filled the void left by big banks. On a per capita basis, these lenders closed approximately 53% to 77% of the gaps left by big banks.

4.3. Consumer Exposure to Lender Misconduct

In this section, we examine whether certain consumers are exposed to lower-quality FHA lenders as a result of the decline in FHA lending by big banks and bank-affiliated lenders. We proxy the quality of lenders facing consumers by constructing two county-level loan officer misconduct measures: *Misconduct Rate 2012-2017, (%)* and *Misconduct Rate 2012, (%)*. In each year, *Misconduct Rate 2012-2017, (%)* is the weighted average county-level probability of working with a loan officer with at least one misconduct record (based on the loan officers' 2012-2017 misconduct records). To calculate the weighted average misconduct measure we first multiply, for each lender, (i) the lender's FHA lending as a fraction of total FHA lending

in a given county-year pair with (ii) the proportion of the lender's loan officers with non-zero misconduct records from 2012-2017. Next, we sum the multiplied values across all the lenders for each county-year pair. *Misconduct Rate 2012, (%)* is calculated similarly to *Misconduct Rate 2012-2017* but only accounts for loan officers' misconduct records in 2012.

We implement a difference-in-differences approach using Equation 3 and a triple-difference approach using Equation 4, which we report in Panels A and B of Table 5, respectively.

[Insert Table 5]

We show that counties with higher exposure to litigation risks in the FHA market experience a greater decrease in the weighted average quality of loan officers (as measured by misconduct rates) in the post-period. For a given county, a one-standard-deviation increase in the ex ante market share of big FHA-participating banks corresponds to a 9% increase in the likelihood of working with a loan officer with misconduct records in the post period (see Panel A). Our results suggest that consumers living in counties that used to rely more heavily on big banks and bank-affiliated lenders were subject to lower-quality services due to the litigation risks. We find similar point estimates under the triple-difference specification in Panel B.

4.4. Heterogeneous Effects across Racial Groups

Racial minorities rely heavily on the FHA market for their mortgage needs.[16] In this section, we investigate whether the reduction in credit access varies among different racial groups. As big banks reduce their lending in the FHA market, there are several possible channels through which the restriction of mortgage credit could disproportionately affect minority groups. First, big banks may become more discerning in providing credit, reducing access for minority households more than for white households. Alternatively, the exit of big banks from the FHA market creates a positive externality for remaining lenders. The lenders that

---

[16]See Figure A.1 for the share of FHA mortgage origination with respect to other loan types across different racial groups.

stay in the market gain more market power and may become more selective in originating mortgages. In either case, we should observe a more severe negative impact in counties with a high proportion of minorities, given their exposure to big banks. To test this hypothesis, we implement a triple difference specification:

$$
\begin{aligned}
Y_{c,t} = {} & \beta_1 Exposure_c \times Post_t \times High\ Minority\ County_c \\
& + \beta_2 Exposure_c \times Post_t + \beta_3 Post_t \times High\ Minority\ County_c \\
& + \beta_4 Controls_{c,t-1} + \delta_c + \gamma_t + \varepsilon_{c,t}.
\end{aligned}
\tag{5}
$$

Subscripts c and t denote the county and year, respectively. $Y_{c,t}$ represents outcome variables measuring FHA lending at the county-year-level. *High Minority County* is an indicator variable that takes the value of one if the fraction of minorities in the county's population is in the top 50 percentile of minority shares across all counties in 2010, and zero otherwise. The remaining variables are defined similarly to those in Equation 3. We report the results in Table 6.

[Insert Table 6]

In all three columns, we show that the coefficient estimate on the triple interaction term $Exposure \times Post \times High\ Minority\ County$ is statistically insignificant. Specifically, consistent with the anecdote that big banks are leaving the FHA market altogether, we find no evidence that counties with high minority shares sustain a more significant decrease in FHA lending conditional on exposure to big banks. Meanwhile, the coefficient estimates on the interaction term $Exposure \times Post$ are similar in magnitude and statistical significance to our estimates in Table 4.

Our results show that households of all racial and ethnic groups experienced the same credit tightening in the FHA market. Specifically, a one-standard-deviation increase in a county's exposure to FHA lending from big banks and bank affiliates led to a 4.27% decline in FHA lending among both white and minority households. However, this same percentage decline had different implications for white and minority households due to the disparity

20

in their reliance on the FHA market. We illustrate this idea in Table 7. In Panel A, we show the share of FHA lending among Black, Hispanic, and white homeowners.[17] It is worth noting that FHA mortgages play an essential role among Black and Hispanic homeowners, representing over 50% of the mortgages originated. In contrast, the FHA market only makes up 25% of the mortgages borrowed by white homeowners. This means that the same 4.27% decline in FHA lending is equivalent to a 2.14% decline in total mortgage credit available for Black and Hispanic households, but only a 1.12% decline for white households. In Panel B, we implemented a difference-in-differences design similar to Equation 3, but with outcome variables that measure mortgage credit to white and minority groups on a per capita basis. Specifically, we focused on the count and dollar volume of loan originations per white or minority person.

[Insert Table 7]

In columns 1 and 2, we present our estimates of changes in FHA mortgage credit allocated to white borrowers. The outcome variable in column 1 is the number of loans taken by white borrowers per 1,000 white population. In column 2, the outcome variable is the dollar volume of loans taken by white borrowers per white person. The results indicate that a one-standard-deviation increase in a county's exposure to FHA lending from big banks and bank affiliates in 2010 resulted in a decrease of 0.01 loans per 1,000 and $2.67 mortgage credit per capita among white borrowers.

Columns 3 and 4 present similar outcome variables calculated for minority borrowers. In particular, a one-standard-deviation increase in a county's exposure to FHA lending from big banks and bank affiliates in 2010 corresponds to a decrease of 0.04 loans per 1,000 and $50.05 mortgage credit per capita among minority borrowers. Despite the similar effects in proportions with respect to the unconditional mean, the coefficient estimates reveal a much larger impact in absolute numbers on minority borrowers. This finding is consistent with

---

[17]For a more detailed figure on the share of mortgages by race and loan type, see Figure A.1.

the idea that minority borrowers rely more on FHA lending and therefore are more severely affected.

5. Conclusion

Following the 2008 financial crisis, lenders who allegedly engaged in questionable mortgage lending practices faced rampant legal actions from regulators. This paper investigates the impact of these legal actions on households' access to mortgage credit in the FHA market, which primarily serves homebuyers with lower creditworthiness who need credit the most. By analyzing the effects of legal actions on the FHA market, we aim to shed light on how these actions could impose societal costs that prevent less-creditworthy homebuyers from obtaining the necessary mortgage credit.

Strikingly, we document that the DOJ settlements were almost entirely concentrated among the very largest FHA lenders, despite the fact that we do not find disproportionately higher misconduct rates among loan officers at these lenders. Consistent with the peer effect of punishment, we show that targeted banks and their peers (large banks and bank affiliates) left the FHA market, whereas shadow banks are largely insulated from the shock. Consequently, counties with high exposure to large banks and bank affiliates experienced a significant decline in FHA mortgage origination after the settlements. Additionally, we observe that smaller shadow banks with dubious mortgage lending practices partially filled the void left by exiting big banks. In particular, consumers living in counties that relied more heavily on big banks and bank-affiliated lenders had no choice but to work with lower-quality lenders and loan officers. Households of all races and ethnic groups experienced the same credit tightening in the FHA market regardless. However, a closer look into our results indicates that the adverse effects on access to mortgage credit faced by minority borrowers were approximately two times as those faced by white borrowers.

While fines are commonly seen as an efficient form of punishment, our research shows that in this case, the penalties and litigation risks were so significant that they forced companies

out of the market, resulting in reduced quantity and quality of services available to consumers. Moreover, low-income borrowers and minority groups, who rely heavily on the FHA market, bear a disproportionate share of these societal costs, underscoring the unintended consequences of legal penalties. Therefore, we emphasize the need to carefully consider the costs and benefits of such legal actions and regulations.

References

Ambrose, Brent W, James Conklin, and Jiro Yoshida, 2016, Credit rationing, income exaggeration, and adverse selection in the mortgage market, *The Journal of Finance* 71, 2637–2686.

Becker, Gary S, 1968, Crime and punishment: An economic approach, in *The economic dimensions of crime*, 13–68 (Springer).

Ben-David, Itzhak, 2011, Financial constraints and inflated home prices during the real estate boom, *American Economic Journal: Applied Economics* 3, 55–87.

Bhutta, Neil, Steven Laufer, and Daniel R Ringo, 2017, Residential mortgage lending in 2016: Evidence from the home mortgage disclosure act data, *Fed. Res. Bull.* 103, 1.

Cohn, Jonathan B, Zack Liu, and Malcolm I Wardlaw, 2022, Count (and count-like) data in finance, *Journal of Financial Economics* 146, 529–551.

D'Acunto, Francesco, Michael Weber, and Jin Xie, 2019, Punish one, teach a hundred: The sobering effect of punishment on the unpunished, *University of Chicago, Becker Friedman Institute for Economics Working Paper* .

DeFusco, Anthony A, Stephanie Johnson, and John Mondragon, 2020, Regulating household leverage, *The Review of Economic Studies* 87, 914–958.

D'Acunto, Francesco, and Alberto G Rossi, 2022, Regressive mortgage credit redistribution in the post-crisis era, *The Review of Financial Studies* 35, 482–525.

Garmaise, Mark J, 2015, Borrower misreporting and loan performance, *The Journal of Finance* 70, 449–484.

Gete, Pedro, and Michael Reher, 2018, Mortgage supply and housing rents, *The Review of Financial Studies* 31, 4884–4911.

Gete, Pedro, and Michael Reher, 2021, Mortgage securitization and shadow bank lending, *The Review of Financial Studies* 34, 2236–2274.

Griffin, John M, 2021, Ten years of evidence: Was fraud a force in the financial crisis?, *Journal of Economic Literature* 59, 1293–1321.

Griffin, John M, and Gonzalo Maturana, 2016, Who facilitated misreporting in securitized loans?, *The Review of Financial Studies* 29, 384–419.

Jiang, Wei, Ashlyn Aiko Nelson, and Edward Vytlacil, 2014, Liar's loan? effects of origination channel and information falsification on mortgage delinquency, *Review of Economics and Statistics* 96, 1–18.

Mian, Atif, and Amir Sufi, 2017, Fraudulent income overstatement on mortgage applications during the credit expansion of 2002 to 2005, *The Review of Financial Studies* 30, 1832–1864.

Piskorski, Tomasz, Amit Seru, and James Witkin, 2015, Asset quality misrepresentation by financial intermediaries: Evidence from the rmbs market, *The Journal of Finance* 70, 2635–2678.

Figure 1: FHA Loan Market

Panel A of this figure shows the annual share of all FHA mortgage originations with respect to all conventional loans and other loan types (e.g., VA, RHS/FSA, etc.) from 2009 to 2017. The sample is restricted to loan originations that meet the following criteria: home purchase, owner-occupied, secured by a first-lien, and one-to-four family dwelling. We exclude refinances and home improvement loans. Panel B of this figure shows the share of FHA, conventional, and other mortgage loans originated in 2010 across each personal income decile (state-year decile sorts). A given loan is matched to a personal income decile bin using the applicant's income and the income decile cutoffs for the state in which the property resides.
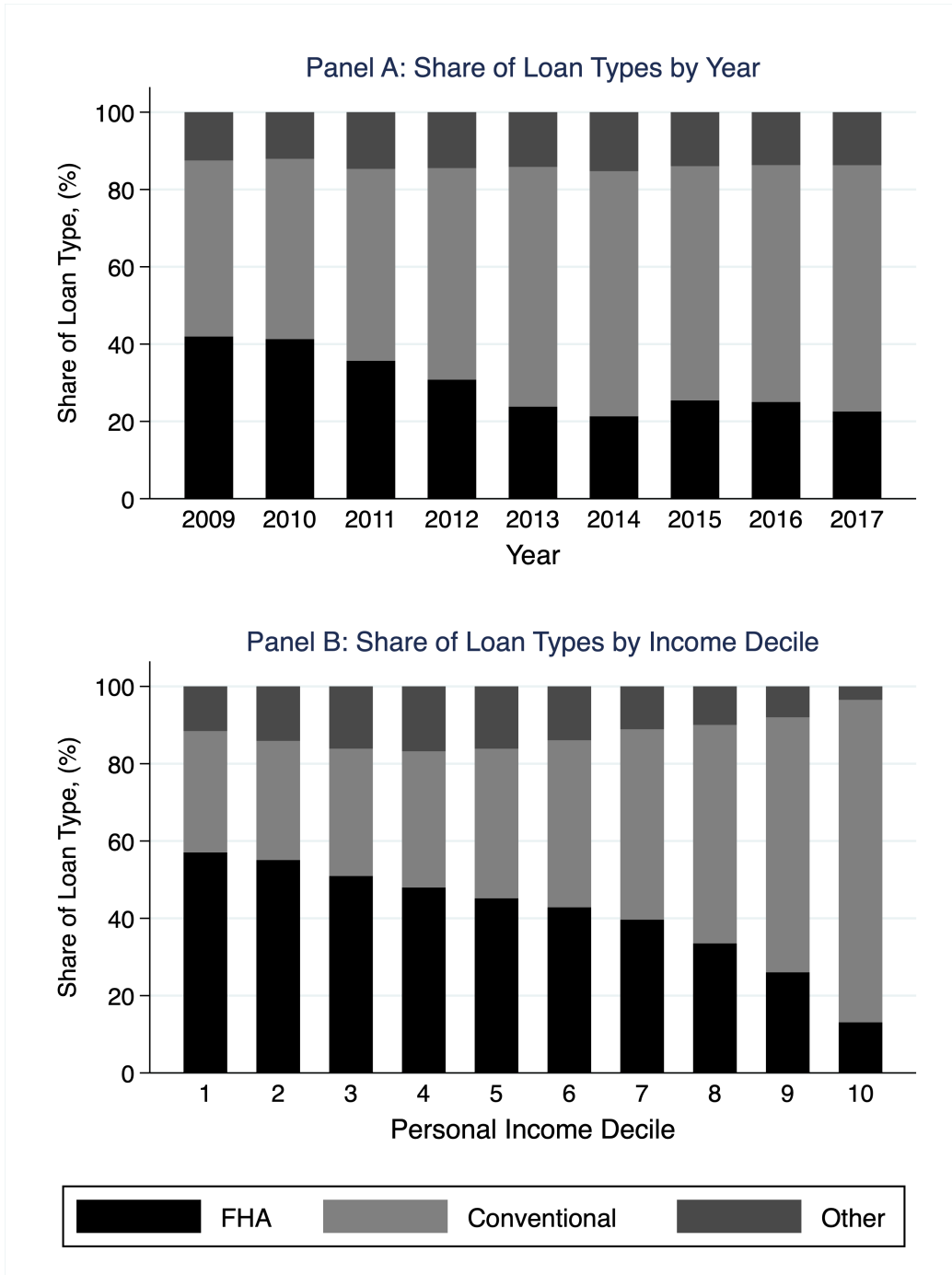
Figure 2: Litigation Activity Relating to False Claims Act Investigations in the FHA Market

Panel A of this figure shows the annual count of alleged fraudulent FHA mortgage investigations/cases from 2008 to 2019 involving the Department of Justice and the Department of Housing and Urban Development. A given investigation/case is matched to its settlement year, which we define as the year in which the investigation/case was settled. We include only investigations/cases that indicate alleged violations of the False Claims Act by a lender in the FHA market. Panel B of this figure shows aggregate settlement amounts (in $M) of investigations/cases grouped by settlement year.
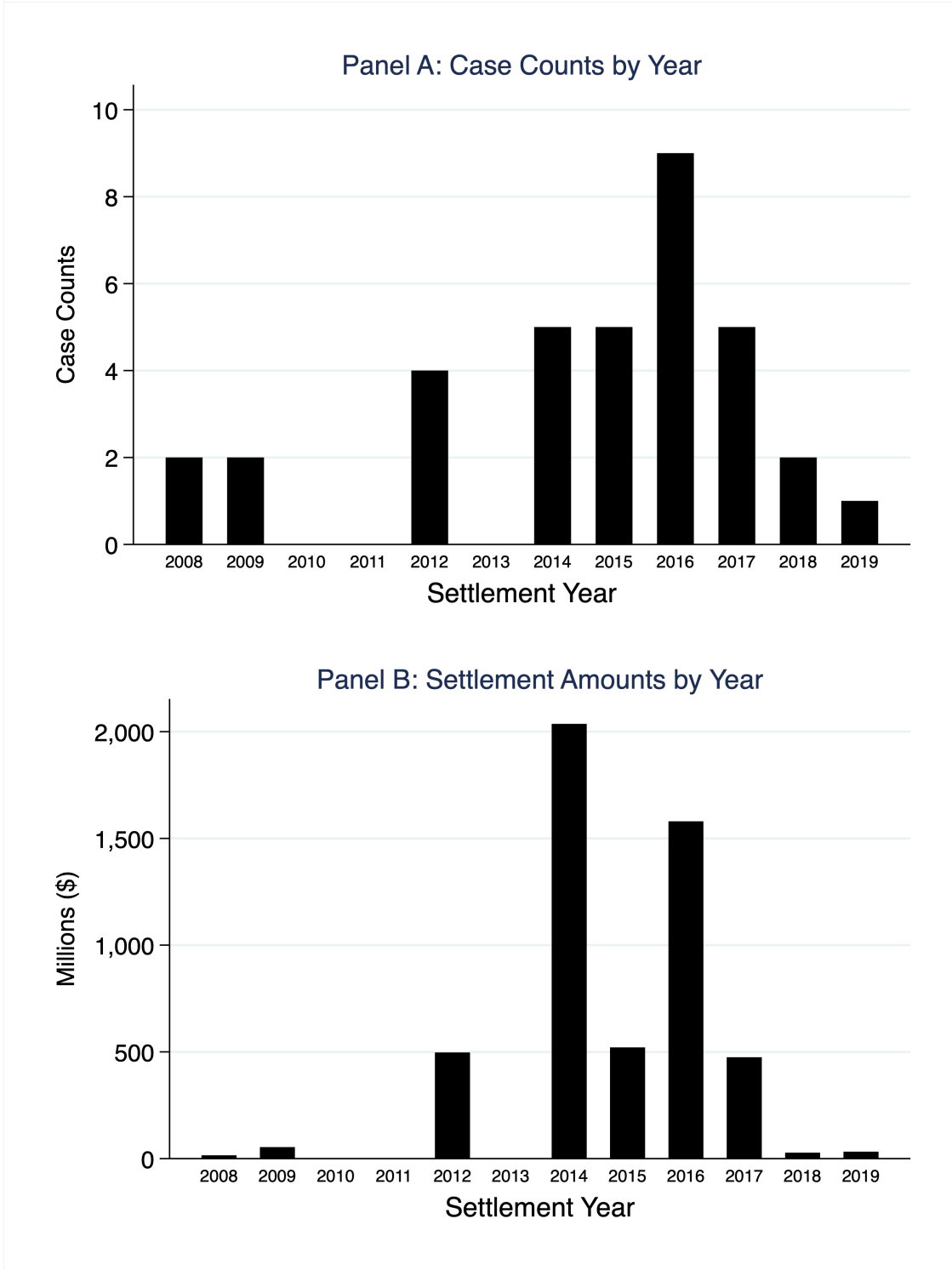
Figure 3: Investigated Lenders by 2010 FHA Lending Volume Quantiles

Panel A of this figure shows the count of investigated lenders sorted across twenty quantiles based on their FHA lending volume in 2010. Black represents counts of investigated banks and affiliates, and gray represents the counts of independent mortgage companies. Panel B of this figure shows the average misconduct rate of loan officers at FHA lenders sorted across twenty quantiles based on the lenders' FHA lending volume in 2010.
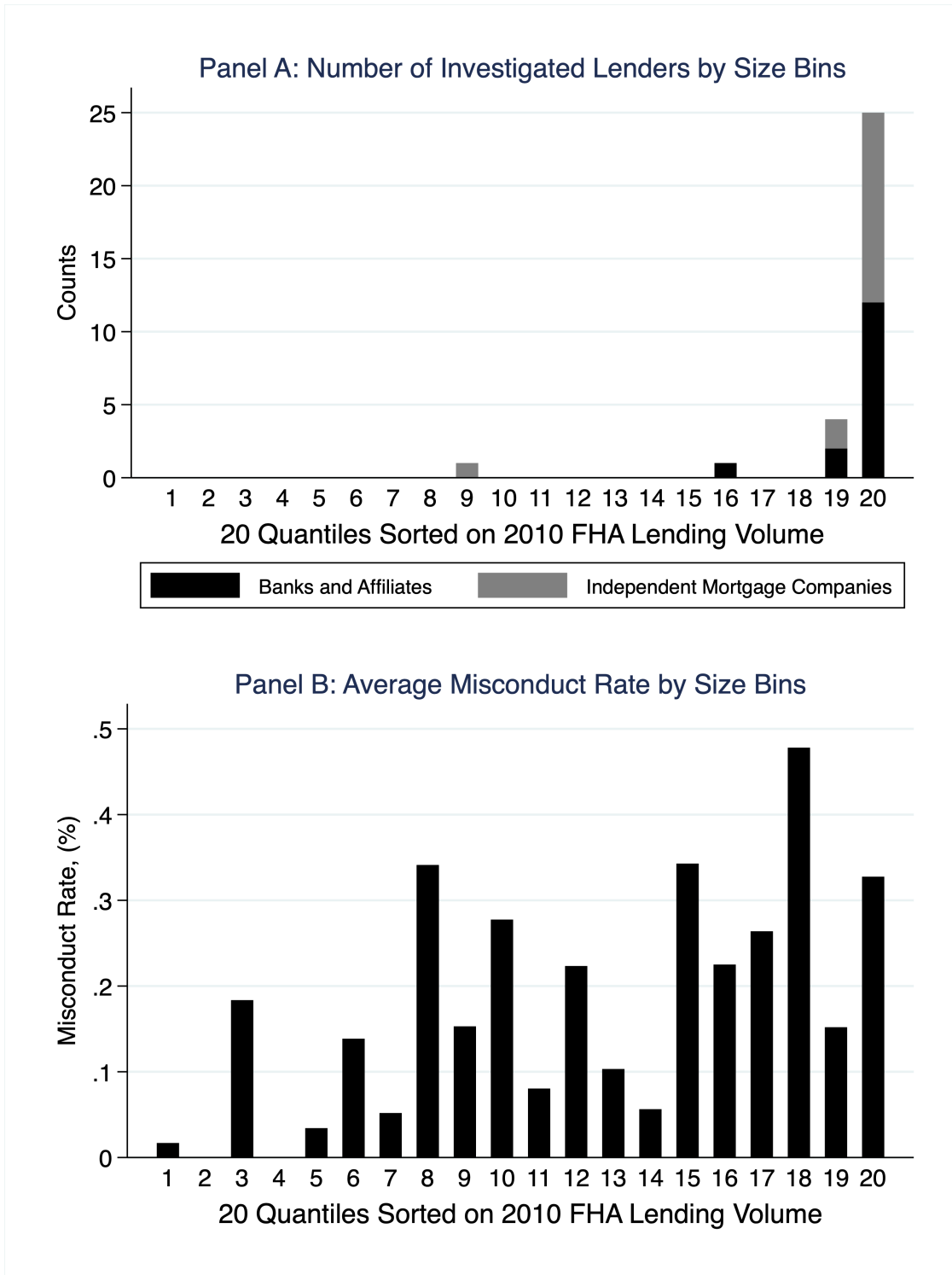
Figure 4: FHA Loan Applications by Year

Panel A of this figure shows the annual count of FHA loan applications received by JPMorgan Chase from 2009 to 2017. The DOJ began investigating JPMorgan Chase for alleged fraudulent activity in the FHA market in January 2013. JPMorgan Chase settled with the DOJ in February 2014. Panel B of this figure shows the annual count of FHA loan applications received by all big banks and other lenders from 2009 to 2017. A big bank is defined as a bank or bank-affiliated lender whose FHA loan origination volume was in the top fifth percentile of FHA loan origination volume across all FHA lenders in 2010. A lender is categorized as other if it is not a big bank or an affiliate.
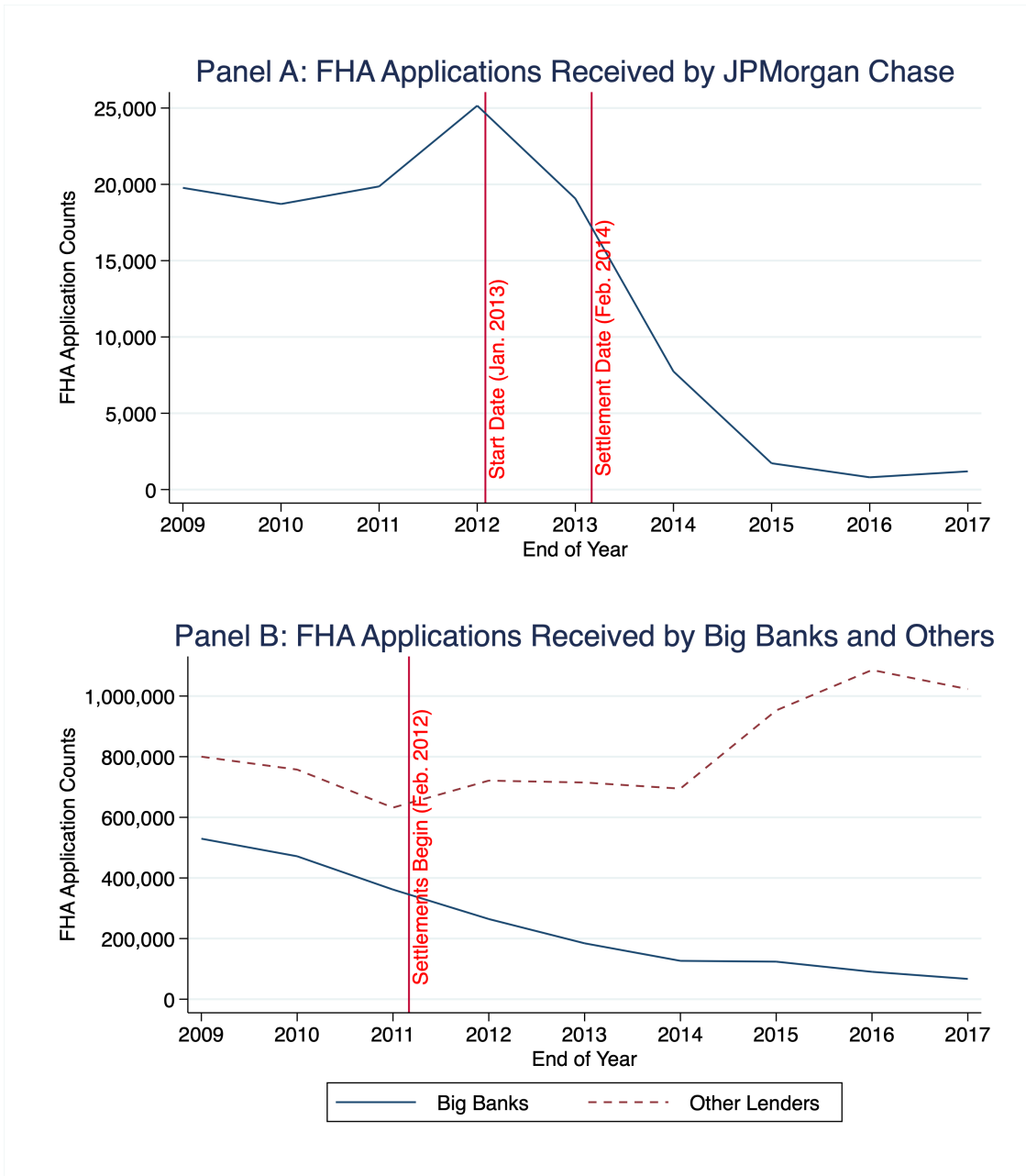
Figure 5: Changes in County-year-level FHA Loan Originations

We regress measures of county-year-level FHA loan originations on *Exposure*, year indicator variables (2011 as the baseline year), *Exposure* interacted with all the year indicator variables, and county-level socioeconomic controls (see Table 4 for the original test). This figure shows the coefficient estimates of the interaction terms between *Exposure* and the year indicator variables. *ln(Volume)* is defined as the natural logarithm of one plus the dollar volume of FHA loan originations in a county. *Volume per Capita* is defined as the total dollar volume of FHA loan originations per capita in a county. *Loans per 1,000* is defined as the total count of FHA loan originations per 1,000 people in a county. For each county, *Exposure* is the dollar volume of FHA loan lending by big banks as a fraction of the dollar volume of all FHA lending in 2010. The dotted line represents the baseline year. 95% confidence intervals are delineated.

ln(Volume)


Volume per Capita

Loans per 1,000
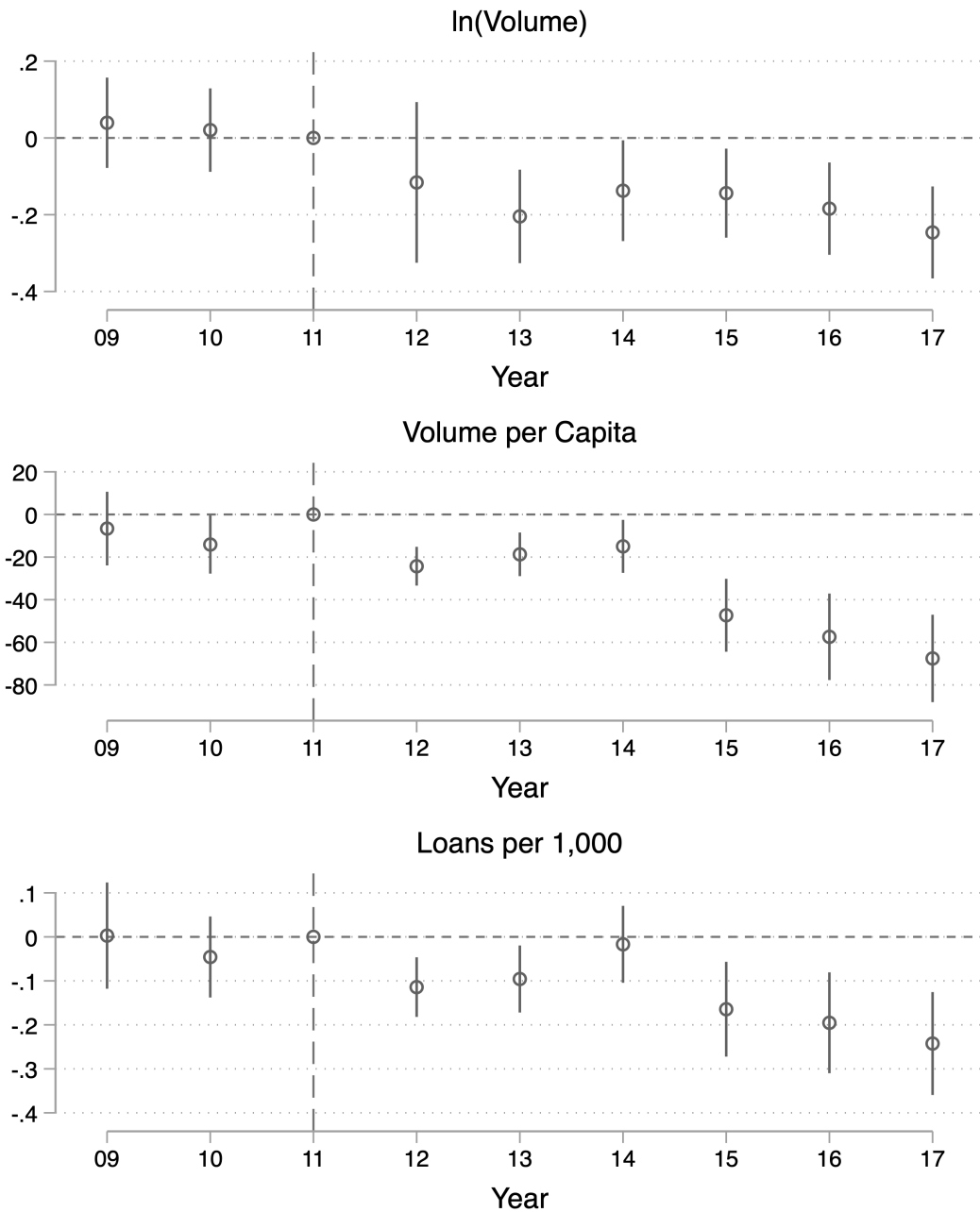
Figure 6: Changes in County-year-level Conventional Loan Originations

We regress measures of county-year-level conventional loan originations on *Exposure*, year indicator variables (2011 as the baseline year), *Exposure* interacted with all the year indicator variables, and county-level socioeconomic controls (see Table 4 for the original test). This figure shows the coefficient estimates of the interaction terms between *Exposure* and the year indicator variables. *ln(Volume)* is defined as the natural logarithm of one plus the dollar volume of conventional loan originations in a county. *Volume per Capita* is defined as the total dollar volume of conventional loan originations per capita in a county. *Loans per 1,000* is defined as the total count of conventional loan originations per 1,000 people in a county. For each county, *Exposure* is the dollar volume of FHA loan lending by big banks as a fraction of the dollar volume of all FHA lending in 2010. The dotted line represents the baseline year. 95% confidence intervals are delineated.

31
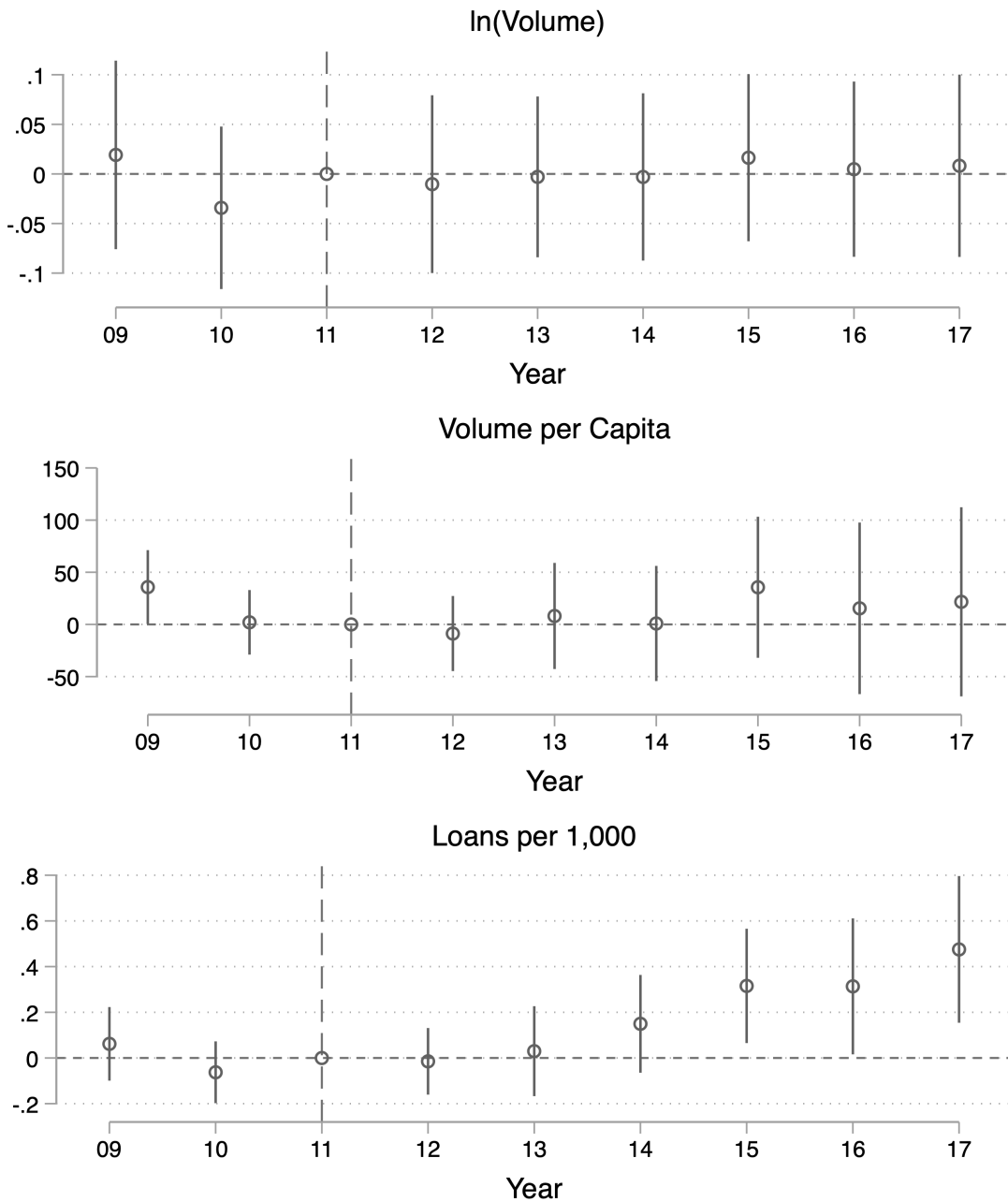
Table 1: List of Investigated FHA Lenders

This table shows all FHA lenders investigated or litigated by the Department of Justice (under the False Claims Act) in connection to alleged fraudulent lending activities in the FHA market and settled during 2008-2019. A settlement date represents the month and year pair in which each lender settled with the DOJ relating to this matter.

Lender	Settlement Date	Settlement Amount (M)
Banks and Bank-Affiliates		
Citimortgage, Inc. (Citibank)	Feb. 2012	158.3
Flagstar Bank	Feb. 2012	132.8
Deutsche Bank (MortgageIT)	May 2012	202.3
JPMorgan Chase	Feb. 2014	614.0
U.S. Bank	Jun. 2014	200.0
SunTrust Mortgage Inc.	Jun. 2014	418.0
Bank of America (Countrywide)	Aug. 2014	800.0
First Tennessee Bank	Jun. 2015	212.5
Fifth Third Bancorp	Oct. 2015	85.0
Wells Fargo Bank	Apr. 2016	1,200.0
M&T Bank	May 2016	64.0
Regions Bank	Sep. 2016	52.4
BB&TC	Sep. 2016	83.0
IberiaBank	Dec. 2017	11.6
Non-Banks		
National City Mortgage Inc.	May. 2008	4.6
RBC Mortgage Company	Nov. 2008	10.7
Beazer Homes USA Inc.	Jul. 2009	53.0
Robert Corp	Dec. 2009	0.7
Capmark Financial LLC	Feb. 2012	3.9
John Adams Mortgage Company	Dec. 2014	4.2
MetLife Home Loans LLC	Feb. 2015	123.5
Reverse Mortgage Solutions	Sep. 2015	212.5
Franklin American Mort. Co.	Dec. 2015	70.0
Freedom Mortgage Corp.	Apr. 2016	113.0
Primary Residential Mortgage Inc.	Oct. 2016	5.0
SecurityNational Mort. Co.	Oct. 2016	4.3
MDR Mortgage Corp.	Nov. 2016	10.4
United Shore F.S. LLC	Dec. 2016	48.0
Financial Freedom	May 2017	89.0
Prospect Mortgage, LLC	Jul. 2017	4.2
PHH	Aug. 2017	74.0
Allied Home Mortgage	Sep. 2017	296.0
Universal American Mort. Co. LLC	Oct. 2018	13.2
Gateway Funding	Dec. 2018	14.5
Quicken Loans	Jun. 2019	32.5

Table 2: Summary Statistics

This table presents summary statistics of FHA and conventional mortgage origination and socioeconomic data at the county-year-level from 2009 to 2017, covering approximately 2,663 U.S. counties. Data are obtained from the Home Mortgage Disclosure Act, Nationwide Mortgage Licensing System, U.S. Census Bureau's American Community Survey, Federal Housing Finance Agency, Bureau of Labor Statistics, and U.S. credit records from a major credit bureau. We aggregate loan-level mortgage information on applications and originations to the county-level and include only loans that meet the following criteria: home purchase, owner-occupied, secured by a first-lien, and one-to-four family dwelling.

	count	mean	sd	p25	p50	p75
FHA, Application Count	23820	404.312	1355.404	19.000	53.000	218.000
FHA, Origination Count	23820	286.085	935.746	12.000	36.000	158.000
FHA, Loans per 1,000	23820	1.563	1.209	0.694	1.212	2.104
FHA, Volume per Capita	23820	236.513	232.239	82.458	157.466	311.550
FHA, ln(Volume)	23820	8.709	2.085	7.274	8.449	10.051
FHA, Misconduct Rate, (%)	23820	0.332	0.307	0.143	0.275	0.444
Conventional, Application Count	23820	780.841	2498.927	51.000	129.000	432.000
Conventional, Origination Count	23820	572.956	1809.994	32.000	89.000	318.000
Conventional, Loans per 1,000	23820	3.487	2.418	1.809	2.895	4.470
Conventional, Volume per Capita	23820	651.972	727.560	224.821	412.019	787.302
Conventional, ln(Volume)	23820	9.727	1.960	8.308	9.457	10.935
Conventional, Misconduct Rate, (%)	23820	0.118	0.127	0.034	0.089	0.167
Exposure to Big Banks	23820	0.386	0.204	0.248	0.368	0.514
Unemployment Rate$_{t-1}$, (%)	23820	7.339	2.885	5.200	6.900	9.000
Poverty Rate$_{t-1}$, (%)	23820	16.066	5.818	11.700	15.400	19.500
Median Income$_{t-1}$	23820	46457.694	11676.015	38574.000	44392.000	51707.000
Population$_{t-1}$	23820	115952.327	344588.953	16130.000	33155.500	83114.500
Percent Minority$_{t-1}$, (%)	23820	11.469	14.183	1.976	5.214	15.389
Percent Bachelor's Degree$_{t-1}$, (%)	23820	14.018	6.194	9.673	12.461	16.704
HPI Change$_{t-1}$, (%)	23820	0.026	5.286	-2.760	0.020	2.780
Avg. Credit Score$_{t-1}$	23820	672.808	26.300	653.460	673.894	692.031

Table 3: Changes in County-lender Mortgage Lending

This table presents regressions that examine whether big lenders changed their FHA lending in response to increased FHA-related litigation risk from the DOJ in 2012 and after. The sample is a county-lender-year panel data of FHA and conventional mortgage originations from 2009 to 2017. The sample is restricted to: (i) lenders that have participated in the FHA market during the sample period and (ii) to lender-county pairs for which there was at least 1 mortgage application in a given year. We exclude loans that do not meet the following criteria: home purchase, owner-occupied, secured by a first-lien, and one-to-four family dwelling. In both panels, the outcome variable, *Number of Loans*, is defined as the total count of loan originations for a county-lender pair in each year. *Top 5% Lender* is an indicator variable that is 1 if the lender's FHA lending in 2010 was in the top fifth percentile of all FHA lending in 2010, and 0 otherwise. *Post* is an indicator variable that is 1 if the year is 2012 or afterwards, and 0 otherwise. Column (1) is the sample of all lenders, including banks, bank-affiliates, and non-banks. Column (2) is the subsample of only banks and bank-affiliates. Column (3) is the subsample of only non-bank lenders. Panel A presents difference-in-differences tests examining only the FHA mortgage market. Panel B presents triple difference tests for both the FHA and conventional mortgage markets. In Panel B we introduce a third variable, *FHA*, which is an indicator variable that is 1 if the mortgage loan market is FHA, and 0 otherwise. Robust standard errors are adjusted for clustering at the lender and county-level and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: FHA Loan Originations

	Number of Loans		
	All	Banks	Non-Banks
	(1)	(2)	(3)
Top 5% Lender × Post	-3.544**	-7.382**	-0.624
	(1.543)	(2.918)	(0.686)
Lender FE	Yes	Yes	Yes
County × Year FE	Yes	Yes	Yes
2010 Mean	3.155	3.210	3.094
Observations	2701435	1329870	1371249

Panel B: FHA and Conventional Loan Originations

	Number of Loans		
	All	Banks	Non-Banks
	(1)	(2)	(3)
Top 5% Lender × Post × FHA	-4.979***	-7.080***	-3.924***
	(1.263)	(2.459)	(0.814)
Top 5% Lender × Post	1.949**	0.276	3.522***
	(0.981)	(1.715)	(1.026)
Top 5% Lender × FHA	1.361***	0.682	2.044***
	(0.497)	(0.628)	(0.542)
Post × FHA	-1.691***	-2.242***	-1.435***
	(0.155)	(0.192)	(0.213)
FHA	-0.517***	-1.421***	0.581***
	(0.115)	(0.144)	(0.179)
Lender FE	Yes	Yes	Yes
County × Year FE	Yes	Yes	Yes
2010 Mean	3.159	3.746	2.479
Observations	5402972	2659982	2742990

Table 4: Changes in County Mortgage Lending

This table presents regressions that examine changes in county-level FHA lending based on counties' exposures to large FHA lenders (i.e., big banks and affiliated lenders of big banks). We define big banks as banks whose FHA lending in 2010 was in the top fifth percentile of all FHA lending in 2010. The sample is a county-year panel data of FHA and conventional mortgage originations from 2009 to 2017. In both panels, *ln(Volume)* is defined as the natural logarithm of one plus the dollar volume of loan originations in a county. *Volume per Capita* is defined as the total dollar volume of loan originations per capita in a county, and *Loans per 1,000* is defined as the total count of loan originations per 1,000 people in a county. For each county, *Exposure* is the dollar volume of FHA loan lending by big banks (and big bank-affiliates) as a fraction of the dollar volume of all FHA lending in 2010. *Post* is an indicator variable that is 1 if the year is 2012 or afterwards, and 0 otherwise. Panel A presents difference-in-differences tests examining only the FHA mortgage market. Panel B presents triple difference tests for both the FHA and conventional mortgage markets. In Panel B we introduce a third variable, *FHA*, which is an indicator variable that is 1 if the mortgage loan market is FHA, and 0 otherwise. Robust standard errors are adjusted for clustering at the county-level and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: FHA Loan Originations

	ln(Volume) (1)	Volume per Capita (2)	Loans per 1,000 (3)
Exposure × Post	-0.209***	-31.235***	-0.123***
	(0.054)	(5.787)	(0.042)
Controls	Yes	Yes	Yes
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
2010 Mean	8.785	246.385	1.709
Observations	23820	23820	23820
Adjusted R^2	0.938	0.881	0.860

Panel B: FHA and Conventional Loan Originations

	ln(Volume) (1)	Volume per Capita (2)	Loans per 1,000 (3)
Exposure × Post × FHA	-0.212***	-43.351	-0.378***
	(0.060)	(33.337)	(0.126)
Exposure × Post	0.007	5.815	0.233**
	(0.032)	(29.497)	(0.104)
Exposure × FHA	-0.380***	-123.112***	-0.755***
	(0.075)	(20.201)	(0.099)
Post × FHA	-0.475***	-347.076***	-1.538***
	(0.025)	(14.963)	(0.056)
FHA	-0.500***	-119.704***	-0.502***
	(0.033)	(8.455)	(0.044)
Controls	Yes	Yes	Yes
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
2010 Mean	9.040	317.151	2.021
Observations	47640	47640	47640
Adjusted R^2	0.937	0.678	0.732

Table 5: Consumer Exposure to Loan Officer Quality

This table presents regressions that examine changes in the average quality of loan officers across counties. The sample is a county-year panel data of FHA and conventional mortgage originations from 2009 to 2017. In each year, *Misconduct Rate 2012-2017, (%)* is the weighted average county-year-level percentage of loan officers with at least one misconduct record (based on the loan officers' 2012-2017 misconduct records). To calculate the weighted average misconduct measure we first multiply, for each lender, (i) the lender's FHA lending as a fraction of total FHA lending in a given county-year pair with (ii) the percentage of the lender's loan officers with non-zero misconduct records from 2012-2017. Next, we sum the multiplied values across all the lenders for each county-year pair. *Misconduct Rate 2012, (%)* is calculated similarly to *Misconduct Rate 2012-2017, (%)* but only accounts for loan officers' misconduct records in 2012. For each county, *Exposure* is the dollar volume of FHA loan lending by big banks (and big bank-affiliates) as a fraction of the dollar volume of all FHA lending in 2010. *Post* is an indicator variable that is 1 if the year is 2012 or afterwards, and 0 otherwise. Panel A presents difference-in-differences tests examining only the FHA mortgage market. Panel B presents triple difference tests for both the FHA and conventional mortgage markets. In Panel B we introduce a third variable, *FHA*, which is an indicator variable that is 1 if the mortgage loan market is FHA, and 0 otherwise. Robust standard errors are adjusted for clustering at the county-level and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: FHA Loan Originations

	Misconduct Rate 2012-2017, (%) (1)	Misconduct Rate 2012, (%) (2)
Exposure × Post	0.127***	0.107***
	(0.021)	(0.025)
Controls	Yes	Yes
County FE	Yes	Yes
Year FE	Yes	Yes
2010 Mean	0.271	0.246
Observations	23821	23821
Adjusted R^2	0.361	0.266

Panel B: FHA and Conventional Loan Originations

	Misconduct Rate 2012-2017, (%) (1)	Misconduct Rate 2012, (%) (2)
Exposure × Post × FHA	0.152***	0.122***
	(0.022)	(0.025)
Exposure × Post	-0.021**	-0.014
	(0.010)	(0.012)
Exposure × FHA	-0.066***	-0.057***
	(0.019)	(0.019)
Post × FHA	0.038***	0.065***
	(0.009)	(0.010)
FHA	0.184***	0.161***
	(0.009)	(0.009)
Controls	Yes	Yes
County FE	Yes	Yes
Year FE	Yes	Yes
2010 Mean	0.196	0.176
Observations	47642	47642
Adjusted R^2	0.447	0.359

Table 6: No Racial Disparity across Counties

This table presents regressions that examine FHA loan originations between counties with a large share of minorities in the population and counties with a smaller share of minorities. The sample period is 2009-2017. *ln(Volume)* is defined as the natural logarithm of one plus the dollar volume of loan originations in a county. *Volume per Capita* is defined as the total dollar volume of loan originations per capita in a county, and *Loans per 1,000* is defined as the total count of loan originations per 1,000 people in a county. For each county, *Exposure* is the dollar volume of FHA loan lending by big banks (and big bank-affiliates) as a fraction of the dollar volume of all FHA lending in 2010. *Post* is an indicator variable that is 1 if the year is 2012 or afterwards, and 0 otherwise. *High Minority County* is an indicator variable that is 1 if the fraction of minorities in the county's population is in the top 50 percentile of minority shares across all counties in 2010, and 0 otherwise. Robust standard errors are adjusted for clustering at the county-level and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	ln(Volume) (1)	Volume per Capita (2)	Loans per 1,000 (3)
Exposure × Post × High Minority County	0.070	-7.311	0.004
	(0.106)	(12.382)	(0.087)
Exposure × Post	-0.248***	-31.779***	-0.151***
	(0.076)	(6.925)	(0.051)
Post × High Minority County	-0.088*	-21.347***	-0.174***
	(0.045)	(5.538)	(0.038)
Controls	Yes	Yes	Yes
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
2010 Mean	8.785	246.385	1.709
Observations	23820	23820	23820
Adjusted R^2	0.938	0.882	0.860

Table 7: Racial Disparities in FHA Reliance

Panel A of this table shows the share of FHA lending among homeowners by race over the sample period from 2009 to 2017. Panel B presents difference-in-differences tests examining the impact of litigation risks on white and minority households. In columns (1) and (2), *Loans per 1,000* is defined as the total count of loan originations to white individuals per 1,000 white individuals living in a county, and *Volume per Capita* is defined as the total dollar volume of loan originations to white individuals per white individual living in a county. In columns (3) and (4), *Loans per 1,000* is defined as the total count of loan originations to non-white individuals per 1,000 non-white individuals living in a county, and *Volume per Capita* is defined as the total dollar volume of loan originations to non-white individuals per non-white individual living in a county. For each county, *Exposure* is the dollar volume of FHA loan lending by big banks (and big bank-affiliates) as a fraction of the dollar volume of all FHA lending in 2010. *Post* is an indicator variable that is 1 if the year is 2012 or afterward, and 0 otherwise. Robust standard errors are adjusted for clustering at the county-level and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Share of FHA Lending by Race

	count	mean	sd
FHA Share, Overall	21920972	0.290	0.454
FHA Share, Black Homeowners	1423852	0.511	0.500
FHA Share, Hispanic Homeowners	2160220	0.520	0.500
FHA Share, White Homeowners	16708017	0.251	0.434

Panel B: Changes in FHA Lending by Race

	Loans to White per White Population		Loans to Minorities per Minority Population	
	Loans per 1,000 (1)	Volume per Capita (2)	Loans per 1,000 (3)	Volume per Capita (4)
Exposure × Post	-0.061	-13.073**	-1.167*	-245.098***
	(0.039)	(5.289)	(0.605)	(79.687)
Controls	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
2010 Mean	1.544	221.942	6.688	909.495
Observations	21194	21194	21184	21184
Adjusted R^2	0.837	0.865	0.606	0.648

Appendix

A.1. Summary of Search Process for Investigated Lenders

Our process for identifying lender investigated by the DOJ for alleged fraudulent activity in the FHA-insured mortgage market is conducted in two parts. First, we identify lenders that settled with the DOJ/HUD for alleged violation of the False Claims Act relating to FHA loans and document their settlement dates. Next, we identify the complaint filing dates (if applicable in the context of a lawsuit) or dates indicating when the DOJ/HUD began investigating or auditing a particular investigated lender (if available).

A.1.1. Identifying Investigated Lenders and Settlement Dates

We search the DOJ News Archive for any FHA-related False Claims Act settlement agreements and settlement dates relating to DOJ/HUD and mortgage lenders engaged in FHA lending from 2006 to 2021. The keyword searches include "federal housing administration," "fha," and "false claims act, fha." Relevant settlements must discuss alleged fraudulent lender activity that violated the False Claims Act in the context of FHA mortgage lending. We infer the settlement dates either from attached settlement agreements or from DOJ press statements. In 2006 and 2007, there were no articles relating to alleged fraudulent FHA activity violating the False Claims Act. Consequently, we stop the search process in year 2006.

A.1.2. Identifying Complaint Filing Dates or Investigation/Audit Start Dates

For each treated lender, we use attached settlement agreements or DOJ press articles obtained on the DOJ News Archive to identify the complaint filing dates when applicable. Either the complaint filing dates are (a) explicitly stated, (b) not explicitly stated, (c) unavailable because the lawsuit has been sealed by the court, (d) or not applicable because there was no lawsuit. In this process, we are usually able to only observe (a), (b), and (c).

For each treated lender that we were not able to obtain a complaint filing date, we use Nexis Uni to search for legal summaries that correspond to federal cases fitting the following search formula: "[lender]" AND "fha" AND "false claims act". For some lenders we were able to obtain legal summaries that indicated the complaint filing date or investigation/audit dates.

For each treated lender that we were not able to obtain a complaint filing date or investigation/audit date, we use Google to search for third-party articles discussing alleged violations of the False Claims Act using the following search formula: "[lender name] fha false claims act." We scan through the first page of results for each search iteration. Occasionally, some third-party articles will indicate the complaint filing date or investigation/audit date.

**Figure A.1:** Share of Loan Types by Race

This figure shows the share of FHA mortgage origination with respect to conventional loans and other loan types from 2009 to 2017 across different races. The sample is restricted to origination that meets the following criteria: home purchase, owner-occupied, secured by a first-lien, and one-to-four family dwelling. We exclude refinances and home improvement loans.
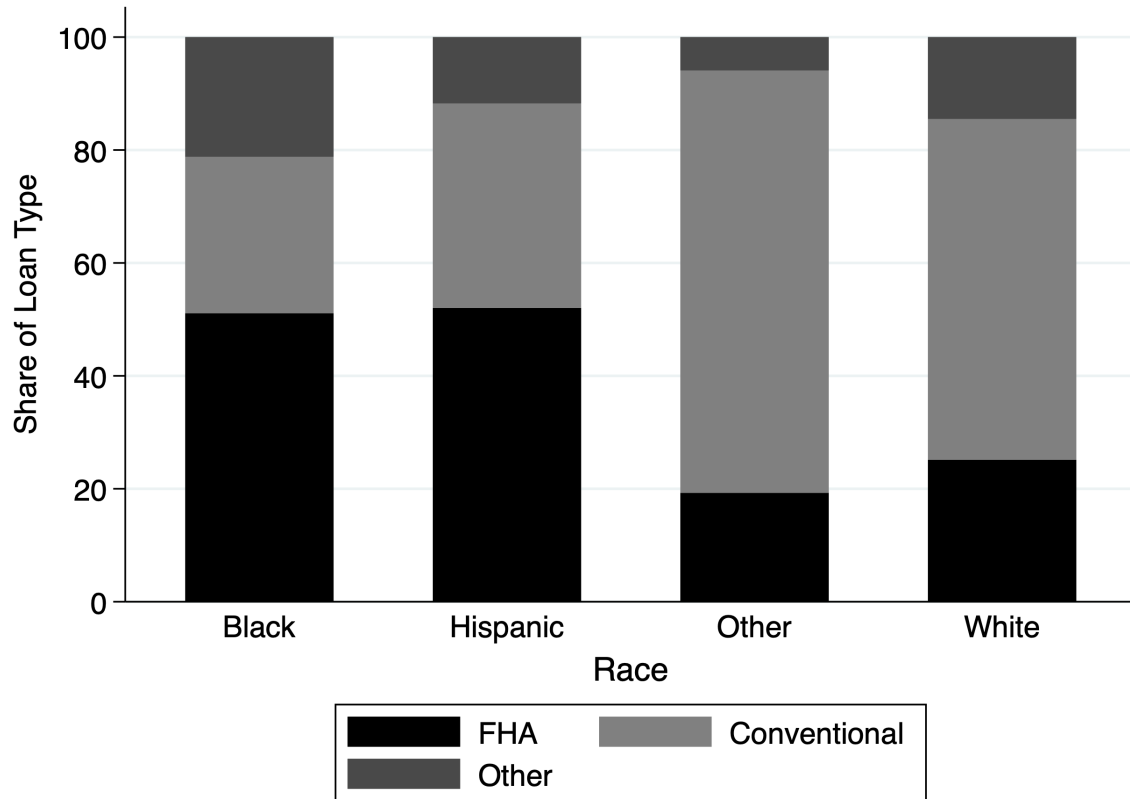
Figure A.2: County Exposure to Big Banks

This figure presents a map categorizing U.S. counties based on the market share of banks and affiliates that were in the top fifth percentile of the FHA mortgage market as of 2010. Darker shades represent counties where big banks have a higher market share in the FHA mortgage market.
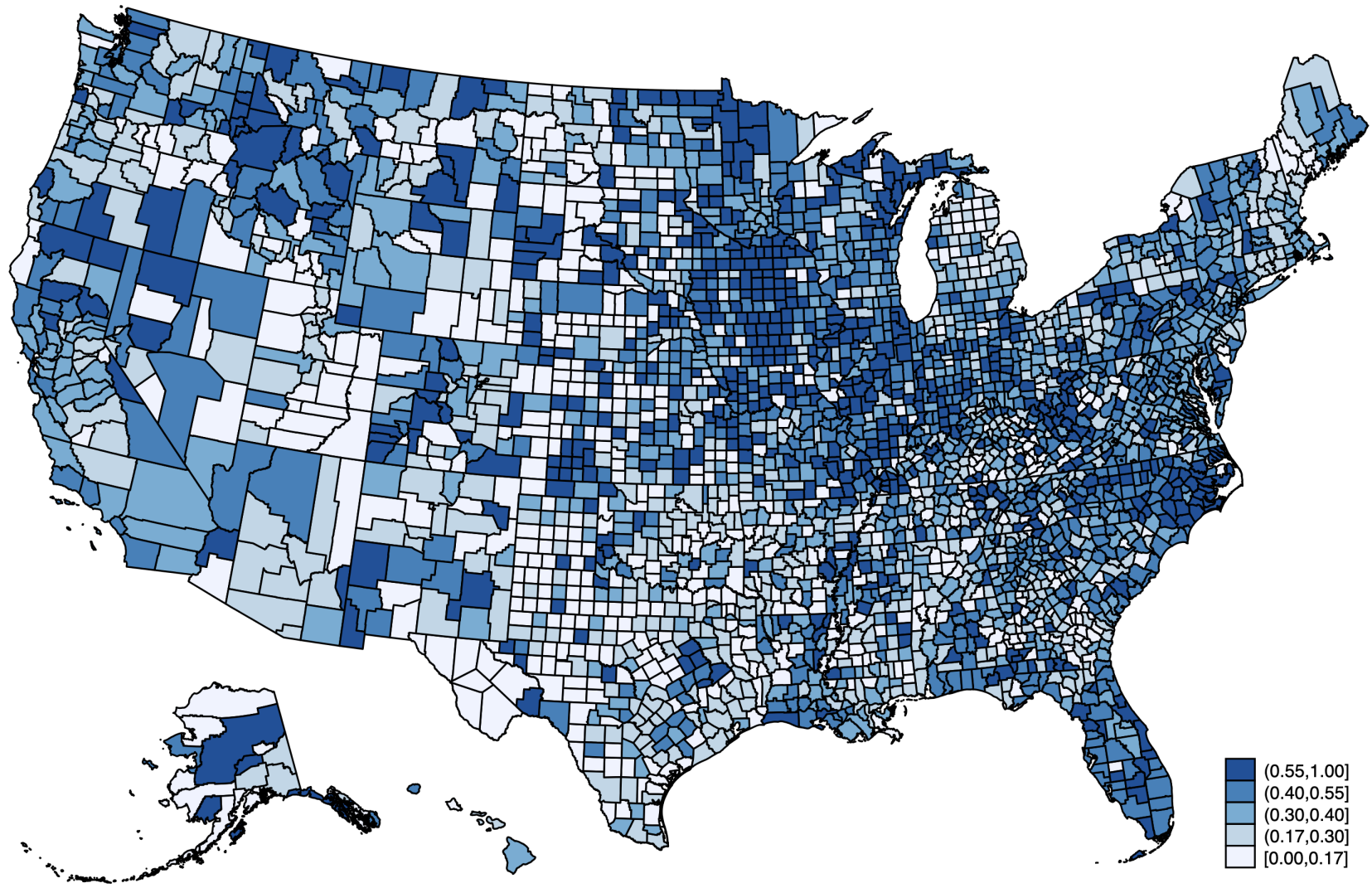
Table A.1: Variable Definitions

Variable	Description
Unemployment Rate, (%)	County unemployment rate in percentage points
Poverty Rate, (%)	County poverty rate in percentage points
Population	County population
Percent Minority, (%)	Share of the county population who identify as non-white in percentage points
Percent Bachelor's Degree, (%)	Share of the county population who have a bachelor's degree or higher in percentage points
HPI Change, (%)	Annual change in a county's House Price Index in percentage points
Avg. Credit Score	Average credit score (300-850) in a count

Table A.2: County-lender-year Regressions, Poisson

This table presents Poisson regressions that examine whether big lenders changed their FHA lending in response to increased FHA-related litigation risk from the DOJ in 2012 and after. The sample is a county-lender-year panel data of FHA and conventional mortgage originations from 2009 to 2017. The sample is restricted to: (i) lenders that have participated in the FHA market during the sample period and (ii) to lender-county pairs for which there was at least 1 mortgage application in a given year. We exclude loans that do not meet the following criteria: home purchase, owner-occupied, secured by a first-lien, and one-to-four family dwelling. In both panels, the outcome variable, *Number of Loans*, is defined as the total count of loan originations for a county-lender pair in each year. *Top 5% Lender* is an indicator variable that is 1 if the lender's FHA lending in 2010 was in the top fifth percentile of all FHA lending in 2010, and 0 otherwise. *Post* is an indicator variable that is 1 if the year is 2012 or afterwards, and 0 otherwise. Column (1) is the sample of all lenders, including banks, bank-affiliates, and non-banks. Column (2) is the subsample of only banks and bank-affiliates. Column (3) is the subsample of only non-bank lenders. Panel A presents difference-in-differences tests examining only the FHA mortgage market. Panel B presents triple difference tests for both the FHA and conventional mortgage markets. In Panel B we introduce a third variable, *FHA*, which is an indicator variable that is 1 if the mortgage loan market is FHA, and 0 otherwise. Robust standard errors are adjusted for clustering at the lender and county-level and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: FHA Loan Originations

	Number of Loans		
	All (1)	Banks (2)	Non-Banks (3)
Top 5% Lender × Post	-0.458**	-0.871***	-0.069
	(0.186)	(0.205)	(0.123)
Lender FE	Yes	Yes	Yes
County × Year FE	Yes	Yes	Yes
2010 Mean	3.371	3.627	3.197
Observations	2543000	1168251	1340699

Panel B: FHA and Conventional Loan Originations

	Number of Loans		
	All (1)	Banks (2)	Non-Banks (3)
Top 5% Lender × Post × FHA	-0.392***	-0.508***	-0.331**
	(0.087)	(0.123)	(0.133)
Top 5% Lender × Post	-0.126	-0.381**	0.265
	(0.157)	(0.155)	(0.189)
Top 5% Lender × FHA	0.403***	0.666***	0.231
	(0.097)	(0.082)	(0.141)
Post × FHA	-0.549***	-0.745***	-0.670***
	(0.051)	(0.059)	(0.097)
FHA	-0.283***	-0.747***	0.353***
	(0.059)	(0.068)	(0.111)
Lender FE	Yes	Yes	Yes
County × Year FE	Yes	Yes	Yes
2010 Mean	3.172	3.755	2.531
Observations	5392718	2655124	2713200

Table A.3: County-lender-year Regressions, Investigated Lenders

This table presents regressions that examine whether investigated lenders changed their FHA lending in response to increased FHA-related litigation risk from the DOJ in 2012 and after. The sample is a county-lender-year panel data of FHA and conventional mortgage originations from 2009 to 2017. The sample is restricted to: (i) lenders that have participated in the FHA market during the sample period and (ii) to lender-county pairs for which there was at least 1 mortgage application in a given year. We exclude loans that do not meet the following criteria: home purchase, owner-occupied, secured by a first-lien, and one-to-four family dwelling. In both panels, the outcome variable, *Number of Loans*, is defined as the total count of loan originations for a county-lender pair in each year. *Investigated* is an indicator variable that is 1 if the lender was investigated, audited, or sued by the DOJ for FHA-related FCA cases, and 0 otherwise. *Post* is an indicator variable that is 1 if the year is 2012 or afterwards, and 0 otherwise. Column (1) is the sample of all lenders, including banks, bank-affiliates, and non-banks. Column (2) is the subsample of only banks and bank-affiliates. Column (3) is the subsample of only non-bank lenders. Panel A presents difference-in-differences tests examining only the FHA mortgage market. Panel B presents triple difference tests for both the FHA and conventional mortgage markets. In Panel B we introduce a third variable, *FHA*, which is an indicator variable that is 1 if the mortgage loan market is FHA, and 0 otherwise. Robust standard errors are adjusted for clustering at the lender and county-level and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: FHA Loan Originations

	Number of Loans		
	All	Banks	Non-Banks
	(1)	(2)	(3)
Investigated × Post	-4.784**	-8.569**	0.028
	(2.349)	(3.461)	(1.165)
Lender FE	Yes	Yes	Yes
County × Year FE	Yes	Yes	Yes
2010 Mean	3.155	3.210	3.094
Observations	2701435	1329870	1371249

Panel B: FHA and Conventional Loan Originations

	Number of Loans		
	All	Banks	Non-Banks
	(1)	(2)	(3)
Investigated × Post × FHA	-5.623***	-7.268***	-3.352***
	(1.840)	(2.806)	(1.120)
Investigated × Post	1.383	-0.277	3.506**
	(1.465)	(2.099)	(1.769)
Investigated × FHA	-0.278	-0.648	0.776
	(0.613)	(0.734)	(0.569)
Post × FHA	-2.054***	-2.474***	-1.995***
	(0.180)	(0.204)	(0.268)
FHA	-0.139	-1.140***	0.991***
	(0.126)	(0.143)	(0.216)
Lender FE	Yes	Yes	Yes
County × Year FE	Yes	Yes	Yes
2010 Mean	3.159	3.746	2.479
Observations	5402972	2659982	2742990

Table A.4: Changes in County Mortgage Lending, Big Banks

This table presents regressions that examine changes in county-level FHA lending by big banks based on counties' exposures to large FHA lenders (i.e., big banks and affiliated lenders of big banks). We define big banks as banks whose FHA lending in 2010 was in the top fifth percentile of all FHA lending in 2010. The sample is a county-year panel data of FHA and conventional mortgage originations from 2009 to 2017. In both panels, *ln(Volume)* is defined as the natural logarithm of one plus the dollar volume of loan originations in a county. *Volume per Capita* is defined as the total dollar volume of loan originations per capita in a county, and *Loans per 1,000* is defined as the total count of loan originations per 1,000 people in a county. For each county, *Exposure* is the dollar volume of FHA loan lending by big banks (and big bank-affiliates) as a fraction of the dollar volume of all FHA lending in 2010. *Post* is an indicator variable that is 1 if the year is 2012 or afterwards, and 0 otherwise. Panel A presents difference-in-differences tests examining only the FHA mortgage market. Panel B presents triple difference tests for both the FHA and conventional mortgage markets. In Panel B we introduce a third variable, *FHA*, which is an indicator variable that is 1 if the mortgage loan market is FHA, and 0 otherwise. Robust standard errors are adjusted for clustering at the county-level and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: FHA Loan Originations

	ln(Volume) (1)	Volume per Capita (2)	Loans per 1,000 (3)
Exposure × Post	-0.956***	-66.512***	-0.553***
	(0.121)	(4.815)	(0.033)
Controls	Yes	Yes	Yes
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
2010 Mean	7.573	91.677	0.643
Observations	23821	23821	23821
Adjusted R^2	0.754	0.686	0.687

Panel B: FHA and Conventional Loan Originations

	ln(Volume) (1)	Volume per Capita (2)	Loans per 1,000 (3)
Exposure × Post × FHA	-0.771***	-73.296***	-0.545***
	(0.138)	(8.103)	(0.040)
Exposure × Post	-0.192**	6.116	-0.009
	(0.097)	(4.885)	(0.021)
Exposure × FHA	0.821***	4.964	0.214***
	(0.124)	(6.992)	(0.033)
Post × FHA	-1.271***	-52.109***	-0.214***
	(0.063)	(3.265)	(0.014)
FHA	-0.354***	-27.852***	-0.064***
	(0.057)	(2.698)	(0.012)
Controls	Yes	Yes	Yes
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
2010 Mean	7.514	99.917	0.605
Observations	47642	47642	47642
Adjusted R^2	0.770	0.617	0.658

Table A.5: Changes in County Mortgage Lending, Non-Big Banks

This table presents regressions that examine changes in county-level FHA lending by non-big banks based on counties' exposures to large FHA lenders (i.e., big banks and affiliated lenders of big banks). We define big banks as banks whose FHA lending in 2010 was in the top fifth percentile of all FHA lending in 2010. The sample is a county-year panel data of FHA and conventional mortgage originations from 2009 to 2017. In both panels, *ln(Volume)* is defined as the natural logarithm of one plus the dollar volume of loan originations in a county. *Volume per Capita* is defined as the total dollar volume of loan originations per capita in a county, and *Loans per 1,000* is defined as the total count of loan originations per 1,000 people in a county. For each county, *Exposure* is the dollar volume of FHA loan lending by big banks (and big bank-affiliates) as a fraction of the dollar volume of all FHA lending in 2010. *Post* is an indicator variable that is 1 if the year is 2012 or afterwards, and 0 otherwise. Panel A presents difference-in-differences tests examining only the FHA mortgage market. Panel B presents triple difference tests for both the FHA and conventional mortgage markets. In Panel B we introduce a third variable, *FHA*, which is an indicator variable that is 1 if the mortgage loan market is FHA, and 0 otherwise. Robust standard errors are adjusted for clustering at the county-level and are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: FHA Loan Originations

	ln(Volume) (1)	Volume per Capita (2)	Loans per 1,000 (3)
Exposure × Post	1.081***	35.555***	0.426***
	(0.079)	(5.349)	(0.033)
Controls	Yes	Yes	Yes
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
2010 Mean	8.193	154.545	1.062
Observations	23821	23821	23821
Adjusted R^2	0.904	0.860	0.850

Panel B: FHA and Conventional Loan Originations

	ln(Volume) (1)	Volume per Capita (2)	Loans per 1,000 (3)
Exposure × Post × FHA	0.893***	30.995	0.146
	(0.089)	(26.353)	(0.102)
Exposure × Post	0.197***	-1.293	0.258***
	(0.042)	(26.013)	(0.099)
Exposure × FHA	-1.686***	-126.267***	-0.957***
	(0.113)	(15.237)	(0.087)
Post × FHA	-0.650***	-295.540***	-1.318***
	(0.035)	(12.175)	(0.047)
FHA	-0.286***	-91.469***	-0.443***
	(0.046)	(6.493)	(0.039)
Controls	Yes	Yes	Yes
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
2010 Mean	8.584	216.028	1.413
Observations	47642	47642	47642
Adjusted R^2	0.908	0.676	0.718