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Enforcing Fair Lending: Evidence from Mortgage Market Litigation

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Abstract: Does fair lending litigation impact mortgage lender decisions? Using a novel dataset of all fair lending legal actions from 1991 to 2023, we find that it does. In the wake of legal settlements for discrimination against Black borrowers, lenders significantly reduced denial rates for Black applicants. The reductions offset pre-litigation racial disparities in denial rates by litigated banks, relative to those banks' competitors. Origination rates for Black applicants also increased post-litigation. We further observe evidence of a spillover effect on the approval decisions of non-litigated banks operating in the same city as a litigated bank. Altogether, the evidence suggests that the enforcement of fair lending laws is an effective tool to reduce racial discrimination in credit markets.

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1 Introduction

An important factor that contributes to the long-run economic well-being of individuals is the location where one lives (Chetty, Hendren, and Katz, 2016). Families who can purchase a home in the neighborhood of their choice at a fair price—and see the value of their home grow over time—do better economically in the long run, as surveyed by Rouse, Bernstein, Knudsen, and Zhang (2021). Over the course of U.S. history, numerous policies have discriminated against racial minorities who wish to pursue the path of homeownership. Over the decades, Congress passed "fair lending laws" such as the Fair Housing Act of 1968 to combat this problem.

Despite their decades-long existence, much remains unknown regarding the difference these laws make. And importantly, if they have made a difference, *how much* of a difference? Theory suggests that having these laws on the books should move the needle against discrimination in credit markets. Yet we still see evidence of discrimination in mortgage lending (Faber, 2018; Zhang and Willen, 2021) and other credit markets, such as the market for auto loans (Butler et. al., 2022). Perhaps these fair lending laws were less powerful than originally imagined. Or, perhaps these laws are powerful but there hasn't been enough enforcement.

We focus on *enforcement* through litigation as a particular method of enforcing the fair lending laws. Specifically, we assess how mortgage lenders and borrowers respond to fair lending litigation, using a difference-in-differences research design across a range of outcome variables and contexts, including denial, origination, and securitization rates as well as national litigation and litigation targeted at specific geographies.

We find that lenders significantly reduce denial rates for Black applicants in the wake of legal settlements, largely eliminating pre-litigation racial disparities in denial rates at litigated banks relative to their local competitors. Pre-litigation, banks that face fair lending enforcement in our sample deny mortgage applications from Black borrowers at a rate that is 3 percentage points higher than the denial rate at banks that are not subject to fair lending enforcement (a statistically significant difference). Post-litigation, banks subject to enforcement reduce their denial rate for Black borrowers by nearly 4 percentage points. This represents about one third of the absolute pre-litigation

difference in Black-White denial disparity rates at litigated banks. The change persists through at least four years post-litigation. Moreover, on average, origination rates for Black applicants increase post-litigation.

We also break down our results by allegation type, and report circumstantial evidence that the additional loans to Black borrowers go toward *creditworthy* borrowers, meaning that litigated banks may have been refusing to lend to creditworthy Black borrowers prior to litigation. Finally, we find evidence consistent with the existence of a "spillover effect" wherein non-litigated banks "exposed" to a fair lending suit against a local competitor *themselves* reduce denial rates for Black applicants in the wake of litigation. After lenders face enforcement for alleged fair lending violations within a given CBSA, the denial rate for Black borrowers in that CBSA—for lenders that do *not* face enforcement—decreases by a statistically significant 1 percentage point post-litigation.

To appreciate the significance of the question of fair lending enforcement, one must understand the history of discrimination that culminated in the fair lending laws. It wasn't until 1948 that the Supreme Court held in *Shelley v. Kraemer* that racially restrictive covenants are legally unenforceable, reversing its own decision from 1926 in *Corrigan v. Buckley*. Because the *Shelley* decision was based on the Equal Protection Clause of the U.S. Constitution, however, it only applied to *government* facilitation of housing discrimination and said nothing of discrimination among private actors, such as banks, landlords, and home-sellers. Nor did *Shelley*'s holding extend beyond the context of express, racially restrictive covenants. As discussed extensively in the literature, race became the primary determinant of mortgage eligibility in the 1930s. Using standardized evaluation forms, officials from the Federal Housing Administration determined which homes it would insure (Baradaran, 2019). The most important determination on each form was the percentage of "negro" or "foreign born" residents in each neighborhood, as well as the likelihood of "infiltration" of each race. Race became a proxy for credit risk in government underwriting. These maps had four color categories based on perceived risk: A (green), B (blue), C (yellow), and D (red). Green was the most desirable and red the least—hence the name "redlining" (Rothstein, 2017).

The economic impact of discrimination in mortgage lending has been significant. Appel and

Nickerson (2016) study the long-term effects of redlining policies that restricted access to credit in urban communities. They find that redlined neighborhoods had 4.8 percent lower home prices in 1990 relative to adjacent areas. Aaronson, Hartley, and Mazumder (2021) show that the redlining maps reduced home ownership rates, house values, and rents and also increased racial segregation in later decades. The authors' results suggest the maps had meaningful and lasting effects on the development of urban neighborhoods through reduced credit access and subsequent disinvestment. Relatedly, Aaronson, Faber, Hartley, Mazumder, and Sharkey (2021) estimate the long-run effects of the 1930s redlining maps on census tract-level measures of socioeconomic status and economic opportunity. They find that the maps had large and statistically significant causal effects on a wide variety of outcomes measured at the census tract level for cohorts born in the late 1970s and early 1980s. Similarly, Li (2022) argues that early constraints on Black households' neighborhood choices explain the persistence in segregation across cities between 1960 and 2010.

In 1968, as part of the Civil Rights Act, Congress passed the Fair Housing Act, which initially prohibited discrimination in residential real estate transactions based on race, color, religion, sex, or national origin (Horowitz, 2018). However, before the 1970s, it was unclear whether federal law prohibited lenders from discriminating against prospective borrowers based on the perceived race of the borrower or the borrower's neighborhood. In 1974, Congress passed the Equal Credit Opportunity Act ("ECOA"), which (including subsequent expansions) prohibited discrimination in any aspect of a credit transaction (Rohner, 1978). And, in 1977, Congress passed the Community Reinvestment Act ("CRA"), which encouraged federally insured banks and thrifts to meet the credit needs of the entire communities that they serve, including low- and moderate-income areas, consistent with safe and sound banking practices (Barr, 2005). By 1980, it was settled that federal law prohibited such discriminatory lending practices, at least when carried out overtly with respect to race, color, national origin, religion, sex, familial status, or disability (Nash, 2008).

In the decades since the passage of these statutes, we still witness discrepancies with respect to lenders providing loans to racial minorities. Munnell, Tootell, Browne, and McEneaney (1996) show that minorities were more than twice as likely to be denied a mortgage as whites in the Boston

area. Zhang and Willen (2020) show that discrimination exists even when accounting for a menu problem wherein mortgage borrowers can choose to either avoid closing costs and pay a high interest rate or contribute to closing costs and get a lower rate. These discrepancies across racial groups even persist with respect to FinTech lenders (Bartlett, Morse, Stanton, and Wallace, 2022).

Given the continued existence of discrimination in lending markets, is it possible that the enforcement of fair lending laws is not effective? Or have the laws simply not been enforced enough? The academic literature has yet to fully address this question empirically. We are aware of only two related working papers. First, An, Bushman, Kleymenova, and Tomy (2022) explore whether banking supervision plays a role in improving access to credit for minorities by investigating enforcement decisions and orders (EDOs) executed as part of the bank supervisory process. They note that regulators bring enforcement actions against banks as a measure of last resort and exercise some discretion in issuing EDOs. While a few EDOs directly reference fair lending practices, EDOs are generally not concerned with banks' adherence to fair lending laws, as fair lending laws are overseen via a separate and distinct supervisory process (as we discuss below). The authors find that mortgage lending to minority borrowers does significantly increase post EDO and that this positive effect increases with the severity of an EDO.

Our article does not examine actions taken by bank supervisors but rather litigation in court. In addition to quantifying the impact of fair lending litigation on a bank's lending behavior, we analyze whether there are spillover effects to other banks in the area. To do so, we assemble a novel dataset of all fair lending legal actions from the early 1990s through 2023 and pair it with regulatory Home Mortgage Disclosure Act ("HMDA") mortgage application data. We use this combined dataset to analyze patterns in mortgage application decisions at litigated lenders, relative to their non-litigated local competitors.

In a second related project, Ballew and Pears (2023) analyze the significant drop in fair lending enforcement actions brought by the Department of Justice between the Obama administration and the first Trump administration. The authors note that the administration change in 2017 led to an immediate 99 percent drop in Consumer Financial Protection Bureau ("CFPB") and Department

of Justice ("DOJ") fair lending enforcement actions. The authors find that following the administration change, banks charged higher interest rate spreads to Black or Hispanic borrowers and borrowers in lower- and middle-income areas. The authors' results were particularly substantial among banks that had previously been the subject of fair lending enforcement.

While we analyze similar mortgage loan data in our project, our analysis is based on individual cases and thus serves as a "bottom up" complement to the "top down" analysis of Ballew and Pears (2023). In particular, Ballew and Pears (2023) analyze how racial disparities across the mortgage market—as well as specifically among banks that had previously been the subject of fair lending enforcement—change following *aggregate* reductions in fair lending enforcement. By contrast, our analysis looks at individual enforcement actions and how the lending behavior of both the targets of those actions and of competitor banks in the locations where discrimination allegedly occurred changes in the immediate aftermath of litigation. We break down our results by allegation type and primarily focus on denial rates. Our sample also includes cases brought by municipalities and private parties as class actions, in addition to federal government enforcement.

The rest of our paper proceeds as follows: Section 2 presents the institutional background and economic theory. Section 3 describes various datasets used in the analysis. Section 4 explains in detail the regression specifications. Section 5 contains our main regression results as well as robustness checks. Section 6 concludes.

2 Background, Theory, and Hypothesis Development

2.1 Institutional and Theoretical Background on the Mortgage Market and Mortgage Discrimination

The U.S. mortgage market consists of myriad credit suppliers, forms of credit, and regulators. Banks and non-bank mortgage lenders alike offer mortgage loans for home purchases, investment properties, mortgage refinances, and home improvements. Whereas "conventional" mortgages' are not insured by the federal government, special mortgage credit programs that insure against the

risk of borrower default are available for target, priority groups and offered by the Fair Housing Administration ("FHA"), United States Department of Agriculture ("USDA"), and United States Department of Veterans' Affairs ("VA"). Originated mortgages can be securitized and sold to government sponsored entities ("GSEs") such as Fannie Mae and Freddie Mac or to private mortgage investors.

The regulatory landscape, in turn, involves a host of regulators, including the Federal Reserve, Federal Deposit Insurance Corporation ("FDIC"), Office of the Comptroller of the Currency ("OCC"), CFPB, and DOJ. While the Federal Reserve, FDIC, and OCC primarily focus on promoting safety and soundness through supervisory exams and stress testing rather than direct fair lending enforcement, An et al. (2022) show how EDOs stemming from the supervisory process reduce racial disparities in mortgage terms among the targets of such EDOs. Moreover, evidence of potential fair lending violations uncovered during supervisory examinations by the Federal Reserve, FDIC, or OCC are often referred to the CFPB or DOJ, who may then conduct a further investigation and/or bring enforcement action.[1]

The CFPB, by contrast, is directly responsible for enforcing the ECOA and Fair Housing Act and to that effect has the power to issue rulemakings and conduct supervisory exams and enforcement actions. Frequently, CFPB enforcement actions are brought in conjunction with the DOJ, which likewise has the power to enforce the ECOA through litigation. Private parties are arguably also part of the regulatory mix. Particularly with class action litigation, litigation vindicates the private interests of named plaintiffs and class members but also the broader public interest in legal compliance by defendants.

In principle, credit suppliers will offer loans in accordance with the expected profitability and risk of lending to a given borrower, accounting for factors such as income, credit score, delinquency history, and the degree of borrower leveraging. As with all markets, mortgage pricing terms will vary based on the level of competition in the market, and rational lenders will extend credit offers so long as the risk-adjusted expected returns meet or exceed the expected sum of the cost and

[1] See, e.g., Complaint, US v. Albank Federal Savings Bank (N.D.N.Y 1998).

opportunity cost associated with offering the loan (Dobbie et al., 2021).

Lenders can vary interest rates as well as "discount points" (upfront fees paid in exchange for lower interest rates) to adjust for the risks associated with offering a given loan to a given mortgage applicant (Zhang and Willen, 2021), including by applying "overage" charges above the levels that objective models of creditworthiness recommend and "underages" that reduce loan charges to below the levels that creditworthiness models recommend.[2] Lenders can also adjust risk through non-price credit rationing, such as by denying a loan application altogether, refusing to operate in neighborhoods they deem high-risk, or (closely related) avoiding marketing and outreach to certain classes of prospective borrowers (Stiglitz and Weiss 1981).

Yet mortgage lenders are not impervious to discrimination on the basis of legally protected classifications. As discussed above, there is a history of race-based disparate treatment of borrowers in the U.S. mortgage lending process.

A key worry with mortgage lending is that, in discriminating against mortgage applicants on the basis of *permissible* characteristics related to creditworthiness and risk, lenders will also discriminate based on impermissible characteristics such as race, sex, or national origin.

The contemporary theoretical literature in economics on discrimination began with Gary Becker's seminal work, "The Economics of Discrimination," published in 1957. Becker's theory provides that lenders with overt bias against persons of a certain group will only extend credit to such persons at a cost- or creditworthiness- premium. Said differently, lenders will either charge higher interest rates to, or expect superior creditworthiness from, persons of a targeted group in order to overcome their aversion to such persons. Accordingly, Becker's theory predicts that loans extended to members of a targeted group will perform better than loans to other borrowers—in terms of risk-adjusted expected profits—given the more stringent standards applied to the targeted group. A corollary of this theory is that, ceteris paribus, borrowers from a discriminated group will be offered higher interest rates and subject to higher denial rates than other similarly situated mortgage applicants.

[2] See US v. Chevy Chase Bank (E.D. Va. 2013).

A second theory of discrimination, presented by Arrow (1973), looks beyond overt aversion to certain groups and instead involves "statistical discrimination." Arrow's theory maintains that lenders may rely on group-wide stereotypes about the creditworthiness of members of certain races and use those stereotypes to resolve uncertainty when make lending decisions on marginal applicants (Arrow 1973). Arrow's theory offers the same predictions about how discrimination will manifest in lending decisions as Becker's, as well as the same corollary implications.

A more recent theory by Dobbie et al. (2021) examines principal-agent problems within lending institutions. Specifically, the authors theorize that mismatched incentives between institutions (i.e., the principals) and agent loan officers lead loan officers to discount the long-term returns associated with extending a loan to a given credit applicant in favor of the loan officer's own short-term gains. Rather than neutrally assessing an applicant's creditworthiness and the long-term profitability of originating a loan to the applicant, loan officers instead employ their own overt or "statistical" biases to vet applicants, since they do not share in the long-term benefits that principals receive from originated loans. Dobbie et al. (2021) offer empirical support for this theory, and other studies present evidence consistent with their theory. While Bhutta et al. (2022) offer compelling evidence to suggest that average racial differences in creditworthiness, rather than prejudice by loan officers, explain mortgage market discrimination, Butler et al. (2022) demonstrate that in places where discrimination is more prevalent, racial minorities face access barriers to and differential treatment in the automotive lending market, where they tend to be vetted in in-person, face-to-face interactions, while escaping such problems when applying for credit cards, for which credit decisions tend to be automated.

The allegations advanced by the litigation actions analyzed in this study involve elements of each of these theories and differential treatment along both price- and non-price terms. Our sample includes fair lending actions alleging discriminatory pricing, discriminatory origination, redlining, and reverse redlining. The actions over discriminatory pricing allege that racial minorities were offered credit on less favorable terms—higher interest rates—on average than White applicants with the same credit scores and levels of creditworthiness. Actions over discriminatory origination

allege the analogous with respect to mortgage application denial rates. Consistent with Becker (1957)'s and Dobbie et al. (2021)'s theories, the complaints in such actions frequently allege that banks gave loan officers too much discretion in the underwriting process, including by failing to implement uniform, objective criteria for assessing applicant creditworthiness and permitting too many opportunities for loan officers to override centralized underwriting systems (to the extent targeted banks have them) and alter recommended mortgage terms on an applicant-by-applicant basis.

In turn, the redlining and reverse redlining actions center around banks allegedly failing to provide credit to majority-Black or Hispanic neighborhoods or deliberately targeting such neighborhoods with loans featuring supra-competitive interest rates and other unfavorable terms, respectively. The targets of redlining litigation, especially, may be engaging in overt discrimination wherein they are actively averse to lending to minorities (Becker, 1957). The targets of redlining and reverse redlining enforcement may also be statistically discriminating; the targets of redlining actions may be relying on the perception that racial minorities are less creditworthy to deny credit to residents of majority-minority neighborhoods altogether (Arrow 1973). In turn, the targets of reverse redlining actions may perceive such residents as less financially savvy or having less access to credit on competitive terms and therefore more susceptible to accepting the unfavorable credit options with which defendants allegedly target residents of such neighborhoods.

Becker (1968) theorizes that enforcement, whether through criminal or civil sanctions, incentivizes legal compliance by forcing potential targets of enforcement to internalize the cost of such sanctions. In the case of overtly biased lenders, a la Becker (1957)'s theory, the expected cost of enforcement shifts the calculus of whether to lend to a member of a disfavored racial minority by counteracting the "benefit"—the satisfaction gained from not lending to such a person—with the *cost* of enforcement, should the lender be caught illegally discriminating. As for the "statistical" and principal-agent theories of discrimination by Arrow (1973) and Dobbie et al. (2021), respectively, the expected cost of enforcement incentivizes the finding of alternative ways for evaluating mortgage applicants (in the case of statistical discrimination) and the establishment of policies, pro-

cesses, and practices for evaluating mortgage applicants that minimize the risk of racial prejudice by loan officers affecting the outcome of credit decisions.

Thus, the "stick" of monetary awards associated with enforcement actions serves as one potential channel through which such actions may redress and deter illicit mortgage discrimination. Injunctive-like relief is a second potential channel. In particular, fair lending settlements often enjoin banks from continuing with the policies or practices that allegedly lead to racial discrimination to begin with. Thus, fair lending settlements may also reduce discrimination by tackling and enjoining head-on such purported root causes of discrimination.

We do not attempt to assess which of the foregoing two channels explain our findings regarding the effectiveness of fair lending litigation. It could well be a combination. Nevertheless, the preceding discussion offers potential theoretical insight as to *how* and *why* mortgage discrimination observably decreases following fair lending enforcement, as the results presented below indicate.

2.2 Hypothesis Development

Our institutional and theoretical discussion yields several hypotheses. First, we hypothesize that:

> *Denial rates (origination rates) for racial minorities at litigated banks will be higher (lower) prior to discriminatory pricing and origination litigation and lower (higher) following such litigation, relative to corresponding rates at non-litigated banks.*

It is obvious why we would expect these results with discriminatory origination litigation: such litigation alleges that defendants have higher denial rates and lower origination rates for racial minorities, relative to their competitors. Accordingly, if such litigation is effective, we would expect it to ameliorate those disparities, with denial rates decreasing and origination rates increasing following litigation.

It is less straightforward why this hypothesis applies to discriminatory pricing litigation, should it be effective. Our sample does not include interest rates or rate spreads for originated mortgages

before 2018, so we primarily analyze the effects of discriminatory pricing cases by looking at denial rates and origination rates at litigated banks before and after litigation. We nevertheless expect racial disparities in interest rates to decrease following litigation, assuming such litigation is effective. As a result, we should also expect origination rates for minority applicants to increase after discriminatory pricing litigation (and disparities in origination rates to narrow) because borrowers would be more likely to accept mortgage credit offers if they are made on more favorable terms. As for denial rates, we expect them to decrease if discriminatory pricing litigation effectively increases origination rates; originated applications by definition are not denied, so an increased probability of origination should mean a decreased probability of denial.[3] Moreover, to the extent banks charge higher interest rates to minority borrowers—whether because of overt prejudice or statistical discrimination—it is possible that they also subject minority applicants to more stringent criteria in whether to offer minority applicants credit to begin with. Accordingly, we would expect banks that offer minority borrowers disfavorable loan terms to also deny their mortgage credit applications at higher rates—and for those heightened denial rates to decrease after effective litigation.

Second, we hypothesize the following with respect to redlining litigation:

> *Origination rates (denial rates) for racial minorities at litigated banks will be lower (higher) prior to redlining litigation and higher (lower) following such litigation, relative to corresponding rates at non-litigated banks.*

This hypothesis follows from the fact that redlining involves under-provision of mortgage credit to majority-minority neighborhoods. A common remedy in redlining litigation, as discussed, is to require defendant banks to open new branches in such previously-under-served neighborhoods and to increase outreach and marketing to the target consumer group. Accordingly, if such measures are effective, we would expect mortgage applications from majority-minority neighborhoods to

[3] It is nevertheless possible for origination rates to increase solely because of reduced rates at which applications are accepted but not originated, in which case effective litigation would not affect denial rates while still increasing origination rates. It is also possible for origination rates and denial rates to both increase post-litigation, but only if (1) increased origination rates exclusively result from reduced rates of being accepted but not originated and (2) that increase is sufficiently large that it offsets the heightened probability of denial.

increase following litigation. To the extent that minorities are more likely to live in such neighborhoods, we would expect applications from minority borrowers to increase as well. Along with those increases, we might also expect overall origination rates for minority borrowers to increase, and denial rates to mechanically decrease in consequence.

Third, with respect to reverse redlining we hypothesize that:

> *Origination rates (denial rates) for racial minorities at litigated banks are higher (lower) prior to reverse redlining litigation and lower (higher) following such litigation, relative to corresponding rates at non-litigated banks. In turn, while our data set does not contain data on interest rates, we expect interest rates offered to minority borrowers—and White–non-White disparities in interest rates—to decrease following reverse redlining litigation, relative to corresponding rates at non-litigated banks.*

This hypothesis follows from the fact that reverse redlining litigation involves the alleged targeting of non-White neighborhoods with unfavorable mortgage loans. Sometimes such litigation alleges that banks engaging in reverse redlining offer credit to borrowers that are not creditworthy, only to create high rates of mortgage default and foreclosure following origination. As banks become more discerning and begin controlling risk through non-price credit rationing, moreover, origination rates would be expected to decrease (and, as a mechanical result, denial rates be expected to increase). In turn, by concentrating the extension of credit on more creditworthy borrowers, interest rate disparities would decrease.

Fourth, with respect to securitization rates for originated loans, there are two competing hypotheses. The first, which occurs if observed White–non-White disparities result from accurate differentiation between creditworthy and non-creditworthy borrowers, is that:

> *Non-GSE securitization rates among non-White borrowers increase after litigation and GSE securitization rates among this group decrease after litigation, relative to non-litigated banks.*

As An et al. (2022) observe, GSEs have stringent requirements surrounding borrower creditworthiness for the securitized mortgages that they purchase. As a result, GSE purchases of securitized loans can serve as a proxy for borrowers being more creditworthy. Accordingly, if observed pre-litigation racial disparities in lending are actually the product of accurate discernment of borrower creditworthiness, then increases in post-litigation origination rates would entail originating mortgages to less creditworthy borrowers. That, in turn, would reasonably lead banks to *increase* securitization rates for new non-White borrowers, in order to mitigate default risk. Given that the securitization and selling of mortgages to GSEs functions as a proxy for a borrower being more creditworthy, however, we would also expect securitizations to GSEs to *decrease*; the increases in securitization to mitigate against the risks of reduced borrower creditworthy would primarily be for sales to *non-GSE* purchasers.

The corollary of the foregoing, therefore, is that observed White–non-White disparities result from impermissible race-based discrimination rather than accurate differentiation between creditworthy and non-creditworthy borrowers. If that is the case, then the alternative, second hypothesis regarding discrimination is that:

> *Non-GSE securitization rates among non-White borrowers decrease after litigation and GSE securitization rates among this group increase after litigation, relative to non-litigated banks.*

The logic behind the foregoing is simply the inverse of the logic for the initial hypothesis surrounding securitization. If race-based disparities are based on race-based discrimination that has nothing to do with discrimination, then effective litigation would increase the amount of loans originated to creditworthy borrowers; accordingly, non-GSE securitization rates would decrease and GSE securitizations, as proxy for positively creditworthy borrowers, would increase (An et al., 2022).

Finally, with respect to our estimates of the spillover effects on local competitors of litigated banks, we hypothesize that:

> *Denial rates (origination rates) for racial minorities at "exposed" banks will be lower*

(higher) following litigation, relative to corresponding rates at banks that are not exposed to the threat of litigation via enforcement against a local competitor.

This final hypothesis is premised on the idea that litigation against a local competitor serves as a reminder of the risk of enforcement if banks do not comply with fair lending laws. As Ballew and Pears (2023) demonstrate, decreases in aggregate bank enforcement are associated with higher racial disparities in mortgage interest rates and thus, presumably, lower levels of compliance with fair lending laws. By contrast, litigation against local competitors may increase the expected cost of enforcement, as perceived by exposed banks, by increasing the perceived probability that non-compliance with fair lending law will lead to enforcement.

3 Data

To conduct our analysis, we make use of six separate datasets: (1) a hand coded original data set of 38 separate fair-lending litigation actions, (2) the Home Mortgage Disclosure Act ("HMDA") dataset, (3) "The Avery File," a government dataset for cross walking bank respondent IDs in HMDA with Federal Financial Institutions Examination Council ("FFIEC") financial institution RSSD codes, (4) the FFIEC financial institution "Relationships" dataset, (5) the FFIEC financial institution "Transformations" dataset, and (6) a hierarchical dataset of Census geographic units.

3.1 Litigation Sample

We draw from the Civil Rights Litigation Clearinghouse run by the University of Michigan Law School and cases listed and brought by the DOJ to construct our sample of fair lending litigation actions.[4] We searched the Clearinghouse and DOJ websites for fair lending litigation brought under the Equal Credit Opportunity Act against banks for alleged discrimination in the mortgage market, and then hand coded the details of each case.[5] In particular, we identified case names, the year

[4] See https://clearinghouse.net/search/case/?case_type=5048ordering=-summary_approved_date and https://www.justice.gov/crt/housing-and-civil-enforcement-section-cases-prior-2018#lending.

[5] Due to limited loan data on Indian reservations, we restricted our sample to litigation for alleged discrimination within the United States but not on Indian reservations.

that each complaint was filed, the names of defendant banks, and the type of discrimination alleged (i.e., mortgage interest rate discrimination, application approval rate discrimination, redlining, and reverse redlining). For each complaint, we also took note of the geographic location(s) where defendants allegedly discriminated, although many complaints allege that discrimination occurred in all geographies where the bank does business.

Because our analysis looks at the effect that litigation concerning discrimination in the home purchase mortgage market has on discrimination within that market, our litigation sample excludes fair lending litigation over forms of credit that do not pertain to home purchases. Thus, we exclude litigation over home equity lines of credit, the secondary mortgage market (e.g., the market for mortgage-backed securities), business loans, and other forms of unsecured credit.

We further restrict our sample to actions brought by the federal government, state governments, municipal governments, and private actions in which plaintiffs successfully obtained class action status. The core insight behind limiting our analysis to government enforcement actions and certified class actions is that $those$ actions, contrary to private individual litigation, pertain to alleged company-wide discriminatory practices, as opposed to one-off instances of discriminatory mistreatment.[6]

The frequency of bank mergers and acquisitions presents a key difficulty in constructing our sample. Several actions in our sample were brought against banks *after* they were acquired by a different bank. Accordingly, our main analysis excludes those enforcement actions as well, as we could not measure how an entity that no longer exists changes its practices after facing enforcement.[7] In other cases, enforcement is brought before a merger or acquisition, but the merger

[6]Of course, individual litigants could bring private, non-class action enforcement challenging bank-wide discriminatory practices. However, given the high volume of private, individual fair lending lawsuits, and the feasibility challenges involved in separating such actions that concern an individual's treatment $alone$ from private actions over allegedly common, bank-wide discriminatory policies and practices, we restrict our sample to government actions and class actions.

[7]One alternative analytical possibility would be to assess the extent to which merged or acquiring entities change their practices–and observed racial disparities in lending–after purchasing or merging with banks that face enforcement actions. That alternative possibility presents myriad problems for our empirical strategy, however, as it would be unclear how to establish relevant "pre-" and "post-" time periods over which to assess differential treatment between White and non-White mortgage applicants, as well as how any differential treatment changes from before to after enforcement. For example, if Bank A acquires Bank B shortly before B faces enforcement, we could analyze B's treatment of mortgage applications pre-acquisition and pre-enforcement, but analyzing post-acquisition (and post-

or acquisition occurs within four years of the filing of the lawsuit. In those cases, we include pre-enforcement mortgage applications in our sample—and measure lending patterns during that window—but exclude post-enforcement mortgage applications.[8] The basis for this decision is that, after controlling for other relevant variables, the pre-enforcement lending patterns can assist in calculating the differential between pre- and post-enforcement. Lastly, one significant point of note is that some supervisory examinations for fair lending compliance occur in response to proposed or recent mergers and acquisitions.[9] This in part explains the relatively substantial number of mergers and acquisitions of defendant banks in our litigation sample.

We further excluded enforcement actions against banks for which the sample size of mortgage applications in HMDA was so small that we could not run regressions estimating pre- and post-litigation trends. All of such excluded actions involved banks with fewer than 20 applications from Black borrowers over an 8-year period surrounding the date of litigation filing (i.e., 4 years before to 4 years after filing).

In our analysis of the spillover effects of fair lending litigation, however, we nevertheless included cases that were otherwise excluded because of an M&A or limited sample size, as just described. The basis for this decision is that, with respect to both, the econometric problems with estimating the effects of litigation on the defendant bank do not carry over to estimating the spillover effects on local competitors.

Appendix 8.1 presents a table of every litigation that we identified but ultimately excluded, as well as the basis for our decision to exclude.

In Table 2, we present the resulting sample of enforcement actions, which consists of thirty-nine separate lawsuits. Twenty-eight cases are brought by the federal government, seven by municipal

enforcement) differential treatment would entail pooling together applications to the new, combined entity. We could alternatively measure A's origination practices before and after B is sued, but any post-acquisition analysis would not control for organizational changes that result from that acquisition. Either way, there would not be a close "apples to apples" comparison of treatment versus control groups, and for that reason we drop these litigations.

[8] In the Appendix, we nevertheless measure the treatment effect of these litigation actions. Our primary reason for excluding the actions in question in our main specification is that we define our treatment window as the four years that follow the filing of each lawsuit.

[9] See, e.g., US v. Chevy Chase Bank (E.D. Va. 2013) (noting that the OCC conducted a fair lending examination of defendant in connection with its acquisition by Capital One).

governments, and four are private class action lawsuits. Eleven of the lawsuits in our sample involve alleged nationwide discrimination by the defendant, while the complaints in the other twenty-seven cases allege discrimination in specific markets or regions. In turn, eighteen cases allege discriminatory pricing, one alleges discriminatory origination rates, thirteen allege illegal redlining, and seven allege illicit reverse redlining. Table 1 outlines these summary statistics.

Monetary relief in successful fair lending settlements tends to encompass compensatory relief for harmed consumers and/or remediation, such as consumer education programs, loan subsidies for non-White applicants, and credit provision targets to minority borrowers. Settlements tend to also include injunctive-like relief. In discriminatory pricing and origination litigation, such relief might include requisite internal policy changes to ensure uniform, objective criteria for vetting mortgage borrowers, with limits on discretionary input from loan officers. Injunctive-like relief in discriminatory pricing and origination settlements often also requires banks to provide their loan officers with anti-bias training. In turn, injunctive-like relief in redlining actions often require banks to open new branches in majority-minority neighborhoods, as well as to conduct marketing and outreach to such neighborhoods.

Table 1: Litigation Summary Statistics

	Count	*Percentage*
Allegation Type		
Disc. Pricing	18	46%
Disc. Origination	1	3%
Redlining	13	33%
Reverse Redlining	7	18%
Plaintiff Type		
Federal	28	72%
Municipal	7	18%
Private Class Action	4	10%
Total	39	100%
Defendant Acquired		
Number of Transactions	5	
Avg. Years After Complaint Filed	0.5	

Table 2: Litigation Sample: Case List

Case	Allegation	Outcome	Location of Discrimination
Payares v. J.P. Morgan Chase (C.D. Cal. 2007) (private class action)	Discriminatory Pricing	$300/class member; $1.965m in attorneys' fees	National
US v. J.P. Morgan Chase (S.D.N.Y 2017)	Discriminatory Pricing	$53m compensatory fund	National
US v. Wells Fargo (D.D.C. 2012)	Discriminatory Pricing	$175m compensatory fund	National
US v. Suntrust Mortgage (E.D. Va. 2012)	Discriminatory Pricing	$21m compensatory fund	National
Puello v. Citifinancial Services, Inc. (D. Mass. 2008) (private class action)	Discriminatory Pricing	$200/class member; $400,000 in attorneys' fees	National
US v. C&F Mortgage Corp. (E.D. Va. 2011)	Discriminatory Pricing	$140,000 compensatory fund	National
Allen v. Decision One Mortgage Co. (D. Mass. 2007) (private class action)	Discriminatory Pricing	$6.5m compensatory & remediation fund & attorneys' fees	National
US v. Primelending (N.D. Tex. 2010)	Discriminatory Pricing	$2m compensatory fund	National
US v. Plaza Home Mortgage (S.D. Cal. 2013)	Discriminatory Pricing	$3m compensatory fund	National
CFPB v. Provident Funding Associates (N.D. Cal. 2015)	Discriminatory Pricing	$9m compensatory fund	National
† Jackson v. Novastar (W.D. Tenn. 2006) (private class action)	Discriminatory Pricing	Litigation stayed after defendant filed for bankruptcy	National
US v. Chevy Chase Bank (D.D.C. 1994)	Redlining	$11m remediation fund	DC MSA
CFPB v. Northern Trust Co. (N.D. Ill. 1995)	Discriminatory Origination	$700,000 compensatory fund	Chicago MSA
US v. Huntington Mortgage Co. (N.D. Ohio 1995)	Discriminatory Pricing	$420,000 compensatory fund	Cleveland MSA

Case	Allegation	Outcome	Location of Discrimination
US v. Fleet Mortgage Corp. (E.D.N.Y. 1996)	Discriminatory Pricing	$4m compensatory & remediation fund	Westbury, NY & Woodbridge, NJ
US v. Long Beach Mortgage Co. (C.D. Cal. 1996)	Discriminatory Pricing	$4m compensatory fund	L.A. MSA
US v. Delta Funding Corp. (E.D.N.Y. 2000)	Discriminatory Pricing	$7.25m compensatory & remediation fund	Kings & Queens Cntys., NY
US v. Mid America Bank (N.D. Ill. 2002)	Redlining	$11.25m remediation fund	Chicago MSA
US v. First American Bank (N.D. Ill. 2004)	Redlining	$5.7m remediation fund	Chicago & Kankakee, IL, MSAs
US v. Centier Bank (N.D. Ind. 2006)	Redlining	$4.38m remediation fund	Gary, IN, MSA
Mayor of Baltimore v. Wells Fargo (D. Md. 2008)	Reverse Redlining	$7.5m remediation fund; Coordinated with US v. Wells Fargo settlement	Baltimore MSA
US v. First United Security Bank (S.D. Ala. 2009)	Redlining	$660,000 remediation fund	Alabama Market Area
City of Memphis v. Wells Fargo (W.D. Tenn. 2010)	Reverse Redlining	$7.5m remediation fund; Coordinated with US v. Wells Fargo settlement	Shelby Cnty., TN
† US v. Citizens Republic Bankcorp., Inc. (E.D. Mich. 2011)	Redlining	$3.63m compensatory & remediation fund	Detroit MSA
US v. Midwest Bankcentre (E.D. Mo. 2011)	Redlining	$1.45m remediation fund	St. Louis MSA
† US v. GFI Mortgage Bankers (S.D.N.Y. 2012)	Discriminatory Pricing	$3.56m compensatory fund & civil penalties	NY & NJ
City of Miami v. Bank of America (S.D. Fla. 2013)	Reverse Redlining	Voluntarily dismissed after protracted appellate litigation over standing	Miami, FL

Case	Allegation	Outcome	Location of Discrimination
City of L.A. v. Wells Fargo (C.D. Cal. 2013)	Reverse Redlining	Motion for Summary Judgment against City granted	L.A., CA
City of L.A. v. Citigroup, Inc. (C.D. Cal. 2013)	Reverse Redlining	Outcome unclear; Initial motion to dismiss denied	L.A., CA
City of L.A. v. JPMorgan Chase (C.D. Cal. 2014)	Reverse Redlining	Dismissed with prejudice; Unclear if there was an accompanying settlement	L.A., CA
† US v. Eagle Bank & Trust Co. of Missouri (E.D. Mo. 2015)	Redlining	$0.98m remediation fund	St. Louis MSA
† CFPB v. Hudson City Savings Bank (D.N.J. 2015)	Redlining	$32.75m remediation fund	New York & Philadelphia MSAs
City of Oakland v. Wells Fargo (N.D. Cal. 2015)	Reverse Redlining	Motion to Dismiss granted after appeal	Oakland, CA
CFPB v. BancorpSouth Bank (N.D. Miss. 2016)	Redlining	$10.8m compensatory & remediation fund	Memphis MSA
US v. Union Savings Bank (S.D. Ohio 2016)	Redlining	$9m remediation fund	Cincinatti, Dayton, & Columbus, OH, & Indianapolis, IN, MSAs
† US v. KleinBank (D. Minn. 2017)	Redlining	$0.6m remediation fund	Minneapolis MSA
US v. First Merchants Bank (S.D. Ind. 2019)	Redlining	$1.7m remediation fund	Indianapolis MSA
† US v. Trustmark Nat'l Bank (W.D. Tenn. 2021)	Redlining	$5.25m remediation fund	Memphis MSA

† Indicates "pretreatment" cases whereby applications to the defendant bank are only included in the 4-year pre-litigation control window but not the 4-year post-litigation treatment window. Jackson v. Novastar is designated "pretreatment" because of a bankruptcy filing by the defendant that coincided with the case. US v. Trustmark Nat'l Bank is designated "pretreatment" because it was filed in 2021, thus only leaving a 2-year post-litigation treatment window. The remaining five "pretreatment" cases are designated as such because of M&A's initiated either the year that litigation was filed or within the 4-year post-litigation treatment window.

3.2 HMDA Data

The HMDA dataset records the near-universe of mortgage applications every year. We downloaded the HMDA dataset for every year from 1991 to 2023, filtered to applications for conventional mortgages for owner-occupied home purchases within designated core-based statistical areas, dropped applications for manufactured homes, and kept observations in which the listed application outcome was: approval without origination, approval with origination, or a denial. Given the differences in underwriting standards among conventional, FHA, USDA, and VA loans, our analysis looks exclusively at conventional mortgages to control for such differences. Given computational limitations associated with analyzing the full sample, as a general matter we take a random 10% sub-sample of all observations in HMDA. Nevertheless, several defendants in our sample cases are relatively small lenders, meaning that sub-sampling would deprive our analysis of the requisite statistical power. Accordingly, for all defendant banks except members of "the big five" (i.e., Wells Fargo, Citi, Bank of America, Chase, and U.S. Bank), we retain *all* observations that meet the foregoing criteria. For defendant banks that are part of the big five, we take a 10% sub-sample of applications by White borrowers but retain all observations of applications by non-White borrowers. To account for these cross-bank and cross-applicant differences in sub-sampling, our regressions include weights indicating when observations are "over-sampled" by virtue of us not taking a 10% sub-sample.

We use datasets (3)-(5) to merge the litigation data with the HMDA dataset. Respondent IDs in HMDA are not the same as RSSD IDs, which are unique identifiers assigned to each financial institution by the Federal Reserve. Dataset (3) allows us to map each HMDA respondent ID onto a Federal Reserve RSSD ID. Given financial institution mergers, acquisitions, and internal re-organizations, RSSD IDs are not always constant from one year to the next. Dataset (4) tracks each change in an RSSD ID, what that RSSD ID transforms into, and whether the transformation results from a merger or acquisition. We use dataset (4) to map each RSSD ID onto the *most recent* RSSD ID that *does not* reflect an RSSD ID change attributable to a merger or acquisition. We then use dataset (5) to "roll up" each RSSD ID to its highest traceable parent financial institution or bank

holding company. These steps allow us to treat every loan originator in a conglomerate of financial institutions as one unitary entity.[10]

In Table 3, we provide summary statistics from our HMDA dataset. The sample contains more than ten million mortgage records, with seven percent filed by Black applicants. Unconditional denial rates are 14 percent for White applicants, 17 percent across all non-White applicants and 30 percent for specifically Black applicants.

On the income statistics, which are presented in thousands of dollars, we see that the average applicant made $85,800, with the average White applicant making $84,300 and the average among Black applicants at $68,200. As expected, the incomes of approved applicants are higher than the average and the incomes of denied applicants are much lower. We also see that the average loan amount of $196,400 is more than twice the average income of approved applicants. Finally, 57 percent of all loans were securitized and sold, with 30 percent sold to GSEs and 27 percent sold to non-GSEs.

Table 3: HMDA Summary Statistics

	White	Black	Non-White	All
Total Applications	8,253,043	892,518	2,405,810	10,658,853
Pct. Total Applications	88.5%	7.0%	11.5%	100.0%
Total Denied	1,019,801	169,375	154,973	1,174,774
Pct. Denied	14.2%	29.7%	16.7%	14.5%
Total Originated	5,658,275	348,473	717,836	6,376,111
Pct. Originated	79.0%	61.2%	77.1%	78.8%
Avg. Income (Thousands)	84.3	68.2	97.5	85.8
SD Income (Thousands)	64.0	52.1	67.5	64.6
Avg. Income if Denied (Thousands)	62.9	54.9	74.6	64.5
Avg. Income if Approved (Thousands)	87.8	73.8	102.0	89.4
Avg. Loan Amount (Thousands)	196.4	181.6	273.8	205.1
SD Loan Amount (Thousands)	147.3	136.4	181.5	153.5
Pct. Securitized & Sold	56.7%	43.4%	56.4%	56.7%
Pct. Sold to GSE	30.0%	17.6%	31.3%	30.1%
Pct. Sold to non-GSE	26.6%	25.6%	24.9%	26.4%

[10]Our assumption is that if Alpha Bank Holding Company owns Bank A, Bank B, and Mortgage Lender C, a lawsuit against Bank B will affect the loan origination patterns of all entities held by Alpha.

4 Empirical Analysis

Our main specification is an applicant level regression. The idea underlying our empirical approach is that, after controlling for other relevant variables, significant decreases in discrimination immediately following a fair lending lawsuit are consistent with the lawsuit having some causal role in the observed decrease.[11] We use what amounts to a triple difference estimation, where the comparison is between Black and White applicants,[12] before and after litigation, at litigated banks relative to non-litigated banks. Thus, for applicant i from Census tract c applying for a mortgage at bank b in city m in year t we run:

$$\begin{aligned} Y_{ibmt} = \beta_0 &+ \beta_1 LitWindow_{mt} X PostLit_{mt} X Black_i + \beta_2 LitWindow_{mt} X PostLit_{mt} \\ &+ \beta_3 LitWindow_{mt} X Black_i + \beta_4 LitWindow_{mt} \\ &+ \beta_5 Black_i + \beta_6 LnIncome_i + \beta_7 LnLoanSize_i \\ &+ \beta_8 LMI_c + \beta_9 Male_i + \beta_{10} SameSex_i + \beta_{11} JointApplicants_i \\ &+ \delta_b + \delta_{mt} + \varepsilon_{ibmt}. \end{aligned} \tag{1}$$

The variable $LitWindow$ turns on for a litigated banks in a window of [-4,+4] years around the litigation year, and in the geography of litigation if one is specified in the lawsuit. Applicants to a litigated bank in the year of litigation are dropped, as we do not observe the month that mortgage applications are submitted, and thus whether they arrive before or after a suit is filed. The coefficient β_5 measures the average difference in denial rates for Black applicants relative to White applicants across the sample, conditional on income and loan amount sought. Coefficients β_3 and β_4 measure the extent to which denial rates at litigated banks are higher, in the four years pre-litigation, for Black and White borrowers, respectively, relative to applicants at non-litigated banks in the same

[11] In particular, we measure discrimination based on the disparity in the probability that a loan application is denied, approved but not originated, or originated. If, after controlling for applicant income, loan size, location, the specific bank applied to, and year, that disparity *narrows* post-litigation, there is a plausible claim that the lawsuit played a causal role in the observed narrowing.

[12] Our analysis looks exclusively at White versus *Black* applicants. This is because the majority of the lawsuits in our sample allege racial discrimination against Black borrowers in particular.

year and metro area. The coefficient β_2 measures whether there is a general change in denial rates for applicants to litigated banks in the four years post-litigation. The focal parameter is β_1, which captures any change in denial rates for Black applicants relative to White applicants post-litigation.

Because the decision to apply for a loan and to approve one is subject to local housing market conditions, we include city-by-year fixed effects. To make before-and-after litigation comparisons within each lender, we also include lender fixed effects. The indicator for the window stretching from four years before to four years after each litigation year narrows the period over which comparisons pre- versus post-litigation comparisons are made. We cluster standard errors at the bank-by-city-by-year level, since approval decisions are likely correlated within bank due to policies set at a management level. We also control for whether an applicant is from a low to moderate income census tract with LMI_c, since that variable may correlate with applicant creditworthiness. In addition, we control for whether an applicant is male ($Male_i$), whether an application comes from joint applicants ($JointApplicants_i$), and whether those applicants are of the same sex ($SameSex_i$). Although mortgage discrimination because of sex, marital status, and LGBT status are illegal, we follow Ballew and Pears (2023) in controlling for these variables to ensure that our focal parameter exclusively measures differences in *race*-based discrimination.

As recent studies have argued, staggered difference-in-differences analyses can produce biased estimates because of the staggered timing of treatment and dynamic treatment effects (Baker et al., 2022; Sun and Abraham, 2021). The problem is most serious in analyses with relatively small sample sizes, a large percent of observations that are treated, and settings with substantial treatment effect heterogeneity (Baker et al., 2022). By contrast, our sample size is relatively large and only a small share of observations are treated.[13] Treatment effect heterogeneity is expected in our setting, perhaps due to litigated banks operating in communities that vary substantially demographically or due to changes in how banks have responded over the three decades of our sample. Nevertheless, our use of $LitWindow$ interacted with $PostLit_{mt}$ in estimating β_1 is consistent with the

[13] In our analysis, only 39 out of 13,075 lenders (0.29%) are treated. And for our spillover analysis, only 8,138 out of 254,703 unique lender-CBSA pairings (0.01% of our sample) are treated through exposure to a lawsuit filed against a local competitor.

suggestions in An et al. (2022), Baker et al. (2022), and Cengiz et al. (2019) in further mitigating the problems associated with staggered difference-in-differences research designs. Specifically, by narrowing our estimated treatment effects to a four-year post-treatment window—measured relative to a four-year pre-treatment period among the litigated banks—our model amounts to an event study with relative-time indicator variables and a control group that is not tainted by the treatment of some lenders before the treatment of others (Baker et al. 2022).

One notable shortcoming in our approach is the absence of applicant-level credit score data. As Bhutta et al. (2022) show, a substantial contributor to observed racial differences in mortgage application denial rates and interest rates is average racial differences in metrics of creditworthiness, such as credit scores. Accordingly, our coefficient estimates on variables and interactions involving race may be biased to the extent that race might serve as a partial proxy for credit score.

While a potential worry, several features of our design mitigate this potentiality. First, because β_1 estimates the *change* in Black applicant denial rates at treated lenders, from before to after litigation relative to the change among White applicants and changes at non-litigated banks, this relative estimate is unlikely to be biased by average racial differences in credit scores —at least in comparison to estimates of *absolute* differences in treatment by race that do not include a variable for credit score. This point is accentuated by the fact that there are no observed, meaningful changes in average racial differences in credit scores over time (Ballew and Pears, 2023). Second, to the extent that we find pre-treatment racial disparities at litigated banks above and beyond market-wide disparities, the pre-treatment disparities are more likely to be the product of idiosyncrasies—idiosyncrasies that might include unlawful discrimination—at litigated banks rather than average racial differences in credit scores. Third, our findings of pre-treatment racial disparities are consistent with the allegations leveled in our sample's fair lending actions. Government agencies tend to have internal bank data, including a full list of variables related to applicant creditworthiness, when conducting fair lending examinations, investigations, and enforcement. And the complaints in our sample litigation actions typically allege the existence of racial disparities *even after controlling for credit score*. Thus, our findings of pre-treatment disparities conform with the conclusions reached

by government investigations (which then lead to enforcement actions). Fourth, as discussed already, securitizing and selling loans to GSEs can serve as a proxy for applicant creditworthiness. Consistent with An et al. (2022), we make use of such securitization data to plausibly argue that our findings pertain to *race* rather than legitimate measures of creditworthiness.

We also investigate potential spillover effects of litigation on local competitors of litigated banks. Thus, for banks not subject to litigation, we estimate the below specification:

$$\begin{aligned} Y_{ibmt} = \gamma_0 &+ \gamma_1 LitExposure_{mt} X PostLit_{mt} X Black_i + \gamma_2 LitExposure_{mt} X Black_i \\ &+ \gamma_3 Black_i + \gamma_4 LnIncome_i + \gamma_5 LnLoanSize_i \\ &+ \gamma_6 LMI_c + \gamma_7 Male_i + \gamma_8 SameSex_i + \gamma_9 JointApplicants_i \\ &+ \delta_{bmt} + \varepsilon_{ibmt}. \end{aligned} \tag{2}$$

$LitExposure$ indicates banks operating in the same city as a litigated bank within the +/- four year window of the litigation date. The coefficient γ_2 measures any difference in disparity in the denial rate for Black applicants relative to White applicants versus non-exposed banks pre-litigation and γ_1 tests for any spillover impact post-litigation. We include a bank by city by year fixed effect so that any spillover effect is measured as a change in the denial rate disparity between White and Black applicants within each bank in a given city and year.

5 Results

5.1 Main Results

Table 4 contains the results from estimating specification (1)—looking at how fair lending litigation actions impact individual level mortgage application denial decisions. Column (1) suggests that, on average, a Black borrower applying to a non-litigated bank will be denied at a 9 percentage point higher rate than a White borrower with the same income applying for the same sized loan to the same bank. However, if the same pair of borrowers applied to a *litigated* bank in the years

before litigation, the gap would be about 12 percentage points. This is roughly double the 14% overall denial rate in the sample. Interestingly, litigated banks also deny White applications at a slightly higher rate (0.7 percentage point) than do their competitors in the same city.

Following litigation, however, litigated banks substantially reduced denial rates for Black borrowers, relative to White borrowers. A Black and a White applicant to a litigated bank, with the same income and loan size sought, will have the gap in their denial rates reduced by 3.9 percentage points post-litigation, relative to pre-litigation—in fact, by more than the initial denial rate disparity at litigated versus non-litigated banks (3 percentage points). The origination rate increases symmetrically with the decrease in the denial rate. However, at 3.2 percentage points, it does not increase as much as the denial rate decreases, which is explained by the fact that the rate at which mortgage applications are accepted but not originated (column (2)) *increases* after litigation. While it is not clear what drives this result, it may be a product of some litigated banks offering loans to Black borrowers on unfavorable terms—which applicants then decline to accept. Nevertheless, the second row of column (2) demonstrates that the rate at which mortgage applications are accepted but not originated for *all* applicants decreases by 2.8 percentage points, thus partially counteracting the 0.7 percentage point increase for Black applicants.

Table 12 in Appendix 8.2 estimates specification (1) with an added control for the natural log of lender assets. As the Table demonstrates, our coefficients of interest do not meaningfully or qualitatively change—either in sign, statistical significance, or magnitude—after adding the lender assets control.[14]

In Figure 1, we look at how the Black-White denial rate disparity evolves year by year relative to non-litigated banks. Four years before litigation is filed, the Black-White denial rate disparity is a statistically significant 2 percentage points higher than at non-litigated banks. In years three and two before litigation filing, there is no observed disparity and then a statistically significant

[14]This control comes from merging our data set with lender asset data from FR Y-9C reports (which report on domestic bank holding companies), FFIEC Call Reports (banks), NCUA Call Reports (credit unions) and FR Y-9C SP reports (small domestic holding companies). Because lender asset data are unavailable for savings and loan holding companies regulated by the Office of Thrift Supervision before the implementation of Dodd-Frank, as well as other mortgage lenders that are not banks, credit unions, or bank holding companies, we lose about one quarter of our sample after adding this control.

Table 4: Full Litigation Sample - Direct Effects on Black Applicants

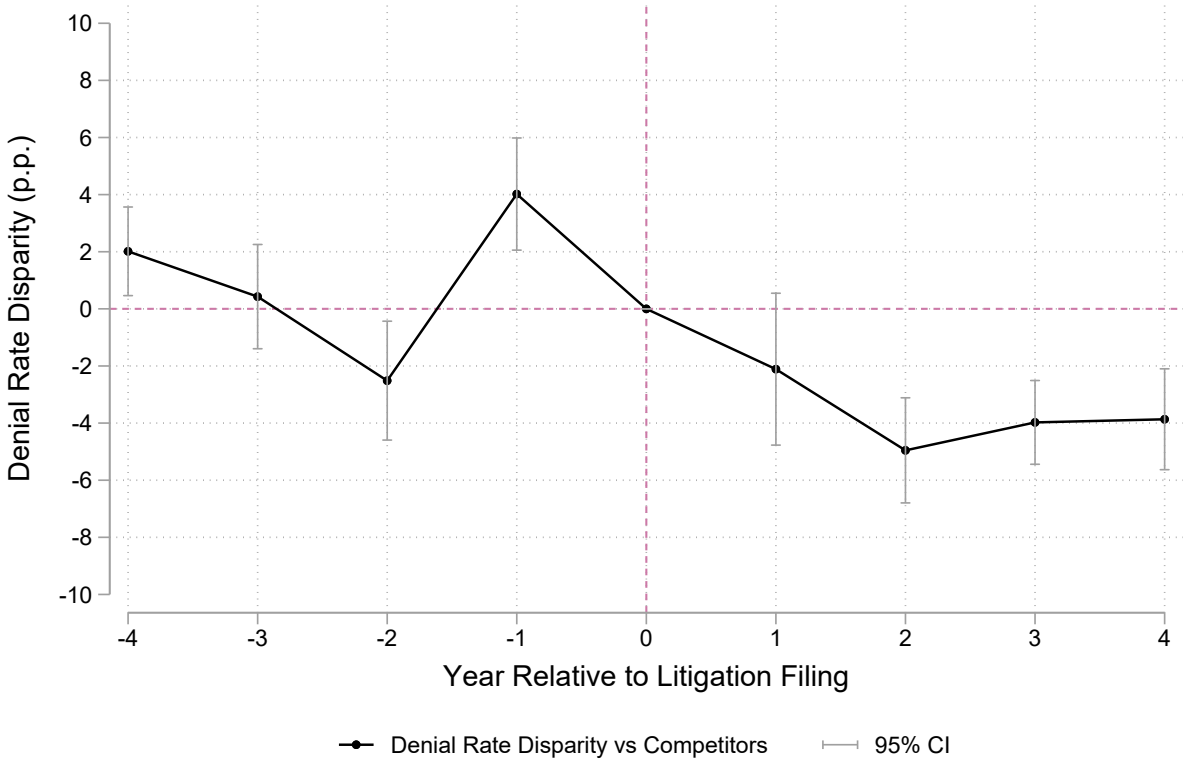
	(1) denied	(2) not_origin	(3) originate
Post-Lit X Black	-0.0387***	0.0069*	0.0318***
	(0.008)	(0.004)	(0.007)
Post-Lit	0.0038*	-0.0282***	0.0243***
	(0.002)	(0.002)	(0.002)
Pre-Lit X Black	0.0313***	-0.0017	-0.0296***
	(0.006)	(0.003)	(0.005)
Pre-Lit	0.0066***	-0.0144***	0.0078***
	(0.002)	(0.001)	(0.002)
Black	0.0900***	0.0024***	-0.0924***
	(0.001)	(0.000)	(0.001)
1.male	0.0065***	0.0009***	-0.0074***
	(0.000)	(0.000)	(0.000)
1.lgbt	0.0331***	-0.0060***	-0.0271***
	(0.001)	(0.001)	(0.001)
1.joint	-0.0135***	-0.0049***	0.0184***
	(0.000)	(0.000)	(0.000)
1.lmi	0.0318***	0.0043***	-0.0361***
	(0.000)	(0.000)	(0.001)
ln_inc	-0.0472***	0.0105***	0.0366***
	(0.000)	(0.000)	(0.000)
ln_loan	-0.0047***	-0.0067***	0.0113***
	(0.000)	(0.000)	(0.000)
R^2	0.204	0.074	0.242
N	8733267	8733267	8733267

Note: Pre- and post-litigation effects estimated within a window of +/- four years. The year of litigation is excluded from the sample. All specifications include bank and MSA-year fixed effects. Standard errors clustered at the bank-MSA-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

smaller disparity (by 2 percentage points) at litigated banks compared with non-litigated banks. The year before litigation filing, the disparity rises to a statistically significant 4 percentage points. This disparity then begins declining the year litigation is filed, and continues to do so through year

plus four. In year two post-litigation, at litigated banks the Black-White denial rate disparity is a statistically significant 4 percentage points below the disparity at non-litigated banks. This result persists through years 3 and 4 post-litigation. Figure 1 plots analogous by-year results, expressed relative to the pre-litigation disparity at litigated banks.

Figure 1: Black-White Denial Disparity Over Time

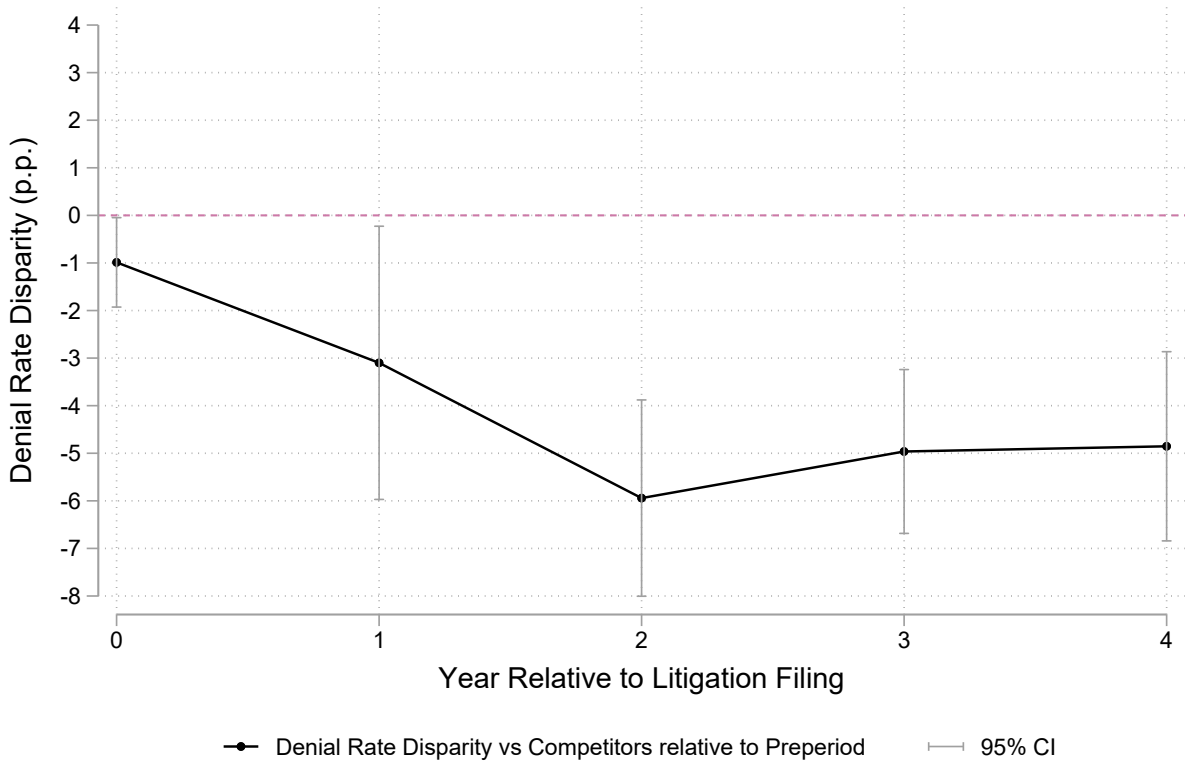


Note: Estimated denial rate disparities between Black and White applicants over time at banks subject to litigation. Estimated denial disparities only include by-year disparities at such banks, with the year that litigation was filed defined as 0. The figure does not include overall racial disparities at such banks, nor does it include industry-wide denial disparities.

In Figure 3, we assess the individual impact of litigation on denial rate disparities for twenty-five separate litigation actions.[15] Following twenty-one of these twenty-five litigation actions, the

[15] We do not include results for all thirty-eight actions for several reasons. First, we cannot estimate post-treatment effects for the seven "pretreatment" actions. See Table 2. Second, five of our sample litigations are all against Wells Fargo (one brought by the U.S. government and four by municipal governments), and we can only estimate the indi-

Figure 2: Black-White Denial Disparity Over Time, Relative to Disparity Pre-Litigation



Note: Estimated denial rate disparities between Black and White applicants over time at banks subject to litigation, relative to the pre-litigation disparity at litigated banks.

Black-White denial rate disparity decreases, relative to before litigation, consistent with our results pooling all litigation actions together. For these actions, the disparity decreases by a range of approximately 2 to 22 percentage points.

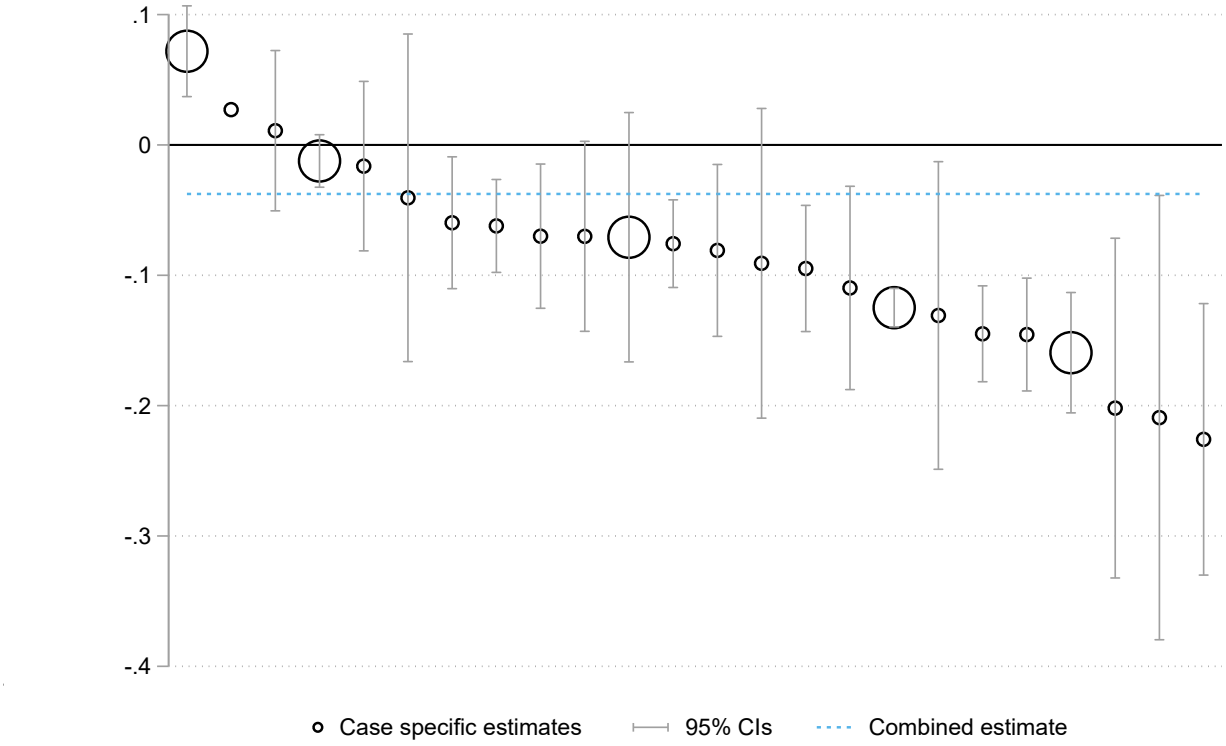
The disparity increases following four of these twenty-five actions, but is statistically significant for only two of these four. For the actions that increase the denial rate disparity, the disparity increases by a range of 1 percentage point to approximately 58 percentage points in the case of US v. First United Security Bank (2009) (which we exclude from Figure 3 given how much of an

vidual effects of one lawsuit against a bank. Thus, we only measure the effects of US v. Wells Fargo but not the effects of the municipal actions against the bank. Third, in two remaining actions, the sample size is too small to estimate an individual effect.

outlier result it is). It is unclear why exactly the disparity increases after any of these actions. One possible explanation is that, post-litigation, creditworthy Black borrowers look elsewhere for credit, meaning that only those most likely to be denied *anywhere* apply to such banks, thereby driving up the estimated denial rate disparity. In the redlining case of US v. First United Security Bank (2009), for example, there are notably only 17 applications from Black applicants in HMDA from the region where the bank was allegedly redlining within the 4-year post-litigation period. It is entirely possible that this small sample of applicants have unfavorable objective metrics of creditworthiness, therefore explaining the increase in denial rates at this institution following litigation.

Further study is warranted to assess specific reasons why some litigation actions decrease lending discrimination more than others do. One possibility is that discrimination decreases more when the magnitude of pre-litigation discrimination was greater. A second possibility, which could work in tandem with the first, is that the litigation strategies employed, or remedies won, affect the magnitude of the decrease in discrimination.

Figure 3: Post-litigation Change in Black Applicant Denial Rate *Across* Litigated Banks



Note: The Y axis reports the change in the Black-White disparity in denial rates (measured in percentage points), relative to pre-litigation. Markers sized by lender's post-litigation loan volume. Not pictured: the post-litigation trend at First United Security Bank following US v. First United Security Bank (2009). In that litigation, which we exclude here given how much of an outlier result it is, the Black-White denial disparity *increased* by a statistically significant 58 percentage points after litigation.

5.2 Allegation Type

Next, we examine how the effects of litigation change based on the alleged type of discrimination. Tables 5, 6, and 7 present results of regressions estimating how the Black-White disparity changes after litigation challenging alleged discriminatory pricing and origination, redlining, and reverse redlining, respectively.

Column (1) of Table 5 indicates that the Black-White denial rate disparity decreases after litigation alleging discriminatory pricing and origination, consistent with our overall results. The statistically significant decrease eliminates the pre-litigation disparity, relative to non-litigated banks. Pre-litigation, banks sued for discriminatory origination and pricing deny Black applicants at a 3.2 percentage point higher rate than they deny White applicants, relative to the disparity at non-litigated banks. Post-litigation, however, such banks reduce the disparity by a statistically significant 3.7 percentage points.

By symmetry, column (3) indicates that the origination rate increases, although not as much as the denial rate decreases, a product of the slight (and not statistically significant) uptick in Black applications that are accepted but not originated, as indicated in column (2). As discussed in Parts 2.2 and 5.1, to the extent that the rate at which mortgage applications are accepted but not originated might serve as a proxy for the favorability of terms offered to borrowers,[16] we would have expected a negative coefficient on this variable for discriminatory pricing litigation. While that does not occur, the second row of column (2) demonstrates that for *all* applicants, the rate at which mortgage applications are accepted but not originated decreases by 3 percentage points, thus partially counteracting the 0.5 percentage point increase for Black applicants.

Table 6 shows that pre-litigation, banks sued for redlining actually deny applications from Black applicants at a weakly significant 1.5 percentage point lower Black-White applicant disparity relative to the disparity at non-litigated banks. This result is surprising, although it may be consistent

[16] One avenue by which the impact of litigation on combating discrimination could be undermined would involve a litigated bank approving more Black loan applications but offering unfavorable interest rates to such applicants, relative to what their competitors offer. If a bank wants to decrease observed disparities in denial rates, but nonetheless does not want to originate loans for Black borrowers, it could offer loans with uncompetitive interest rates, leading applicants to opt against loan origination.

with pre-litigation Black applicants to redlining banks being from majority-White neighborhoods. Post-litigation, the Black-White denial rate disparity decreases by 1 percentage point and the origination rate increases by 0.8 percentage point, although neither is statistically significant.

In turn, Table 7 presents results from reverse redlining litigation. Several of the reverse redlining actions we sampled did not culminate in favorable settlements for the plaintiff. Nevertheless, the results are broadly consistent with our hypotheses in Part 2.2. With reverse redlining, banks specifically target borrowers from minority neighborhoods, offering them credit at supracompetitive interest rates. Although not statistically significant, the post-litigation Black-White denial rate disparity increases by 2.7 percentage points and the disparity among applications that are accepted but not originated decreases by 1.3 percentage points, consistent with lenders becoming more discerning about applicant creditworthiness, ceasing to target Black borrowers with high-priced mortgages, but nevertheless offering approved applicants more favorable loan terms. The disparity in origination rates widens by 1.4 percentage points (not statistically significant), as expected. Notably, among all applicants the rate at which applications are accepted but not originated decreases by a statistically significant 3.5 percentage points, explaining the entirety of the statistically significant 3.5 percentage point increase in origination rates. This is consistent with banks providing loans on better terms to *all* applicants after reverse-redlining litigation. Notably, lawsuits against one large lender make up the majority of our reverse redlining cases, and it was a defendant in several concurrent actions while being sued for reverse redlining. We must therefore be cautious that the results of Table 7 are not biased by those other actions. Our inclusion of bank fixed effects and city-year fixed effects should nevertheless control in part for this potential confounding factor.

Table 5: Discriminatory Pricing and Origination Litigation Effects

	(1) denied	(2) not_origin	(3) originate
Post-Lit X Black	-0.0374***	0.0054	0.0320***
	(0.008)	(0.004)	(0.008)
Post-Lit	0.0043*	-0.0300***	0.0257***
	(0.002)	(0.002)	(0.002)
Pre-Lit X Black	0.0320***	-0.0016	-0.0304***
	(0.006)	(0.003)	(0.005)
Pre-Lit	0.0068***	-0.0150***	0.0082***
	(0.002)	(0.001)	(0.002)
Black	0.0899***	0.0024***	-0.0924***
	(0.001)	(0.000)	(0.001)
1.male	0.0065***	0.0009***	-0.0074***
	(0.000)	(0.000)	(0.000)
1.lgbt	0.0331***	-0.0060***	-0.0271***
	(0.001)	(0.001)	(0.001)
1.joint	-0.0135***	-0.0049***	0.0184***
	(0.000)	(0.000)	(0.000)
1.lmi	0.0318***	0.0043***	-0.0361***
	(0.000)	(0.000)	(0.001)
ln_inc	-0.0472***	0.0106***	0.0366***
	(0.000)	(0.000)	(0.000)
ln_loan	-0.0047***	-0.0067***	0.0114***
	(0.000)	(0.000)	(0.000)
R^2	0.204	0.074	0.243
N	8627367	8627367	8627367

Note: Pre- and post-litigation effects estimated within a window of +/- four years. The year of litigation is excluded from the sample. All specifications include bank and MSA-year fixed effects. Standard errors clustered at the bank-MSA-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Redlining Litigation Effects

	(1) denied	(2) not_origin	(3) originate
Post-Lit X Black	-0.0095	0.0017	0.0078
	(0.018)	(0.007)	(0.020)
Post-Lit	-0.0010	-0.0070**	0.0079
	(0.004)	(0.003)	(0.006)
Pre-Lit X Black	-0.0150*	0.0068	0.0082
	(0.009)	(0.005)	(0.009)
Pre-Lit	-0.0076**	0.0082***	-0.0006
	(0.003)	(0.002)	(0.005)
Black	-0.0216	0.0176	0.0040
	(0.015)	(0.013)	(0.020)
1.w	-0.0001	0.0046	-0.0045
	(0.008)	(0.006)	(0.008)
Black	0.0916***	0.0032***	-0.0948***
	(0.001)	(0.000)	(0.001)
1.male	0.0064***	0.0009***	-0.0073***
	(0.000)	(0.000)	(0.000)
1.lgbt	0.0336***	-0.0055***	-0.0281***
	(0.001)	(0.001)	(0.001)
1.joint	-0.0147***	-0.0052***	0.0199***
	(0.000)	(0.000)	(0.000)
1.lmi	0.0324***	0.0046***	-0.0370***
	(0.000)	(0.000)	(0.001)
ln_inc	-0.0455***	0.0107***	0.0348***
	(0.000)	(0.000)	(0.000)
ln_loan	-0.0043***	-0.0069***	0.0111***
	(0.000)	(0.000)	(0.000)
R^2	0.196	0.071	0.232
N	8952436	8952436	8952436

Note: Pre- and post-litigation effects estimated within a window of +/- four years. The year of litigation is excluded from the sample. All specifications include bank and MSA-year fixed effects. Standard errors clustered at the bank-MSA-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Reverse Redlining Litigation Effects

	(1) denied	(2) not_origin	(3) originate
Post-Lit X Black	0.0271	-0.0130	-0.0141
	(0.037)	(0.021)	(0.043)
Post-Lit	-0.0004	-0.0345***	0.0349***
	(0.011)	(0.009)	(0.012)
Pre-Lit X Black	-0.0127	0.0197	-0.0070
	(0.015)	(0.016)	(0.023)
Pre-Lit	0.0087	0.0037	-0.0124
	(0.009)	(0.007)	(0.009)
1.w1.Black	-0.0306*	0.0069	0.0237
	(0.017)	(0.006)	(0.015)
1.w	-0.0153***	0.0098***	0.0055
	(0.005)	(0.003)	(0.005)
Black	0.0916***	0.0032***	-0.0948***
	(0.001)	(0.000)	(0.001)
1.male	0.0064***	0.0009***	-0.0073***
	(0.000)	(0.000)	(0.000)
1.lgbt	0.0336***	-0.0055***	-0.0281***
	(0.001)	(0.001)	(0.001)
1.joint	-0.0147***	-0.0052***	0.0199***
	(0.000)	(0.000)	(0.000)
1.lmi	0.0324***	0.0046***	-0.0370***
	(0.000)	(0.000)	(0.001)
ln_inc	-0.0455***	0.0107***	0.0348***
	(0.000)	(0.000)	(0.000)
ln_loan	-0.0043***	-0.0069***	0.0111***
	(0.000)	(0.000)	(0.000)
R^2	0.196	0.071	0.232
N	8952436	8952436	8952436

Note: Pre- and post-litigation effects estimated within a window of +/- four years. The year of litigation is excluded from the sample. All specifications include bank and MSA-year fixed effects. Standard errors clustered at the bank-MSA-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

5.3 Trends in Securitization Rates

Table 8 estimates specification (1) with the outcome variables of whether, after being originated, loans are securitized and sold, and if so whether they are sold to a GSE or a private investor. Pre-litigation, the Black-White disparity in securitizing and selling loans to Black borrowers among litigated banks is a 3.7 percentage point higher rate than pre-litigation. On net, this is the result of greater sales rates to private investors (column (3)) as opposed to GSEs (column (2)). As An et al. (2022) argue, these results are consistent with litigated banks originating loans to Black borrowers with relatively lower metrics of creditworthiness.

Crucially, the disparity increases by an insignificant 1.9 percentage points after litigation. This result comes from a 10 percentage point increase in loans to Black borrowers that are sold to GSEs, and an 8 percentage point decrease in loans sold to private investors. Because the sale of a loan to GSEs can serve as a loose proxy for creditworthiness (An et al. (2022)), these results provide contextual evidence that overall, denial rates decrease and origination rates increase among Black borrowers, but that that result comes from more credit extended to *creditworthy* borrowers. These results therefore also provide contextual evidence that, prior to litigation, litigated banks were not offering loans to creditworthy borrowers, either because of overt bias and principal-agent failures or because of statistical discrimination against Black borrowers. By contrast, post-litigation, lenders implemented new anti-bias measures and/or found ways to better assess applicant creditworthiness without regard to race, explaining the combination of higher Black origination rates and higher (lower) rates of securitizing and selling loans to GSEs (non-GSEs).

Table 8: Overall Direct Effects on Securitization and Black Borrowers

	(1)	(2)	(3)
	secur	secur_gse	secur_non_gse
Post-Lit X Black	0.0186	0.0983***	-0.0797***
	(0.012)	(0.013)	(0.011)
Post-Lit	-0.0110**	-0.1191***	0.1081***
	(0.005)	(0.006)	(0.007)
Pre-Lit X Black	0.0368***	-0.0197***	0.0566***
	(0.006)	(0.007)	(0.009)
Pre-Lit	0.0748***	0.1164***	-0.0416***
	(0.004)	(0.004)	(0.005)
Black	-0.0460***	-0.0502***	0.0042***
	(0.001)	(0.001)	(0.001)
1.male	-0.0013***	-0.0004	-0.0009***
	(0.000)	(0.000)	(0.000)
1.lgbt	-0.0085***	0.0044***	-0.0129***
	(0.001)	(0.001)	(0.001)
1.joint	0.0201***	0.0261***	-0.0060***
	(0.000)	(0.000)	(0.000)
1.lmi	-0.0247***	-0.0245***	-0.0002
	(0.001)	(0.001)	(0.001)
ln_inc	-0.0547***	-0.0626***	0.0078***
	(0.001)	(0.001)	(0.001)
ln_loan	0.0274***	0.0101***	0.0172***
	(0.001)	(0.001)	(0.001)
R^2	0.287	0.343	0.378
N	7476455	7476455	7476455

Note: Pre- and post-litigation effects estimated within a window of +/- four years. The year of litigation is excluded from the sample. All specifications include bank and MSA-year fixed effects. Standard errors clustered at the bank-MSA-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

5.4 Spillovers

In Table 9 we show results from estimation of specification 2, looking for spillover effects of litigation. The idea is that a lawsuit against a bank's competitor in a certain location may raise the salience to the bank of the risk of facing liability from practices deemed discriminatory. We test this hypothesis by examining how banks in particular MSAs respond after a competitor in their MSA is targeted with MSA-specific litigation.

There is evidence that litigation has spillover effects on non-litigated banks. After geographic-specific litigation of their local competitors, non-litigated banks reduced denial rates for Black applicants by 1 percentage points relative to White applicants at the same bank at a 10 percent level of statistical significance. Banks also increased relative origination rates for Black borrowers by 1.5 percentage points at a 5 percent level of statistical significance. This suggests that raising the salience of the threat of litigation has a non-trivial impact on lender behavior.

Table 9: Spillover Effects of Litigation on Exposed Banks

	(1) denied	(2) not_origin	(3) originate
Post-Lit X Exposed X Black	-0.0104*	-0.0042	0.0146**
	(0.006)	(0.004)	(0.007)
Exposed X Black	-0.0096**	0.0109***	-0.0013
	(0.004)	(0.003)	(0.005)
1.Black	0.0850***	0.0006	-0.0857***
	(0.001)	(0.000)	(0.001)
1.male	0.0067***	0.0011***	-0.0078***
	(0.000)	(0.000)	(0.000)
1.lgbt	0.0319***	-0.0056***	-0.0263***
	(0.001)	(0.001)	(0.001)
1.joint	-0.0125***	-0.0048***	0.0173***
	(0.000)	(0.000)	(0.000)
1.lmi	0.0306***	0.0045***	-0.0351***
	(0.000)	(0.000)	(0.001)
ln_inc	-0.0451***	0.0112***	0.0339***
	(0.000)	(0.000)	(0.000)
ln_loan	0.0033***	-0.0040***	0.0006
	(0.000)	(0.000)	(0.001)
R^2	0.291	0.161	0.325
N	8383114	8383114	8383114

Note: Pre- and post-litigation effects estimated within a window of +/- four years. The year of litigation is excluded from the sample. All specifications include bank-MSA-year fixed effects. Standard errors clustered at the bank-MSA-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

5.5 Robustness Checks

Our results demonstrate a consistent, strong link between fair lending litigation and reduced disparities in outcomes for Black versus White applicants. We nevertheless consider two potential alternative explanations—other than fair lending litigation—for the observed reductions in disparities: (1) Community Reinvestment Act agreements ("CRA agreements") and (2) enforcement decisions and orders ("EDOs"). CRA agreements (sometimes referred to as "Community Benefits Agreements") are bank commitments to extend a certain amount of credit to minority borrowers and communities; Bostic and Robinson (2003) find a significant, positive association between the number of newly–initiated CRA agreements in a county and increased CRA, minority, and overall conventional mortgage lending. Given this association, our results could be biased upward if enough of our sample litigation occurs around the same time as defendants enter CRA agreements. In turn, EDOs are public enforcement actions issued by regulatory supervisors requiring banks to cease an activity or promptly remedy a deficiency.[17] Similar to Bostic and Robinson (2003)'s results on the effects of CRAs, An et al. (2022) find a significant association between EDOs and increased lending to minority borrowers. Accordingly, our results could also be biased upward if enough litigation in our sample coincides with EDO issuances.

We control for these alternative causal pathways by identifying CRA agreements entered and EDOs issued within the +/- 4 year window of the filing of litigation and then re-running specification (1)—first excluding defendant banks that enter CRA agreements within the time window, and second excluding defendant banks that face EDOs within the window. We report the results in tables that, apart from these exclusions, are identical to Table 4.

To conduct these analyses, we collect data on CRA agreements and EDOs that occur during our sample period. Our CRA data come from the National Community Reinvestment Coalition

[17] Unlike litigation in court, which is the subject of our study, EDOs are administrative actions commenced by financial regulators. While not always the case, regulators frequently issue EDOs in conjunction with enforcement actions brought in court by the DOJ or CFPB; in such cases, the EDO and lawsuit pertain to the same underlying set of deficiencies. There are nevertheless many other instances where a litigation does not have an accompanying EDO or an EDO does not have an associated litigation.

("NCRC"), which has records of CRA agreements from before the 1990s through 2025.[18] We hand match CRA agreements entered by banks in our database of litigation actions if the agreement occurs within the +/- 4 year observation window around the litigation date. We collect data on EDOs from the three federal banking regulators and hand match them to our database if they occur within the +/- 4 year window around the litigation date (Prior to its closure in 2011 the Office of Thrift Supervision (OTS) was the primary federal regulator for some lenders and their EDO records are maintained by the OCC).[19] We only hand match an EDO to a litigation if the EDO concerns institutional compliance with bank regulations (e.g., EDOs pertaining to deficiencies in safety and soundness, risk management, mortgage loan servicing and foreclosures, consumer protection practices, and fair lending)—we exclude EDOs that pertain to minor, one-off issues such as misconduct by an individual employee. Appendix 8.3 outlines banks in our litigation sample that enter CRA agreements within the litigation window, as well as banks that are subject to EDOs within the litigation window.

Table 10 reports our results after excluding litigation against banks that enter CRA agreements within the litigation window. As with our main specification in Table 4, there is a negative, statistically significant coefficient on the "Post-Lit X Black" variable, meaning that the Black-White disparity in denial rates narrows by 3.8 percentage points following litigation. Likewise, the Black-White disparity in origination rates narrows by 3.2 percentage points after litigation. As with Table 4, the disparity in the rate that applications are accepted but not originated increases—here, by 0.6 percentage points, although that number is not statistically significant. The coefficients on the "Post-Lit" variable also align with the results in Table 4: there is a positive, statistically significant (at the 10% level) coefficient of 0.38 percentage points when application denial is the outcome variable, a negative, statistically significant (at the 1% level) coefficient of 3.0 percentage points for applications that are accepted but not originated, and a positive, statistically significant (at the

[18] Bostic and Robinson (2003) and Bostic and Robinson (2004) use data from the NCRC in their analyses of the link between CRA agreements and minority access to credit.

[19] The EDOs from each respective agency are available at https://orders.fdic.gov/s/ (FDIC), https://www.occ.treas.gov/topics/laws-and-regulations/enforcement-actions/index-enforcement-actions.html (OCC), https://www.federalreserve.gov/supervisionreg/enforcementactions.htm (FRS), and https://www.occ.treas.gov/news-events/newsroom/news-issuances-by-year/ots-issuances/index-ots-issuances.html (OTS).

1% level) coefficient of percentage points for origination rates.

Table 11 reports our results after excluding banks in our litigation sample that are subject to EDOs within the litigation window. The results of this robustness check materially differ from the results in Tables 4 and 10. After excluding banks that are also subject to EDOs, the Black-White disparity in denial rates no longer narrows post-litigation and in fact increases by 0.8 percentage points, although this figure is not statistically significant. By contrast, as with Table 4, the gap in origination rates narrows by 1 percentage point (although this figure is also not statistically significant). In turn, the rate that applications from Black borrowers are accepted but not originated decreases, with the Black-White disparity narrowing by 1.8 percentage points. This figure is statistically significant at the 1% level.

While we no longer see a post-litigation narrowing in the Black-White disparity in denial rates after excluding banks subject to EDOs, fair lending litigation appears to effectively reduce denial rates and increase origination rates for *all* applicants in this subsample. As Column 1 of Row 2 of Table 11 indicates, relative to before litigation, after being sued banks subject to litigation but not EDOs reduce denial rates for all applicants by 5.1 percentage points. Likewise, banks in this subsample increase origination rates by 4 percentage points post-litigation, relative to before litigation. Both figures are statistically significant at the 1% level. Notably, there is an overall increase in the rate that applications are accepted but not originated: 1.1 percentage points, which also is statistically significant at the 1% level. Because the Black-White disparity for this figure narrows by 1.8 percentage points, however, accepted-but-not-originated rates decrease on net for Black applicants (by about 0.7 percentage point).

It is not straightforwardly clear why the Black-White disparity in denial and origination rates ceases to decrease when we remove banks subject to EDOs. One possibility is selection bias. It is possible that (1) regulators only issue EDOs associated with litigation when the pre-litigation racial disparity is particularly pronounced, and (2) a larger disparity has more room to be narrowed—whether because of litigation, an EDO, or the combination of the two. If these conditions obtain, then the litigation we excluded happens to have the highest likelihood of effectively reducing denial

rates and increasing origination rates. Our results offer some evidence that is consistent with this hypothesis. Unlike with our overall sample, where the Black-White denial rate disparity at litigated banks is a statistically significant 3 percentage points higher (relative to non-litigated banks) pre-litigation[20], in this subsample the pre-litigation disparity is a statistically significant 2.8 percentage points *lower* than at non-litigated banks. The same goes for origination rates. In the overall sample, the pre-litigation Black-White denial rate disparity is a statistically significant 3.0 percentage points higher at litigated banks, relative to non-litigated banks.[21] By contrast, in this subsample the pre-litigation disparity is 0.3 percentage point narrower at litigated banks, relative to non-litigated banks. Excluding litigation that has accompanying EDOs may simply exclude our sample litigation that is best positioned to reduce discrimination along the metrics we study.

A second possibility is that litigation is most effective when paired with EDOs. While we do not rule out this hypothesis, exploring the nuanced intersection of litigation and EDOs is outside the scope of this study. A third possibility is that eliminating litigation with associated EDOs compromises statistical power by removing sufficiently many treatment observations from our sample. As recorded in Table 14 in Appendix 8.3, 14 banks in our sample were subject to EDOs within the litigation window, meaning that we lose a substantial share of our litigation sample after excluding these enforcement actions. (By comparison, only six actions in our litigation sample involved banks that entered CRAs within the litigation window, meaning that far fewer actions were excluded when conducting the robustness check for CRAs.)

[20] See Column 1, Row 3 of Table 4.
[21] See Column 3, Row 3 of Table 4.

Table 10: CRA Robustness Check

	(1) denied	(2) not_origin	(3) originate
Post-Lit X Black	-0.0379***	0.0061	0.0318***
	(0.008)	(0.004)	(0.008)
Post-Lit	0.0038*	-0.0295***	0.0256***
	(0.002)	(0.002)	(0.002)
Pre-Lit X Black	0.0320***	-0.0017	-0.0303***
	(0.006)	(0.003)	(0.005)
Pre-Lit	0.0074***	-0.0149***	0.0075***
	(0.002)	(0.001)	(0.002)
Black	0.0899***	0.0024***	-0.0924***
	(0.001)	(0.000)	(0.001)
1.male	0.0065***	0.0009***	-0.0074***
	(0.000)	(0.000)	(0.000)
1.lgbt	0.0331***	-0.0060***	-0.0271***
	(0.001)	(0.001)	(0.001)
1.joint	-0.0135***	-0.0049***	0.0184***
	(0.000)	(0.000)	(0.000)
1.lmi	0.0318***	0.0043***	-0.0361***
	(0.000)	(0.000)	(0.001)
ln_inc	-0.0472***	0.0106***	0.0367***
	(0.000)	(0.000)	(0.000)
ln_loan	-0.0047***	-0.0067***	0.0114***
	(0.000)	(0.000)	(0.000)
R^2	0.204	0.074	0.242
N	8647555	8647555	8647555

Note: Pre- and post-litigation effects estimated within a window of +/- four years. The year of litigation is excluded from the sample. All specifications include bank fixed effects and county-year fixed effects. Standard errors clustered at the bank-MSA-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 11: EDO Robustness Check

	(1) denied	(2) not_origin	(3) originate
Post-Lit X Black	0.0079	-0.0179***	0.0100
	(0.010)	(0.004)	(0.010)
Post-Lit	-0.0507***	0.0107***	0.0400***
	(0.004)	(0.002)	(0.004)
Pre-Lit X Black	-0.0282***	0.0254***	0.0029
	(0.009)	(0.003)	(0.009)
Pre-Lit	0.0051	-0.0412***	0.0360***
	(0.003)	(0.002)	(0.003)
Black	0.0900***	0.0021***	-0.0921***
	(0.001)	(0.000)	(0.001)
1.male	0.0064***	0.0009***	-0.0073***
	(0.000)	(0.000)	(0.000)
1.lgbt	0.0326***	-0.0062***	-0.0264***
	(0.001)	(0.001)	(0.001)
1.joint	-0.0129***	-0.0048***	0.0178***
	(0.000)	(0.000)	(0.000)
1.lmi	0.0312***	0.0043***	-0.0355***
	(0.000)	(0.000)	(0.001)
ln_inc	-0.0471***	0.0105***	0.0367***
	(0.000)	(0.000)	(0.000)
ln_loan	-0.0055***	-0.0068***	0.0123***
	(0.000)	(0.000)	(0.000)
R^2	0.210	0.076	0.249
N	8469160	8469160	8469160

Note: Pre- and post-litigation effects estimated within a window of +/- four years. The year of litigation is excluded from the sample. All specifications include bank fixed effects and county-year fixed effects. Standard errors clustered at the bank-MSA-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

6 Conclusion

We began this project by questioning the efficacy of fair lending enforcement actions. We find that, in the wake of legal settlements for discrimination against Black borrowers, lenders significantly reduced denial rates for Black applicants. The reductions offset pre-litigation racial disparities in denial rates by litigated banks, relative to those banks' competitors. Origination rates for Black applicants also increased post-litigation. We further observe evidence of a spillover effect on the approval decisions of non-litigated banks operating in the same city as a litigated bank. In conclusion, the evidence suggests that enforcement of fair lending laws is an effective tool to reduce racial discrimination in credit markets.

7 References

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8 Appendix

8.1 Cases Reviewed But Excluded from Our Sample

Figure 4: Cases Reviewed But Excluded from Our Sample

Case	Reason for Exclusion
US v. First National Bank of Gordon (1996)	Discrimination in consumer loans; no observations in HMDA
US v. AIG Federal Savings Bank (2010)	Mortgage discrimination but low obs in HMDA
US v. Pacific Mercantile Bank (2018)	Mortgage discrimination but low obs in HMDA
US v. Sage Bank (2015)	Mortgage discrimination but low obs in HMDA
US v. Community State Bank (2013)	Mortgage discrimination but low obs in HMDA
US v. Southport Bank (2013)	Mortgage discrimination but low obs in HMDA
US v. Luther Burbank Savings Bank (2012)	Mortgage discrimination but low obs in HMDA
US v. Albank Federal Savings Bank (1997)	Mortgage discrimination but low obs in HMDA
US v. KleinBank (2017)	Mortgage discrimination but low obs in HMDA
CFPB and US v. National City Bank (2013)	Mortgage discrimination but acquired by PNC in 2008
US v. Texas Champion Bank (2013)	Unsecured loans
US v. Countrywide Financial Corporation (2011)	Mortgage discrimination but acquired by BAML in 2008
US v. Chevy Chase Bank (2013)	Mortgage discrimination but acquired by Capital One in 2009
Ramirez v. Greenpoint Mortgage Funding, Inc. (2008)	Mortgage discrimination but acquired by Capital One 2 yrs before suit
Zamora v. Wachovia (2007)	Mortgage discrimination but class cert denied
Miller v. Countrywide (2007)	Mortgage discrimination but class cert denied after appellate litigation
National Community Reinvestment Coalition v. Novastar Financial (2007)	Mortgage discrimination but defendant filed for bankruptcy, so no obs in HMDA; also concurrent w Jackson v. Novastar
JAT Inc. v. Nat'l City Bank of the Midwest (2006)	Business loans
Boykin v. Bank of America Corporation (2004)	Mortgage discrimination but private non-class suit
Hargraves v. Capital City Mortgage Corporation (1998)	Mortgage discrimination but private non-class suit
Edwards v. Flagstar Bank (1995)	Mortgage discrimination but private non-class suit
Doane v. National Westminster Bank (1995)	Mortgage discrimination but private non-class suit
Latimore v. Citibank Fed. Sav. Bank (1995)	Mortgage discrimination but private non-class suit
Barrett v. H&R Block, Inc. (2008)	Mortgage discrimination but class cert denied on appeal
US v. Deposit Guaranty National Bank	Home improvement loans
US v. Old Kent Financial Corporation (2004)	Commercial loans; Bank Acquired by Fifth Third Bank, May 2001
US v. First National Bank of Dona Ana County (1997)	Mobile home mortgages loans
Adkins v. Morgan Stanley (2012)	Lawsuit over disparate impact from activity in the secondary mortgage market
City of Pittsburgh Commission on Human Relations v. Key Bank USA	Home improvement loans
Powell v. American General Financial, Inc.	Mortgage discrimination but private non-class suit
Cooley v. Sterling Bank	Private non-class suit over unsecured lines of credit
Dumas v. Sentinel Mortgage Corporation	Private non-class suit that didn't center mortgage loans
Hood v. Midwest Savings Bank	Private non-class suit that didn't center mortgage loans

Case	Reason for Exclusion
Church of Zion Christian Center v. Southtrust Bank	Private non-class suit that didn't center mortgage loans
Housing Opportunities Made Equal a/k/a HOME v. Nationwide Insurance	Insurance redlining, not mortgage redlining
Sallion v. Suntrust Banks, Inc.	Mortgage discrimination but class cert denied on appeal
Milton v. Bancplus Mortgage Corporation	Mortgage discrimination but class cert denied on appeal
US v. Auto Fare (2014)	Auto lending market, not mortgage
US v. Synchrony Bank f/k/a GE Capital Retail Bank (2014)	Credit card lending
US v. Fifth Third Mortgage (2014)	disability discrimination
US v. First United Bank (2014)	consumer loans, not mortgages
US v. Sallie Mae (2014)	pre service loans, not mortgages
US v. Santander (2014)	unlawful reposession of automobiles
US v. American Honda Finance Corp (2015)	Auto lending
US v. Fifth Third Bank (2015)	Auto Lending
US v. Toyota Motor Credit Corp (2015)	Auto lending
US v. Evergreen Bank Group (2015)	motorcycle lending
US v. Evolve Bank & Trust (2015)	disability discrimination
US v. Charter Bank (2016)	vehicle secured consumer loans
US v. The Home Loan Auditors (2016)	mortgage loan modification
US v. First Federal Bank of Flordia (2016)	discriminiation on basis of familial status(maternity)
US v. Hatfield (2017)	sexual harrassment
US v. COPOCO Community Credit Union (2017)	illegal auto reposession
US v CitiFinancial Credit Co (2017)	illegal auto reposession
US v. Westlake Services (2017)	illegal auto reposession
US v. Wells Fargo Bank, N.A., d/b/a Wells Fargo Dealer Services (2017)	illegal auto reposession
US v. Northwest Trustee Services (2017)	illegal home foreclosure
US v. Advocate Law Groups of Flordia (2018)	mortgage loan modification
US v. BMW Financial Services (2018)	Motor vehicle lease terminations
US v. Northwest Trustee Services (2018)	Home forclosures
US v. Hudson Valley Federal Credit Union (2018)	illegal auto reposession
US v. California Auto Finance (2018)	illegal auto reposession
US v. Guaranteed Auto Sales (2019)	race discrimination on auto loans
US v. Nissan Motor Acceptance Corp (2019)	Auto reposessions
US v. PHH Mortgage Corp (2019)	home forclosures
US v. Bank of America (2020)	discrimination on basis of disability
US v. Conn Credit (2021)	overcharged interest rates

Case	Reason for Exclusion
US v. New Jersey Higher Education Student Assistance Authority (2021)	Student loan case
US v. Ally Financial Inc and Ally Bank (2013)	auto lending
US v. Nara Bank (2013)	auto lending
US v. Bank of America (2012)	discrimination on basis of disability
US v. Union Auto Sales (2012)	Discrimination in auto lending
US et al., v. Bank of America Corp., et al. (2012)	Not discrimination on basis of race
US v. Capital One (2012)	not a mortgage case
US v. Nixon State Bank (2011)	consumer loans
US v. Mortgage Guaranty Insurance Corp (2011)	sex based discrimination
US v BAC Home Loans Servicing (2011)	wrongful forclosure
US v Saxon Mortgage Services (2011)	wrongful forclosure
US v. Nationwide Nevada (2008)	refused to purchase automobile contracts based on ethnicity
US v. Compass Bank (2007)	Discrimination on basis of marital status
US v. Springfield Ford (2007)	Discrimination on car loan rates
US v. Pacifico Ford (2007)	Discrimination on car loan rates
US v. First Nat'l Bank of Pontotoc (2007)	sexual harrassment of female borrowers
US v. Fifth Third Bank (2004)	discrimination on basis of race for business loans
US v. Fidelity Federal Bank (2002)	credit card program discrimination
US v. Associates National Bank (2001)	credit card program discrimination
US v. Deposit Garanty National Bank (1999)	Home improvement loan discrimination
Cason v. Nissan Motor Acceptance Corp (2000)	higher finance charges for African Americans at Nissan Dealerships
Louisiana ACORN Fair Housing v. LeBlanc (1998)	rent discrimination
Regional Economic Community Action Program, Inc. v. City of Middletown (1998)	discrimination against alcoholics
US v. Big D Enterprises (1998)	Discrimination against African American renters
US v. City of Lake Station (1998)	City refused to permit development of affordable, owner occupied, single family homes
US v. City of Toledo (1998)	discrimination on basis of disability
US v. Crawford (1998)	sexual harrassment
US v. Damron (1998)	refused to rent to African Americans
US v. Gardner (1998)	discrimination against children
US v. Inland Empire Builders (1998)	discrimination on basis of disability
US v. Krueger (1998)	sexual and racial harassment of black tenants
US v. Lexington Village Apartments and Hillcrest Village (1998)	defendant not a mortgage originator
US v. Nejam Properties (1998)	defendant not a mortgage originator
US v. Richmond (1998)	defendant not a mortgage originator

Case	Reason for Exclusion
US v. Vernon (1998)	defendant not a mortgage originator
US v. Village of Addison (1998)	defendant not a mortgage originator
US v. Housing Authority of the Town of Milford (1997)	defendant not a mortgage originator
US v. Las Vegas Jaycees Senior Citizens Mobile Home Community (1997)	defendant not a mortgage originator
US v. Nationwide Mutual Insurance (1997)	Discrimination in home insurance
US v. Rock Springs Vista Development Corp (1997)	defendant not a mortgage originator
US v. Town of Cicero (1997)	defendant not a mortgage originator
US v. Williams (1997)	defendant not a mortgage originator
US v. Associates National Bank (1997)	discrimination in credit card applications
US v. Big D Enterprises (1997)	defendant not a mortgage originator
US v. Choice Property Consultants (1997)	defendant not a mortgage originator
US v. City of Milwaukee (1997)	defendant not a mortgage originator
US v. Hagadone (1997)	defendant not a mortgage originator
US v. Harlan (1997)	defendant not a mortgage originator
US v. JDL Management (1997)	defendant not a mortgage originator
US v. Cedar Builders (1996)	defendant not a mortgage originator
US v. City of Waukegan (1996)	defendant not a mortgage originator
US v. Village of Hatch (1996)	defendant not a mortgage originator
US v. American Family Mutual Insurance (1995)	defendant not a mortgage originator
US v. City of Pharma (1995)	defendant not a mortgage originator
US v. Pinewood Associates (1995)	defendant not a mortgage originator
US v. Secutiry State Bank (1995)	discrimination in consumer loans
US v. Veal (1994)	defendant not a mortgage originator
US v. Blackpipe State Bank (1994)	not discrimination on mortgages
US v. Chevy Chase Bank (1994)	not discrimination on mortgages
US v. First National Bank of Vicksburg (1994)	Home improvement loan discrimination
US v. Jacksonville Housing Authority and City of Jacksonville (1994)	defendant not a mortgage originator
US v. Nedialkov (1994)	defendant not a mortgage originator
US v. Flagstar Corporation and Denny's (1993)	not discrimination on mortgages
US v. Plaza Mobile Estates (1991)	defendant not a mortgage originator

8.2 Total Asset Covariates

Table 12: Overall Results with Bank Asset Controls

	(1) denied	(2) not_origin	(3) originate
Post-Lit X Black	-0.0432***	0.0080**	0.0352***
	(0.008)	(0.004)	(0.008)
Post-Lit	0.0032	-0.0247***	0.0215***
	(0.002)	(0.002)	(0.002)
Pre-Lit X Black	0.0192***	-0.0057**	-0.0135**
	(0.006)	(0.003)	(0.005)
Pre-Lit	0.0056***	-0.0149***	0.0092***
	(0.002)	(0.001)	(0.002)
Black	0.1045***	0.0047***	-0.1092***
	(0.001)	(0.001)	(0.001)
1.male	0.0077***	0.0006**	-0.0083***
	(0.000)	(0.000)	(0.000)
1.lgbt	0.0389***	-0.0053***	-0.0335***
	(0.001)	(0.001)	(0.001)
1.joint	-0.0132***	-0.0046***	0.0178***
	(0.000)	(0.000)	(0.000)
1.lmi	0.0366***	0.0043***	-0.0408***
	(0.001)	(0.000)	(0.001)
ln_inc	-0.0494***	0.0098***	0.0396***
	(0.000)	(0.000)	(0.000)
ln_loan	-0.0110***	-0.0072***	0.0183***
	(0.000)	(0.000)	(0.001)
ln_total_assets	0.0058***	-0.0084***	0.0026***
	(0.000)	(0.000)	(0.000)
R^2	0.169	0.051	0.183
N	6135311	6135311	6135311

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Pre- and post-litigation effects estimated within a window of +/- four years. The year of litigation is excluded from the sample. All specifications include bank and MSA-year fixed effects. Standard errors clustered at the bank-MSA-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

8.3 CRA and EDO Robustness Check

Table 13: Banks That Enter CRA Agreements Within Litigation Window

Case	Allegation	Outcome	Location of Discrimination
US v. Huntington Mortgage Co. (N.D. Ohio 1995)	Discriminatory Pricing	$420,000 compensatory fund	Cleveland MSA
US v. Mid America Bank (N.D. Ill. 2002)	Redlining	$11.25m remediation fund	Chicago MSA
US v. Fleet Mortgage Corp. (E.D.N.Y. 1996)	Discriminatory Pricing	$4m compensatory & remediation fund	Westbury, NY & Woodbridge, NJ
City of L.A. v. Citigroup, Inc. (C.D. Cal. 2013)	Reverse Redlining	Outcome unclear; Initial motion to dismiss denied	L.A., CA
US v. Union Savings Bank (S.D. Ohio 2016)	Redlining	$9m remediation fund	Cincinatti, Dayton, & Columbus, OH, & Indianapolis, IN, MSAs
US v. First Merchants Bank (S.D. Ind. 2019)	Redlining	$1.7m remediation fund	Indianapolis MSA

Table 14: Banks Subject to EDOs Within Litigation Window

Case	Allegation	Outcome	Location of Discrimination
Payares v. J.P. Morgan Chase (C.D. Cal. 2007) (private class action)	Discriminatory Pricing	$300/class member; $1.965m in attorneys' fees	National
US v. J.P. Morgan Chase (S.D.N.Y 2017)	Discriminatory Pricing	$53m compensatory fund	National
US v. Wells Fargo (D.D.C. 2012)	Discriminatory Pricing	$175m compensatory fund	National
US v. Suntrust Mortgage (E.D. Va. 2012)	Discriminatory Pricing	$21m compensatory fund	National
Puello v. Citifinancial Services, Inc. (D. Mass. 2008) (private class action)	Discriminatory Pricing	$200/class member; $400,000 in attorneys' fees	National
City of Miami v. Bank of America (S.D. Fla. 2013)	Reverse Redlining	Voluntarily dismissed after protracted appellate litigation over standing	Miami, FL
CFPB v. BancorpSouth Bank (N.D. Miss. 2016)	Redlining	$10.8m compensatory & remediation fund	Memphis MSA
City of Oakland v. Wells Fargo (N.D. Cal. 2015)	Reverse Redlining	Motion to Dismiss granted after appeal	Oakland, CA
City of L.A. v. Wells Fargo (C.D. Cal. 2013)	Reverse Redlining	Motion for Summary Judgment against City granted	L.A., CA
City of Memphis v. Wells Fargo (W.D. Tenn. 2010)	Reverse Redlining	$7.5m remediation fund; Coordinated with US v. Wells Fargo settlement	Shelby Cnty., TN
Mayor of Baltimore v. Wells Fargo (D. Md. 2008)	Reverse Redlining	$7.5m remediation fund; Coordinated with US v. Wells Fargo settlement	Baltimore MSA
US v. First American Bank (N.D. Ill. 2004)	Redlining	$5.7m remediation fund	Chicago & Kankakee, IL, MSAs
City of L.A. v. Citigroup, Inc. (C.D. Cal. 2013)	Reverse Redlining	Outcome unclear; Initial motion to dismiss denied	L.A., CA
† US v. Citizens Republic Bankcorp., Inc. (E.D. Mich. 2011)	Redlining	$3.63m compensatory & remediation fund	Detroit MSA

† Indicates "pretreatment" cases.