Leverage without Risk Weights:
A Double-Edged Reform for Community Banks

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Abstract

This paper examines how the introduction of the Community Bank Leverage Ratio (CBLR) affects the capital, risk-taking, and profitability of small U.S. community banks. Using a difference-in-differences approach with propensity score matching, I find that CBLR adoption increases banks' tier 1 leverage ratios, primarily through asset contraction rather than capital accumulation. I show that adopting banks experience a rise in nonperforming loans and charge-offs and an increase in the number and volume of subordinate mortgages, both indicating heightened risk-taking. Furthermore, adopting banks report higher net interest margins, driven by strategic pricing adjustments—lowering deposit rates while increasing loan spreads. The effects on the balance sheet are less pronounced among banks with weaker pre-CBLR capital buffers, indicating a strong strategic motivation regarding risk-taking for those banks. Unlike the regulatory expectations, I do not find any evidence that CBLR adoption reduces compliance costs, challenging the intended benefits of the framework. My findings underscore the trade-offs between regulatory simplicity and financial stability, suggesting that leverage-based capital rules may inadvertently incentivize risk-taking. The study contributes to the broader debate on regulatory proportionality and the unintended consequences of simplified capital frameworks.

Keywords: Community bank, capital requirement, risk-taking

JEL Codes: E58, E63, G14, G18, G32

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Introduction

The financial health of small community banks is vital to the economic well-being of rural America and underserved regions. Rather than merely managing deposits, they extend credit to small businesses, farmers, and households that often fall outside the scope of large, nationwide lenders (Behr et al. 2013). Unlike the largest financial institutions, which rely on advanced technology and diversified capital markets, community banks typically build their business around close customer relationships and deep knowledge of local conditions[1]. Their business model is simple by design, yet that very simplicity can put them at odds with one-size-fits-all regulatory frameworks.

Since the introduction of Basel Accords, capital requirements have taken center stage in banking regulation. The idea is straightforward: banks must maintain enough capital to absorb losses during downturns and avoid cascading failures that could destabilize the financial system. Capital adequacy frameworks like the ones established under Basel III aim to ensure that banks hold capital in proportion to the risks they take[2] (Admati et al., 2018). These frameworks are layered, complex, and tailored to financial institutions with diverse portfolios and the capacity to manage extensive regulatory compliance operations. In the United States, while the federal agencies do not directly adopt Basel in its pure form, the spirit of risk-based regulation has shaped domestic capital requirements for decades.

While capital requirements are crucial in promoting financial stability, they are not a perfect solution, as banks often strategically bypass or minimize regulatory constraints. One major limitation is that capital regulations do not always prevent excessive risk-taking, as banks may engage in regulatory arbitrage by shifting risks into areas not captured by capital rules (Acharya et al., 2013).[3] Another key issue is that there is no universal agreement on the optimal level of capital requirements. Some studies suggest higher capital

[1] In fact, as of June 2021, banks with total assets greater than $10 billion held only 6% of small business loans, while small banks with total assets less than $1 billion held more than 13% of their portfolio as small business loans, see https://www.federalreserve.gov/publications/2022-october-availability-of-credit-to-small-businesses.htm

[2] Basel III introduced stricter capital adequacy requirements, including higher Tier 1 capital thresholds and additional buffers, to enhance bank resilience following the 2008 financial crisis. The reforms also introduced liquidity requirements and leverage constraints to limit excessive risk-taking.

[3] For instance, banks can securitize risky assets or use off-balance-sheet vehicles to reduce their regulatory capital needs while maintaining economic exposure to those risks (Calomiris and Nissim, 2013). Internal risk models under Basel II and III also allow banks to assign lower risk weights to specific assets, artificially reducing their capital requirements (Haldane, 2011).

buffers (e.g., above 15%) maximize stability without significantly restricting credit supply (Miles et al., 2013; Dagher et al., 2016), while others argue that one-size-fits-all regulations disproportionately burden smaller banks, which have fewer resources to raise capital and a less diversified revenue stream (Berger & Bouwman, 2013).

Prior literature focuses on the impact of capital requirements on capital adequacy, risk-taking, and bank lending behavior. On the one hand, Yang et al. (2021) show that risk-based capital regulations incentivize banks to reduce asset risks, not limited to credit portfolios but also extend to equity exposure. On the other hand, Lundtofte and Nielsen (2019) show that banks may respond to stricter regulations by increasing the share of high-risk assets. Baker and Wurgler (2015) argue that rules designed to make banks less risky may raise their cost of capital due to an inverse relationship between cost of capital and leverage. Fraisse et al. (2017) find that increasing capital requirements reduces lending.[4] Despite the extensive studies of the impact of capital requirements on banks' behavior, little attention has been given to its impact on the leverage ratio and risk-taking of small community banks. This paper attempts to fill this gap by examining how a change in capital requirement impacts the behavior of small community banks using the introduction of the Community Bank Leverage Ratio (CBLR) framework.

Regulatory policies that mandate stringent risk-weight capital adequacy ratios, stress testing, and extensive reporting obligations impose a higher burden on small banks. In response to the challenges, U.S. regulators introduced the Community Bank Leverage Ratio (CBLR) framework[5], allowing small banks to switch to a simplified leverage ratio rather than complex risk-based calculations. Specifically, CBLR framework implemented in the first quarter of 2020 allows qualifying community banks to opt into a simplified regulatory regime by maintaining a minimum Tier 1 leverage ratio of 9%, thereby eliminating the need to comply with risk-weighted capital requirements (Hogan, 2015; Kovner and Van Tassel 2022; Schliephake, 2016; and Bichsel et al. 2022). This framework is intended to reduce regulatory complexity

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[4] See also Berger (1995), Holmstrom and Tirole (1997), Kapan and Minoiu (2013), and Gambacorta and Shin (2016) for example.

[5] The CBLR framework, implemented in first quarter of 2020, allows qualifying community banks to opt into a simplified regulatory regime by maintaining a minimum Tier 1 leverage ratio of 9%, thereby eliminating the need to comply with risk-weighted capital requirements. This framework is designed to reduce regulatory complexity while ensuring that small banks continue to operate with sufficient capital buffers.

while ensuring that small banks operate with sufficient capital buffers. This event provides a unique opportunity to examine whether reducing compliance burdens affects bank behavior in meaningful ways.

At first glance, the CBLR seems like a reasonable solution that streamlines compliance for smaller institutions while preserving safety and soundness. But the policy also introduces trade-offs that have received limited empirical scrutiny. Unlike the risk-based approach, CBLR treats all assets equally, regardless of their inherent risk. That may encourage banks to shift toward riskier assets that offer higher returns per unit of capital, thereby undermining the prudential goals of capital regulation. Moreover, it is not clear whether the promised cost savings materialize at the bank level or whether adoption decisions are primarily driven by strategic considerations around capital management and profitability.

This study seeks to understand how the CBLR framework has changed the behavior of the small banks that adopted it. At its core, the analysis revolves around three questions. First, how do banks respond in terms of capital management? If the simplified leverage ratio is binding, banks may increase their capital buffers—or they may take an alternative route by shrinking their balance sheets to meet the threshold. Second, does the shift to a leverage-based regime affect the way banks take on and manage risk? With risk weights removed from the equation, banks may have greater freedom to pursue higher-yield, higher-risk assets. Finally, does CBLR actually deliver on its promise to reduce regulatory burdens and compliance costs for small banks?

There are several empirical challenges of studying the impact of CBLR introduction. One primary concern is the issue of self-selection bias. The banks voluntarily opt into the CBLR, making it difficult to distinguish whether observed changes in bank behavior are driven by the new regulatory framework or by pre-existing differences between adopters and non-adopters. If banks that choose to adopt the CBLR already have stronger balance sheets or different strategic goals, simple comparisons between adopters and non-adopters may lead to biased estimates of the framework's impact. Another challenge is that the introduction of the CBLR coincided with the COVID period, during which banks faced significant challenges. Additionally, some banks may switch back and forth between the two frameworks, either voluntarily or forced by inadequate capital ratio.

This study employs a difference-in-differences (DID) approach with propensity-score matching (PSM) to address these challenges. First, PSM matches CBLR adopters with non-adopters based on pre-adoption characteristics such as size, capital structure, funding structure, and profitability. This matching ensures that the two groups are comparable before introducing the CBLR, reducing concerns that observed differences are driven by initial disparities rather than regulatory changes. Second, the DID framework allows us to estimate the causal impact of CBLR adoption by comparing changes in key financial metrics between adopters and their matched non-adopter counterparts before and after the implementation of the framework. By controlling for time-invariant differences across banks and common macroeconomic trends, this approach isolates the effect of the CBLR on capital management, risk-taking, and lending behavior.

I start by documenting the factors influencing a bank's likelihood of adopting the CBLR framework. My findings indicate that smaller banks, well-capitalized banks, and those with a lower proportion of commercial and industrial (C&I) loans are more likely to opt into CBLR. These results align with the strategic motivations of small community banks: larger banks benefit from economies of scale in regulatory compliance, making the cost of Basel III adherence less burdensome than smaller institutions. Moreover, as banks approach the asset size threshold, they must eventually comply with Basel's risk-based capital requirements, reducing the long-term appeal of CBLR. Regarding capital adequacy, less-capitalized banks face a higher risk of non-compliance with CBLR's fixed leverage threshold. Lastly, a higher proportion of C&I loans reflects a riskier portfolio, meaning that banks already engaged in riskier lending gain little from switching to CBLR, as the framework does not offer capital relief based on asset risk. These findings highlight how banks strategically weigh regulatory costs, capital constraints, and portfolio risk when deciding whether to adopt the CBLR framework.

Then, I examine the effect of the CBLR on the leverage ratios of CBLR adopters and non-adoptoers. I find that banks that opted into the CBLR framework exhibited a higher capital ratio, driven primarily by asset contraction rather than an increase in equity. This result indicates that banks managed their balance sheets strategically to meet the simplified leverage requirement rather than raising additional capital. Furthermore, the asset shrinkage was primarily observed in lower-yield, lower-risk assets, such as cash and government securities, rather than loan portfolios, suggesting that CBLR adopters sought to optimize capital efficiency without significantly altering their core lending functions. The increase in capital ratio is also less pronounced in banks with lower capital adequacy before introducing CBLR. This finding suggests that banks strategically opt-in and explore the risk-weight disclosure. On the contrary, well-capitalized banks face very little trade-off between the two frameworks, and their main motivation is more likely to be driven by operating cost reduction.

Next, I investigate the risk-taking behavior of CBLR adopters and non-adoptors after the introduction of CBLR. I find that CBLR adopters exhibit an apparent increase in risk-taking: adopters show higher nonperforming loan ratios, net charge-off ratios, and loan loss provisions than non-adopters after the introduction of CBLR. This finding suggests that banks relax credit standards or engage in more aggressive lending to sustain profitability under the leverage-only requirement without risk-based capital constraints. Since CBLR does not penalize riskier assets with higher capital charges, banks have greater flexibility to take on risk without immediate regulatory consequences, potentially leading to a deterioration in asset quality over time. The increase in nonperforming loan and net charge-off ratios suggests that a larger share of loans is becoming delinquent, indicating weaker borrower credit quality or a shift toward higher-risk lending practices. Similarly, higher loan loss provisions reflect a proactive response to anticipated credit deterioration, suggesting banks recognize the elevated risk exposure in their portfolios. Consistent with Cao and Juelsrud (2022) which shows that banks with higher opacity on the balance sheet have higher realized risk, the increase in balance sheet opacity for CBLR adopters, induced by the removal of risk weight measurements, prompts an increase in risk-taking. Taken together, these findings indicate that the new framework leads to unintended consequences on risk-taking of small community banks.

To provide further evidence, I use the Home Mortgage Disclosure Act data and find that CBLR adopters originate a greater number and volume of subordinate mortgages, which are inherently riskier due to their lower repayment priority and higher default probabilities. This finding suggests that the leverage-based capital framework, while simplifying regulatory compliance, may unintentionally encourage greater risk-taking, raising concerns about the long-term stability of CBLR banks.

Next, I examine the lending activity of CBLR adopters and non-adopters. Unlike prior studies using other capital requirement changes, CBLR adopters exhibit no shift from one category of loans to another.

For instance, there is often a documented shift from real estate loans to commercial and industrial loans if banks want to increase risk-taking. On one hand, this finding is consistent with evidence that bank tend to diversify loan portfolio to reduce idiosyncratic risk and stabilize earnings (Gelman et al., 2023; Goetz, 2012). This is even more important for community banks as they typically operate in more localized markets with concentrated exposure to regional economic conditions. On the other hand, community banks are often less flexible in shifting the composition of loans because they have less market power than large banks (Berger and Udell, 2002; Black and Hazelwood, 2012). Combined with the increase in overall risk-taking, CBLR adopters increase risk-taking within each category of loans rather than shifting from less risky loans to more risky loans.

In addition, I also examine the net interest margin, the deposit rate, and the loan rate for adopters and non-adopters. As the restriction on total assets is stricter, banks cannot expand the loan portfolio aggressively in quantity. Instead, raising profitability is the solution and is consistent with the observed increase in risk-taking. I show that CBLR adopters exhibit an increasing net interest margin, a decrease in the deposit rate but the money market account rate remains constant. This indicates that banks do not intend to expand the deposit base as the total assets are more restricted in the new framework. Additionally, banks require liquidity to manage short-term funding needs, yet money market rates remain unadjusted. Using small business loan data, I show that the average interest rate charged increases for CBLR adopters, indicating increased risk-taking by lending to more risky borrowers.

Finally, I examine whether the CBLR framework successfully reduces regulatory costs and burdens for small institutions. To assess its effectiveness, I use non-interest expense, employee salaries, and the inefficiency ratio as proxies for regulatory cost reductions. I show that none of these variables exhibit significant changes post-adoption, suggesting that any cost savings from simplified compliance requirements are not substantial enough to be observable at the bank level. This finding further reinforces that cost reduction is not a primary driver behind a bank's decision to adopt CBLR. Instead, other strategic factors—such as capital flexibility, compliance predictability, or risk-taking incentives—likely play a more influential role in shaping adoption decisions.

My findings align with previous studies, which suggest that capital requirements may have unintended consequences. Early studies, such as Kashyap, Rajan, and Stein (2002), highlight the role of capital in mitigating systemic risk and enhancing financial stability, while Berger and Bouwman (2013) emphasize the countercyclical benefits of higher capital buffers in reducing bank fragility, particularly during financial crises. Similarly, Jordà, Richter, Schularick, and Taylor (2021) document that higher capital ratios improve bank solvency and resilience, reinforcing post-crisis regulatory measures such as Basel III. However, a competing strand of the literature suggests that capital requirements may have unintended consequences, mainly when risk weights influence capital allocation. Admati et al. (2013) argue that risk-weighted capital requirements can lead to distortions in bank behavior, encouraging institutions to manipulate risk assessments or shift assets toward lower risk-weighted but not necessarily safer instruments. Haldane (2011) critiques the reliance on internal models for risk assessment, noting that banks may game regulatory models to reduce required capital artificially. In a more recent study, Degryse et al. (2021) use the European Banking Authority (EBA) stress test exercise to show that banks prefer secured lending to optimize regulatory capital requirements, reinforcing concerns about regulatory arbitrage. My findings suggest that small community banks strategically respond to capital requirements by shrinking assets rather than raising capital to maintain higher capital ratios. At the same time, they increase overall risk-taking while preserving lending capacity and loan composition. The rise in asset riskiness is accompanied by higher profitability, driven by a lower deposit ratio and higher interest rates charged to small businesses and in the mortgage market.

This paper contributes to the literature by providing empirical evidence on how capital regulation impacts small community banks, an area that has received relatively little attention. Gropp, Mosk, Ongena, and Wix (2019) document that higher capital requirements can lead to credit contractions as banks adjust their balance sheets to meet regulatory thresholds. Fraisse, Lé, and Thesmar (2020) find that banks facing tighter capital constraints tend to shift portfolios toward lower-risk, lower-yield assets, reducing credit access for riskier borrowers. Begenau and Landvoigt (2022) extend this analysis by showing that capital requirements influence not only loan quantity but also the composition of credit supply, with banks shifting away from riskier borrowers to reduce regulatory capital needs. Laura, Popov, and Ongena (2023) use the

EBA framework to demonstrate that banks distort credit allocation during financial distress, suggesting that capital requirements can have unintended procyclical effects. However, much of this research has centered on large banks, leaving a gap in understanding how capital regulation affects small banks, which play a distinct role in financial intermediation.[6]

Unlike prior research focusing on large banks and Basel III, this study examines a tailored capital framework designed specifically for community banks. By leveraging the CBLR framework, this research isolates the impact of simplified leverage-based capital regulations on small bank behavior. The findings shed light on how regulatory relief influences capital allocation, risk-taking, and credit supply in the community banking sector. Besides, unlike other events mentioned earlier, CBLR framework is the only event in recent years that intends to alleviate capital requirement and adjust the risk-weight standards.

This paper also provides insights into the broader debate on regulatory proportionality, highlighting the importance of designing capital frameworks that account for institutional differences while maintaining financial stability. The study illustrates the unintended consequences of policy: with the main objective of reducing regulatory burden and cost not successfully achieved, the impact on risk-taking is not foreseen by the regulators.

1. Institutional Background

The Community Bank Leverage Ratio (CBLR) framework was introduced as part of the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA) of 2018. This framework was designed to simplify regulatory capital requirements for small community banks by allowing eligible institutions to bypass the traditional risk-weighted capital framework, in favor of a single leverage ratio requirement. The regulatory intent behind the CBLR was to reduce compliance burdens for smaller banks while maintaining sufficient capital adequacy to ensure financial stability.

Historically, U.S. banks have been subject to capital requirements under Basel I, II, and III, which introduced risk-based capital adequacy ratios to ensure that banks maintained sufficient capital buffers relative to their exposure to different asset classes. Basel I, implemented in the 1980s, introduced the first

[6] See also Hogan (2015), Kovner and Van Tassel (2022), Schliephake (2016), Bichsel et al. (2022).

risk-weighted capital rules, requiring banks to hold capital based on the perceived riskiness of their assets. Basel II, introduced in the early 2000s, sought to refine this system by allowing large banks to use internal models for risk assessment, which increased complexity and regulatory costs. The 2008 financial crisis exposed weaknesses in these frameworks, particularly in how banks manipulated risk weights to minimize capital requirements, leading to the adoption of Basel III. Basel III, implemented in the 2010s, introduced higher capital requirements, additional buffers, and liquidity constraints, making compliance particularly burdensome for smaller banks that lacked the resources to manage complex risk-weighted capital calculations.

In contrast, the CBLR framework provides an alternative approach to capital regulation by replacing risk-weighted capital rules with a single, static leverage ratio requirement. Under the CBLR framework, banks with less than $10 billion in total consolidated assets can opt in if they meet specific criteria, including maintaining a leverage ratio above the regulatory threshold, limiting off-balance sheet exposures, and restricting trading assets and liabilities to ensure that banks remain focused on traditional lending rather than speculative trading activities. Qualifying banks that elect to use the CBLR framework are no longer subject to the complex Basel III risk-based capital requirements and instead adhere to a single but higher Tier 1 leverage ratio as their primary capital adequacy measure.

Table 1 presents the detailed eligibility criteria and the number of eligible banks at the end of 2019, when banks can decide whether to opt in the new framework. Of all 5,196 commercial banks, 97.2% are small community banks meeting the asset requirements. Around 12% of banks did not have enough capital buffer to be eligible, and around 2% have speculative trading behavior or are subsidiaries of advanced approach banks. 83.8% of all banks ended up being eligible to accept the new framework at the end.[7] As of the third quarter in 2022, more than 1700 banks opted for the CBLR framework, representing roughly 38% of US community banks.[8]

Table 2 compares capital requirements under the CBLR framework, and the Basel capital adequacy framework based on risk-weight capital requirements. The CBLR framework establishes a single capital

[7] For a detailed discussion of eligibility, see https://www.federalreserve.gov/econres/notes/feds-notes/analyzing-the-community-bank-leverage-ratio-20200526.html

[8] See https://www.spglobal.com/market-intelligence/en/news-insights/articles/2023/11/over-1-700-banks-adopt-community-bank-leverage-ratio-reporting-standard-in-q3-79067203

requirement, defined as Tier 1 capital divided by average total consolidated assets, with a minimum threshold of 9%, an increase from 5% compared to Basel Framework.[9] As a tradeoff, multiple capital requirements based on risk-weighted assets, including the common equity tier 1 capital ratio, the tier 1 capital ratio, and the total capital ratio are not required in CBLR framework[10].

One key distinction between the CBLR framework and prior regulatory frameworks studies, such as the European Banking Authority's (EBA) capital adequacy guidelines, is the fundamental approach to capital measurement. Prior regulations focused on impose stricter requirements based on risk-wight approach, while CBLR simplifies capital adequacy. Besides, unlike the EBA's requirements, which often involve dynamic capital buffers and additional measures tailed to systemic risk considerations, the CBLR framework offers a static leverage ratio threshold. The last major distinction is that CBLR framework is a voluntary opportunity for small banks rather than a mandatory order.

The adoption of the CBLR framework is voluntary, meaning banks must evaluate the trade-offs associated with opting in. The primary intended advantage is a reduced regulatory burden, as banks are relieved from the necessity of calculating risk-weighted assets and managing capital under multiple tiers of regulatory oversight. This is expected to result in lower operating costs and reduced compliance effort.

However, concerns remain about the framework's rigidity and unintended consequences. The CBLR may impose a more binding capital constraint than the risk-based framework, particularly for banks with low-risk loan portfolios. Under Basel III, banks holding safer assets were required to hold less capital, while under CBLR, all assets are treated equally. This means that banks with low-risk portfolios may be required to hold excessive capital, making CBLR a less attractive option for them.

Conversely, since the leverage ratio does not distinguish between asset risk levels, banks with riskier portfolios may appear well-capitalized despite holding high-risk assets. To maintain compliance with the CBLR, some banks might adjust their loan origination strategies, shifting towards higher-margin, riskier

[9] Based on the Coronavirus Aid, Relief, and Economic Security (CARES) Act, the leverage ratio requirement is 8 percent for Q2 2020, 8.5 percent for 2021, and back to 9 percent from 2022 and forward.

[10] Tier 1 capital is the core capital of a bank, including common equity, retained earnings, and certain qualifying preferred stock; CET1 capital is a subset of tier 1 capital, consisting solely of common equity; Total capital is the sum of tier 1 and tier 2 capital, with tier 2 capital including subordinated debt and loan loss reserves; Risk-weighted assets is total assets adjusted for risk, where different asset classes are assigned risk weights based on their credit and market risk.

loans to maximize returns while still meeting the leverage ratio requirement. This potential shift toward higher-risk assets raises questions about whether CBLR could unintentionally incentivize increased risk-taking, as banks no longer face capital penalties for holding riskier loans.

2. Data, Variable, and Empirical Strategy

2.1. Data

The sample consists of all U.S. commercial banks that were eligible to adopt CBLR framework. The sample is quarterly based, and the sample period is from 2017 to 2024, representing three years before and five years after the introduction of CBLR framework. Banks that switched between CBLR and Basel frameworks multiple times are excluded because their strategic motivations may differ significantly from those of banks that made a one-time adoption or rejection decision. These banks might be responding to short-term regulatory interpretations, supervisory interventions, or internal risk assessments, rather than reflecting broader capital management strategies.

To study bank responses, I obtain the bank-level data from U.S. Call Reports provided by the Federal Deposit Insurance Corporation (FDIC). Call Reports provide quarterly regulatory filings on the income statements and balance sheets of all U.S. commercial banks. I obtain the interest rates of bank products from RateWatch, which provides branch-level data on rates for different loans and deposit products. The loan products include mortgages and consumer loans such as auto loans. The deposit products include the two most popular ones: 12-month certificate of deposits (CDs) with an account size of $10,000 and money market accounts with an account size of $25,000 (Drechsler et al. 2017; Lin 2020; Dlugosz et al. 2023). I constructed the quarterly average rate at bank level to match the call report.

To investigate the effect of CBLR adoption on small business lending[11], I obtain loan-level data from the Small Business Administration (SBA) 7(a) program. The SBA 7(a) program is the largest federal loan guarantee program, designed to facilitate small business access to credit by offering partial government guarantees to lenders.

[11] Another relevant dataset is the Community Reinvestment Act (CAR) data, which tracks bank lending in low- and middle-income communities. CRA data is not used in this study because only relatively large banks are obligated to report while majority of community banks in the sample are not required to report.

To investigate the effect of CBLR adoption on mortgage lending, I obtain loan-level data from the Home Mortgage Disclosure Act (HMDA), collected by the Federal Financial Institutions Examination Council (FFIEC). The dataset contains comprehensive records on mortgage loan applications, originations, and denials, providing information for studying credit supply dynamics in the residential mortgage market.

2.2. Variable

To examine the bank responses to change of capital requirement, I group bank balance sheet variables into three major categories: capital adequacy, lending behavior, and risk-taking. The main dependent variables include tier 1 leverage ratio and equity ratio. The numerator and denominator, that is equity, and total assets are examined to figure out what drives the change in ratio. The size of loans and proportion of loan to asset uncovers whether there is expansion or contraction of lending or shift from loans to other assets or vice versa. The composition of different types of loans are examined as well. As for risk-taking, there are three commonly used measurements, the nonperforming loan ratio, the net charge-off ratio, and the loan loss provision ratio. From the mortgage data, I construct two measurements of risk-taking: the percentage of the number of subordinate loans a bank originates and the percentage of the amount of subordinate loans a bank originates in a given year. The loan level rate is not used because the rate charged to a borrower depends on the borrower characteristics and the effect of CBLR is on how many risky loans a bank is willing to originate instead of how much a bank can charge compared to another bank. Finally, I examine the profitability of banks, which includes the net interest margin at bank level, and the deposit rate at product level and loan rate at bank level from small business loan[12], which combined determine the profitability. The loan rate is defined as the average interest rate a bank charged to small businesses in a given quarter.

To account for other factors influencing the outcome variables, I include a set of control variables that capture bank-specific financial conditions. Bank-level variables control for size, capitalization, funding structure, risk, and loan composition, which are important factors impacting bank's balance sheet and strategic response to capital requirement change. Following literature, I include total assets, number of

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[12] The loan rates from RateWatch are not used because they are 'advertised' rates to consumers. Firstly, they do not represent the actual rates a bank charge from customers. Secondly, there is no direct relationship with those rates and riskiness of loans. A lower 'advertised' rate may attract riskier borrowers in some circumstances.

branches, large deposits ratio, time deposit-to-liability ratio, equity-to-assets ratio, loan-to-assets ratio, charge-off ratio, asset quality, brokered deposits ratio, and loan mix as controls (Ben-David, et al. 2017; Dou et al. 2018). Detailed definition of variables used is presented in Appendix A1.

Table 3 summarizes the descriptive statistics of the dependent and control variables. All eligible banks are included in the table. The size of eligible banks is right skewed, indicated by a mean of $702 million and a median of $276 million in total assets. Real estate loans are the most important part of bank business, followed by commercial loans. We also see that CBLR adopters are not required to report CET1 capital ratio, Tier 1 capital ratio, and Total capital ratio post adoption. These three measures are roughly the same, indicating the most important part comes from the denominator, i.e., risk-weighted assets, rather than the difference between tier 1 and core tier 1 capital. Thus, the tier 1 leverage ratio is more comparable to equity ratio, with mean of 12.02% and 11.62%, respectively. Combined with Table 2, we see that the main restriction of Basel framework comes from the total capital requirement of a minimum of 10.5%, and more specifically, the risks contained in the assets.

2.3. Empirical Strategy

Evaluating the impact of the CBLR framework poses a fundamental identification challenge due to the voluntary nature of adoption. Banks that opt in may differ systematically from non-adopters in ways that influence their financial outcomes, creating a potential selection bias. For example, banks with stronger capital buffers or more conservative lending strategies may be more inclined to adopt the CBLR framework, whereas banks with more complex portfolios or higher risk exposure may prefer to remain under the risk-weighted capital framework. If these underlying differences are not properly accounted for, any observed changes in financial performance post-adoption may reflect pre-existing trends rather than the effect of the CBLR framework itself. To address this concern, this study employs propensity score matching (PSM) to construct a comparable control group, ensuring that treated and untreated banks are similar in observable characteristics prior to the policy implementation.

Table 4 presents the matching strategies. The matching strategy is designed to mitigate selection bias by pairing treated banks—those that opted into the CBLR framework—with non-adopting banks that exhibit similar pre-treatment characteristics. Motivated by Gropp et al. (2019), a nearest-neighbor matching algorithm is applied using a set of key financial covariates, including total assets, pre-adoption leverage ratio, return on assets (ROA), proportion of commercial and industrial loans, loans-to-asset ratio and deposit-to-asset ratio. These variables capture the size, capital adequacy, profitability, business model, and the funding structure of a bank. The propensity score is estimated using logit regression, where the probability of CBLR adoption is modeled as a function of these covariates. Each treated bank is then matched to its nearest non-adopting counterpart based on the estimated propensity score, ensuring that the treatment and control groups are balanced on observable characteristics. Standard covariate balance tests, including standardized mean differences and variance ratios, are conducted to verify that the matched sample effectively reduces observable differences between adopters and non-adopters. This approach allows for a more credible estimation of the causal effects of the CBLR framework by reducing biases stemming from non-random selection into treatment.

For robustness, in the second sample, I control bank type, categorized into commercial banks and savings banks based on institutional structure. Commercial banks include national banks (OCC-supervised) and state non-member banks (FDIC-supervised), while savings banks consist of state member banks (Fed-supervised) and savings institutions. This classification captures potential differences in regulatory oversight and capital enforcement, which may influence banks' incentives to opt into the CBLR framework. By incorporating bank type into the matching process, I ensure that comparisons account for institutional heterogeneity in regulatory constraints and capital management strategies.

Following the matching procedure, a difference-in-differences (DID) estimation strategy is employed to measure the effect of the CBLR framework on bank outcomes. This approach leverages the staggered adoption of the framework, comparing the pre- and post-adoption changes in key financial metrics between treated and control banks. The DID framework controls time-invariant unobserved heterogeneity and common macroeconomic shocks, isolating the differential impact of CBLR adoption. The primary estimating equation is specified as:

$$Y_{it} = \alpha + \beta(CBLR_i \times Post_t) + \gamma X_{it} + \delta_i + \lambda_t + \epsilon_{it} \tag{1}$$

where Y_{it} represents the outcome variable of interest for bank at time t, $CBLR_i$ is an indicator variable equals one if the bank is a CBLR adopter, $Post_t$ is a post-adoption time indicator equals one after 2019, and their interaction β captures the treatment effect. The specification includes bank fixed effects to account for time-invariant bank-specific characteristics, time fixed effects to control for macroeconomic trends, and a vector of time-varying control variables including bank-level financial controls. The coefficient β represents the causal effect of CBLR adoption on the outcome variable, allowing for a robust assessment of the policy's impact on capital allocation, risk-taking behavior, and lending activity.

This empirical strategy provides a framework for identifying the effects of the CBLR framework while addressing concerns related to self-selection and confounding factors. By combining PSM with DID, this study ensures that observed differences in financial outcomes can be attributed to the adoption of the CBLR framework rather than pre-existing heterogeneity or macroeconomic shocks.

3. Empirical Findings

In this section, I discuss the empirical findings. Section 3.1 provides the result of the cross-sectional test on what characteristics of the banks are related to the choice of adopting CBLR framework. Section 3.2 discusses how banks react in terms of capital adequacy, and section 3.3 provides analysis for the lending behavior and risk-taking of banks. Section 3.4 discusses the results of profitability. Section 3.5 provides robustness checks.

3.1. Motivation for adopters

Before digging into the matched sample, we first need to understand what kinds of banks are more likely to adopt CBLR, that is, the strategic motivation for banks to opt-in or stay out. The decision to opt into the CBLR framework is driven by several economic and regulatory incentives. The primary motivation for adoption stems from the simplified capital requirement that allows qualifying banks to avoid the complexities of risk-based capital regulations under Basel III. Banks with higher leverage ratios may find CBLR particularly attractive, as they can maintain compliance without calculating risk-weighted assets, reducing compliance costs. Smaller banks, which typically face higher regulatory burden relative to their size because of lack of expertise, may find the streamlined approach beneficial. However, larger banks, well-capitalized institutions, or those with a high proportion of risk-weighted assets may prefer to maintain under the Basel framework. Banks with more complex risk exposures or those engaging in activities requiring significant capital buffers might find CBLR constraint inflexible. Furthermore, banks with substantial commercial loan exposure or volatile asset portfolios may find CBLR does not sufficiently capture their risk profiles, leading them in favor of a more tailored risk-based approach.

Table 5 runs a logic regression using the cross-sectional data at the end of 2018, one year prior to the formal introduction of CBLR, to avoid potential influence of early planning. The dependent variable is a dummy equals to one if a bank adopts CBLR and zero otherwise. The independent variables are the ones used in Table 4, including size, tier 1 leverage ratio, return to assets (ROA), proportion of commercial loans, loans-to-asset ratio, and deposit-to-asset ratio. The expectations are confirmed: bank size has a strong and highly significant negative effect on CBLR adoption, indicating smaller banks are more likely to opt in. The regulatory capital ratio is positively related to adoption, suggesting well-capitalized banks find CBLR attractive. Proportion of commercial loans, as a proxy for risk contained in loan portfolio, has significant negative effect, confirming that banks with already riskier portfolios tend to avoid CBLR. Other coefficients, though not statistically significant, have expected signs. For instance, loan-to-asset ratio is also a proxy for risk contained in bank asset as loans are risky part of the asset, thus, the negative relationship is consistent with the proportion of commercial loans.

Overall, these findings confirm that among eligible banks, certain characteristics are highly correlated with the decision to adopt CBLR. To evaluate the effect of CBLR clearly, propensity score matching is necessary to provide common support and exclude banks that are different from the adopters in terms of key characteristics.

Table 6 presents the pretreatment characteristics of banks in Q4 2018. The variables used to perform matching are the same as in Table 5. There is a substantial difference between adopters and other banks as indicated in column (1) and (2). Adopters have smaller sizes, higher capital adequacy, lower profitability, less commercial loans and total loans. Column (3) and (4) present the statistics for matched sample while column (6) and (7) present the statistics for matched sample using banks within same type. There are still some biases, however, matching reduces the difference between two groups significantly. To confirm the effectiveness of matching, I rerun the logistic regression in Table 5 using the matched samples. The results are shown in Appendix A-2, with only two covariates marginally significant.

3.2. Effect on Capital Adequacy

Prior regulations that increased the capital requirement such as EBA has a direct impact about bank's capital adequacy ratio. Banks had to comply with the new regulation that may set a higher standard than the current ratio some banks had. However, the situation is more complex in our case. First, CBLR is not a mandatory requirement, and banks can choose to opt in, stay out or switch between. Second, all eligible banks meet both the requirements of Basel and CBLR, leaving them sufficiently capitalized under both regulations. Although there are some differences, I expect the impact on capital adequacy is consistent, that adopters tend to increase tier 1 leverage ratio, to avoid potential violation of regulation by preparing more capital buffers.

Table 7 confirms that CBLR adoption significantly increases the tier 1 leverage ratio of 28.8 and 32.4 basis points indicated by the coefficients on $Treat_i \times POST_t$, depending on the matched sample used. Key bank financials are controlled along with bank and year-quarter fixed effects. This pattern suggests that banks strategically adjust their balance sheets to meet the new leverage-based requirement. Since CBLR mandates a minimum leverage ratio without risk-weighted capital requirements, banks must optimize their capital structure accordingly.

A key question is whether this increase in the tier 1 leverage ratio is driven by an increase in capital, the numerator, or a reduction in assets, the denominator. I expect banks adopters tend to shrink assets instead of raising capital, consistent with prior studies using EBA as an experiment and conclude banks are reluctant to raise capital (Gropp et al., 2019). Column (2), (3), and column (5), (6) confirm that total assets decline significantly both statistically and economically while the total equity does not change in similar magnitude. The results suggest that banks primarily adjust tier 1 leverage ratio by shrinking assets rather than raising new equity capital. The lack of substantial equity growth implies that CBLR banks choose to contract their balance sheets rather than accumulate additional equity buffers, likely to avoid the dilution of shareholder value or costly capital raises. As CBLR is a voluntary framework and equity raising can be costly, there is no reason that a bank will choose to opt in if they need to raise capital under the new framework.

Figure 3 presents event study estimates that examine the effect of CBLR adoption on the Tier 1 leverage ratio, total assets, and total equity over time. In this context, testing for parallel trends ensures that, absent CBLR adoption, the leverage ratios, assets, and equity levels of treated and control banks would have evolved similarly prior to the adoption of CBLR. To assess this, the event study estimates trace the trajectory of key financial indicators both before and after CBLR adoption, allowing us to observe whether there were any systematic pre-treatment differences between adopting and non-adopting banks.

The results in Figure 3 confirm that there are no significant pre-trends in leverage ratios, total assets, or equity levels prior to CBLR adoption, reinforcing the validity of the identification strategy. The Tier 1 leverage ratio (top-left panel) remains stable before CBLR adoption, suggesting that treated and control banks followed a common trend before the policy change. However, following adoption, leverage ratios increase significantly, demonstrating that banks adjust their capital structure to comply with the new regulatory requirement.

Similarly, the total asset trajectory (top-right panel) indicates a clear downward trend post-adoption, with no significant differences before CBLR adoption. This confirms that banks primarily adjust to the new leverage constraint by contracting their balance sheets rather than raising new capital. The total equity response (bottom panel) remains largely unchanged both before and after CBLR adoption, further supporting the hypothesis that asset reduction, rather than capital accumulation, is the main driver of leverage ratio increases.

The observed asset contraction rather than capital accumulation aligns with strategic bank behavior in response to regulatory constraints. Banks may find reducing assets to be a more efficient mechanism for meeting leverage ratio requirements than raising additional equity, particularly when equity issuance is costly or dilutive. Additionally, balance sheet contraction allows banks to adjust their risk exposure and liquidity profiles in response to regulatory changes. This strategic choice reflects an underlying trade-off: while a higher leverage ratio ensures regulatory compliance, reducing assets can limit lending capacity and long-term growth prospects. The fact that CBLR adoption is voluntary suggests that banks opting in are those for whom this trade-off is more favorable, particularly smaller banks that benefit from reduced compliance costs and regulatory complexity.

The subsample analysis in Table 8 further explores whether banks with stronger pre-adoption capital positions adjust differently post-CBLR. The $Treated \times Post \times Equity$ interaction is positive and significant, meaning that banks with higher pre-adoption equity ratios experience a larger increase in their post-CBLR leverage ratio. This effect is expected because banks with stronger capital buffers are better positioned to comply with the leverage requirement without making drastic balance sheet adjustments.

In contrast, banks with lower pre-adoption equity ratios face greater constraints, as they have less capital available to support the required leverage ratio under CBLR. Without sufficient pre-existing capital, these banks are hard to engage in more aggressive asset reductions to comply with the new framework. Since raising new capital can be costly—due to dilution concerns, regulatory scrutiny, or investor confidence, these banks choose to maintain the marginally qualified level of capital ratio. That poses another question: why do those banks choose to adopt CBLR even if they face the imminent risk of having leverage ratio lower than qualifiable threshold? Then the answer must be related to the risk disclosure part of the new framework, which we will discuss in the next section.

These findings contribute to the broader literature on regulatory arbitrage and capital structure adjustments, showing that banks actively manage their balance sheets in response to changes in capital requirements. Unlike risk-based capital rules, which encourage banks to optimize risk-weighted assets, the leverage-based CBLR framework incentivize balance sheet size adjustments rather than risk reallocation. The evidence suggests that CBLR-constrained banks primarily increase leverage by reducing asset size rather than building additional capital buffers, a strategic response that allows them to comply with the regulation while minimizing the impact on profitability and capital costs.

The findings in Table 9 provide further insight into how CBLR adoption affects bank balance sheet adjustments, particularly regarding asset composition and lending activity. While previous results suggest that banks increase their Tier 1 leverage ratios primarily by reducing total assets, this table clarifies that such reductions are not driven by a contraction in loan supply. Instead, CBLR adopters appear to maintain lending activity while cutting non-loan assets such as cash, securities, or other liquid investments. This strategic adjustment allows banks to comply with the leverage requirement without restricting credit availability, which is crucial for sustaining borrower relationships and revenue generation. However, the reduction in non-loan assets could have implications for liquidity management and risk exposure, as lower levels of cash and securities might leave banks more vulnerable during economic downturns or periods of financial stress. This suggests that CBLR adoption may come with trade-offs—while reducing regulatory complexity, it may increase financial fragility by lowering liquidity buffers.

The empirical results in Table 9 support this interpretation. The coefficient on $Treated \times Post$ is statistically insignificant for loan amounts and loan growth (Columns 1, 3, 4, and 6), indicating that banks do not significantly alter their lending activity following CBLR adoption. However, the loan-to-asset ratio increases significantly in both the full sample match (Column 2) and same-type match (Column 5), suggesting that total asset reductions stem from non-loan categories. On average, CBLR adopters increase loan-to-asset ratio by 0.46% and 0.52%, depending on matched samples. The large and positive coefficients on loan-to-asset ratio confirm that CBLR adopters retain their loan portfolios while shrinking other asset components. These results reinforce the idea that banks strategically manage their balance sheets by optimizing their asset composition rather than altering their core lending operations.

3.3. Effect on Lending Behavior and Risk-taking

The decision to opt into CBLR, as discussed earlier, reflects a strategic trade-off between regulatory simplicity and financial flexibility. Banks that choose CBLR but have leverage ratios only marginally above the qualifying threshold face a higher cost if they fail to maintain compliance. Thus, they are more likely to adopt CBLR because of the removal of risk weight measures, which provide an opportunity for banks to exploit the policy. However, even for well-capitalized banks, by moving away from risk-based capital requirements, these banks may become less sensitive to underlying asset risk, as their capital buffers are no longer explicitly tied to portfolio risk levels. This shift raises an important question: does the removal of risk-based capital constraints lead to greater risk-taking? Understanding this transition from capital adequacy to risk behavior is crucial for evaluating the long-term implications of CBLR adoption.

Under the CBLR framework, banks operate under a simplified capital regulation that removes risk-weighted capital constraints, potentially altering their lending behavior and risk-taking incentives. One plausible expectation is that banks may shift their loan composition toward riskier categories, such as commercial loans, given that they are no longer subject to higher capital charges for riskier assets. However, small banks—who are the primary adopters of CBLR—face structural constraints that make large-scale portfolio adjustments difficult. Unlike large institutions with diversified lending operations, small banks typically specialize in specific loan segments, such as real estate or small business lending, making it challenging to reallocate credit to new categories. Instead of shifting loan composition, it is more likely that banks adjust risk levels within existing loan segments, relaxing credit standards or lending more aggressively. This distinction is important because it implies that any observed increase in risk-taking is likely to occur within loan categories rather than across them.

The results in Table 10 confirm that CBLR adoption does not significantly affect loan composition. The coefficient on $Treated \times Post$ is statistically insignificant across commercial, real estate, and consumer loan shares, indicating that banks do not rebalance their loan portfolios in response to CBLR. This suggests that rather than shifting their loan mix, banks primarily modify their lending behavior within each category to accommodate the new regulatory constraints. This difference compared to prior studies is likely attributed to the unique business model of community banks.

To examine the bank risk-taking and consistent with prior studies, I use nonperforming loan ratio, net charge-off ratio, and loan loss provision ratio to approximate the risk-taking behavior. All dependent variables are leading 2, 4, and 6 quarters as risks take time to accumulate and appear on balance sheet.

Table 11 provides strong evidence of increased risk-taking post-CBLR adoption. The nonperforming loan (NPL) ratio rises significantly in the years following adoption, suggesting that banks expand lending to riskier borrowers. Similarly, charge-off ratios increase, confirming that CBLR adopters experience higher loan losses over time. Additionally, banks respond by raising loan loss provisions, indicating that they anticipate future deterioration in loan performance. Importantly, these effects occur without a shift from real estate loans to commercial loans, reinforcing the idea that risk-taking intensifies within existing loan categories rather than through portfolio reallocation. This pattern aligns with the incentives created by

CBLR—without risk-based capital constraints, banks may loosen credit standards, extend more loans to marginal borrowers, or engage in riskier underwriting practices while keeping their overall loan distribution unchanged.

To find more evidence on the increased risk-taking, I use the HMDA dataset to examine whether CBLR banks supply credits to more risky borrowers[13]. I construct two measures of bank risk-taking in the mortgage market, the first one is the total number of subordinate liens a bank originates divided by the total number of mortgage a bank originates in a year ($\%Num\ Sub\ Loan$), and the second one is the total amount of subordinate liens a bank originates divided by the total number of mortgage a bank originates in a year ($\%Amt\ Sub\ Loan$)[14].

Table 12 shows the bank risk-taking in the mortgage market. The results show that after adopting CBLR, banks increase their exposure to higher-risk borrowers. $\%Num\ Sub\ Loan$ increase by 1.2% and 1% significantly based on different samples. Compared to an average of 8.7% of the number of the subordinate liens, this represents an increase of 14% in magnitude. The increase not only occurs at the quantity of risky loans, but also at the total exposure level. $\%Amt\ Sub\ Loan$ increase by 0.67% and 0.60% significantly based on different samples. Compared to an average of 3.3% of the amount of the subordinate liens, this represents an increase of 20% in magnitude.

Overall, the evidence indicates that while CBLR adoption does not lead to large-scale changes in loan portfolios, it does incentivize banks to take on greater credit risk within their established lending segments. This shift in risk-taking behavior has important implications for financial stability, as it suggests that the removal of risk-based capital constraints encourages more aggressive lending strategies among small banks. Future research could explore whether these effects persist over time and whether they contribute to increased financial fragility in the long run.

[13] Syndicated loan data is another loan-level data that provides detailed information on borrower and loan characteristics, however, only a small proportion of community banks participate in syndicated loans, making it less applicable in this study.

[14] There are six types of bank actions reported under HMDA: Loan originated, application approved but not accepted, application denied, application withdrawn, file closed for incompleteness, and loan purchased. I only include loan originated to construct the measure as these reflect the bank's actual risk-taking. Loan purchased only represents a small proportion of institutions, and most banks do not involve in loan purchasing.

3.4. Effect on Profitability and the Intended Effect

A key objective of CBLR adoption is to improve bank performance by simplifying capital requirements. One expected channel for this effect is through increased profitability, as banks gain regulatory flexibility in capital allocation. The results presented in Table 13 indicate that CBLR adoption is associated with a significant improvement in net interest margin (*NIM*). The coefficient on *Treated* × *Post* is positive and statistically significant, suggesting that CBLR banks increase profitability after opting into the framework. Compared to the average net interest margin of 3.59%, CBLR adopters have increases of 3.24 and 3.59 basis points depending on different samples.

The increase in NIM can be attributed to two key mechanisms. First, banks may be charging higher loan rates to compensate for increased risk-taking. While loan pricing is not directly reported in the table, earlier findings on risk exposure suggest that banks extend more credit to riskier borrowers, which likely translates into higher loan spreads. Second, banks optimize their funding structure by lowering deposit costs. The decline in certificate of deposit (CD) rates, as reflected in Columns 2 and 5 of Table 13, indicates that banks reduce the cost of long-term funding. Interestingly, money market deposit rates remain unchanged, suggesting that banks focus on adjusting longer-term rather than short-term deposit pricing. These findings align with the hypothesis that CBLR banks adopt a profit-driven strategy by simultaneously expanding riskier lending and reducing funding costs, ultimately enhancing net interest margins.

While banks improve profitability post-adoption, the expected cost reduction effects of CBLR adoption do not materialize. As shown in Table 14, the coefficients on *Treated* × *Post* for noninterest expenses, employee salaries, and inefficiency ratios [15] remain statistically insignificant across all specifications. This suggests that CBLR does not meaningfully reduce regulatory or operational costs, at least in the short term. Despite the simplified capital requirements, banks do not experience significant declines in compliance-related expenses, employee costs, or overall inefficiency measures.

These findings challenge the notion that banks opt into CBLR primarily to achieve cost efficiencies. If compliance burdens were a major concern, one would expect to observe a decline in operational costs.

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[15] Named as "Efficiency Ratio" on call report but it measures the inefficiency of a bank, defined as Non-interest Expenses / (Net interest income + non-interest income)

Instead, the lack of measurable cost reductions suggests that banks may be motivated by alternative strategic incentives, such as capital flexibility, balance sheet management, or regulatory arbitrage. This is consistent with earlier evidence showing that CBLR banks contract their balance sheets rather than raising new capital, potentially offsetting any reductions in regulatory burden.

Taken together, the results suggest that CBLR adoption has a positive impact on profitability but does not lead to significant cost savings. Banks appear to leverage the simplified regulatory framework to optimize their revenue structure rather than reduce expenses, supporting the view that CBLR provides strategic flexibility rather than direct cost relief.

3.5. Robustness Check

One potential concern is that the adoption of CBLR overlaps with COVID-19, which may have influenced bank capital decisions, loan portfolios, and overall risk-taking behavior in ways unrelated to the CBLR framework. To mitigate this concern, I exclude data from 2020 and 2021, as the pandemic significantly affected economic conditions during this period. Rerunning the primary regressions without these two years, the main results remain unchanged, suggesting that the observed effects of CBLR adoption are not driven by pandemic-related disruptions. Table A-3 in appendix suggests that the main results remain the same.

It's important to note that the pandemic's impact was widespread, affecting both CBLR-adopting and non-adopting banks similarly. This widespread effect suggests that the differences between the treatment and control groups are not significantly biased by the pandemic, as both groups were subjected to similar external shocks during this period.

Conclusion

This paper examines how small community banks adjust their capital, risk-taking, and profitability in response to CBLR adoption. I show that CBLR banks primarily increase their Tier 1 leverage ratios by shrinking assets rather than raising capital, with no evidence of reductions in regulatory compliance costs. Despite maintaining lending activity, banks take on greater credit risk within existing loan categories, leading to higher nonperforming loans, charge-offs, and loan loss provisions. Additionally, CBLR banks improve profitability through higher net interest margins (NIM), achieved by lowering deposit rates while expanding riskier lending.

A key contribution of this study is its focus on small community banks, which operate under unique constraints compared to larger institutions. These banks play a crucial role in local credit markets, particularly for small businesses and mortgage borrowers, yet their response to capital regulations differs significantly. Unlike large banks with diversified portfolios and access to alternative funding sources, small banks face greater trade-offs between capital preservation and risk-taking.

These results contribute to the literature on regulatory capital requirements and bank behavior by showing that shifting from risk-based capital rules to a simplified leverage-based approach alters risk incentives. Unlike prior studies focusing on capital optimization under Basel III, this paper highlights how banks strategically adjust their balance sheets when faced with a non-risk-sensitive capital framework. The findings suggest that leverage-based capital regimes may incentivize higher risk-taking without improving cost efficiency, raising concerns about long-term financial stability.

From a policy perspective, these findings suggest that CBLR may not achieve its intended goal of reducing regulatory burdens while maintaining prudential safeguards. While the framework simplifies compliance, it also incentivizes banks to adjust their portfolios in ways that increase financial vulnerability. Under simplified capital frameworks, regulators should consider complementary risk-based oversight mechanisms to prevent excessive risk-taking. Future research could explore longer-term impacts on bank stability and credit availability, particularly during economic downturns.

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Table 1 CBLR Eligibility Criteria and Bank Counts

This table outlines the eligibility criteria for the Community Bank Leverage Ratio (CBLR) framework and the number of banks meeting each criterion as of Q4 2019. The filtering process sequentially excludes banks that exceed size, capitalization, or risk-related thresholds.

Filtering Criteria	Number of Banks
Number of Banks in 2019 Q4	5196 (100.0%)
Minus: Large banks having Avg. Total Consolidated Assets > $10 Billion	5051 (97.2%)
Minus: Not adequately capitalized banks having tier 1 leverage ratio < 9%	4434 (85.3%)
Minus: Banks having off-balance sheet items > 25% of Total Assets	4359 (83.9%)
Minus: Banks having trading assets + trading liabilities > 25% of Total Assets and banks that are subsidiaries of advanced approach banks	4352 (83.8%)

Table 2 Comparison of Capital Requirements

This table compares the capital adequacy requirements under the Community Bank Leverage Ratio (CBLR) framework and the Basel framework. The CBLR framework relies on a simple leverage ratio based on total consolidated assets, whereas the Basel framework applies risk-weighted capital ratios, requiring different capital levels depending on asset risk.

	CBLR Framework	Basel Framework			
Ratio	Tier 1 Leverage Ratio	Tier 1 Leverage Ratio	CET1 Capital Ratio	Tier 1 Capital Ratio	Total Capital Ratio
Numerator	Tier 1 Capital	Tier 1 Capital	CET1 Capital	Tier 1 Capital	Total Capital
Denominator	Avg. Total Consolidated Assets	Avg. Total Consolidated Assets	Risk-weighted Assets	Risk-weighted Assets	Risk-weighted Assets
Min. Requirement	9%	5%	7%	8.5%	10.5%

Table 3 Summary Statistics

This table presents summary statistics for key bank variables used in this study. The sample includes all eligible banks that can switch to CBLR framework and run from 2017 to 2024. CET1 capital ratio, tier 1 capital ratio, and total capital ratio, have fewer observations because adopters of CBLR do not report these capital ratios afterwards. Certificate of deposit rate and money market account rate runs from 2017 to 2023 Q2 due to the limited coverage of RateWatch.

Bank characteristics	N	Mean	Median	SD	25%	75%
Total assets ($M)	101134	702.77	276.43	1370.58	128.39	642.74
Total loans leases ($M)	101134	479.61	174.73	980.36	74.2	437.68
Commercial loans (%)	101134	13.25	10.98	10.92	6.44	17.17
Real estate loans (%)	101134	72.81	76.38	19.01	63.18	86.3
Consumer loans (%)	101134	5.28	2.69	8.87	.96	6.05
Equity capital ratio (%)	101134	11.62	10.78	4.74	9.29	12.8
CET1 capital ratio (%)	74286	19.16	15.53	101.8	12.98	20
Tier 1 capital ratio (%)	74286	19.17	15.54	101.8	13	20
Total capital ratio (%)	74286	20.28	16.64	107.47	14.1	21.11
Tier 1 leverage ratio (%)	101134	12.01	10.92	4.41	9.7	12.9
Non-interest expense (%)	101134	1.77	1.52	2.93	.88	2.22
Return on assets (%)	101134	1.22	1.03	6.97	.68	1.42
Return on equity (%)	101134	11.05	9.58	186.43	6.03	13.34
Net interest margin (%)	101134	3.63	3.55	1.32	3.09	4.03
Charge-offs/total loans (%)	101134	7.3	.4	129.17	-.2	4.94
Nonperforming/total loans (%)	101134	.53	.28	1.86	.07	.67
Loan-loss/total loans (%)	101134	.08	.03	.38	0	.08
Deposit/total liability	101134	95.05	97.28	6.41	92.89	99.31
Log(number of branches)	101134	1.43	1.39	1.04	.69	2.08
Large deposit ratio (%)	101134	35.3	33.66	15.13	24.93	43.79
Time deposit to liability ratio (%)	101134	26.83	24.56	14.72	16.33	34.73
Total loans/total assets (%)	101134	63.74	66.15	16.18	53.89	76.07
Asset quality	101134	93.19	93.58	3.85	91.91	95.18
Brokered deposit ratio (%)	101134	2.82	0	7.35	0	2.34
Employee salary and benefit ($M)	101134	6.27	2.24	13.97	.93	5.73
Efficiency ratio (%)	101134	67.39	65.86	24.55	57.1	75.43
Certificate of deposit rate (%)	70000	.69	.45	.65	.25	.9
Money market account rate (%)	66086	.25	.17	.28	.1	.3

Table 4 Matching Strategies

This table summarizes the matching strategy used to construct a comparable sample of CBLR adopters and non-adopters. The matching is performed using a 1:1 ratio with replacement based on financial characteristics from Q4 2018, one year before CBLR implementation—to prevent systematic differences driven by anticipatory behavior. Two approaches are employed: full sample matching, where treated banks are matched across all eligible banks, and same-type matching, where treated banks are only matched to control banks of the same bank type (commercial banks and saving banks).

Matching Strategies	Full Sample	Same type
Sample used	Full Sample	Full Sample
Number of matches	1:1	1:1
Matching covariates:		
Total assets	√	√
CET1 leverage ratio	√	√
Net income / total assets	√	√
Commercial & industrial loans / total loans	√	√
Total loans / total assets	√	√
Total deposits / total assets	√	√
Bank Type		√

Table 5. CBLR Adoption Logit Regression

This table presents the results of a logistic regression estimating the likelihood of CBLR adoption. The regression model is specified as: $Y_i = \frac{e^{\beta_0+\beta X_i+\varepsilon_i}}{1+e^{\beta_0+\beta X_i+\varepsilon_i}}$ where $Y_i = 1$ if bank i adopts the CBLR framework and 0 otherwise. The vector X_i includes key financial characteristics: total assets, CET1 leverage ratio, net income to total assets (ROA), commercial and industrial loans to total loans, total loans to assets, and deposits to assets. The sample consists of cross-sectional bank observations from 2018 Q4. ***, **, * indicate the significance level at 1%, 5% and 10% respectively.

Variable	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
Total assets	-.451	.036	-12.48	0	-.522	-.38	***
CET1 leverage ratio	.041	.015	2.66	.008	.011	.071	***
ROA	-.006	.004	-1.51	.132	-.015	.002	
C&I loans to total loans	-.013	.004	-3.16	.002	-.022	-.005	***
Loans to assets	-.003	.003	-1.32	.188	-.009	.002	
Deposits to assets	.003	.008	0.40	.69	-.013	.019	
Constant	4.934	1.017	4.85	0	2.941	6.927	***

Mean dependent var	0.435	SD dependent var	0.496
Pseudo R-squared	0.067	Number of obs	3180
Chi-square	242.181	Prob > chi2	0.000
Akaike crit. (AIC)	4075.382	Bayesian crit. (BIC)	4117.835

Table 6 Pretreatment Characteristics of Banks

This table provides the pretreatment mean comparisons for bank characteristics in Q4 2018. Column (1) and (2) compare the mean of matching covariates of 1437 adopted banks and 1784 non-adopted banks in the unmatched full sample. Column (3) and (4) compare the mean values of the full matched sample. Column (6) and (7) compare the mean values of the same-type matched sample. Column (5) and (8) presents the standardized percentage bias[16] (*%Bias*) between adopters and other banks in the two matched sample.

	Full Sample		Full Sample Match			Same Type Match		
Variable	Adopted	Other	Adopted	Other	%Bias	Adopted	Other	%Bias
Total assets	12.057	12.643	12.057	11.996	6.0	12.052	11.998	4.8
CET1 leverage ratio	13.292	11.885	13.292	12.766	10.1	13.313	12.799	10.9
Net income / total assets	1.202	1.332	1.202	1.052	9.3	1.203	1.043	2.4
C&I loans / total loans	11.475	13.103	11.475	11.348	1.4	11.477	11.013	4.7
Total loans / total assets	64.7	67.8	64.7	64.0	4.6	64.6	65.4	-5.0
Total deposits / total assets	82.706	83.37	82.706	83.567	-11.7	82.746	83.237	-7.0

[16] Defined as $\%Bias = \frac{\overline{X_{\text{Treated}}} - \overline{X_{\text{Control}}}}{\sqrt{\frac{S^2_{\text{Treated}} + S^2_{\text{Control}}}{2}}} \times 100$

Table 7 Effect of CBLR Adoption on Bank Balance Sheet

This table reports the regression results of the difference-in-difference analysis based on the event of adoption of CBLR framework. The regression model is specified as:

$$Y_{it} = \alpha + \beta(CBLR_i \times Post_t) + \gamma X_{it} + \delta_i + \lambda_t + \epsilon_{it}$$

where Y_{it} are tier 1 leverage ratio, total asset, and total equity of banks. The sample consists of bank-quarter observations during the 2017-2024 time period. The treatment variable ($Treated$) equals to one for adopted banks and zero for the banks adhering to Basel framework. $Post$ is the post-event dummy variable that equals one for the five years after the introduction of CBLR framework and zero for three years before the introduction of CBLR framework. Only coefficients for $Treated \times Post$ are reported, as $Treated$ and $Post$ are subsumed by bank and year fixed effects. All variables are defined in Appendix A. Standard errors are clustered at the bank level. ***, **, * indicate the significance level at 1%, 5% and 10% respectively.

	Full Sample Match			Same Type Match		
	(1)	(2)	(3)	(4)	(5)	(6)
	Leverage Ratio	Log (Asset)	Log (Equity)	Leverage Ratio	Log (Asset)	Log (Equity)
Treated × Post	0.2884***	-0.0141***	0.0221**	0.3238***	-0.0152***	0.0244**
	(3.50)	(-4.35)	(2.35)	(3.51)	(-4.21)	(2.36)
Deposits to Liabilities (%)	0.0383***	0.0008***	0.0076***	0.0409***	0.0007**	0.0075***
	(5.25)	(3.00)	(10.02)	(5.47)	(2.33)	(8.80)
log (Asset)	-1.6216***	0.8776***	0.8150***	-1.5213***	0.8772***	0.8191***
	(-6.46)	(63.86)	(28.57)	(-5.72)	(60.18)	(26.32)
log (Num of Branches)	-0.5574**	0.0057	-0.0060	-0.6431**	0.0084	-0.0051
	(-2.11)	(0.68)	(-0.24)	(-2.20)	(0.93)	(-0.18)
Large Deposits Ratio (%)	-0.0101*	0.0003	-0.0008	-0.0077	0.0003	-0.0004
	(-1.82)	(0.95)	(-0.95)	(-1.30)	(0.81)	(-0.39)
Time Deposits to Liabilities (%)	-0.0180**	-0.0001	-0.0046***	-0.0182**	-0.0000	-0.0042***
	(-2.52)	(-0.44)	(-6.23)	(-2.35)	(-0.06)	(-5.12)
Loans to Assets (%)	-0.0041	0.0017***	0.0031***	-0.0037	0.0015***	0.0029***
	(-0.87)	(6.76)	(5.37)	(-0.73)	(5.54)	(4.61)
Charge-off Ratio (%)	0.2018**	-0.0121***	0.0074	0.2080*	-0.0115**	0.0078
	(1.97)	(-2.58)	(0.66)	(1.88)	(-2.25)	(0.65)
Asset Quality	-0.0192	-0.0004	-0.0050**	-0.0209	-0.0005	-0.0050**
	(-0.96)	(-0.60)	(-2.16)	(-0.97)	(-0.80)	(-2.01)
Brokered Deposits Ratio (%)	-0.0349**	0.0009	-0.0026**	-0.0387**	0.0011	-0.0029**
	(-2.55)	(0.94)	(-2.39)	(-2.56)	(1.06)	(-2.40)
Real Estate Loans (%)	-0.0249	0.0023***	-0.0005	-0.0164	0.0025***	-0.0001
	(-1.46)	(3.66)	(-0.45)	(-1.01)	(3.77)	(-0.09)
Commercial Loans (%)	-0.0217	0.0017***	-0.0022*	-0.0084	0.0018***	-0.0019
	(-1.43)	(4.81)	(-1.85)	(-0.70)	(4.47)	(-1.40)
Consumer Loans (%)	-0.0366	0.0020**	-0.0008	-0.0309	0.0024**	-0.0003
	(-1.34)	(2.09)	(-0.31)	(-1.06)	(2.26)	(-0.09)
Bank FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	77237	77237	77237	64952	64952	64952
R^2	0.869	0.995	0.975	0.866	0.995	0.975

Figure 1 Dynamic Difference-in-Differences Estimates

This figure presents the point estimates and 95% confidence intervals for η_τ from estimating

$$Y_{it} = \alpha + \sum_{\tau=-11}^{20} \eta_\tau CBLR_i \times Post_t I(\tau_t) + \gamma X_{it} + \delta_i + \lambda_t + \varepsilon_{it}$$

Where Y_{it} are tier 1 leverage ratio, total asset, and total equity of banks and $I(\tau_t)$ represents a dummy variable indicating that quarter t is τ quarters before/after the adoption of CBLR, i.e., the end of 2019. All specifications include bank control variables. Standard errors are clustered at the bank level. ***, **, * indicate the significance level at 1%, 5% and 10% respectively.

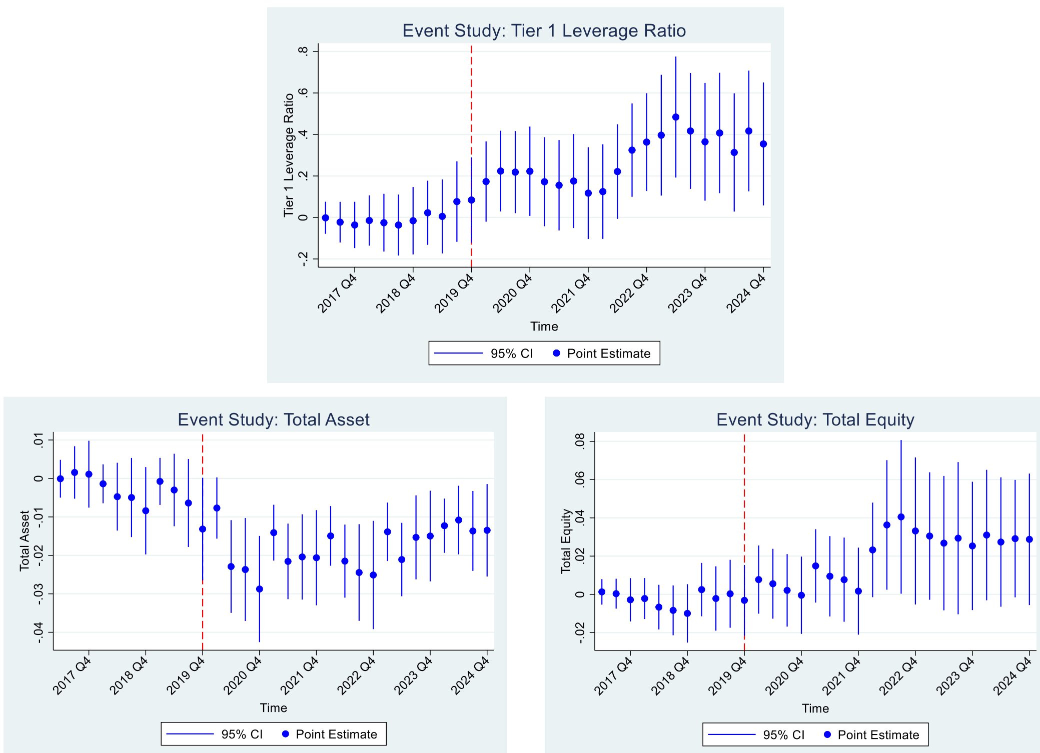

Table 8 Subsample on Pre-Event Capital Adequacy

This table reports the regression results of the CBLR adoption on tier 1 leverage ratio conditional on the capital adequacy ex ante. I measure the capital adequacy of banks using two measures: i) *Equity* is the equity ratio (equity/assets), and ii) *Leverage* is the tier 1 leverage ratio (tier 1 capital/assets). All variables are defined in Appendix A. Standard errors are clustered at the bank level. ***, **, * indicate the significance level at 1%, 5% and 10% respectively.

	Full Sample Match		Same Type Match	
	(1)	(2)	(3)	(4)
	Leverage Ratio	Leverage Ratio	Leverage Ratio	Leverage Ratio
Treated × Post × Equity	0.0863**		0.0840**	
	(2.27)		(2.08)	
Treated × Post	-0.7782*		-0.7196	
	(-1.73)		(-1.50)	
Post × Equity	-0.1072***		-0.1141***	
	(-3.64)		(-3.42)	
Treated × Post × Leverage		0.1010**		0.0795*
		(2.33)		(1.79)
Treated × Post		-1.0084*		-0.6953
		(-1.87)		(-1.27)
Post × Leverage		-0.0793***		-0.0845***
		(-2.96)		(-2.64)
Bank Controls	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Observations	77237	77237	64952	64952
R^2	0. 871	0. 870	0.868	0.868

Table 9 Asset Shrinking

This table reports the regression results of the difference-in-difference analysis based on the event of adoption of CBLR framework. The regression model is specified as:

$$Y_{it} = \alpha + \beta(CBLR_i \times Post_t) + \gamma X_{it} + \delta_i + \lambda_t + \epsilon_{it}$$

where Y_{it} are log of total loans, total loans to total assets, and the growth rate of total loans. The sample consists of bank-quarter observations during the 2017-2024 time period. The treatment variable ($Treated$) equals to one for adopted banks and zero for the banks adhering to Basel framework. $Post$ is the post-event dummy variable that equals one for the five years after the introduction of CBLR framework and zero for three years before the introduction of CBLR framework. Only coefficients for $Treated \times Post$ are reported, as $Treated$ and $Post$ are subsumed by bank and year fixed effects. All variables are defined in Appendix A. Standard errors are clustered at the bank level. ***, **, * indicate the significance level at 1%, 5% and 10% respectively.

	Full Sample Match			Same Type Match		
	(1)	(2)	(3)	(4)	(5)	(6)
	Loan Amount	Loan / Asset	Loan Growth	Loan Amount	Loan / Asset	Loan Growth
Treated × Post	0.0024	0.4649***	0.0004	0.0003	0.5152***	0.0002
	(0.46)	(3.19)	(0.41)	(0.05)	(3.24)	(0.18)
Bank Controls	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	77237	77237	77233	64952	64952	64952
R^2	0.993	0.946	0.214	0.993	0.945	0.217

Table 10 Loan Composition

This table reports the regression results of the difference-in-difference analysis based on the event of adoption of CBLR framework. The regression model is specified as:

$$Y_{it} = \alpha + \beta(CBLR_i \times Post_t) + \gamma X_{it} + \delta_i + \lambda_t + \epsilon_{it}$$

where Y_{it} are proportion of commercial loans, real estate loans, and consumer loans as percentage of total loans. The sample consists of bank-quarter observations during the 2017-2024 time period. The treatment variable ($Treated$) equals to one for adopted banks and zero for the banks adhering to Basel framework. $Post$ is the post-event dummy variable that equals one for the five years after the introduction of CBLR framework and zero for three years before the introduction of CBLR framework. Only coefficients for $Treated \times Post$ are reported, as $Treated$ and $Post$ are subsumed by bank and year fixed effects. All variables are defined in Appendix A. Standard errors are clustered at the bank level. ***, **, * indicate the significance level at 1%, 5% and 10% respectively.

	Full Sample Match			Same Type Match		
	(1)	(2)	(3)	(4)	(5)	(6)
	% Commercial	% Real Estate	% Consumer	% Commercial	% Real Estate	% Consumer
Treated × Post	-0.1641	0.4176	0.0006	-0.1493	0.3538	0.0009
	(-0.63)	(1.04)	(0.61)	(-0.50)	(0.76)	(0.77)
Bank Controls	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	77237	77237	77237	64952	64952	64952
R^2	0.836	0.933	0.929	0.837	0.934	0.928

Table 11 Bank Risk-taking

This table reports the regression results of the difference-in-difference analysis based on the event of adoption of CBLR framework. The regression model is specified as:

$$Y_{it} = \alpha + \beta(CBLR_i \times Post_t) + \gamma X_{it} + \delta_i + \lambda_t + \epsilon_{it}$$

where Y_{it} are various measures of bank risk-taking, including nonperforming loans ratio, net charge-off ratio, and loan loss provision ratio. The measures are leading 2 quarters, 4 quarters, and 6 quarters as risks take time to accumulate and realize. The sample consists of bank-quarter observations during the 2017-2024 time period. The treatment variable ($Treated$) equals to one for adopted banks and zero for the banks adhering to Basel framework. $Post$ is the post-event dummy variable that equals one for the five years after the introduction of CBLR framework and zero for three years before the introduction of CBLR framework. Only coefficients for $Treated \times Post$ are reported, as $Treated$ and $Post$ are subsumed by bank and year fixed effects. All variables are defined in Appendix A. Standard errors are clustered at the bank level. ***, **, * indicate the significance level at 1%, 5% and 10% respectively.

Panel A. Full Sample Match

	Full Sample Match								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Nonperform T+2	Nonperform T+4	Nonperform T+6	Charge-off T+2	Charge-off T+4	Charge-off T+6	Provision T+2	Provision T+4	Provision T+6
Treated × Post	0.6385*	0.7747**	0.7500**	0.5815*	0.7145**	0.5839**	0.0037	0.0070**	0.0069**
	(1.95)	(2.15)	(2.04)	(1.96)	(2.25)	(2.04)	(1.51)	(2.42)	(2.37)
Bank Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	72379	67521	62665	72379	67521	62665	72379	67521	62665
R^2	0.515	0.523	0.540	0.358	0.361	0.366	0.455	0.464	0.466

Panel B. Same Type Match

	Same Type Match								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Nonperform T+2	Nonperform T+4	Nonperform T+6	Charge-off T+2	Charge-off T+4	Charge-off T+6	Provision T+2	Provision T+4	Provision T+6
Treated × Post	0.7719**	0.9772**	0.9702**	0.6680*	0.8049**	0.6265*	0.0035	0.0066**	0.0065**
	(2.06)	(2.37)	(2.32)	(1.90)	(2.12)	(1.82)	(1.26)	(2.01)	(1.96)
Bank Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	60868	56784	52700	60868	56784	52700	60868	56784	52700
R^2	0.514	0.519	0.534	0.356	0.359	0.364	0.450	0.459	0.461

Table 12 Bank Risk-taking in Mortgage Market

This table reports the regression results of the difference-in-difference analysis based on the event of adoption of CBLR framework. The regression model is specified as:

$$Y_{it} = \alpha + \beta(CBLR_i \times Post_t) + \gamma X_{it} + \delta_i + \lambda_t + \epsilon_{it}$$

where Y_{it} are measures of bank participation in risky mortgages constructed using the Home Mortgage Disclosure Act (HMDA) data. $\%Num\ Sub\ Loan$ is the total number of subordinate liens a bank originates in a year divided by the total number of mortgage a bank originate in a year. $\%Amt\ Sub\ Loan$ is the total amount of subordinate lien a bank originates in a year divided by the total amount of mortgage a bank originates in a year. The sample consists of bank-year observations during the 2018-2023 time period[17]. The treatment variable ($Treated$) equals to one for adopted banks and zero for the banks adhering to Basel framework. $Post$ is the post-event dummy variable that equals one for the five years after the introduction of CBLR framework and zero for three years before the introduction of CBLR framework. Only coefficients for $Treated \times Post$ are reported, as $Treated$ and $Post$ are subsumed by bank and year fixed effects. All variables are defined in Appendix A. Standard errors are clustered at the bank level. ***, **, * indicate the significance level at 1%, 5% and 10% respectively.

	Full Sample Match		Same Type Match	
	(1)	(2)	(3)	(4)
	%Num Sub Loan	%Amt Sub Loan	%Num Sub Loan	% Amt Sub Loan
Treated × Post	1.2015***	0.6757***	0.9968**	0.6011**
	(2.81)	(3.13)	(2.06)	(2.47)
Bank Controls	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Observations	2670	2670	2209	2209
R^2	0.742	0.621	0.744	0.620

[17] The national loan-level data is gathered after 2017 and the most recent record is 2023, making the sample period different from previous regressions.

Table 13 Bank Profitability and Interest Rate

This table reports the regression results of the difference-in-difference analysis based on the event of adoption of CBLR framework. The regression model is specified as:

$$Y_{it} = \alpha + \beta(CBLR_i \times Post_t) + \gamma X_{it} + \delta_i + \lambda_t + \epsilon_{it}$$

where Y_{it} are measures of bank profitability and interest rates for deposit and loan products. NIM is the net interest income to total earning assets. $CD\ Rate$ is the certificate of deposit rate for bank account of $10,000 with maturity of 12 months. $MM\ Rate$ is the rate for money market account with a size of $25,000. Both are the most popular deposit products from RateWatch. $Loan\ Rate$ (SBL) is the average interest rate charged to small businesses and is gathered from small business loan data. The sample consists of bank-year observations during the 2018-2024 time period. The treatment variable ($Treated$) equals to one for adopted banks and zero for the banks adhering to Basel framework. $Post$ is the post-event dummy variable that equals one for the five years after the introduction of CBLR framework and zero for three years before the introduction of CBLR framework. Only coefficients for $Treated \times Post$ are reported, as $Treated$ and $Post$ are subsumed by bank and year fixed effects. All variables are defined in Appendix A. Standard errors are clustered at the bank level. ***, **, * indicate the significance level at 1%, 5% and 10% respectively.

	Full Sample Match				Same Type Match			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	NIM	CD Rate	MM Rate	Loan Rate (SBL)	NIM	CD Rate	MM Rate	Loan Rate (SBL)
Treated × Post	0.0324**	-0.0398***	-0.0018	0.0754**	0.0359**	-0.0342**	0.0000	0.1013**
	(2.05)	(-2.89)	(-0.24)	(1.98)	(2.00)	(-2.28)	(0.00)	(2.55)
Bank Controls	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	77237	52424	49093	7832	64952	44118	41245	6633
R^2	0.781	0.646	0.520	0.864	0.780	0.647	0.522	0.863

Table 14 Direct Effects on Noninterest Costs

This table reports the regression results of the difference-in-difference analysis based on the event of adoption of CBLR framework. The regression model is specified as:

$$Y_{it} = \alpha + \beta(CBLR_i \times Post_t) + \gamma X_{it} + \delta_i + \lambda_t + \epsilon_{it}$$

where Y_{it} are log of noninterest expense, log of employee salaries, and inefficiency ratio of banks. The sample consists of bank-quarter observations during the 2017-2024 time period. The treatment variable ($Treated$) equals to one for adopted banks l and zero for the banks adhering to Basel framework. $Post$ is the post-event dummy variable that equals one for the five years after the introduction of CBLR framework and zero for three years before the introduction of CBLR framework. Only coefficients for $Treated \times Post$ are reported, as $Treated$ and $Post$ are subsumed by bank and year fixed effects. All variables are defined in Appendix A. Standard errors are clustered at the bank level. ***, **, * indicate the significance level at 1%, 5% and 10% respectively.

	Full Sample Match			Same Type Match		
	(1)	(2)	(3)	(4)	(5)	(6)
	Noninterest Expense	Employee Salary	Inefficiency Ratio	Noninterest Expense	Employee Salary	Inefficiency Ratio
Treated × Post	-0.0060	-0.0057	0.3263	-0.0052	-0.0019	0.3348
	(-1.42)	(-0.84)	(0.86)	(-1.09)	(-0.25)	(0.77)
Bank Controls	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	77237	77237	77237	64952	64952	64952
R^2	0.965	0.985	0.779	0.964	0.984	0.778

Appendix

Table A-1 Variable Definition

Variable	Definition
Asset Quality (%)	Earning assets / total assets
Brokered Deposit Ratio (%)	Brokered deposits / total deposits
CET1 Capital Ratio (%)	CET1 capital / average total consolidated assets
CD Rate (%)	Certificate of deposit rate for bank account of $10,000 with maturity of 12 months
Charge-off Ratio (%)	Total charge offs / total loans
C&I Loans to Total Loans (%)	The share of commercial and industrial loans out of the entire loan portfolio
Consumer Loans to Total Loans (%)	The share of consumer loans out of the entire loan portfolio
Deposits to Liabilities (%)	Total deposits / total liabilities
Equity to Assets (%)	Total equity / total assets
Inefficiency Ratio (%)	Non-interest expense / total revenue
Large Deposit Ratio (%)	Total deposits of $250,000 or more / total deposits
Loan Growth (%)	log (total loans(t)) – log (total loans (t-1))
Loan Loss Provision Ratio (%)	Provisions for credit losses / total assets
Loans to Assets (%)	Total loans / total assets
log (Num of Branches)	Logged number of branches
log (Assets $K)	log (total assets ($thousands))
MM Rate (%)	Rate for money market account with a size of $25,000
Net Interest Margin (%)	(Interest income – interest expense) / total earning assets
Non-interest Expense (%)	Non-interest expense / total assets
Nonperforming Loan Ratio (%)	Nonperforming assets / total assets
Real Estate Loans to Total loans (%)	The share of real estate loans out of the entire loan portfolio
Return on Assets (%)	Net income / total asset
Return on Equity (%)	Net income / total equity
Risk-weighted Assets	Bank's assets weighted by risk
Tier 1 Capital Ratio (%)	Tier 1 capital / risk-weighted assets
Tier 1 Leverage Ratio (%)	Tier 1 capital / average total consolidated assets
Time Deposits to Total Liabilities (%)	Time deposits / total liabilities
Total Capital Ratio (%)	Total capital / risk-weighted assets
Total Loans & Leases	Total loans & leases of bank

Table A-2 Logistic Regression after Matching

This table presents the results of a logistic regression estimating the likelihood of CBLR adoption for the matched samples. The regression model is specified as: $Y_i = \frac{e^{\beta_0+\beta X_i+\varepsilon_i}}{1+e^{\beta_0+\beta X_i+\varepsilon_i}}$ where $Y_i = 1$ if bank i adopts the CBLR framework and 0 otherwise. The vector X_i includes key financial characteristics: total assets, CET1 leverage ratio, net income to total assets (ROA), commercial and industrial loans to total loans, total loans to assets, and deposits to assets. The sample consists of cross-sectional bank observations from 2018 Q4. ***, **, * indicate the significance level at 1%, 5% and 10% respectively.

Panel A. Full Sample Match

Variable	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
Total assets	-.094	.052	-1.82	.069	-.195	.007	*
CET1 leverage ratio	.035	.021	1.69	.09	-.006	.076	*
ROA	.077	.159	0.48	.628	-.235	.389	
C&I loans to total loans	-.003	.005	-0.51	.61	-.013	.008	
Loans to assets	.016	.344	0.05	.963	-.658	.69	
Deposits to assets	-.005	.011	-0.48	.633	-.028	.017	
Constant	1.582	1.401	1.13	.259	-1.163	4.328	

Mean dependent var	0.624	SD dependent var	0.484
Pseudo R-squared	0.008	Number of obs	2091
Chi-square	9.375	Prob > chi2	0.154
Akaike crit. (AIC)	2759.831	Bayesian crit. (BIC)	2799.349

Panel B. Same Type Match

Variable	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
Total assets	-.09	.05	-1.79	.074	-.189	.009	*
CET1 leverage ratio	.03	.018	1.66	.096	-.005	.065	*
ROA	.01	.123	0.08	.937	-.231	.251	
C&I loans to total loans	-.003	.005	-0.52	.604	-.013	.008	
Loans to assets	-.151	.335	-0.45	.653	-.807	.506	
Deposits to assets	-.006	.011	-0.58	.561	-.027	.015	
Constant	1.836	1.335	1.38	.169	-.78	4.452	

Mean dependent var	0.619	SD dependent var	0.486
Pseudo R-squared	0.006	Number of obs	2075
Chi-square	11.845	Prob > chi2	0.066
Akaike crit. (AIC)	2755.534	Bayesian crit. (BIC)	2794.998

Table A-3 Effect on Bank Balance Sheet excluding Covid

This table reports the regression results of the difference-in-difference analysis based on the event of adoption of CBLR framework. The regression model is specified as:

$$Y_{it} = \alpha + \beta(CBLR_i \times Post_t) + \gamma X_{it} + \delta_i + \lambda_t + \epsilon_{it}$$

where Y_{it} are tier 1 leverage ratio, total asset, and total equity of banks. The sample consists of bank-quarter observations during the 2017-2024 time period with exclusion of eight quarters in 2020 and 2021 to avoid the impact of Covid. The treatment variable ($Treated$) equals to one for adopted banks l and zero for the banks adhering to Basel framework. $Post$ is the post-event dummy variable that equals one for the five years after the introduction of CBLR framework and zero for three years before the introduction of CBLR framework. Only coefficients for $Treated \times Post$ are reported, as $Treated$ and $Post$ are subsumed by bank and year fixed effects. All variables are defined in Appendix A. Standard errors are clustered at the bank level. ***, **, * indicate the significance level at 1%, 5% and 10% respectively.

	Full Sample Match			Same Type Match		
	(1)	(2)	(3)	(4)	(5)	(6)
	Leverage Ratio	Log (Asset)	Log (Equity)	Leverage Ratio	Log (Asset)	Log (Equity)
Treated × Post	0.3636***	-0.0118***	0.0348**	0.4005***	-0.0138***	0.0371**
	(3.38)	(-3.37)	(2.43)	(3.36)	(-3.52)	(2.37)
Deposits to Liabilities (%)	0.0437***	0.0006**	0.0069***	0.0492***	0.0007**	0.0069***
	(4.61)	(2.38)	(7.49)	(5.55)	(2.22)	(6.69)
log (Asset)	-1.5194***	0.9068***	0.8509***	-1.3903***	0.9051***	0.8540***
	(-5.19)	(65.79)	(29.62)	(-4.49)	(63.27)	(27.38)
log (Num of Branches)	-0.5804*	0.0071	0.0051	-0.6699**	0.0061	0.0048
	(-1.88)	(0.86)	(0.18)	(-1.96)	(0.65)	(0.15)
Large Deposits Ratio (%)	-0.0067	0.0003	0.0000	-0.0045	0.0004	0.0005
	(-1.00)	(0.90)	(0.01)	(-0.64)	(0.90)	(0.53)
Time Deposits to Liabilities (%)	-0.0131	-0.0003	-0.0046***	-0.0130	-0.0002	-0.0041***
	(-1.60)	(-0.97)	(-5.50)	(-1.47)	(-0.76)	(-4.49)
Loans to Assets (%)	-0.0047	0.0014***	0.0030***	-0.0042	0.0013***	0.0028***
	(-0.88)	(5.47)	(4.84)	(-0.74)	(4.48)	(4.17)
Charge-off Ratio (%)	0.2452*	-0.0132**	0.0050	0.2391	-0.0136**	0.0043
	(1.81)	(-2.27)	(0.35)	(1.60)	(-2.11)	(0.28)
Asset Quality	-0.0255	-0.0002	-0.0056**	-0.0282	-0.0003	-0.0056*
	(-1.11)	(-0.22)	(-2.01)	(-1.15)	(-0.35)	(-1.90)
Brokered Deposits Ratio (%)	-0.0398***	0.0008	-0.0029**	-0.0442***	0.0010	-0.0033**
	(-2.61)	(0.74)	(-2.38)	(-2.65)	(0.86)	(-2.33)
Real Estate Loans (%)	-0.0156	0.0024***	-0.0007	-0.0030	0.0027***	-0.0000
	(-0.83)	(2.86)	(-0.66)	(-0.20)	(2.89)	(-0.04)
Commercial Loans (%)	-0.0093	0.0013***	-0.0022	0.0103	0.0014***	-0.0016
	(-0.46)	(3.13)	(-1.55)	(0.78)	(3.10)	(-0.99)
Consumer Loans (%)	-0.0281	0.0025**	0.0001	-0.0168	0.0029**	0.0010
	(-0.96)	(1.98)	(0.05)	(-0.58)	(2.13)	(0.31)
Bank FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	57821	57821	57821	48616	48616	48616
R^2	0.861	0.996	0.975	0.860	0.996	0.974