

ABSTRACT

Title of Dissertation: ARE THE VOICES OF CUSTOMERS
LOUDER WHEN THEY ARE SEEN?
EVIDENCE FROM CFPB COMPLAINTS

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This paper exploits a unique policy change in the banking sector – the first disclosure of the customer complaints submitted to the Consumer Financial Protection Bureau (CFPB) – to examine whether regulatory scrutiny represents one mechanism through which the disclosure of customer complaints can affect bank behavior. I find that banks with a higher complaint volume on the disclosure date increase mortgage approval rates relative to banks with fewer complaints in the same county, and that this effect is strongest in financially underserved communities. I further find that the disclosure effect is larger for banks under more regulatory scrutiny, namely, those operating in states with stronger consumer financial protection enforcement and those with prior consumer affairs violations. Taken together, the results suggest that the public disclosure of customer complaints, especially when accompanied by regulatory pressure, can serve as a mechanism for customers to influence banks' consumer lending behavior.

ARE THE VOICES OF CUSTOMERS LOUDER WHEN THEY ARE SEEN?
EVIDENCE FROM CFPB COMPLAINTS

by

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Dedication

I dedicate this dissertation to the individuals who were on this educational journey with me. Special thanks to my parents, Vincent and Wendy Mazur, and my fiancé, Patrick Ballard.

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1 Introduction

Prior literature on the real effects of financial reporting and disclosure focuses primarily on the impact of information produced and disclosed by a firm (e.g., Dyreng, Hoopes, and Wilde 2016; Kanodia and Saprà 2016; Leuz and Wysocki 2016; Roychowdhury, Shroff, and Verdi 2019). In more recent years, due to greater focus on transparency in areas such as product quality and safety as well as the advent of social media, disclosure by third parties has reduced firms' control over their information environment (Miller and Skinner 2015). Evidence from recent studies suggests that one type of third-party disclosure – word-of-mouth reviews from customers – can have significant real effects (e.g., Dou and Roh 2020; Eyring 2020; Hayes, Jiang, and Pan 2021). Yet we know relatively little about whether publicly disclosing such information enhances customers' voice and, if so, what channels make disclosure an effective mechanism to influence firm behavior. In this study I exploit a unique setting in the banking industry to examine whether the initial disclosure of customer complaints by the Consumer Financial Protection Bureau (CFPB) increased the provision of financial services, especially in financially underserved areas, and to explore one specific channel – regulatory scrutiny – through which disclosure may amplify the voice of customers.

The initial complaint disclosure by the CFPB is a particularly attractive setting to address these questions for three reasons. First, unlike other third-party customer reviews (e.g., Yelp) that have always been publicly available, CFPB complaints were initially not disclosed to the public and only became available in 2013. This policy

change allows me to observe firm reactions to an identical information set with public visibility as the only altered factor, providing an ideal setting to examine the effect of disclosure in the context of customer voice. Second, a majority of CFPB complaints are related to mortgages. The focus on one type of complaint allows for cleaner identification of the effect of complaint disclosure. Third, regulators play a particularly important role in the banking sector. For instance, the primary bank regulators – the Federal Deposit Insurance Corporation (FDIC), the Federal Reserve System (FRS), and the Office of the Comptroller of the Currency (OCC) – conduct routine bank examinations to evaluate the financial health of the bank as well as to ensure compliance with consumer protection regulations.¹ The presence of regulatory agencies at the state and federal levels as well as their interactions with the CFPB therefore offers a unique opportunity to study whether public disclosure affects bank behavior by triggering additional regulatory scrutiny.

While prior literature on the disclosure of the CFPB complaint database has focused on the role of market discipline arising from the reactions of customers, investors, and peer firms (e.g., Dou and Roh 2020; Dou, Hung, She, and Wang 2021), little attention has been paid to the role of other regulators in this context. In this paper, I argue that the initial disclosure of CFPB complaints likely affected banks' lending decisions through the threat of increased regulatory oversight from regulators other than the CFPB (hereafter, the “regulatory channel”) for at least two reasons.

¹ While the CFPB – the third-party discloser in this context – is itself a regulator, unlike the FDIC, FRS, and the OCC, it is only responsible for supervising and enforcing consumer protection regulations and does not examine bank actions more broadly. Since the establishment of the CFPB in 2011, the responsibility for the enforcement of consumer protection regulations is shared between the CFPB, the three banking regulators, and state consumer protection agencies.

First, the initial disclosure may have pressured regulators to more strongly supervise banks' compliance with consumer protection regulations due to media coverage of the database and growing public interest in issues related to consumer financial protection. Given that complaints could be indicative of regulators failing to properly supervise consumer protection issues, the disclosure of the database may have been damaging to the reputations of these regulators. Since the CFPB was created in response to the perceived inability of the existing regulatory system to adequately protect consumers during the financial crisis, this pressure was likely most pronounced for the primary bank regulators, as an increase in enforcement would be a rational reaction by regulators to the criticism levied against them prior to the establishment of the CFPB. This effect is likely to be stronger after the initial disclosure of the consumer complaint database. To the extent that banks respond to the threat of increased enforcement, we should see observable changes in lending areas of regulatory interest, such as the provision of credit and financial services to low- and moderate-income (LMI) communities.

Second, the disclosure of CFPB complaints increased awareness of consumer protection issues, likely leading to more scrutiny in this area. In the banking sector, banks' reputations with regulators are particularly important as banks are frequently examined to ensure compliance and soundness. Therefore, banks may have anticipated increased regulatory focus and scrutiny arising from the monitoring and examination of compliance with consumer protection regulations. As a result of this heightened awareness, and because state and bank regulators plausibly did not possess complete information about complaints prior to the database's initial

disclosure, banks likely had incentives to change their behavior after the CFPB complaint database was first disclosed in order to stave off increased scrutiny.

To empirically test for both the disclosure effect and the regulatory channel, I rely on the CFPB complaint database, which was first disclosed on March 28, 2013. My sample includes commercial banks supervised by the CFPB. I focus on mortgage complaints at the county level as this type of complaint was the most prominent at the time the database was first disclosed and thus allows me to exploit granular mortgage application data to study how the disclosure of the CFPB complaint database impacted lending in the counties from which the complaints originated, particularly lending in LMI areas. To capture banks' response, I examine total mortgage approval rates at the bank-county level. To measure the initial disclosure effect, I measure the county-level complaint volume in the period prior to the initial disclosure, which represents the level of complaints that was not previously known until 2013. The sample spans the period 2011 to 2016, with 2013 as the disclosure event year.

I begin the analysis by looking at the effect of the complaint database disclosure on total mortgage approval rates at CFPB-supervised banks. I find that banks with a higher complaint volume in 2013 (i.e., in the pre-disclosure period) have higher approval rates in the years after initial database disclosure. Economically, this translates into a roughly 0.07% increase in the total mortgage approval rate relative to the mean. Given this result, I examine whether the disclosure effect varies across mortgage applications originated from LMI areas versus middle- and upper-income (MUI) areas. This analysis sheds light on whether banks took remedial action after the database disclosure in response to stronger expected regulatory enforcement. I

expect to see banks increase mortgage application approvals more in LMI areas. In line with this view, I find a 1.5% increase in the LMI approval rate on average, compared to a 0.04% increase in MUI areas. These results, which are robust to ensuring that the parallel trends assumption is satisfied, are consistent with banks increasing their consumer-facing services in the markets where they have received the most complaints.

Next, I explore whether the behavior of banks under more regulatory scrutiny drives the change in mortgage lending behavior after the initial database disclosure. I hypothesize that the effect of regulatory pressure is stronger for banks operating in states with stronger consumer protection enforcement. I expect this effect to be more pronounced if the database disclosure increases the information available to state agencies tasked with enforcing consumer protection regulations or increases pressure on these agencies to respond. Consistent with this prediction, I find that while banks significantly increase LMI lending in all states in which they operate, the effect is greater in states with stronger consumer protection enforcement.

To investigate the impact of regulatory scrutiny by bank examiners on bank behavior in response to complaint disclosure I separately identify two forms of scrutiny occurring as a result of both routine supervision and punitive enforcement. For routine supervision, I focus on banks with an upcoming Community Reinvestment Act (CRA) exam. The CRA is one of the regulations that the primary regulatory agencies retained responsibility of after the establishment of the CFPB. I, therefore, expect the pressure exerted by the database disclosure on both banks and their regulators to be particularly relevant to CRA enforcement. I find that banks with

upcoming CRA exams do not significantly increase lending in total or to LMI areas in particular.

I define the sample of banks plausibly experiencing increased scrutiny as a result of punitive enforcement as those that received enforcement actions related to consumer affairs in the pre-disclosure period. Not only do these banks have identified violations in an area potentially related to the disclosed complaints, but they are also those more likely to cater to their regulators in response. Supporting the role of scrutiny resulting from punitive enforcement, I find that the sample of banks receiving consumer-related enforcement actions increase lending in LMI areas. Furthermore, this behavior is amplified when a bank has both a prior enforcement action and an upcoming CRA examination.

In additional analysis, I examine the outcomes of and another explanation for the observed change in bank lending behavior. Looking first at borrower attributes, I find some evidence to suggest that banks reacted to the disclosure by increasing lending to financially underserved borrowers within LMI or MUI areas. In addition, it does not appear that this increase in approvals is accomplished through a relaxation of bank underwriting standards. I also find some evidence that the observed change in lending behavior may be driven by banks' efforts to provide financial services to areas that they had previously underserved. The main results are robust to using different definitions of complaint volume, county-level controls, different sample periods and sample restrictions, additional control variables, separately examining the impact on the numerator and denominator of the approval rate, as well as to running a placebo test.

This study contributes to several literatures in accounting, economics, and finance, most notably to the literature on firm responses to disclosures released by third parties (e.g., Dranove, Kessler, McClellan, and Satterthwaite 2003; Jin and Leslie 2003), particularly word-of-mouth reviews (e.g., Eyring 2020; Dube and Zhu 2021). I show that, when there is additional scrutiny from a regulatory body both in the disclosure and response to the released information, public disclosure can increase the effectiveness and impact of word-of-mouth reviews. In investigating the regulatory channel, I document a real effect of third-party disclosure – an increase in mortgage approval rates, particularly to borrowers in LMI areas. This suggests that the combination of the disclosure of word-of-mouth reviews coupled with regulatory enforcement can amplify the voices of customers that have been traditionally more marginalized.

Broadly, this study answers the call of Leuz and Wysocki (2016) for more research on disclosure regulation by examining the disciplinary effects of disclosure regulation on firms, specifically in the banking industry (e.g., Ertan, Loumioti, and Wittenberg-Moerman 2017; Granja 2018; Balakrishnan and Ertan 2019; Dou and Roh 2020; Gopalan 2021; Kang, Loumioti, and Wittenberg-Moerman 2021). Moreover, I provide evidence on the disciplinary effects of disclosure on regulators (e.g., Guo and Tian 2020; Kleymenova and Tomy 2022) by examining the response of regulators to third-party disclosure. The finding that, by increasing the threat of regulatory scrutiny, the disclosure of consumer complaints leads banks to increase lending to LMI areas suggests that disclosure may increase compliance in other areas of

regulatory responsibility through its disciplinary effects on both banks and their regulators.

This study also contributes to the recent literature on the effect of CFPB complaints (e.g., Dou and Roh 2020; Begley and Purnanandam 2021; Dou, Hung, She, and Wang 2021; Fuster, Plosser, and Vickery 2021; Hayes, Jiang, and Pan 2021; Hayes, Jiang, Pan, and Tang 2021). Evidence from this stream of research suggests that the disclosure of the complaint database has real effects on both customer and bank behaviors. What remains largely unexplored are the mechanisms through which disclosure influences this response. In this study, I highlight a specific channel – increased regulatory scrutiny – and investigate how this interacts with disclosure to impact bank behavior. My findings suggest that regulators can play a complementary role in this context to amplify the voice of customers through disclosure.

Finally, this paper contributes to the debate on whether the consumer complaint database should be disclosed. My findings suggest that the disclosure, as opposed to the existence, of the database appears to have a significant disciplining effect on banks, particularly through increased regulatory scrutiny. To the extent that the disclosure is not only useful for customers but can also lead to beneficial changes in bank lending decisions, particularly in financially underserved areas, the benefits of disclosure may outweigh any potential costs. These findings can inform regulators of other industries interested in leveraging the disclosure of customer-produced information to discipline firms, inform supervisory efforts, and increase firm-specific information.

The remainder of the paper is organized as follows. Section 2 provides institutional background on the CFPB, the disclosure of the complaint database, and the importance of mortgage lending. Section 3 reviews related literature and develops the paper's hypotheses. Section 4 describes the data, sample, and empirical design. Results are presented in Section 5. Finally, Section 6 concludes.

2 Institutional Background

2.1 The Consumer Financial Protection Bureau

The CFPB was established as part of the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act in response to the deficiencies of the existing financial regulatory structure identified after the 2007-2009 financial crisis. Prior to the establishment of the CFPB, responsibilities for consumer financial protection supervision and regulation were split between a number of different federal and state regulatory agencies (Levitin 2013).² Not only was this fragmented supervisory structure operationally inefficient, but it was also the case that consumer financial protection was only one of a number of supervisory responsibilities for these agencies, most notably for the primary bank regulators. This, combined with the historical supervisory focus on bank financial safety and soundness, may have resulted in less effective monitoring and enforcement of issues related to consumer

² The Office of the Comptroller of the Currency, Office of Thrift Supervision, National Credit Union Administration, Federal Reserve Board, Federal Deposit Insurance Corporation, Federal Housing Finance Agency, Department of Housing and Urban Development, Veterans Administration, Internal Revenue Service, Federal Trade Commission, Department of Defense, and the Department of Justice

financial protection. Therefore, the creation of the CFPB as the institution with responsibility for consumer financial protection can be seen as a response to the shortcomings of the regulatory system that preceded it (Balleisen and Jacoby 2019).

The CFPB formally began operations on July 21, 2011, and is a regulatory and supervisory agency solely responsible for consumer financial protection. While the experience of the crisis highlighted the deficiencies in consumer financial protection regulation related to mortgages specifically, the CFPB has supervisory and enforcement responsibilities for all aspects of consumer finance. This includes, but is not limited to, credit cards, student loans, savings and checking accounts, credit reports and monitoring, payday loans, and auto loans. The CFPB's rulemaking authority applies to all institutions engaging in the provision of consumer financial services, however the direct supervisory and enforcement powers of the CFPB are limited to those institutions with over \$10 billion in total assets.³ The CFPB has the authority to write rules, supervise companies, and enforce consumer protection laws. They also conduct ongoing monitoring of consumer protection issues including accepting and analyzing customer complaints, researching consumer experiences, monitoring financial markets, and educating consumers.⁴

For institutions both above and below the \$10 billion threshold, the CFPB may work with the institution's primary supervisor if violations are identified or in an information-sharing capacity (Fuster, Plosser, and Vickery 2021). Section 1025 of the Dodd-Frank Act outlines that the CFPB should have exclusive ability to conduct

³ The primary regulatory agencies still maintain full responsibility for consumer protection supervision of banks with under \$10 billion in total assets.

⁴ "The Bureau," Consumer Financial Protection Bureau, <https://www.consumerfinance.gov/about-us/the-bureau/>.

examinations of insured depository institutions over \$10 billion in total assets with appropriate coordination with other regulatory authorities (Dodd-Frank Act Section 1025). The CFPB has multiple memoranda of understanding (MOUs) with other regulatory bodies including, relevant to this paper, the three prudential banking regulators, with respect to regulatory coordination, information sharing, and procedures regarding disseminating relevant information regarding customer complaints.^{5,6}

While rulemaking authority and a large majority of enforcement powers related to consumer affairs were transferred to the CFPB upon its establishment, the prudential bank regulators still maintain responsibility for select existing consumer protection regulations. Appendix B lists the regulations for which responsibility lies with the CFPB and those for which it remains with the prudential banking regulators. For banks over \$10 billion in total assets, most relevant to the mortgage lending activities analyzed in this paper, the Dodd-Frank Act transferred responsibility for enforcement of the Equal Credit Opportunity Act, Home Mortgage Disclosure Act of 1975, and the Real Estate Settlement Procedures Act of 1974 to the CFPB. The prudential regulatory agencies retain responsibility for the enforcement of the Community Reinvestment Act and the Fair Housing Act.

The establishment of the CFPB also coincided with provisions within the Dodd-Frank Act that increased the power of state regulatory agencies in the

⁵ “Coordination of Responsibilities Among the Consumer Financial Protection Bureau and the Prudential Regulators – Limited Scope Review,” Offices of Inspector General, 2015, <https://oig.federalreserve.gov/reports/cfpb-responsibilities-coordination-review-jun2015.pdf>

⁶ “List of MOUs,” Consumer Financial Protection Bureau, https://files.consumerfinance.gov/f/documents/bcfp_sources-uses-of-data_list-of-mou.pdf

enforcement of state consumer protection laws. Specifically, the Consumer Financial Protection Act (CFPA) decreased the scope of preemption in the banking industry.⁷ The act stipulates that state laws can only be preempted if the application of the law would have a disciplinary effect against banks, in accordance with the *Barnett Bank of Marion County, N.A. v. Nelson* Supreme Court decisions, and if the state law is preempted by a provision in Federal law other than Title LXII of the Revised Statutes.⁸

Apart from reducing the scope of possible preemption, the Dodd-Frank Act also gave states more enforcement power. Specifically, Section 1042 of the Dodd-Frank Act gives state attorneys general and state regulators the ability to bring civil action against a bank under certain circumstances. While these actions require the consultation of the CFPB and the bank's primary prudential regulator, there is no requirement that the federal agencies consent to the action. States with more robust consumer protection enforcement powers and statutes were those expected to be able to exercise these powers more effectively.

2.2 The CFPB Consumer Complaint Database

As part of the CFPB's supervisory and enforcement efforts, the agency collects and publicly discloses customer complaints about consumer financial

⁷ The preemption doctrine ins the idea that a higher authority of law will displace the law of a lower authority of law when the two authorities come into conflict (Cornell Law School, LII). Preemption was particularly prevalent in the banking industry as the significant federal laws and regulations banks were required to comply with were perceived to be equivalent to and supersede many state consumer protection laws.

⁸ Office of Thrift Supervision Integration; Dodd-Frank Act Implementation. 12 CFR Parts 4, 5, 7, 8, 28, and 34.

products and services offered by institutions with over \$10 billion in total assets.⁹ Initially, the CFPB only accepted complaints regarding credit cards but has expanded its scope to nearly all consumer financial products. While the CFPB has been collecting customer complaints since the agency began operations on July 21, 2011, the full database of complaints has been publicly disclosed and continuously updated since March 28, 2013. Data for mortgage complaints extends back to December 1, 2011, while complaints for financial products, with the exception of credit cards, extend back to March 1, 2012. The database is updated daily and includes information about the submitting customer, specific complaint, and the bank's response. Available fields include the product/sub-product and issue/sub-issue identified in the complaint; the company name, company's response to the consumer, whether the response was timely, and the company's public response; as well as consumer information such as state, zip code, and tags for servicemembers and older Americans. In June 2015, the CFPB added customer complaint narratives to the database, whereby consumers are able to choose to make public a firsthand account of their experience with the financial institution.

In the full database, the most commonly complained about products are credit reporting, debt collection, credit/prepaid cards, mortgages, and checking and savings accounts. When the database was first disclosed in 2013, over half of the submitted complaints were about mortgages. Banks have the option to close the complaints with or without monetary relief, with an explanation, with an administrative response, or with a notification of continued review. Most complaints in the database are closed

⁹ Complaints about institutions under \$10 billion in total assets are forwarded to the institution's primary federal regulator.

with an explanation. There is little variation in the timeliness of company response, with only 0.3% of complaints receiving an untimely response as of 2020.^{10,11}

When a complaint is received, the CFPB sends the complaint to the listed company to confirm a commercial relationship between the bank and the consumer. After the relationship is confirmed by the bank, or 15 days, whichever comes first, the complaint is published in the complaint database. Although the CFPB does not verify the content and accuracy of the complaint itself, the verification of an existing relationship between the bank and consumer establishes some validity. The CFPB cautions that the database is not necessarily representative of all consumers' experiences in the marketplace and that complaint volume needs to be analyzed in the context of the bank's company size and market share.¹²

The complaint database has been heralded as being useful to consumers while, at times, being actively opposed by the banking industry. In contrast to other crowd-sourced review sites such as Yelp and the Better Business Bureau, the CFPB complaint database not only has the potential to pose significant reputational risk to institutions named in the database, but it is also maintained and enforced by a regulatory agency with the power, willingness, and track record of punitive enforcement. Anecdotally, the CFPB and its complaint mechanism appear to be

¹⁰ "Consumer Response Annual Report January 1 – December 31, 2020," Bureau of Consumer Financial Protection, March 2021, https://files.consumerfinance.gov/f/documents/cfpb_2020-consumer-response-annual-report_03-2021.pdf.

¹¹ A response is considered untimely if a bank does not respond to a complaint within fifteen days.

¹² "Consumer Complaint Database," Consumer Financial Protection Bureau, <https://www.consumerfinance.gov/data-research/consumer-complaints/>

effective, with consumers receiving explanations or relief from banks shortly after submitting complaints, sometimes within days.¹³

Industry officials, lobbyists, and lawmakers, however, tend to oppose the public disclosure of the database stating that it includes inaccurate information, does not protect consumer privacy, and may even undermine companies' own customer complaint processes.¹⁴ The primary concern is that the disclosure of the database could place undue pressure on a bank's reputation that results from complaints based on customer misunderstanding or dissatisfaction with previously agreed upon terms as opposed to actual wrongdoing on the part of the bank.¹⁵ In April 2018, the CFPB solicited comments on a proposal to end the public disclosure of the database, but ultimately decided to keep the database publicly available in September 2019.¹⁶

2.3 Mortgage Lending

While there are many criteria to assess whether the disclosure of the customer complaint database is welfare-enhancing for bank customers, in this paper, I choose to focus on the provision of mortgage credit as the primary metric. The impact of the disclosure of complaints on mortgage lending is an important area of inquiry for multiple reasons. First, at the time of disclosure, mortgage complaints made up the largest share of the complaint database. Second, I am able to tie the disclosure of the

¹³ Massimo Calabresi, "The Agency that's Got your Back," *Time*. August 13, 2015; Yuka Hayashi, "Consumers With Complaints Flock to CFPB," *The Wall Street Journal*. July 25, 2016; Yuka Hayashi, "Battle Is On Over Government's Version of Yelp for Banks," *The Wall Street Journal*. July 23, 2017.

¹⁴ Yuka Hayashi, "Consumers With Complaints Flock to CFPB," *The Wall Street Journal*. July 25, 2016.

¹⁵ Julia Horowitz and Donna Borak, "Mick Mulvaney wants to shut public out of CFPB's 'Yelp' of banks," *CNN Business*. April 24, 2018

¹⁶ Michelle Singletary, "CFPB complaints data base remains public, in big win for consumers," *The Washington Post*. September 20, 2019.

database to bank actions in one specific area. Third, looking at the potential welfare implications of changes in mortgage lending behavior, buying a home is likely one of the largest financial decisions that an average individual will make. In fact, Campbell (2016) finds that mortgage debt makes up over 50% of a household's debt. In addition, home equity is often a household's most important asset.¹⁷

Fourth, the focus on consumer access to credit, as well as many consumer financial protection regulations, often emphasizes the importance of mortgage lending.¹⁸ This is particularly important as homeownership has been shown to influence a variety of outcomes, including intergenerational wealth accumulation, the well-being of children, and the stability of neighborhoods and communities (Green and White 1997; Aaronson 2000). Homeownership has also been found to lead to increased borrower wealth, potentially improving the economic conditions and stability for LMI households and areas (Di, Belsky, and Liu 2007; Turner and Luea 2009; Coulson and Li 2013). While much of the research on the benefits to homeownership covered periods prior to the housing market turmoil associated with the financial crisis, Wainer and Zabel (2020) confirm continuing benefits accruing to homeowners in the post-crisis period so long as they are able to avoid foreclosure.

¹⁷ Andrew Haughwout, Donghoon Lee, Joelle Scally, and Wilbert van der Klaauw, "Inequality in U.S. Homeownership Rates by Race and Ethnicity," New York Federal Reserve *Liberty Street Economics*, July 8, 2020.

¹⁸ For example, the Truth in Lending Act (1968), Fair Housing Act (1968), Flood Disaster Protection Act (1968), The Equal Credit Opportunity Act (1974), Real Estate Settlement Procedures Act (1974), Home Mortgage Disclosure Act (1975), the Community Reinvestment Act (1977), Homeowner's Protection Act (1998), and SAFE Act (2008).

2.3.1. Community Reinvestment Act (CRA) and the Home Mortgage Disclosure Act (HMDA)

Given the documented importance of homeownership and credit availability, increasing access to mortgage credit is a supervisory priority within consumer financial protection regulation. One such regulation, the Community Reinvestment Act (CRA), was enacted in 1977 to prevent redlining and is focused on ensuring that financial institutions meet the needs of the communities in which they do business, placing special emphasis on LMI neighborhoods. The aim of CRA is to encourage banks to continue to make credit available in LMI communities within the boundaries of financial safety and soundness. While the CRA is often associated with fair lending laws such as the Equal Credit Opportunity Act and the Fair Housing Act, there is no mention of factors such as race and ethnicity within the text of the CRA (12 U.S.C. 2901-2908) or examination guidance.¹⁹

If a bank receives an unsatisfactory rating during a CRA examination, they may be prevented from engaging in activities such as branch openings and closures as well as mergers and acquisitions. The outcomes of CRA examinations, including ratings and detailed performance evaluations, are made public which allows community and consumer advocacy groups the opportunity to further scrutinize a bank's performance. This also allows these groups to assess whether the regulator was able to proactively identify deficiencies.²⁰ Recent research finds that customers

¹⁹ Office of the Comptroller of the Currency Community Reinvestment Act Examination Procedures

²⁰ Susan Schaaf, "The CRA Is Important for Underserved Communities, and Your Input Can Help Modernize It," *Federal Reserve Bank of Cleveland Notes from The Field*. November 16, 2020.

appear to respond to downgrades of banks' CRA ratings, showing that the impact of the CRA extends beyond regulators (Chen, Hung, and Wang 2019). Due to the importance of CRA examinations and public disclosure of exam outcomes, many banks highlight their CRA-related activities, compliance, and ratings as key pillars of their organization's environmental, social, and governance (ESG) and corporate social responsibility (CSR) performance and strategy.²¹

Another institutional feature which makes changes in mortgage lending a compelling choice for banks looking to stave off increased regulatory scrutiny after complaint database disclosure is the release of mortgage lending data under the Home Mortgage Disclosure Act (HMDA) of 1975. Since 1989, HMDA requires banks and other mortgage lending institutions to disclose information about the geographic location and prospective borrower characteristics of the mortgage applications that they receive, including whether or not the application was approved, in each year (Avery, Brevoort, and Canner 2007). The purpose of HMDA reporting is to enable public officials and regulators to assess whether financial institutions are serving the housing needs of their communities and to identify whether banks may be engaging in discriminatory practices.²² At its core, HMDA is a disclosure law that relies on public examination and scrutiny for its effectiveness.²³ The data is assessed by examiners in their routine supervision of consumer protection issues, such as in the

²¹ In a survey of 58 CFPB-supervised banks, forty-eight published an ESG/CSR report, included an ESG/CSR section in their annual report, or included a substantial discussion of ESG/CSR on their website. Of those forty-eight banks, forty-six explicitly mentioned their commitment to providing mortgage credit in LMI geographies, highlighting the importance of CRA-based lending composition in the assessment of a bank's CSR/ESG performance.

²² "Background & Purpose," Home Mortgage Disclosure Act, FFIEC, <https://www.ffiec.gov/hmda/history.htm>.

²³ Federal Reserve Board Home Mortgage Disclosure Act Examination Procedures

course of a CRA examination, and is often used by enforcement agencies, community groups, and consumer advocates to assess a bank's compliance with fair lending laws and basic tenets of consumer protection.^{24,25}

3 Literature Review and Hypothesis Development

The CFPB complaint database is a subject of growing interest in the accounting and finance literatures. The first stream of research in this area investigates the contents of the complaint database. These studies focus on the attributes of the consumers submitting complaints as well as the characteristics of the geographies from which the complaints arise. Begley and Purnanandam (2021) find substantially more mortgage complaints arising in areas with lower average income, lower educational attainment, and higher shares of minority populations. Focusing on the Community Reinvestment Act, the authors provide evidence that areas more impacted by quantity-based lending goals may, on average, experience significantly worse quality outcomes. Similarly, Ayres, Lingwall, and Steinway (2014) find that complaints are more frequent and institution responses less timely in geographies with higher proportions of the population in groups on which the CFPB is mandated to focus, such as larger minority populations, older Americans, and college students. Hayes, Jiang, and Pan (2021) investigate the impact of social norms on customer complaint behavior and find more complaints arising from areas with lower levels of

²⁴ Julie Stackhouse, "Do Home Mortgage Disclosure Act Data Prove Lending Discrimination?" Federal Reserve Bank of St. Louis *On the Economy*. March 21, 2018.

²⁵ The Federal Reserve Bank of Philadelphia has made an interactive data tool available, the Home Mortgage Explorer, to enable individuals to learn about and use the data in a user-friendly way. (<https://www.philadelphiafed.org/surveys-and-data/community-development-data/home-mortgage-explorer>)

trust. Investigating the impact of the recent COVID-19 pandemic on complaint activity, Hayes, Jiang, Pan, and Tang (2021) find a significant increase in the racial gap in financial complaints, with complaints arising disproportionately from high minority communities.

Another stream of research investigates the impact of the information in the complaint database on both customers and peer firms, a line of inquiry made possible by the disclosure of the database in 2013. In a concurrent working paper, Dou and Roh (2020) investigate whether the complaint database is effective at protecting mortgage borrowers. The authors find a reduction in mortgage applications in local markets with more mortgage complaints originating from that county. This suggests that the disclosure of the database is increasing the information available to consumers, allowing them to more easily identify and avoid banks with suboptimal customer service. Supporting this conclusion, Bertsch, Hull, Qi, and Zhang (2020) find increased demand for online lending products in states and counties with higher numbers of CFPB complaints, suggesting that either the disclosure of the database, word-of-mouth, or overall deteriorations of customer service induces substitution away from traditional banks. Extending beyond the reaction of customers Dou, Hung, She, and Wang (2021) examine the response of rival peer banks, finding that these banks increase mortgage approvals in areas with more mortgage complaint activity. This response is stronger in areas with less information about CFPB-supervised banks, suggesting that peer banks gain valuable information from the complaint database disclosure. Complaint volume and resultant response have been shown to be dependent on other attributes of the local area including borrower sophistication,

banking market competition, corporate social attitudes, and local trust culture (Bertsch, Hull, Qi, and Zhang 2020; Dou and Roh 2020; Dou, Hung, She, and Wang 2021; Hayes, Jiang, and Pan 2021; Hayes, Jiang, Pan, and Tang 2021).

There has been limited work on the actions of CFPB-supervised banks in response to the establishment of the complaint database as well as its disclosure. Hayes, Jiang, and Pan (2021) find that banks reduce fees after the establishment of the CFPB, potentially as a response to the threat of complaints. Further, Dou and Roh (2020) find faster mean reversion in complaint volume after disclosure, suggesting that banks may take complaints more seriously after the disclosure of the database. I add to this line of inquiry in two specific ways. First, I explore a mechanism through which disclosure may impact bank behavior and amplify the voices of customers, specifically increased regulatory scrutiny. Second, I add to the finding in Dou and Roh (2020) of increased mean reversion by examining a specific action banks may take in response to the disclosure of the database – changes in mortgage lending.

Firms' responses to the release of third-party disclosure – such as the CFPB complaint database – over which they have little to no control, have been documented in the literature in accounting, economics, and finance. Some examples of this are the responses to the release of restaurant hygiene report cards (Jin and Leslie 2003), healthcare report cards (Dranove, Kessler, McClellan, and Satterthwaite 2003), water contaminant levels (Benneer and Olmstead 2008), physician ratings (Eyring 2020), and bank enforcement actions (Kleymenova and Tomy 2022). With the rise of social media and crowd-sourced reviews, the literature has begun to consider the

disciplinary effect of new information channels such as social media (Miller and Skinner 2015; Dube and Zhu 2021).

Underlying many of these responses is a firm's concern for its reputation, as actions taken after a negative third-party disclosure can be understood in the framework of reputation repair as outlined in Chakravarthy, deHaan, and Rajgopal (2014). As modeled in Klein and Leffler (1981), a firm can maintain its reputation for providing high-quality goods or services so long as it continually honors its commitment to doing so. The disclosure of the customer complaint database can be considered a shock to the included banks' information environments, as the disclosed complaints contain information that may cast doubt on the credibility of the banks' commitment to quality and customer service. In addition, the fact that the complaints were known to the bank in the time prior to disclosure may have increased reputational damage if the bank had not adequately addressed the issues identified in the complaints in the pre-disclosure period.

Early empirical evidence has provided some support for the suggestion that banks suffered reputational harm after disclosure. For instance, Dou and Roh (2020) find a negative stock market reaction to the disclosure of the database, particularly for those banks with more complaints retroactively disclosed. In addition, their finding that banks with more mortgage complaints experience a decline in mortgage applications provides initial suggestive evidence that the disclosure of the database served to alter consumers' perceptions of the quality of the bank.

To the extent that the disclosure of customer complaints has a significant negative impact on banks' reputation and increasing access to mortgage credit is a

rational response I hypothesize that banks with more complaints from the pre-disclosure period will increase mortgage lending, specifically to LMI areas, in the post-disclosure period. This could occur for multiple reasons, including bank stakeholders' increasing preference for banks considered 'responsible corporate citizens' (e.g., Giuli and Kostovetsky 2014; Mishra and Modi 2016; Dyck, Lins, Roth, and Wagner 2019), the disciplinary effects of word-of-mouth reviews and disclosures (e.g., Dube and Zhu 2021), and, as discussed in detail below, increased regulatory scrutiny. However, if the issue of credit access is not perceived to be related to the disclosed complaints or if banks judge that taking more procedural actions in response to the disclosure may be more relevant, then there may not be an observable real effect of the disclosure on mortgage lending. Given this, I state the first hypothesis in null form:

H1: After the disclosure of the customer complaint database, banks with more disclosed complaints do not alter mortgage lending relative to those banks receiving fewer complaints.

As consumer protection and compliance with relevant regulations is core to the banking mission, then it is likely that perceived failures in this space would have the potential to negatively reverberate to various stakeholders. Reputational capital, in this sense, is potentially lost due to the perception that banks are less able to provide effective service to their customers. This can impact the bank through the actions and reactions of a range of different stakeholders (Clarkson 1995). While the most direct stakeholder in the case of the complaint database is a bank's customers and depositors, in this paper, I introduce another relevant stakeholder to whom the bank

may cater – the regulatory agencies tasked with enforcing consumer protection laws and regulations.

The inclusion of regulators as a stakeholder to whom banks may feel the need to cater is potentially more nuanced as, in this particular case, the disclosure of the CFPB complaint database can exert reputational pressure on not only the banks, but also their regulators. I propose two channels through which this is likely to occur, jointly labeled as the “regulatory channel.” The first channel is that the database disclosure likely exerted increased pressure on other regulatory agencies tasked with consumer protection enforcement to more strongly supervise and enforce compliance with consumer protection regulations. Just as the disclosure of complaints that were previously submitted and subsequently disclosed could potentially identify deficiencies in bank management, if the issues were not resolved before the disclosure, a similar effect could occur for regulators. If the content of the complaints pointed to persistent or systemic deficiencies in banks’ consumer compliance that had yet to be identified and addressed by regulators, the disclosure of the database could be seen as publicly released information of regulatory effectiveness (Holmström 1999). Given that prior research has shown that regulators can be compelled to be more diligent in the presence of increased disclosure on their efforts or work outputs (Kleyменова and Tomy 2022; Guo and Tian 2020), I expect banks to face increased regulatory scrutiny after the complaint database is disclosed.

The second proposed channel is that, with the release of retroactively disclosed consumer complaints, banks rationally anticipated scrutiny arising from the increased awareness and attention paid to consumer protection issues. Given that

banks are routinely monitored and examined to ensure compliance with consumer protection laws and regulations, I conjecture that banks likely expected increased scrutiny from their regulators.

The database may have also increased awareness of consumer protection issues through the content of the information released. Even if complaints about a given bank were shared with that bank's examiners by the CFPB, it is likely that the full disclosure of the complaint database provided incremental information. For example, the database could provide information on emerging issues at the industry level as well as at more granular levels such as within individual institutions or geographies. Regulators could use the database to compare a given bank's complaint volume with a bank's peers operating in the same market. As a bank's peers are often the benchmark group to which that bank's performance is compared in a consumer compliance examination, this may have been an important source of incremental information to examiners.²⁶ For these reasons, the increased awareness and anticipation of regulatory scrutiny of consumer protection issues is another component of the regulatory channel that could have exerted pressure on banks.

In the current framework, it is not possible to empirically separate whether the regulatory channel is operating through the banks' anticipation of increased regulatory scrutiny or the presence of scrutiny due to regulators' concern for their own reputation. As banks are assessed for compliance with consumer protection issues on a variety of metrics, including the presence of complaints, I hypothesize that

²⁶ For example, the CRA Examiner Handbook states that "an institution's performance under the regulatory assessment criteria is evaluated in the context of information about the institution, its community, and its competitors" (Occ CRA Examiner Handbook, 3).

banks will attempt to counteract the negative impacts of the complaints by improving performance in other areas of regulatory review, namely credit access to LMI

communities. Therefore, I state the second hypothesis as follows:

H2: If banks experienced real or perceived increased regulatory scrutiny after the disclosure of the customer complaint database, banks with more disclosed complaints will increase credit access, particularly in LMI communities, in areas and circumstances with plausibly stronger regulatory monitoring incentives.

4 Sample, Data, and Empirical Design

4.1 Sample and Data

To investigate the impact of the customer complaint database disclosure on bank lending behavior, I gather data from multiple sources in addition to the CFPB complaint database over the period 2011-2016. Bank financial variables are collected from the FFIEC 031/041 call reports and the FR Y-9C and structure data from the National Information Center. Data from the FDIC Summary of Deposits is used to capture a bank's branch network, deposit concentration, and brick-and-mortar county-level presence. I collect data on county-level characteristics such as minority population share, poverty rate, and average income from the Census Bureau's American Community Survey. County-level data on unemployment is collected from the Bureau of Labor Statistics and data on county-level personal income growth and GDP growth come from the Bureau of Economic Analysis. Mortgage lending data at the yearly frequency is available through HMDA and includes detailed application-level information such as borrower demographics, loan characteristics, and attributes of the census tract in which the property is located. Information about state-level

consumer protection enforcement is collected from the National Consumer Law Center, CRA exam data is collected from the CRA Analytics Data Tables published by the Federal Reserve Board of Governors, and enforcement actions are collected from S&P Capital IQ.

The sample period, 2011-2016, covers the period after the establishment of the CFPB and prior to the start of the Trump administration in 2017, when CFPB enforcement was expected to decrease.²⁷ To eliminate the influence of outliers, continuous variables are winsorized at the 1st and 99th percentiles.

4.2 Customer Complaints

For the purpose of this study, I hold constant the set of banks supervised by the CFPB when it was founded in the third quarter of 2011 and stay under their supervision for the duration of the sample to control for other factors potentially influencing a bank's decision to exceed or fall below the \$10 billion asset threshold. I drop all other banks that become subject to CFPB supervision in later years from the sample, as well as those who exit the CFPB-supervised sample early. With this restriction, the sample contains ninety-two banks which are consistently under CFPB supervision from 2011 to 2016.²⁸

To match individual complaints with the entities identified in the prior step, I merge the complaint-level and entity-level datasets by name. While the CFPB's

²⁷ Marcy Gordon, "End Dodd-Frank? Unlikely, but consumer agency in crosshairs," *Associated Press*, November 17, 2016; Matthew Nussbaum, "Dodd-Frank will be targeted, Mnuchin says," *Politico*, November 30, 2016; [Michelle Singletary, "Trump's election does not bode well for the Consumer Financial Protection Bureau," *Washington Post*, November 15, 2016.](#)

²⁸ One bank, Barclays Bank Delaware Holdings LLC, is dropped from the empirical analysis as there are many complaints received but the bank does not actively participate in mortgage and other consumer lending.

supervisory authority is over individual banks and other financial firms with consumer-facing departments, complaints in the database also often name the institution's bank-holding company. Therefore, I create a comprehensive list of bank and bank-holding company (BHC) names gathered from the prior step to match with the CFPB complaint data. For this study, I retain only those complaints with a non-missing five-digit zip code in order to match the complaint to a given county. After matching and hand-verifying, the sample contains 59,827 complaints, with 31,120 directly naming BHCs and 28,707 directly naming banks from 2011q4 to 2013q1. In total, I was able to match CFPB-supervised banks and complaints for 81 unique entities. Looking specifically at mortgage complaints, the sample contains 31,468 complaints from seventy-six unique entities, 14,010 naming BHCs and 17,458 naming banks. While I aggregate complaints to the bank-holding company level, the empirical analysis is done at the individual commercial bank level, as most consumer lending decisions are made at the bank level.

In order to conduct empirical analysis at the county level, I match the zip code listed in the complaint database with the HUD-USPS crosswalk files, which maps a zip code to the county or counties in which it is located.²⁹ In the event that a zip code is split within two or more counties, I assign a zip code to the county in which most of the residential addresses within the zip code are located.

My primary complaint measure is constructed as the total number of mortgage complaints disclosed in the database against a bank in a given county of operation as of March 28, 2013, normalized by the number of mortgages originated by the bank in

²⁹ More information on the HUD crosswalk files can be found at: [HUD USPS ZIP Code Crosswalk Files | HUD USER](#).

that county in 2011 (Dou and Roh 2020). The benefit to this measure is that I am able to normalize the number of complaints received by a bank by a measure of its consumer lending activity in a given year. This is an important step, as considering a bank's complaint volume, or the presence or lack of complaints, in a given area has limited meaning in the absence of appropriate consideration of a bank's business scope in that area. I focus only on complaints prior to the disclosure of the database to control for any changes banks may make in the post-disclosure period that would impact both the complaint volume and the outcome variables of interest. This also allows me to abstract away from any changes in customer's incentives to submit complaints once they are aware that the submitted complaints will be publicly disclosed.

I characterize the release of these complaints, and the database in general, as a negative shock to the bank's information environment. The disclosure of the complaint database provides a unique setting in which to examine the impact of the disclosure of information that was previously known to the affected banks, but not concurrently publicly available. This allows me to attempt to disentangle whether it is the information contained in a complaint itself, or the public knowledge of such complaints that imposes real effects on the impacted banks. With the disclosure of the database, the public and other bank stakeholders were able to retroactively assess the performance of the bank in the consumer affairs space and, if significant deficiencies were revealed, could potentially spur further action.

4.3 HMDA Mortgage Application Data

The HMDA mortgage database is available at the application level by year. I identify the banks in the dataset by merging the application-level data with the HMDA reporter panel containing attribute information from the universe of all institutions reporting under HMDA. I drop applications for mortgages less than \$1,000 and with borrower income less than \$10,000. I focus on the percentage of applications that were accepted by the bank in each county-year, both in total as well as by property location and borrower characteristics. I also use the information available in the HMDA data to control for a given bank's market share relative to other CFPB banks operating in the same county.

I aggregate all data to the county-year level to prepare to merge with the CFPB complaint dataset, which results in a sample of 171,420 county-year observations from 60 CFPB-supervised institutions.

4.4 Empirical Design

To assess the impact of the disclosure of customer complaints on banks' mortgage lending behavior, I estimate the following generalized difference-in-differences regression model:

$$\begin{aligned} \% \text{ Approved}_{i,c,t} = & \alpha_0 + \beta_1 \text{Post}_t + \beta_2 \text{Complaint Volume}_{i,c} + \\ & \beta_3 \text{Post}_t \times \text{Complaint Volume}_{i,c} + \beta_4 \text{Branch Indicator}_{i,c,t} + \\ & \beta_5 \text{Lagged Market Share}_{i,c,t-1} + \delta_{c,t} + \gamma_{i,t} + \varphi_{i,c} + \epsilon_{i,c,t}, \quad (1) \end{aligned}$$

where *% Approved* is the percent of mortgage applications approved by a bank in a given county-year; *Post* is an indicator variable equal to one from 2013 onwards; *Complaint Volume* is the number of mortgage complaints for a bank-county submitted between December 1, 2011 and March 28, 2013 divided by the total number of mortgage originations in the bank-county in 2011; *Branch Indicator* is an indicator variable equal to one if the bank has a brick-and-mortar branch located in a county-year; and *Lagged Market Share* is calculated as the ratio of bank-county-year originations over total CFPB county-year originations. .

I include three sets of fixed effects in the main model: county-year, bank-year, and bank-county. County-year fixed effects allow me to account for time-variant county-level conditions that may influence both the supply and demand for lending. Bank-year fixed effects control for both observable and unobservable changes in bank conditions that vary by year such as financial conditions, regulatory changes, supervisory examinations, etc. Finally, bank-county fixed effects control for time-invariant factors influencing the behavior of the bank in a given county. Note that, the main effects of *Post* and *Complaint Volume* are collinear with bank-year, county-year, and bank-county fixed effects and are dropped from the model. The inclusion of the three sets of fixed effects also precludes the inclusion of a comprehensive set of other control variables. I include *Branch Indicator* as the sole control variable in my estimation, as the presence of a bank branch in a given county influences the visibility of the bank in a local area as well as the extent of interactions between customers and the bank. This could potentially influence both the mortgage approval rate as well as complaint volume in that particular county. Standard errors are clustered by bank.

In additional analysis, I replace the pre-disclosure complaint volume variable with a yearly measure of mortgage complaints, labeled *Yearly Complaints*, to assess if the documented reaction appears to be mostly in response to the initial disclosure or whether the reaction is sustained throughout the sample period. Further, in a robustness test, I replace county-year fixed effects with county-specific control variables. Specifically, I include the county-level unemployment rate (*Unemployment Rate*), the year-over-year growth in county-level GDP (*GDP Growth*), and the year-over-year growth in county-level personal income (*Personal Income Growth*).

4.4.1. Mortgage Approval Variables

I examine the impact of the complaint database disclosure on mortgage application approvals by banks. While the impact on the total approval rate is interesting, not much can be gleaned from this action absent some stratification of these approvals.³⁰ In the majority of the main analysis, I separately examine mortgage approval rates for properties in LMI and MUI areas. According to the CRA, an LMI area is one in which the median family income is either less than 50% of the area median income (low income) or between 50% and 80% of the area income (moderate income). MUI areas are those in which the median income is between 80% and 120% of the area income (middle income) and above 120% of the area income (upper income).

³⁰ It is important to note that the mortgage type approval categories are not mutual exclusive. Many banks receive loan applications, for examples, from customers looking to purchase a property in both LMI and MUI areas, from both minority and non-minority borrowers, etc.

It is important to note that, in the HMDA data, areas are designated as LMI or MUI at the census tract level, meaning that many counties in the dataset include both LMI and MUI tracts.³¹ Therefore, most banks in the sample lend to borrowers applying to purchase properties in both LMI and MUI areas within their counties of operation, leading to significant overlap between the two categories at a county level. At the mortgage application level, the property for which the application is submitted is identified as being located in either an LMI or MUI census tract. Therefore, when the data is aggregated to the bank-county-year level, there are distinctly calculated approval rates for properties in LMI areas and properties in MUI areas within counties containing tracts in both income levels. Because of this, as well as the presence of significantly more MUI compared to LMI census tracts, there are consistently more observations for tests looking at MUI approval rates than LMI approval rates.

While the CRA guidelines emphasize the importance of lending to a bank's entire business community, the needs of LMI geographies are highlighted and heavily weighted in examinations (Agarwal, Benmelech, Bergman, and Seru 2012).³² In addition, due to the perception that banks should be responsible corporate citizens, lending to LMI areas is also often discussed and analyzed in bank-produced disclosures as well as in the media. If banks change mortgage lending behavior as a way to stave off increased regulatory scrutiny, I would expect to see a stronger reaction in LMI areas.

³¹ As of 2010, there were 73,057 census tracts and 3,143 counties in the United States (2010 Census Tallies, United States Census Bureau).

³² 12 CFR 25

I also divide the total approval rate on applicant characteristics within the LMI and MUI designation. Due to the relatively limited borrower information included in the HMDA data, I specifically focus on whether the borrower identifies as a member of a minority or non-minority group as well as whether the borrower's income is above or below the Metropolitan Statistical Area (MSA) median income of the property's location.

4.4.2. State-Level Consumer Protection

To identify whether a state is considered a strong enforcer of consumer protection, I use data provided by the National Consumer Law Center in their 2009 report entitled "Consumer Protection in the States: A 50-State Evaluation of Unfair and Deceptive Practices Laws." The report evaluates the strengths and weaknesses of each state's written laws and statutes around unfair and deceptive practices (UDAP) as well as their enforcement, and ranks each state as strong, mixed, or weak across four categories and seventeen sub-categories.³³ I define a state as having strong consumer protection if the number of sub-categories listed as mixed or weak that is below the median of all states listed in the report.³⁴ I predict that state agencies in charge of enforcing state-level consumer protection statutes and laws would apply more pressure, thus potentially increasing the impact of the regulatory scrutiny channel, in states with stronger consumer protection enforcement.

³³ The four categories are: Prohibition of unfairness, deception; scope; state enforcement; and remedies for consumers.

³⁴ The median number of weak/mixed provisions is three and the mean is 3.4, so state-level designation is constant when either the mean or median is used.

It is important to note that the strength of consumer protection laws in a state is distinct from and does not necessarily mirror the political leaning of that state. Using presidential election outcomes in each state in 2012 as a proxy for that state's political leaning, I find that, of the twenty-six states with weak consumer protection statutes and enforcement, fourteen are republican states and twelve are democrat.

4.4.3. Bank Regulatory Scrutiny

I divide regulatory scrutiny into two distinct classifications – routine supervision and punitive enforcement. I define a bank as being under more regulatory scrutiny by its primary bank regulator related to routine supervision around the time of the database disclosure if they have a scheduled CRA exam in either the current or following year during the sample period. CRA exams are regularly scheduled, with banks being examined, on average, every three years dependent upon prior performance.³⁵ The examination schedule is also made public, with the Federal Reserve Board posting the schedule of exams for the upcoming two quarters 30 days before the beginning of each quarter. Given this, it can be justifiably assumed that banks are aware of upcoming examinations.

While literature looking at the effect of CRA examinations find little bank reaction to the news of a rating downgrade (Dahl, Evanoff, and Spivey 2010), it does appear that banks alter mortgage lending behavior, particularly to LMI communities, in anticipation of a CRA examination (Agarwal, Benmelech, Bergman, and Seru

³⁵ “Community Reinvestment Act,” Office of the Comptroller of the Currency. <https://www.occ.gov/publications-and-resources/publications/community-affairs/community-developments-fact-sheets/pub-fact-sheet-cra-reinvestment-act-mar-2014.pdf>

2012). Therefore, if banks with a higher complaint volume have a greater incentive to cater to regulators by increasing lending consistent with the stated goals and purposes of the CRA, I expect to see this magnified for banks with scheduled examinations during the 2011-2016 sample period. Increased pressure on regulators is likely to be most pronounced around CRA exams as well, given that this is arguably the main area of consumer protection supervision retained by the primary bank regulatory agencies. In addition, detailed outcomes of CRA examinations are made public, allowing for increased public scrutiny of the performance of not only the bank but also an assessment of the strictness of regulators in the examination of consumer protection regulations.

Banks may also be under more intense regulatory scrutiny due to instances of punitive enforcement. I define a bank as experiencing high regulatory scrutiny if they received an enforcement action related to consumer affairs issues in the pre-disclosure period. While the public disclosure of an enforcement action indicates that the investigation into the violation is complete, banks are likely still remediating the identified issues for a while after. In addition, these banks are likely to cater to their regulators, as credibility with regulators is lost and expected scrutiny is increased following an enforcement action (An, Bushman, Kleymenova, and Tomy 2021). Therefore, banks that have had prior identified violations of consumer protection laws and regulations are likely to be under increased real or perceived regulatory scrutiny and may respond more to the information contained in the complaint database disclosure. Finally, combining both routine supervision and punitive enforcement, I investigate whether those banks with prior consumer affairs enforcement actions and

scheduled CRA examinations behave significantly differently than those banks with only regularly scheduled exams.

5 Results

5.1 Summary Statistics

Descriptive statistics are shown in Table 1 and Table 2. Variable definitions are provided in Appendix A. Table 1 displays summary statistics related to the complaint volume metrics. The mean value of the number of pre-disclosure mortgage complaints divided by originations in 2011 is 0.009 with a median of zero, suggesting that a significant number of bank-county pairs did not receive complaints. Of the 60 CFPB-supervised banks in the sample, thirteen of them did not receive any mortgage complaints in the pre-disclosure period. Looking at the yearly measure of mortgage complaints, *Yearly Complaints*, the mean of the ratio of the yearly number of mortgage complaints over bank-county originations in the prior year is 0.004 with a median of zero, indicating that banks do not receive mortgage complaints in quite a few of the counties in which they are active in lending. Only five banks in the sample did not receive any mortgage complaints from 2011 to 2016.

In Table 1, Panel B, I compare the mean of both the static and continuous complaint variables split on county attributes, specifically the mean minority population, mean poverty rate, and mean income per capita. A comparison of the complaint volume in each area is important as Begley and Purnanandam (2021) find more complaints coming from LMI areas, specifically those with a higher minority population share. The results in Panel B confirm this finding for counties with a

higher percentage of minority residents, as the mean of *Complaint Volume* in counties with an above-mean percentage of minority residents (0.012) is significantly larger than the average in counties with a below-mean minority percentage (0.006). When splitting counties based on whether they are above or below the state-level mean poverty rate or income, average complaint volume is significantly higher for counties with below mean poverty rate (0.01 vs. 0.008) and those with above mean income (0.012 vs. 0.006). The findings for the yearly measure of mortgage complaints are qualitatively identical. This provides some initial evidence to suggest that banks are not merely rationally responding to LMI areas due to a higher complaint volume arising from these areas, opening up the possibility that banks' strategic motivations may be driving the observed results.

The additional variables used in the empirical analysis are presented in Table 2. Panel A contains information on the mortgage approval rates in total, as well as for properties in LMI and MUI areas separately. The average approval rate across all mortgage application is 69.8% with a lower mean in LMI areas, 64.6%, and a slightly higher average in MUI areas at 70.7%. Moving to borrower characteristics in Panel B, the average approval rate for minority borrowers in both LMI (53.7%) and MUI (62.0%) are smaller than the approval rates for non-minority borrowers in LMI (68.1%) and MUI (72.1%) areas. In LMI areas, the mean approval rate for borrowers with below median income (58.9%) is lower than for borrowers with above median income (69.3%). Similarly, 63.5% of applications from borrowers with below median income and 74.2% from borrowers with above median income are approved.

Looking at county-level economic variables, the average of *Unemployment Rate* is 7.5% consistent with the relatively benign economic times during the 2011-2016 sample period. The mean *GDP Growth* and *Personal Income Growth* are 1.4% and 3.4%, respectively.

In addition, in Table 3, I examine the univariate pre- and post-disclosure trends in mortgage approval rates at the aggregate bank level and at the bank-county level used in the following empirical analysis. If banks with higher complaints also have higher mortgage approval rates in the pre-disclosure period, then the findings in the paper could be mechanical and not attributable to the disclosure event. To analyze this, I conducted difference-in-means tests on the mean approval rates in the pre- and post-disclosure period for banks, and bank-county observations, with high and low complaint volume. To designate a bank as receiving either a relatively higher or lower complaint volume, I calculate the median pre-disclosure complaint volume for banks in aggregate and for the bank-county units of observation used in the empirical analysis.

In Panel A, I investigate whether there are any persistent patterns in the relevant mortgage approval rates at the bank level (i.e., if banks with higher complaints disclosed in the database have, on average, higher mortgage approval rates in general). I find that across all three approval rates – total, LMI, and MUI – the difference in the means is significant between high and low complaint banks both in the pre- and post-disclosure period. In addition, banks with high complaints uniformly increase mortgage approval rates between the two periods, while banks with low complaints decrease approval rates in the post-disclosure period. This allows

me to confirm that there is not a persistent trend of high-complaint banks having relatively higher approval rates across both periods.

Panel B focuses on differences between the pre-and post-disclosure periods at the bank-county level, the unit of analysis used in the remainder of the paper. A similar trend is observed with the univariate analysis showing the mean approval rate in each category increasing for banks with an above-median complaint volume in a county and the approval rate decreasing between the pre-disclosure and post-disclosure period for banks with a low complaint volume in total and in MUI areas. An interesting relationship emerges in the approval rates to LMI areas, with an insignificant difference in bank-counties with low complaints between the pre- and post-period and a significant increase for banks with high complaint volume. Reflecting the different trends between both subsamples, the difference between bank-counties with high- and low-complaint volume in the pre-period is insignificant, with the approval rate becoming significantly larger for banks with high-complaints in the post-disclosure period. While this univariate analysis provides some evidence that the complaint database disclosure differentially impacted the behavior of banks with high complaint volume, I expand the analysis in the multivariate results presented below.

5.2 Main Results

Table 4, column (1) shows that, in the period after the customer complaint database was disclosed, banks operating in counties with a higher number of mortgage complaints relative to 2011 mortgage originations increased mortgage

application approvals.³⁶ Note that the *Post* and *Complaint Volume* variables are collinear with the bank-year and bank-county fixed effects and are dropped from the estimation. The coefficient of 0.121 is significant at the 1% level and suggests that the mortgage approval rate increased for banks with higher complaint volume after the database disclosure. This implies that a one-standard-deviation increase in *Mortgage Complaints* is related to a 0.07% increase in the total mortgage approval rate relative to the mean in the period after the database is disclosed.³⁷ Splitting the total approval rate into separate rates for LMI and MUI areas, while banks with more complaints increased approval rates in both geographic areas after the database disclosure, the coefficient is statistically significantly larger (F-stat = 6.76) for LMI areas (0.249, p-value<0.01) than for MUI areas (0.074, p-value<0.1).³⁸ This provides initial suggestive evidence that banks may have responded to the complaint disclosure by increasing lending in those areas subject to increased scrutiny by regulators.

A key assumption of the difference-in-differences empirical design is the parallel trends assumption, namely that there is no significant difference between CFPB-supervised banks based on complaint volume in the pre-disclosure period. To test this, in Table 5, I interact the pre-disclosure complaint volume variable with each year in the sample, omitting 2011. Confirming the parallel trends assumption, the coefficient on *2012 x Complaint Volume*, while positive, is insignificant for all three approval rate variables. Beginning in 2013, the year the database was disclosed, the

³⁶ In untabulated analysis, I rerun the main model using total bank-county-level applications in 2011 and the results are qualitatively unchanged.

³⁷ Calculated as $(0.121 * 0.041) / 0.697$

³⁸ Statistical significance of the difference between coefficients is assessed using a Seemingly Unrelated Regression (SUR) model. Given that each model contains the same amount of independent regressors, the SUR estimates are equivalent to OLS (Greene 2018).

coefficient approximately doubles in magnitude and remains significant through the remainder of the sample, suggesting that the increase in mortgage approvals may have been triggered by the disclosure of the complaint database. While the coefficient magnitudes for the total and MUI approval rates peak in 2013 (0.207 and 0.144, respectively), the coefficients for LMI lending increase throughout the entire sample period.

5.3 Regulatory Scrutiny: State Agencies

Next, I test the hypothesis that banks' response to the consumer complaint database is influenced by the regulatory channel. In the first test of the regulatory channel, I assess whether there is differential behavior for banks operating in states with relatively stronger or weaker willingness and ability to enforce consumer protection laws and statutes. If the enforcement powers in states with stronger consumer protection influences banks' perceptions of regulatory scrutiny, I expect to observe a stronger relationship between county-level pre-disclosure complaints and mortgage approval rates from those banks doing business in these states.

The results are reported in Table 6. Panel A looks at the change in mortgage approval rates to LMI areas and I find the expected result that, while banks significantly increase lending in all areas of operation, the coefficient is larger in LMI areas (0.173, $p\text{-value} < 0.01$; 0.359, $p\text{-value} < 0.01$). Economically, this signifies an increase in approval rate of 2.22% in LMI areas relative to the mean acceptance rate in each area. Turning to Panel B, banks do not significantly increase approval rates in less consumer-friendly states in MUI areas but do significantly increase approval rates in states with strong consumer protection (0.107, $p\text{-value} < 0.1$). I interpret these

results as suggesting that banks likely respond to stronger regulatory risk in states with stronger consumer protection. This manifests in a stronger relationship between pre-disclosure mortgage complaints and mortgage approval rates in states with more enforcement willingness and power. In addition, the fact that the coefficient on *Post x Complaint Volume* is positive and significant for lending in MUI areas as well suggests that stronger state agencies may enforce upon banks for consumer protection violations with no mandate or track record of emphasizing only certain groups or areas.

5.4 Regulatory Scrutiny: Primary Bank Regulators

5.4.1. Community Reinvestment Act Exams

An additional test of the regulatory channel investigates whether increased scrutiny from the primary banking regulators appears to heighten banks' incentives to change lending behavior in response to the database disclosure. First, I designate those banks with a scheduled CRA exam in either the current or following year during the sample period as those likely to receive more regulatory scrutiny as well as those most likely to respond by increasing lending to underserved, or LMI, communities. This is particularly relevant in the case of CRA exams and ratings disclosures, as a bank's lending activities in LMI communities is one of the most important aspects contributing to the bank's overall examination assessment. Due to the fact that the CRA is one of the areas for which the primary regulatory agencies' retained consumer protection responsibility, examiners may face more pressure to proactively identify and properly enforce identified issues. This likely increased the intensity of regulatory scrutiny.

Table 7 displays the results of the regulatory scrutiny test, and the variable of interest is the triple interaction, *Post x Complaint Volume x CRA Exam*. The variable is insignificant for both LMI and MUI lending, indicating that those banks with more disclosed complaints do not significantly change their behavior in advance of a scheduled CRA exam. This result is inconsistent with either real or perceived increases in regulatory scrutiny during routine supervisory exams after the complaint database was disclosed.

5.4.2. Regulatory Enforcement Actions

I next investigate whether those banks plausibly under more regulatory scrutiny due to instances of punitive enforcement change their lending behavior around the complaint disclosure. To do this, I assess whether there is a differential response between those banks that received regulatory enforcement actions for violations of consumer affairs regulations in the pre-disclosure period. After the enforcement action is disclosed and the investigation has concluded, these banks are likely to both expect and receive increased scrutiny from their regulators. To the extent that the disclosure of the complaint database is seen as an additional input available with which to assess a bank's performance in the consumer affairs space, I expect to observe a positive relationship between disclosed complaints and mortgage approval rates, specifically to borrowers in LMI areas, that is more pronounced for banks that have recently experienced punitive enforcement.

The results are shown in Table 8. Splitting the sample between those banks with and without prior consumer-related enforcement actions, Panel A displays results for LMI lending and Panel B displays results for MUI lending. While the

coefficients on *Post x Complaint Volume* is positive in all specifications, it is only significant for LMI lending by banks with prior enforcement actions (0.343, p-value<0.01), translating into a 2.02% increase in LMI lending relative to the mean. The difference in LMI lending between banks with and without consumer-related enforcement actions is statistically significant (F-Stat. = 4.24). This shows that those banks likely under the most regulatory scrutiny as a result of punitive enforcement appear to cater to regulators by changing mortgage lending behavior consistent with regulatory goals.

In Table 9, I examine the behavior of the sample of enforced upon banks with CRA examinations occurring during the sample period. This effectively tests the impact of regulatory scrutiny for those banks experiencing both routine supervision and punitive enforcement. Splitting the sample as described above and adding *Post x Complaint Volume x CRA Exam*, I find that not only do the enforcement banks with more county-level complaints increase post-disclosure LMI lending in general, but that this is significantly increased in preparation for a CRA exam. This translates into around a 7.37% increase in LMI lending relative to the mean. These results suggest that, while the disclosure of the complaint database does not significantly alter the behavior of banks and regulators in the course of routine supervision, the disclosure significantly impacts the lending behavior of those banks under more regulatory scrutiny as a result of prior punitive enforcement.

5.5 Additional Analysis

I perform three distinct sets of empirical analyses to complement the main finding that banks increase mortgage approval rates, particularly in LMI areas, both in

general and as a result of the regulatory channel. First, I investigate two related outcomes – whether the observed increase in mortgage approval rates for banks with more complaints leads to more lending to financially underserved borrowers and whether there is evidence that banks compromised mortgage underwriting quality in the process. Second, I investigate whether banks increase lending in certain areas in order to correct for underserving these areas prior to the database disclosure. Finally, I examine banks’ responses to a continuous measure of mortgage complaints to attempt to disentangle whether banks primarily responded to the shock of the initial disclosure or the content of the continuously disclosed complaints.

5.5.1. Outcomes

I first examine the relationship between mortgage lending and *Complaint Volume* in the post-disclosure period to investigate whether banks are lending more or less to financially underserved borrowers. The results are shown in Table 10, Panel A for lending to LMI areas and Panel B for lending to MUI areas. In both panels, the models looking at approval rates for minorities and non-minorities are shown in columns (1) and (2) and borrowers with below median and above median income in columns (3) and (4), respectively. The results in column (1) show that banks significantly increase mortgage approval rates for minority borrowers in LMI areas after the complaint disclosure (0.213, p-value<0.05), while there is no significant increase in minority lending in MUI areas. There is a significant increase in lending to non-minority borrowers in both geographic splits. Overall, the disclosure of the complaint database appears to lead to banks substantially increasing mortgage approval rates to minority borrowers in LMI areas only.

Turning to borrower income, columns (3) and (4) of both panels show an insignificant increase in loan approvals to low-income borrowers and a significant increase in lending to borrowers with above median income. The increase in the mortgage approval rate to higher income borrowers is both positive and significant in LMI (0.273, p-value<0.05) and MUI (0.093, p-value<0.05) areas, but the difference between the two is not statistically significant. This finding is potentially not surprising, as researchers at the Urban Institute found that around 60% of CRA-qualifying loans to LMI areas were made to borrowers with above median income.³⁹ Plausibly because banks are given the same ‘credit’ for lending to LMI areas and LMI borrowers, banks may avoid making relatively riskier loans to lower-income borrowers while still receiving credit for socially responsible lending. Also, looking specifically at the impact of the complaints, it appears as if the borrowers made better off by receiving mortgage credit, in the case of income levels, are those borrowers most qualified in the first place. Overall, the disciplinary effect of the disclosure of the consumer complaint database does not seem to lead to increases in credit access for historically financially undeserved groups, specifically low-income borrowers.

Perceived borrower default risk is likely to impact a bank’s decision of whether or not to approve a given loan application. In the absence of detailed information on applicant-level default risk, in untabulated analysis, I re-run the regressions above including county-level economic characteristics likely to influence borrowers’ financial condition and ability to repay. The results are qualitatively similar when I include these control variables into the model.

³⁹ Laurie Goodman, John Walsh, and Jun Zhu, “Most CRA-qualifying loans in low- and moderate-income areas go to middle- and upper-income borrowers,” Urban Institute *Urban Wire*. March 4, 2019.

It is important to note that a complete analysis of the welfare implications of the observed increase in mortgage approval rates associated with a higher bank-county-level complaint volume would require considerations of other metrics such as loan terms, contractual interest rate, and loan performance. While consideration of most of these outcomes is out of the scope of this study, in Table 11, I examine the impact of *Post x Complaint Volume* on an approximation of the county-level contribution and sensitivity to bank-wide non-performing and past-due loans. To construct an approximate measure of the county-level contribution and sensitivity to a bank's non-performing loan portfolio, I first calculate the ratio of non-performing or delinquent closed-end mortgage loans divided by the bank's total portfolio of closed-end mortgage loans.⁴⁰ I then construct a bank's hypothetical county-level contribution or sensitivity to the bank-level portfolio of delinquent and non-performing closed-end mortgage loans by multiplying the bank-level ratio by the ratio of the dollar value of county-level mortgage originations over the dollar value of the bank's total mortgage originations in the prior year. This gives me a rough estimate of an individual county's hypothetical contribution to the bank's delinquent mortgage portfolio based on the bank's origination activity in that county. As the ratio for each individual county is quite small, I multiply the county-level delinquency ratios by one hundred for ease of interpretation.

If banks loosen lending standards in the process of approving more mortgages after the complaint database is disclosed, then I would expect to see an increase in

⁴⁰ The delinquent loan portfolio is calculated by summing the dollar amount of loans that are 30-89 days past due, 90+ days past due, and loans in non-accrual status. Non-performing loans are those loans in more advanced levels of delinquency and is calculated as the sum of loans that are 90+ days past due and in non-accrual status only.

delinquent loans in those bank-counties where a bank received more complaints.

Alternatively, if banks prudently approve mortgage applications from borrowers that are less risky and deemed more likely to repay, then the estimated county-level share of delinquent and non-performing loans would not be expected to increase. As county-level loan performance is closely tied to the state of the economy, I replace county-year with county fixed effects and control for the county-level unemployment rate, year-over-year county-level GDP growth, and year-over-year county-level personal income growth in the model. The results in Table 11 show a positive, yet insignificant, relationship between both the non-performing loan and delinquent loan ratio and the bank-county-level complaint volume in the post-disclosure period. This provides initial, albeit primarily descriptive, evidence suggesting that banks did not loosen lending standards in the process of increasing their mortgage approval rate.

5.5.2. The ‘Catching Up’ Explanation

While I highlight the role of regulatory scrutiny in leading banks to change mortgage lending behavior after the CFPB complaint database was disclosed, I acknowledge that there are other plausible explanations for this behavior. It is important to note that banks, as a whole and in certain areas, face different incentives to change their mortgage lending behavior in response to the disclosure of the database and that these explanations are not mutually exclusive. However, for completeness, I investigate one additional reason why banks may change mortgage lending in response to complaint disclosure – the ‘catching up’ explanation.

It is possible that the disclosure of the complaint database provided the impetus for banks that had previously been underserving certain areas relative to their

peers to increase lending in these areas. Therefore, it would be expected that the observed increase in lending, particularly in LMI areas, would be concentrated in those bank-counties with relatively lower business activity in these areas prior to disclosure. The incentives driving banks' decisions to increase lending in areas that they had previously underserved are multifaceted, as lending to LMI areas is important to a bank's reputation with multiple different stakeholders including their regulators, investors, and customers. It is also plausible that banks seeking to increase lending in previously underserved areas could be doing so as a result of regulatory scrutiny. This could occur as, absent concrete quantitative indicators of satisfactory performance in the consumer affairs space, examiners often benchmark and assess a given bank's exposure in certain areas relative to its peers during the course of an examination. There is no clear way to attribute banks' incentives to match the performance of their peers to regulatory scrutiny, per se, so I have included this explanation as a related, yet distinct, potential motivation.

To empirically test whether banks appear to be increasing mortgage lending relative to their peers in certain areas, I compare the mortgage approval rate of a bank relative to peer banks with over \$1 billion in total assets operating in the same location. While there is a significant difference in the number of individual institutions between CFPB and non-CFPB banks with over \$1 billion in total assets, the sample is roughly comparative in terms of total mortgage lending and has been used in prior studies as a relevant peer group for CFPB-supervised banks (Fuster, Plosser, and Vickery 2021).

The results at the state- and county-levels are presented in Tables 12 and 13. Banks are categorized as having low exposure in each category of mortgage lending if the approval rate is below the median of that of all other banks in the sample operating in the same area in the pre-disclosure period. Table 12 shows that banks with LMI approval rates both above and below the state-level median increase lending in the post disclosure period, while only banks with below the state-level median approval rate increase lending in MUI areas. Restricting peer comparison to the county level, Table 13 shows that only banks with low approval rates relative to peers in LMI areas significantly increase lending after the complaint database is disclosed, while no such relationship is observed for MUI areas. This shows that banks with lower lending relative to peers, particularly in LMI areas, respond more strongly to the complaint disclosure and that this impact is more pronounced at increasingly more local levels. These results suggest that other factors other than simply regulatory scrutiny at the bank-level may play a role in banks' response to the disclosure of the complaint database in their states and counties of operation. It is unlikely, however, that banks increasing lending in those areas that they have previously underserved can completely explain the results shown in the tests of regulatory scrutiny above.

5.5.3. Continuous Complaints

While I focus on the complaints received by the banks prior to public disclosure and retroactively disclosed on March 28, 2013, in Table 14, I examine whether the documented relationship between complaint volume and mortgage lending holds over time. I replace *Complaint Volume* with *Yearly Complaints*, defined

as the number of complaints received by a bank in a county in year t divided by the number of originated loans by the bank in that county in year $t-1$. As the dependent variable, I look at the approval rate for LMI and MUI mortgage applications in year $t+1$. As shown in Table 14, while the coefficient on *Mortgage Complaints* for the LMI approval rate is negative and insignificant, the coefficient on *Mortgage Complaints x Post* is positive and significant (0.313, p-value<0.05). The sum of the two coefficients is significantly different from zero (F-stat = 2.93). This result suggests that while the main effect of mortgage complaints on mortgage approval rates is negative, the relationship became positive in the post-disclosure period suggesting that the public scrutiny around the database may have compelled banks to increase lending. There is no significant relationship with the MUI approval rate.

In general, these results suggest that the impact of the complaint database on bank mortgage lending in LMI areas is not only attributable to the shock of the initial disclosure. However, after disclosure, it is difficult to pinpoint the incremental effect of new complaints due to changed incentives of customers submitting complaints and the banks and regulators responding to them in the post-disclosure period. Therefore, more work must be done to evaluate the impact of contemporaneous complaints on bank lending behavior.

5.6 Robustness

To assess the robustness of my results, I perform a battery of different tests. In Table 15, I include county-level control variables in the model in lieu of county-year fixed effects. The main results hold, and the coefficients are uniformly larger in magnitude across both geographical groups, when county-level controls are included.

In Table 16, I restrict the sample to only those bank-county-year observations where a bank engages in both LMI and MUI lending activity. This can be seen as a test investigating how a bank shifts its mortgage lending activities within both income groups. The results show that banks with more complaints significantly increase approval rates for properties in LMI areas (0.264, $p\text{-value} < 0.01$), but not MUI, tracts after the disclosure. This suggests that banks operating in counties with applications from both LMI and MUI areas shift to emphasize lending in low-income areas after the complaint database is disclosed.

I also conduct robustness checks using alternative specifications, specifically different time periods, sample constructions, and control variables shown in Table 17. The sample period robustness tests are displayed in Panel A and Panel B and show that the LMI lending results are qualitatively unchanged when the sample period is limited to 2011-2014 and when 2013, the year of the database disclosure, is dropped from the sample. The *Post x Complaint Volume* variable is insignificant for MUI lending when dropping 2013, likely resulting from the fact that most of the reaction in this lending category occurred in the disclosure year. Next, in Panel C and Panel D, I restrict the sample to county-year observations for which the bank has received at least twenty applications and to banks operating in a given county in every year of the 2011-2016 sample period and the results again hold for LMI lending only. In Panel E, I include a variable measuring yearly complaints bank-county-level in the post-disclosure period. The variable takes a value of 0 in 2011 and 2012 and is defined at the bank-county level as the number of complaints in year t divided by total originations in year $t-1$. Including this variable into the model helps to me to further

support my finding that banks are reacting to the disclosure of the database as opposed to merely responding to any additional complaints submitted in the post-disclosure period. The main results are robust to the inclusion of this variable. The relative lack of robustness of the MUI lending compared to LMI lending results calls for further investigation.

The increase in mortgage approval rates for banks with higher complaint volume in the post-disclosure period could be a function of either an increase in applications approvals or a decrease in applications received by the bank. To ensure that the results are not driven by decreases in applications, I re-run the main analysis replacing the approval rate variables with natural logs of the number of applications and approvals in LMI and MUI areas, respectively. In Panel F, I show that banks with higher complaint volumes increased application approvals in the post period. I also show that the coefficient on the number of applications for mortgages in LMI and MUI areas are positive, albeit insignificant for LMI areas, showing that declines in the number of applications do not drive the main findings in the paper.

Finally, I conduct a placebo test whereby I randomly assign the total number of mortgage complaints in the pre-disclosure period received in a county received by one bank to another bank also doing business in that county. Despite the inclusion of bank-county, bank-year, and county-year fixed effects, the potential exists that confounding events may be driving the observed relation. The results of this test are displayed in Panel G and show that, when the placebo complaint volume is used, no significant relation exists between *Post x Complaint Volume* and the three lending variables of interest.

6 Conclusion

In this study, I find suggestive evidence that the disclosure of customer complaints by the CFPB had real effects on the mortgage lending behavior of impacted banks, namely that CFPB-supervised banks with a greater number of pre-disclosure complaints increased mortgage approval rates. Moreover, the increase in approval rate is generally larger in magnitude and significance for properties located in LMI areas. This result is more pronounced under the regulatory channel when banks plausibly have more incentives to cater to regulators under the threat of increased regulatory scrutiny after instances of punitive enforcement. The disclosure of the complaint database, however, does not appear to substantially increase credit access for lower-income borrowers. The observed approval increase does not appear to indicate that banks loosened lending standards in the process. Overall, I find suggestive evidence that consumers were made better off after the complaint disclosure on the metric of improved credit access, and that either real or perceived increased regulatory scrutiny significantly contributed to this. In addition, the significant relationship between contemporaneous complaints and LMI approval rates suggests that the impact may not only be concentrated around the shock of the disclosure. In future work, I plan to look more closely at the content of complaints submitted and disclosed to investigate whether the observed lending changes persist in certain subsets of banks.

While an assessment of the welfare implications of these changes is outside of the scope of this paper, the results suggest that the disclosure of the consumer

complaint database may be an effective and beneficial tool with which to influence bank behavior. The results of this paper contribute to the debate on the benefits and downsides of the CFPB's public disclosure of the consumer complaint database, indicating that banks may increase their willingness to lend in general and more to LMI areas after the disclosure. In addition, this study shows that disclosure may also have a disciplinary effect on regulators, potentially leading to more effective supervision of, in this case, consumer financial protection.

Although the evidence presented in this paper suggest that consumers may have been made better off after the complaint database was disclosed, further work must be done to assess the full net benefits and potential costs of these changes. The finding that the approval rate increase is concentrated in lending to borrowers with above-median income casts doubt on whether or not the observed changes were welfare-improving for low-income borrowers. Specific to the CRA, current guidelines give banks credit for mortgages made in LMI areas even if they are made to MUI borrowers, increasing banks' incentives to approve applications from borrowers with the lowest credit risk within LMI areas. This practice may be short-lived, however, as current proposals are in place that would no longer grant banks credit for these types of loans. Therefore, the findings of this study can contribute to the debate on modernization of regulations such as CRA and others.

In addition, if banks began to increase application approvals without regard to the quality of the service they were providing to these customers, then this could partially explain the findings of suboptimal service quality in LMI areas, specifically with high minority populations, documented in Begley and Purnanandam (2021). If

banks focus more on increasing lending to cater to regulators and less on providing high-quality service, this could be a potential unintended consequence of the database disclosure. Therefore, in future work, I plan to assess the impacts of the documented changes in mortgage lending behavior on the incidence of future complaints.

Appendices

Appendix A – Variable Definitions

Variable Name	Source	Definition
<i>Post</i>		Indicator variable equal to one after the CFPB complaint database is disclosed in 2013 and zero otherwise.
<i>Complaint Volume</i>	CFPB Complaint Database/FFIEC HMDA Data	The total number of mortgage complaints for a bank-county on or before March 28, 2013, divided by mortgage originations for that bank-county in 2011.
<i>Mortgage Complaints</i>	CFPB Complaint Database/FFIEC HMDA Data	The total number of mortgage complaints for a bank-county in year t , divided by mortgage originations for that bank-county in year $t-1$.
<i>Low- and Moderate-Income (LMI) Area</i>	FFIEC HMDA Data/Community Reinvestment Act	A census tract in which the median income is below 50% or between 50% and 80% of the median income for the MSA in which the tract is located.
<i>Middle- and Upper-Income (MUI) Area</i>	FFIEC HMDA Data/Community Reinvestment Act	A census tract in which the median income is between 80% and 120% or over 120% of the median income for the MSA in which the tract is located.
<i>High (Low) Complaints</i>	CFPB Complaint Database	An indicator variable equal to one (zero) if the complaint volume of a bank or bank-county is higher (lower) than the overall median complaint volume in the sample.
<i>% Approved</i>	FFIEC HMDA Data	The number of mortgage applications approved by the bank in a county-year over the number of total applications received by the bank in that county-year.
<i>% Approved LMI</i>	FFIEC HMDA Data	The number of mortgage applications for properties located in LMI areas over the number of total applications for properties located in LMI areas received by the bank in that county-year.
<i>% Approved MUI</i>	FFIEC HMDA Data	The number of mortgage applications for properties located in MUI areas over the number of total applications for

		properties located in MUI areas received by the bank in that county-year.
<i>% Approved LMI (MUI) – Minority</i>	FFIEC HMDA Data	The number of mortgage applications for properties located in LMI (MUI) areas submitted by minority borrowers over the number of total applications for properties located in LMI (MUI) areas submitted by minority borrowers received by the bank in that county-year.
<i>% Approved LMI (MUI) – Non-Minority</i>	FFIEC HMDA Data	The number of mortgage applications for properties located in LMI (MUI) areas submitted by non-minority borrowers over the number of total applications for properties located in LMI (MUI) areas submitted by non-minority borrowers received by the bank in that county-year.
<i>% Approved LMI (MUI) – Below Median Income</i>	FFIEC HMDA Data	The number of mortgage applications for properties located in LMI (MUI) areas submitted by borrowers with below median income over the number of total applications for properties located in LMI (MUI) areas submitted by borrowers with below median income received by the bank in that county-year.
<i>% Approved LMI (MUI) – Above Median Income</i>	FFIEC HMDA Data	The number of mortgage applications for properties located in LMI (MUI) areas submitted by borrowers with above median income over the number of total applications for properties located in LMI (MUI) areas submitted by borrowers with above median income received by the bank in that county-year.
<i>Branch Indicator</i>	FDIC Summary of Deposits	Indicator variable equal to one if the bank operates a brick-and-mortar branch in a county-year.
<i>Lagged Market Share</i>	FFIEC HMDA Data	The number of mortgages originated by a given bank in a county-year over the total number of mortgages originated by all CFPB banks in that county year.
<i>Strong Consumer Protection</i>	National Consumer Law Center	Indicator variable equal to one if a state has below the median number of weak or mixed categories of consumer protection statutes or enforcement.
<i>CRA Exam</i>	Federal Reserve Board of Governors	Indicator variable equal to one if a bank had a scheduled CRA examination in

	CRA Analytics Data Table	year t or $t+1$ during the 2011-2016 sample period.
<i>Consumer EA</i>	S&P Capital IQ	Indicator variable equal to one if a bank received an enforcement action for violations of consumer affairs laws and regulations in the pre-disclosure period.
<i>Below (Above) Median Approval Rate</i>	HMDA Data	An indicator variable equal to one (zero) if a bank's approval rate in a given state or county is below (above) the median approval rate in that state or county in the pre-disclosure period.
<i>Non-Performing Loan Ratio</i>	FFIEC 031/041/HMDA Data	Ratio of closed end mortgage loans that are 90+ days past due or in non-accrual status divided by total closed-end mortgage loans. This ratio is multiplied by the dollar amount of mortgages originated by a bank in a county in the prior year divided by the total dollar among of mortgages originated by that bank in the prior year.
<i>Delinquent Loan Ratio</i>	FFIEC 031/041/HMDA Data	Ratio of closed end mortgage loans that are 30-89 days past due, 90+ days past due, or in non-accrual status divided by total closed-end mortgage loans. This ratio is multiplied by the dollar amount of mortgages originated by a bank in a county in the prior year divided by the total dollar among of mortgages originated by that bank in the prior year.
<i>Unemployment Rate</i>	BLS Local Area Unemployment Statistics	County-level unemployment rate.
<i>GDP Growth</i>	BEA	County-level year-over-year change in GDP.
<i>Personal Income Growth</i>	BEA	County-level year-over-year change in personal income.
<i>ln(LMI Approved)</i>	HMDA	Natural log of the number of mortgage loan applications for properties located in LMI areas approved by the bank in a county-year.
<i>ln(LMI Applied)</i>	HMDA	Natural log of the number of mortgage loan applications for properties in located in LMI areas submitted to the bank in a county-year.
<i>ln(MUI Approved)</i>	HMDA	Natural log of the number of mortgage loan applications for properties located in

		MUI areas approved by the bank in a county-year.
<i>ln(MUI Applied)</i>	HMDA	Natural log of the number of mortgage loan applications for properties in located in MUI areas submitted to the bank in a county-year.

Appendix B – Regulatory Responsibilities for Consumer Protection Regulations⁴¹

CFPB

- Alternative Mortgage Transaction Parity Act of 1982
- Consumer Leasing Act of 1976
- Electronic Fund Transfer Act, except for section 920 of the Act
- Equal Credit Opportunity Act
- Fair Credit Billing Act
- Fair Credit Reporting Act, except for sections 615(e) and 628 of the Act
- Home Owners Protection Act of 1998
- Fair Debt Collection Practices Act
- Subsections (b) through (f) of section 43 of the Federal Deposit Insurance Act
- Sections 502 through 509 of the Gramm-Leach-Bliley Act except for section 505 as it applies to section 501(b)
- Home Mortgage Disclosure Act of 1975
- Home Ownership and Equity Protection Act of 1994
- Real Estate Settlement Procedures Act of 1974
- S.A.F.E. Mortgage Licensing Act of 2008
- Truth in Lending Act
- Truth in Savings Act
- Section 626 of the Omnibus Appropriations Act, 2009
- Interstate Land Sales Full Disclosure Act

Prudential Regulators

- Community Reinvestment Act
- CRA Sunshine Act

⁴¹ “Coordination of Responsibilities Among the Consumer Financial Protection Bureau and the Prudential Regulators – Limited Scope Review,” Offices of Inspector General, 2015, <https://oig.federalreserve.gov/reports/cfpb-responsibilities-coordination-review-jun2015.pdf>

- Fair Housing Act
- Fair Credit Reporting Act sections 615(e) and 628
- Section 5 of the Federal Trade Commission Act
- National Flood Insurance Act
- Protecting Tenants at Foreclosure Act
- Home Ownership Counseling (under HUD authority)
- Advertising of FDIC Membership
- Servicemembers Civil Relief Act and Talent Amendment
- Military Lending Act
- Section 19 of the Federal Reserve Act
- Right to Financial Privacy Act
- Notice of Branch Closure
- Section 109 of the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994
- Government Securities Act of 1986
- Exemptions and Definitions Related to the Exceptions for Banks from the Definition of Broker
- Children's Online Privacy Protection Act of 1998
- Controlling the Assault of Non-solicited Pornography and Marketing Act of 2003
- Telephone Consumer Protection Act of 1991
- Electronic Signatures in Global and National Commerce Act

Tables

Table 1 – Summary Statistics: Complaints

This table reports summary statistics for the mortgage complaints disclosed in the CFPB customer complaint database. Panel A contains descriptive statistics of the variables used in the sample while Panel B compares the average values of complaints based on specific county-level attributes. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A.

Panel A – Sample Variables

	N	Mean	SD	P25	P50	P75
Complaint Volume	153556	0.009	0.041	0	0	0
Yearly Complaints	148568	0.004	0.021	0	0	0

Panel B – Complaints by County Attributes

	Above Mean Minority		Below Mean Minority	
	N	Mean	N	Mean
Complaint Volume	60481	0.012***	99128	0.006
Yearly Complaints	58655	0.006***	89913	0.003

	Above Mean Poverty		Below Mean Poverty	
	N	Mean	N	Mean
Complaint Volume	61690	0.008	91866	0.01***
Yearly Complaints	59651	0.003	88917	0.004***

	Below Mean Income		Above Mean Income	
	N	Mean	N	Mean
Complaint Volume	71953	0.006	81603	0.012***
Yearly Complaints	69575	0.003	78993	0.005***

Table 2 – Summary Statistics: Variables

This table reports summary statistics for the variables used in the main empirical analysis. Panel A contains descriptive statistics for the total, LMI, and MUI mortgage approval rates and Panel B contains approval rates for different borrower characteristics. Panel C contains relevant bank and county variables used in the main analysis as well as robustness. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A.

Panel A – Total Approval Rates

	N	Mean	SD	P25	P50	P75
% Approved - Total	171420	0.697	0.265	0.571	0.744	0.889
% Approved LMI - Total	83226	0.646	0.315	0.500	0.680	1.000
% Approved MUI - Total	165064	0.707	0.266	0.589	0.750	0.909

Panel B – Borrower Characteristics

	N	Mean	SD	P25	P50	P75
% Approved LMI - Minority	41899	0.537	0.366	0.250	0.533	1.000
% Approved MUI - Minority	77789	0.620	0.347	0.429	0.667	1.000
% Approved LMI - Non-Minority	74565	0.681	0.315	0.500	0.750	1.000
% Approved MUI - Non-Minority	157144	0.721	0.267	0.600	0.767	0.951
% Approved LMI - Below Median Income	65985	0.589	0.340	0.373	0.625	1.000
% Approved MUI - Below Median Income	127344	0.635	0.307	0.500	0.667	0.875
% Approved LMI - Above Median Income	66721	0.693	0.328	0.500	0.754	1.000
% Approved MUI - Above Median Income	150867	0.742	0.268	0.636	0.800	1.000

Panel C – Bank and County Variables

	N	Mean	SD	P25	P50	P75
Branch Indicator	171420	0.232	0.422	0.000	0.000	0.000
Lagged Market Share	171420	0.101	0.145	0.003	0.038	0.136
County-Level Unemployment Rate	171381	0.075	0.026	0.051	0.067	0.086
County-Level GDP Growth	167461	0.014	0.060	-0.013	0.012	0.039
County-Level Personal Income Growth	167461	0.034	0.038	0.015	0.034	0.051
County-Level Non-Performing Loan Ratio	144796	0.006	0.019	0.000	0.000	0.002
County-Level Delinquent Loan Ratio	144796	0.008	0.026	0.000	0.001	0.003

Table 3 – Pre- and Post-Disclosure Comparison

This table reports difference-in-means tests for total, LMI, and MUI mortgage approval rates for banks with above and below the median number of pre-disclosure complaints in the sample. Panel A displays the information at the bank level while Panel B displays the information at the bank-county level used in the empirical analysis. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A.

Panel A – Bank-Level Analysis

Total Mortgage Lending

	Post	Pre	Difference (Post - Pre)
High Complaints	0.737	0.680	0.057***
Low Complaints	0.694	0.732	-0.038***
	0.043***	-0.052***	

Low- and Moderate-Income Mortgage Lending

	Post	Pre	Difference (Post - Pre)
High Complaints	0.693	0.628	0.065***
Low Complaints	0.620	0.658	-0.038***
	0.073***	-0.030***	

Middle- and Upper-Income Lending

	Post	Pre	Difference (Post - Pre)
High Complaints	0.746	0.689	0.057***
Low Complaints	0.705	0.742	-0.037***
	0.041***	-0.053***	

Panel B – Bank-County-Level Analysis

Total Mortgage Lending

	Post	Pre	Difference (Post - Pre)
High Complaints	0.728	0.688	0.040***
Low Complaints	0.706	0.718	-0.012***
	0.022***	-0.030***	

Low- and Moderate-Income Mortgage Lending

	Post	Pre	Difference (Post - Pre)
High Complaints	0.667	0.641	0.026***
Low Complaints	0.646	0.645	0.001
	0.073***	-0.030	

Middle- and Upper-Income Lending

	Post	Pre	Difference (Post - Pre)
High Complaints	0.740	0.700	0.040***
Low Complaints	0.716	0.725	-0.009***
	0.024***	-0.025***	

Table 4 – Complaints and Mortgage Lending

This table shows the difference-in-difference regression estimates for the baseline model investigating the effect of pre-disclosure mortgage complaint volume on the mortgage approval rate. Column (1) shows the results for the total mortgage approval rate, while columns (2) and (3) show results for the approval rate in LMI and MUI areas separately. The variable of interest, *Post x Complaint Volume*, is equal to one multiplied by the number of a bank's county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 from 2013 onward. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

VARIABLES	(1) % Approved - Total	(2) % Approved - LMI Area	(3) % Approved - MUI Area
Post x Complaint Volume	0.121*** (0.036)	0.249*** (0.062)	0.074* (0.041)
Branch Indicator	-0.010 (0.008)	-0.036*** (0.013)	-0.002 (0.008)
Lagged Market Share	-0.104*** (0.023)	-0.044* (0.026)	-0.100*** (0.023)
Constant	0.725*** (0.003)	0.669*** (0.006)	0.730*** (0.003)
Bank-Year FE	YES	YES	YES
County-Year FE	YES	YES	YES
Bank-County FE	YES	YES	YES
Observations	151,574	74,838	146,682
Adjusted R-squared	0.294	0.264	0.281

Table 5 – Parallel Trends

This table shows the regression estimates for the test of the difference-in-difference parallel trends assumption. Column (1) shows the results for the total mortgage approval rate, while columns (2) and (3) shows results for the approval rate in LMI and MUI areas separately. Each variable of the form *Year x Complaint Volume* is equal to one multiplied by the number of a bank's county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 if in the year specified in the variable name. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

VARIABLES	(1) % Approved - Total	(2) % Approved - LMI Area	(3) % Approved - MUI Area
2012 x Complaint Volume	0.088 (0.096)	0.222 (0.145)	0.063 (0.099)
2013 x Complaint Volume	0.207*** (0.060)	0.280** (0.123)	0.144** (0.061)
2014 x Complaint Volume	0.159** (0.074)	0.354*** (0.128)	0.116 (0.077)
2015 x Complaint Volume	0.115 (0.074)	0.458*** (0.138)	0.052 (0.084)
2016 x Complaint Volume	0.150* (0.077)	0.480*** (0.109)	0.089 (0.083)
Constant	0.711*** (0.000)	0.647*** (0.001)	0.719*** (0.001)
Bank-Year FE	YES	YES	YES
County-Year FE	YES	YES	YES
Bank-County FE	YES	YES	YES
Observations	151,574	74,838	146,682
Adjusted R-squared	0.293	0.264	0.281

Table 6 – State-Level Consumer Protection

This table shows the difference-in-difference regression estimates for the model investigating the effect of pre-disclosure mortgage complaint volume on the mortgage approval rates based on the state-level consumer protection in the county of operation. Panel A shows the results for the mortgage approval rate in LMI areas, while Panel B shows results for the approval rate in MUI areas. The variable of interest, *Post x Complaint Volume*, is equal to one multiplied by the number of a bank's county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 from 2013 onward. Column (1) looks at the approval rate in states with relatively weaker consumer protection and Column (2) looks at the approval rate in states with relatively stronger consumer protection. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Panel A – Low- and Moderate-Income Areas

VARIABLES	(1) % Approved – LMI Area	(2) % Approved – LMI Area
	Weak Consumer Protection	Strong Consumer Protection
Post x Complaint Volume	0.173*** (0.063)	0.359*** (0.113)
Branch Indicator	-0.029 (0.018)	-0.041** (0.020)
Lagged Market Share	-0.025 (0.036)	-0.078*** (0.023)
Constant	0.663*** (0.009)	0.676*** (0.008)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	40,246	34,578
Adjusted R-squared	0.254	0.275

Panel B – Middle- and Upper-Income Areas

VARIABLES	(1) % Approved – MUI Area	(2) % Approved – MUI Area
	Weak Consumer Protection	Strong Consumer Protection
Post x Complaint Volume	0.030 (0.061)	0.107* (0.063)
Branch Indicator	-0.016 (0.012)	0.015 (0.010)
Lagged Market Share	-0.097*** (0.031)	-0.107*** (0.023)
Constant	0.736*** (0.004)	0.724*** (0.004)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	77,305	69,370
Adjusted R-squared	0.271	0.293

Table 7 – Regulatory Scrutiny: Routine Supervision

This table shows the difference-in-difference regression estimates for the model investigating the effect of pre-disclosure mortgage complaint volume on the mortgage approval rates, particularly focusing on banks perceived to be under more regulatory scrutiny. Panel A shows the results for the mortgage approval rate in LMI areas, while Panel B shows results for the approval rate in MUI areas. The variable of interest, *Post x Complaint Volume x CRA Exam*, is equal to one multiplied by the number of a bank's county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 from 2013 onward multiple by an indicator variable equal to one if a bank has a scheduled CRA exam in 2013 or 2014. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

VARIABLES	(1) % Approved - LMI Area	(2) % Approved - MUI Area
Post x Complaint Volume	0.233*** (0.068)	0.057 (0.038)
Post x Complaint Volume x Exam	0.051 (0.063)	0.054 (0.062)
Branch Indicator	-0.036*** (0.013)	-0.004 (0.008)
Lagged Market Share	-0.045* (0.026)	-0.103*** (0.023)
Constant	0.668*** (0.006)	0.728*** (0.003)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	72,973	140,750
Adjusted R-squared	0.260	0.272

Table 8 – Regulatory Scrutiny: Punitive Enforcement

This table shows the difference-in-difference regression estimates for the model investigating the effect of pre-disclosure mortgage complaint volume on the mortgage approval rates, particularly focusing on banks perceived to be under more regulatory scrutiny due to punitive enforcement. Panel A shows the results for the mortgage approval rate in LMI areas, while Panel B shows results for the approval rate in MUI areas. The variable of interest, *Post x Complaint Volume*, is equal to one multiplied by the number of a bank's county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 from 2013 onward. Column (1) displays results for banks without enforcement actions related to consumer affairs in the pre-disclosure period. Column (2) displays results for banks that did receive an enforcement action related to consumer affairs in the pre-disclosure period. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Panel A – Low- and Moderate-Income Areas

VARIABLES	(1)	(2)
	% Approved - LMI Area No Consumer EA	% Approved - LMI Area Consumer EA
Post x Complaint Volume	0.148 (0.094)	0.343*** (0.040)
Branch Indicator	-0.022 (0.025)	-0.040*** (0.005)
Lagged Market Share	-0.069 (0.050)	-0.080*** (0.014)
Constant	0.644*** (0.011)	0.711*** (0.002)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	40,483	31,296
Adjusted R-squared	0.271	0.159

Panel B – Middle- and Upper-Income Areas

VARIABLES	(1)	(2)
	% Approved - MUI Area No Consumer EA	% Approved - MUI Area Consumer EA
Post x Complaint Volume	0.055 (0.065)	0.086 (0.052)
Branch Indicator	-0.005 (0.013)	0.004 (0.003)
Lagged Market Share	-0.062 (0.040)	-0.091*** (0.014)
Constant	0.717*** (0.005)	0.748*** (0.002)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	85,277	58,352
Adjusted R-squared	0.305	0.175

Table 9 – Regulatory Scrutiny: Routine Supervision and Punitive Enforcement

This table shows the difference-in-difference regression estimates for the model investigating the effect of pre-disclosure mortgage complaint volume on the mortgage approval rates, particularly focusing on banks perceived to be under more regulatory scrutiny due to both routine supervision and punitive enforcement. Panel A shows the results for the mortgage approval rate in LMI areas, while Panel B shows results for the approval rate in MUI areas. The variable of interest, *Post x Complaint Volume x CRA Exam*, is equal to one multiplied by the number of a bank's county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 from 2013 onward multiple by an indicator variable equal to one if a bank has a scheduled CRA exam in year *t* or year *t*+1 during the 2011-2016 sample period. Column (1) displays results for banks without enforcement actions related to consumer affairs in the pre-disclosure period. Column (2) displays results for banks that did receive an enforcement action related to consumer affairs in the pre-disclosure period. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Panel A – Low- and Moderate-Income Areas

VARIABLES	(1) % Approved – LMI Area No Consumer EA	(2) % Approved - LMI Area Consumer EA
Post x Complaint Volume	0.128 (0.110)	0.328*** (0.033)
Post x Complaint Volume x Exam	0.044 (0.074)	0.922** (0.225)
Branch Indicator	-0.021 (0.026)	-0.040*** (0.005)
Lagged Market Share	-0.063 (0.051)	-0.088*** (0.016)
Constant	0.638*** (0.011)	0.715*** (0.003)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	38,894	31,002
Adjusted R-squared	0.266	0.144

Panel B – Middle- and Upper-Income Areas

VARIABLES	(1)	(2)
	% Approved - MUI Area No Consumer EA	% Approved - MUI Area Consumer EA
Post x Complaint Volume	0.034 (0.068)	0.085 (0.054)
Post x Complaint Volume x Exam	0.051 (0.062)	0.102 (0.072)
Branch Indicator	-0.009 (0.014)	0.004 (0.003)
Lagged Market Share	-0.062 (0.039)	-0.099*** (0.013)
Constant	0.709*** (0.005)	0.752*** (0.002)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	79,940	57,734
Adjusted R-squared	0.293	0.160

Table 10 – Borrower Characteristics

This table shows the difference-in-difference regression estimates for the model investigating the effect of pre-disclosure mortgage complaint volume on the mortgage approval rates split by borrower attribute. Panel A shows the results for the mortgage approval rate in LMI areas, while Panel B shows results for the approval rate in MUI areas. The variable of interest, *Post x Complaint Volume*, is equal to one multiplied by the number of a bank's county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 from 2013 onward. The dependent variable varies by column. Columns (1) and (2) use the approval rate for minority and non-minority borrowers, respectively. Columns (3) and (4) use the approval rate for borrowers with below and above median income, respectively. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Panel A – Low- and Moderate-Income Areas

	(1) % Approved – LMI Area	(2) % Approved – LMI Area	(3) % Approved – LMI Area	(4) % Approved – LMI Area
VARIABLES	Minority	Non-Minority	Below Median Income	Above Median Income
Post x Complaint Volume	0.213** (0.088)	0.318*** (0.078)	0.125 (0.095)	0.273** (0.126)
Branch Indicator	-0.056*** (0.020)	-0.028*** (0.010)	-0.038** (0.016)	-0.023 (0.014)
Lagged Market Share	-0.004 (0.044)	-0.022 (0.024)	-0.028 (0.031)	-0.000 (0.031)
Constant	0.571*** (0.012)	0.697*** (0.005)	0.617*** (0.008)	0.705*** (0.008)
Bank-Year FE	YES	YES	YES	YES
County-Year FE	YES	YES	YES	YES
Bank-County FE	YES	YES	YES	YES
Observations	34,996	66,860	58,625	59,081
Adjusted R-squared	0.287	0.216	0.254	0.199

Panel B – Middle- and Upper-Income Areas

	(1)	(2)	(3)	(4)
	% Approved – MUI Area	% Approved – MUI Area	% Approved – MUI Area	% Approved – MUI Area
VARIABLES	Minority	Non-Minority	Below Median Income	Above Median Income
Post x Complaint Volume	0.084 (0.080)	0.109** (0.053)	0.087 (0.063)	0.093** (0.046)
Branch Indicator	-0.047*** (0.013)	0.002 (0.008)	-0.019 (0.015)	0.008 (0.007)
Lagged Market Share	-0.060 (0.037)	-0.086*** (0.020)	-0.075** (0.033)	-0.076*** (0.012)
Constant	0.656*** (0.008)	0.739*** (0.003)	0.659*** (0.007)	0.757*** (0.003)
Bank-Year FE	YES	YES	YES	YES
County-Year FE	YES	YES	YES	YES
Bank-County FE	YES	YES	YES	YES
Observations	67,276	140,494	115,565	135,921
Adjusted R-squared	0.258	0.252	0.238	0.235

Table 11 – Non-Performing Real Estate Loans

This table shows the difference-in-difference regression estimates for the model investigating the effect of pre-disclosure mortgage complaint volume the county-level sensitivity to a bank's non-performing and delinquent loan portfolios. The variable of interest, *Post x Complaint Volume*, is equal to one multiplied by the number of a bank's county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 from 2013 onward. Column (1) looks at county-level estimation of the Non-Performing Loan Ratio while Column (2) looks at the county-level estimation of the Delinquent Loan Ratio. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

VARIABLES	(1) Non-Performing Loan Ratio	(2) Delinquent Loan Ratio
Post x Complaint Volume	0.007 (0.009)	0.012 (0.011)
Branch Indicator	0.003 (0.002)	0.004 (0.002)
Lagged Market Share	0.007*** (0.002)	0.009*** (0.002)
Unemployment Rate	-0.003 (0.013)	-0.006 (0.017)
GDP Growth	0.001* (0.0004)	0.001* (0.001)
Personal Income Growth	-0.007*** (0.001)	-0.009*** (0.001)
Constant	0.004*** (0.001)	0.006*** (0.001)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	135,405	135,405
Adjusted R-squared	0.797	0.802

Table 12 – ‘Catching Up:’ State-Level Tests

This table shows the difference-in-difference regression estimates for the model investigating the effect of pre-disclosure mortgage complaint volume on the mortgage approval rates split of banks with above- and below-median mortgage approval rates relative to their state-level peers. Panel A shows the results for the mortgage approval rate in LMI areas, while Panel B shows results for the approval rate in MUI areas. The variable of interest, *Post x Complaint Volume*, is equal to one multiplied by the number of a bank’s county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 from 2013 onward. The dependent variable varies by column. Columns (1) and (2) include those bank-county observations with approval rates above and below the median in each state during the pre-disclosure period. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Panel A – Low- and Moderate-Income Areas

VARIABLES	(1) % Approved - LMI Area Below Med. Approval	(2) % Approved - LMI Area Above Med. Approval
Post x Complaint Volume	0.436*** (0.104)	0.150* (0.077)
Branch Indicator	0.019 (0.016)	-0.036 (0.025)
Market Share Lag	-0.031 (0.038)	-0.034 (0.034)
Constant	0.635*** (0.009)	0.693*** (0.009)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	34,160	36,885
Adjusted R-squared	0.264	0.218

Panel B – Middle- and Upper-Income Areas

VARIABLES	(1)	(2)
	% Approved - MUI Area Below Med. Approval	% Approved - MUI Area Above Med. Approval
Post x Complaint Volume	0.142** (0.060)	-0.053 (0.089)
Branch Indicator	-0.005 (0.008)	0.012 (0.014)
Market Share Lag	-0.089*** (0.025)	-0.079*** (0.027)
Constant	0.711*** (0.004)	0.788*** (0.003)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	108,268	32,732
Adjusted R-squared	0.272	0.186

Table 13 – ‘Catching Up:’ County-Level Tests

This table shows the difference-in-difference regression estimates for the model investigating the effect of pre-disclosure mortgage complaint volume on the mortgage approval rates split of banks with above- and below-median mortgage approval rates relative to their county-level peers. Panel A shows the results for the mortgage approval rate in LMI areas, while Panel B shows results for the approval rate in MUI areas. The variable of interest, *Post x Complaint Volume*, is equal to one multiplied by the number of a bank’s county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 from 2013 onward. The dependent variable varies by column. Columns (1) and (2) include those bank-county observations with approval rates above and below the median in each county during the pre-disclosure period. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Panel A – Low- and Moderate-Income Areas

VARIABLES	(1) % Approved - LMI Area Below Med. Approval	(2) % Approved - LMI Area Above Med. Approval
Post x Complaint Volume	0.286** (0.115)	0.053 (0.117)
Branch Indicator	-0.033* (0.020)	-0.020 (0.020)
Market Share Lag	-0.116*** (0.042)	0.000 (0.038)
Constant	0.638*** (0.010)	0.706*** (0.007)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	38,863	33,174
Adjusted R-squared	0.323	0.175

Panel B – Middle- and Upper-Income Areas

VARIABLES	(1)	(2)
	% Approved - MUI Area Below Med. Approval	% Approved - MUI Area Above Med. Approval
Post x Complaint Volume	0.037 (0.048)	-0.011 (0.054)
Branch Indicator	0.004 (0.009)	-0.003 (0.017)
Market Share Lag	-0.135*** (0.023)	-0.085*** (0.018)
Constant	0.705*** (0.004)	0.794*** (0.004)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	98,805	42,798
Adjusted R-squared	0.290	0.226

Table 14 – Continuous Complaints

This table shows the difference-in-difference regression estimates for the model investigating the effect of contemporaneous mortgage complaints on future mortgage loan approvals. The variable of interest, *Post x Yearly Complaints*, is equal to one multiplied by the number of a bank's county-level mortgage complaints in year t divided by the number of county-level mortgage originations in year $t-1$. Column (1) looks at the mortgage approval rate for LMI areas and Column (2) looks at the approval rate in MUI areas. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

VARIABLES	(1) % Approved – LMI Area	(2) % Approved – MUI Area
Mortgage Complaints	-0.182 (0.136)	0.104* (0.053)
Post x Mortgage Complaints	0.313** (0.156)	-0.071 (0.078)
Branch Indicator	-0.035** (0.014)	0.002 (0.009)
Lagged Market Share	-0.048 (0.031)	-0.093*** (0.023)
Constant	0.675*** (0.008)	0.725*** (0.004)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	60,470	111,945
Adjusted R-squared	0.266	0.305

Table 15 –County-Level Controls

This table shows the difference-in-difference regression estimates for the baseline model investigating the effect of pre-disclosure mortgage complaint volume on the mortgage approval rate with bank and county-level controls included. Panel A shows the results for the mortgage approval rate in LMI areas, while Panel B shows results for the approval rate in MUI areas. The variable of interest, *Post x Complaint Volume*, is equal to one multiplied by the number of a bank's county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 from 2013 onward. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

VARIABLES	(1) % Approved - LMI Area	(2) % Approved - MUI Area
Post x Complaint Volume	0.283*** (0.071)	0.125*** (0.041)
Branch Indicator	-0.034*** (0.011)	0.003 (0.007)
Lagged Market Share	-0.078*** (0.028)	-0.129*** (0.026)
Unemployment Rate	0.001 (0.002)	-0.002*** (0.001)
GDP Growth	0.014 (0.018)	-0.026 (0.021)
Personal Income Growth	-0.062 (0.049)	0.046** (0.022)
Constant	0.666*** (0.016)	0.745*** (0.006)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	73,541	144,004
Adjusted R-squared	0.240	0.255

Table 16 – Lending in Low- and Moderate-Income and Middle- and Upper-Income Areas

This table shows the difference-in-difference regression estimates for the baseline model investigating the effect of pre-disclosure mortgage complaint volume on the mortgage approval rate restricting the sample to county-years during which a given bank received mortgage applications from both LMI and MUI areas. Panel A shows the results for the mortgage approval rate in LMI areas, while Panel B shows results for the approval rate in MUI areas. The variable of interest, *Post x Complaint Volume*, is equal to one multiplied by the number of a bank's county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 from 2013 onward. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

VARIABLES	(1) % Approved - LMI Area	(2) % Approved - MUI Area
Post x Complaint Volume	0.264*** (0.066)	0.039 (0.042)
Branch Indicator	-0.034** (0.013)	0.004 (0.009)
Lagged Market Share	-0.004 (0.027)	-0.057** (0.022)
Constant	0.664*** (0.006)	0.720*** (0.004)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	70,195	70,195
Adjusted R-squared	0.273	0.466

Table 17 – Robustness

This table shows the difference-in-difference regression estimates for the baseline model investigating the effect of pre-disclosure mortgage complaint volume on the mortgage approval rate under various additional conditions. The variable of interest, *Post x Complaint Volume*, is equal to one multiplied by the number of a bank's county-level pre-disclosure mortgage complaints divided by the number of county-level mortgage originations in 2011 from 2013 onward. Panel A displays results from shortening the sample to 2011-2014 and Panel B displays results dropping the year 2013 from the sample. Panel C displays results when bank-county-year observations with less than 20 mortgage applications are dropped from the estimation and Panel D displays results with only bank-counties for which the full 2011-2016 panel is non-missing. Panel E displays the results when a control variable for post-disclosure complaints is included. Panel F displays results for the number of mortgage approvals and applications separately. Panel G displays results from a placebo tests whereby bank-county observations are randomly assigned the number of pre-disclosure mortgage complaints from another peer bank operating in the same county. In all Panels, Column (1) displays results for the LMI approval rate and Column (2) displays results from the MUI approval rate. All continuous variables are winsorized at the 1st and 99th percentiles. Variable definitions can be found in Appendix A. Standard errors are clustered by bank. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Panel A – 2011-2014

VARIABLES	(1) % Approved - LMI Area	(2) % Approved - MUI Area
Post x Complaint Volume	0.187*** (0.056)	0.107** (0.044)
Branch Indicator	-0.027 (0.020)	0.001 (0.011)
Lagged Market Share	-0.149*** (0.033)	-0.143*** (0.019)
Constant	0.681*** (0.009)	0.733*** (0.004)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	50,939	102,040
Adjusted R-squared	0.266	0.303

Panel B – Dropping 2013

VARIABLES	(1) % Approved - LMI Area	(2) % Approved - MUI Area
Post x Complaint Volume	0.290*** (0.081)	0.053 (0.047)
Branch Indicator	-0.042*** (0.012)	0.003 (0.008)
Lagged Market Share	-0.067 (0.042)	-0.118*** (0.033)
Constant	0.669*** (0.006)	0.729*** (0.004)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	59,309	120,852
Adjusted R-squared	0.258	0.274

Panel C – At least 20 Applications in Bank-County-Year

VARIABLES	(1) % Approved - LMI Area	(2) % Approved - MUI Area
Post x Complaint Volume	0.150** (0.061)	0.063* (0.033)
Branch Indicator	-0.026 (0.016)	-0.019** (0.007)
Lagged Market Share	0.029 (0.030)	0.002 (0.013)
Constant	0.662*** (0.009)	0.738*** (0.004)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	46,482	58,549
Adjusted R-squared	0.380	0.716

Panel D – Full 2011-2016 Sample

VARIABLES	(1) % Approved - LMI Area	(2) % Approved - MUI Area
Post x Complaint Volume	0.272*** (0.065)	0.049 (0.041)
Branch Indicator	-0.037*** (0.013)	-0.005 (0.009)
Lagged Market Share	-0.029 (0.027)	-0.085*** (0.025)
Constant	0.670*** (0.006)	0.729*** (0.004)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	69,935	124,656
Adjusted R-squared	0.265	0.297

Panel E – Post-Disclosure Complaint Control

VARIABLES	(1) % Approved - LMI Area	(2) % Approved - MUI Area
Post x Complaint Volume	0.241*** (0.063)	0.080* (0.040)
Post-Disclosure Mortgage Complaints	0.015 (0.087)	0.019 (0.041)
Branch Indicator	-0.035*** (0.013)	-0.002 (0.008)
Lagged Market Share	-0.019 (0.028)	-0.045** (0.022)
Constant	0.668*** (0.006)	0.726*** (0.003)
Bank-Year FE	YES	YES
County-Year FE	YES	YES
Bank-County FE	YES	YES
Observations	73,311	141,213
Adjusted R-squared	0.269	0.306

Panel F – Applications and Approvals

VARIABLES	(1) ln(LMI Approved)	(2) ln(LMI Applied)	(3) ln(MUI Approved)	(4) ln(MUI Applied)
Post x Complaint Volume	0.693** (0.333)	0.520 (0.324)	0.845*** (0.256)	0.692** (0.285)
Branch Indicator	0.496*** (0.089)	0.652*** (0.108)	0.779*** (0.150)	0.807*** (0.160)
Market Share Lag	0.621*** (0.142)	0.576*** (0.152)	0.367** (0.180)	0.460** (0.218)
Constant	1.460*** (0.049)	1.630*** (0.053)	2.186*** (0.052)	2.405*** (0.055)
Bank-Year FE	YES	YES	YES	YES
County-Year FE	YES	YES	YES	YES
Bank-County FE	YES	YES	YES	YES
Observations	66,629	74,838	140,335	146,682
Adjusted R-squared	0.879	0.894	0.929	0.934

Panel G – Placebo Test

VARIABLES	(1) % Approved	(2) % Approved - LMI Area	(3) % Approved - MUI Area
Post x Complaint Volume	-0.003 (0.007)	0.011 (0.013)	-0.002 (0.007)
Branch Indicator	-0.009 (0.008)	-0.035*** (0.013)	-0.001 (0.008)
Market Share Lag	-0.104*** (0.023)	-0.043 (0.027)	-0.100*** (0.023)
Constant	0.726*** (0.003)	0.670*** (0.006)	0.731*** (0.003)
Bank-Year FE	YES	YES	YES
County-Year FE	YES	YES	YES
Bank-County FE	YES	YES	YES
Observations	151,574	74,838	146,682
Adjusted R-squared	0.294	0.264	0.281

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