# BANK CONSOLIDATION AND UNIFORM PRICING*

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**Abstract**

We evaluate how bank mergers affect consumer welfare when banks set deposit rates with a high degree of uniformity across their branch networks. First, we document that merger-induced changes to local market concentration are only weakly correlated with pricing decisions. Second, we develop a structural model of the banking sector to simulate equilibrium post-merger deposit rates with and without uniform pricing. The simulated deposit rates from the model with uniform pricing best match the observed changes in deposit rates following bank mergers. We use the model to evaluate antitrust decisions that force acquirers to divest branches in order to contain local market concentration levels. Our counterfactual exercises suggest that forced divestitures sometimes improve consumer welfare but can also impose consumer welfare losses when antitrust regulators do not consider that uniform pricing practices might lead to better deposit rates at acquired branches after a merger.

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# 1 Introduction

The number of U.S. banks has declined from approximately 15,000 in 1990 to less than 5,000 by 2021. During this period, antitrust authorities did not block a single bank merger and acquisition (M&A) despite reviewing all merger proposals to screen for deals that could cause increases in markups and harm consumers. (Wollmann, 2019).[1] The absence of intervention by antitrust authorities has triggered a contentious debate around the review process for M&A deals in the banking sector. For instance, Senator Elizabeth Warren's "Bank Merger Review Modernization Act" proposed an "end to the rubber stamping of bank mergers". Leadership changes at the Federal Deposit Insurance Corporation (FDIC) during 2022 have also made the overhaul of the bank merger review process a top priority (Ackerman, 2022).

In a typical bank merger review, antitrust authorities evaluate a deal's expected impact on *local* market concentration to decide whether to approve, approve with remedies, or block the deal (e.g., Carlton, 2007). These reviews focus on local market concentration because demand for retail banking services is mostly local (e.g., Abrams, 2019; Honka, Hortaçsu and Vitorino, 2017) and regulators expect acquirers to raise markups substantially more in markets in which a merger significantly increases the market share of the resulting bank.[2] Yet, recent literature examining the pricing strategies of retailers (e.g., Dellavigna and Gentzkow, 2019; Hitsch, Hortaçsu and Lin, 2019; Nakamura, 2008) and banks (e.g., Radecki, 1998; Park and Pennacchi, 2009; Yankov, 2018) has shown that firms operating in multiple markets price their products centrally, such that their prices have a high degree of uniformity across a firm's locations, even though distinct firms competing in the same location set very different prices for the same product.

In this paper we study if a high degree of uniform pricing impacts the interest rates set by branches involved in a merger. We then investigate how this high degree of uniform pricing shapes the relation between post-merger changes in local market concentration and local prices. Finally, we analyze the circumstances under which failing to account for banks' high degree of uniform pricing practices might lead to antitrust decisions that increase prices and harm consumer welfare.

To better understand how uniform pricing affects the evolution of interest rates and consumer welfare following a merger, our analysis employs a structural model of monopolistic competition in the banking sector. We use the model to simulate the mergers in our sample and to compute what the equilibrium

[1] Banking regulators and the U.S. Department of Justice (DoJ) did not block any merger application in this period, though they have required remedies to proposed M&A deals in cases that the merger would increase a local market's concentration of deposits beyond some threshold (Liebersohn, 2020; Williams, 2019). It is also possible that some mergers did not get to the merger application stage because potential merging partners were discouraged by the merger guidelines.

[2] The US Horizontal Merger Guidelines define a market as the smallest set of products and locations wherein a presumptive monopolist would be able to permanently raise prices due to the lack of viable alternatives for consumers.

post-merger interest rates would be when banks do and do not set uniform prices across their branch networks. A model featuring both convergence in branch quality and uniform pricing explains more of the variation in the observed evolution of interest rates at acquired branches after a merger than a similar model with convergence in branch quality but without uniform pricing. We employ the model to evaluate past antitrust decisions forcing acquirers to divest branches in areas where local market concentration would otherwise increase substantially. The main policy implication of our counterfactual exercises is that forced branch divestitures often improve consumer welfare but can also carry welfare losses when antitrust regulators do not consider that uniform pricing practices might lead some acquirers to offer better deposit rates at acquired branches.

The U.S. banking sector offers unique advantages for studying the effects of M&A deals on pricing when firms set prices uniformly or near-uniformly. First, it is an important product market, with over $17 trillion in deposits and trillions more in annual loans. Thus, even small post-merger rate changes equate to substantial wealth transfers between banks and their clients. Second, the sector underwent significant consolidation in the past twenty years, thus providing plenty of opportunities to study the role that uniform pricing plays in shaping the economic effects of mergers. Finally, markets are geographically segmented in that the typical customer considers only a limited number of local banking options (e.g., Abrams, 2019; Egan, Hortaçsu and Matvos, 2017; Honka, Hortaçsu and Vitorino, 2017). In fact, 75% of respondents in the 2019 Survey of Consumer Finances reported banking with institutions whose branches are within five miles of their homes. These local markets are served by both small banks and larger institutions with a multi-market presence. We leverage this setting to examine the potential consumer welfare effects of overlooking uniform pricing in antitrust merger reviews.

We begin our empirical analysis building upon Radecki (1998), Heitfield (1999), Biehl (2002), Park and Pennacchi (2009), and Yankov (2018) who show that U.S. banks set rates with a high degree of uniformity across their branch networks. Our study is the first to confirm the findings of some of this earlier literature using a data set with a broader and more extensive coverage of interest rates. We show that over the last twenty years, variation in deposit and loan interest rates offered by branches of the same bank accounts for less than 10% of all variation in deposit and loan rates across all bank branches in the U.S. economy. Put differently, the absolute differences in deposit and loan rates offered by pairs of branches of the same bank are much smaller than the differences between the rates of pairs of branches of different banks. We also see that uniform pricing practices have become more prevalent over time. The within-bank variation in deposit and loan rates offered accounted for approximately 20%–30% of all variation in interest rates between 2004 and 2007 but for less than 5% of this variation since 2008.

Having established these empirical patterns, we examine how this high prevalence of uniform pricing shapes the evolution of interest rates during the two-year window around a merger event. Immediately after the consummation of a merger, we observe a substantial reduction in the absolute difference between the deposit and loan rates offered by the acquiring and acquired branches in a M&A agreement. We observe this rate convergence across multiple deposit and loan products and find it to be more pronounced when the acquiring bank is particularly committed to uniform pricing.

After showing that deposit and loan rates converge after a M&A deal, we characterize how this convergence takes place. There are almost as many mergers in which acquirers set higher deposit rates than there are mergers in which acquirers set lower deposit rates relative to acquired branches prior to the merger. It is possible that acquirers lower the deposit rates of acquired branches if acquired branches were offering better rates and reduce their own rates if their own branches were the ones offering relatively better rates to customers. However, our evidence does not support this pattern. Instead, rate convergence primarily occurs through adjustments at the acquired branches, regardless of who initially offered better rates. The implication is that an M&A deal could actually improve deposit and loan rates for customers of acquired branches if the acquiring bank offered relatively better rates before the deal. Additionally, we find that acquired branches with higher rates, due to a high degree of uniform pricing, attract more deposits over a five-year horizon than other acquired branches.

Next, we investigate whether converging rates or increases in local market concentration play the greater role in explaining the post-M&A evolution of deposit and loan rates at acquired branches. Our empirical evidence is only partially consistent with the possibility that increases in local market concentration allow banks to exert market power by raising prices. We find that the certificate of deposit (CD) rates of acquired branches fell by approximately 11 bps after a merger when local market concentration was predicted to increase by more than 200 points, which is one of the thresholds that triggers an in-depth merger review by antitrust authorities.[3] Yet, we find that the CD rates offered by acquired branches *also* declined by approximately 8.5 bps when local market concentration increased by less than 200 points. Moreover, we do not consistently find lower rates on other deposit products or higher rates of loan products at acquired branches whose local market concentration increased more than 200 points as a result of the merger.

In contrast, the pre-merger differences between the rates offered by acquirers and the acquired branches are a strong predictor of the evolution of rates after a merger, regardless of the product we consider. For

[3]The other threshold is if the overall market concentration exceeds 1,800 basis points after a merger.

instance, the 20% of acquired branches whose CD rates were higher than those offered by their acquirers reduced their rates by approximately 29 bps after the merger. Conversely, the 20% of acquired branches that offered lower CD rates than their acquirers saw their deposit rates increase, on average, by 24 bps. We then restrict our attention to the subset of branches that saw substantial increases in local market concentration. Our results show that pre-merger rate differences are an important determinant of the post-merger evolution of bank rates even when the acquirer gains significant local market share in a deal. Overall, the evidence indicates that banks do not always exploit merger-related gains in local market share by raising prices at acquired branches.

We might be unable to observe the outcomes of the mergers that would be most harmful to consumers because regulators intervene in these cases by requesting remedies that stifle the anti-competitive effects of additional concentration. As a result, the causal link between changes in local market concentration and post-merger price changes may be understated. To address this concern, we follow Liebersohn (2020) and exploit the fact that antitrust review guidelines do not require detailed review of mergers where post-merger local market concentration is below 1,800. These bank mergers thus receive discontinuously less attention from antitrust authorities even if they significantly increase local concentration. Our strategy consists of using the subset of acquired branches with post-merger local market concentration slightly below the 1,800 threshold. Consistent with the idea that antitrust actions affect the relationship between concentration and prices, we find a stronger association between changes in local market concentration and changes in price in this analysis. But, even in this subsample, pre-merger rate differences more strongly predict future interest rates than changes in local market concentration.

The empirical evidence so far is consistent with the idea that acquirers set prices with a high degree of uniformity across their branch networks and that this type of conduct induces rate convergence. Acquirers, however, might also introduce changes at the newly-acquired branches to offer better liquidity services (e.g., d'Avernas et al., 2023) and align the customer experience with the one they offer in other branches. These post-merger changes in the quality of the newly-acquired branches could in turn explain why rates converge following a bank merger. To assess whether uniform pricing shapes post-merger deposit rates beyond what is explained by convergence in branch quality characteristics, we follow Egan, Hortaçsu and Matvos (2017) and estimate a simple model of retail deposit banking that accounts for differences in product quality and non-price characteristics. We model two possible types of supply of deposits: (i) banks optimally set rates in each market to maximize local profits (*local pricing*) and (ii) banks optimally set a single rate across all branches to maximize overall bank's profits (*uniform pricing*). This model allows us to explore counterfactuals that isolate the impact of uniform pricing on post-merger interest rate changes. Furthermore, we also use the model to conduct counterfactual analyses of the welfare implications of antitrust decisions that force acquirers to divest branches.

In the model, consumers have preferences over differentiated bank branches in a given local market. Demand depends on the deposit interest rate as well as branch- and bank-level attributes, such as the branch's local relationships and customer capital, the geographical coverage of the bank's network of branches in a given market, and other invariant bank- and zip-code characteristics. The model also includes bank-fixed effects to account for unobserved bank characteristics as proxy for bank quality. This demand model allows us to estimate how depositors value both price and non-price characteristics. We estimate the model using standard demand-estimation approaches (e.g., Berry, 1994; Berry, Levinsohn and Pakes, 1995). Following prior work by Hausman (1996), Nevo (2001), and Dellavigna and Gentzkow (2019), we leverage uniform pricing behavior within a bank's branch network to instrument for the deposit rates offered at a branch using the deposit rates offered by branches of the same bank in other markets.

The supply of deposits at each bank depends on whether the bank sets deposit interest rates uniformly. If a bank sets differentiated prices among its local markets, the supply of bank deposits in each market follows the standard monopolistic pricing formula, such that the inverse of the local-demand semi-elasticity for a bank's deposit rate equals its local deposit spread. When a bank chooses the same price for all of its branches, the supply of bank deposits will instead be such that the bank's deposit spread equals the inverse of the weighted sum of the local-demand semi-elasticities for deposit rates across all markets with the weights given by the share of a bank's total deposits held in each respective local market.

We use the estimates from our banking model to simulate each merger in our sample. We solve a fixed-point problem to obtain the equilibrium post-merger interest rates in two counterfactual scenarios in which banks do and do not set uniform prices across their branch networks. Importantly, in both counterfactual scenarios, the post-merger equilibrium deposit rates are computed taking into consideration that the acquired branches adopt the quality characteristics of the acquirer such that the differences between the equilibrium post-merger rates of these model simulations reflect solely the role played by uniform pricing.

Two groups of branches are key for distinguishing between the models with and without uniform pricing. Both the uniform and local pricing model predict that deposit rates at acquired branches partly converge with the deposit rates of the acquirer as acquired branches adopt the quality characteristics of the acquirer. But, in equilibrium, an acquirer in the local pricing model will also adjust the deposit rates of geographically-overlapping acquired branches to take advantage of gains in local market share. Instead, the uniform pricing model predicts less sensitivity to changes in local market concentration as acquirers pull the deposit rates of each acquired branch toward a uniform rate that depends on a weighted average of the local deposit rate semi-elasticities across its banking markets. The models also make substantially different predictions for acquirer branches that did not geographically overlap with acquired branches. The model without uniform pricing predicts that the merger deal will not affect the post-merger equilibrium rates of non-overlapping acquirer branches. The uniform pricing model, in contrast, predicts that any adjustment made to the equilibrium uniform deposit rate of the acquirer after a merger will spread across all local markets in which the acquirer owns branches including those where the acquirer did not compete directly with the acquired bank.

We find that a model featuring both convergence in branch quality and uniform pricing explains more of the variation in the observed evolution of interest rates at acquired branches after a merger than a similar model with convergence in branch quality but without uniform pricing. Moreover, we also show that the observed changes in deposit rates of acquirer branches that do not overlap with the acquired bank are positively correlated with the post-merger changes in the equilibrium rates of acquirer branches under uniform pricing. Hence, our simulations show that uniform pricing practices shape the evolution of interest rates at acquired branches beyond what would be expected from considering other factors, such as the adoption of acquirer quality characteristics by acquired branches.

Our structural model not only allows us to establish that the rates of the acquirer and acquired branches converge after the merger because of banks' uniform pricing but to also conduct counterfactual analyses. While antitrust authorities have not blocked any merger over the past twenty years, they have on multiple occasions requested that acquirers divest branches in local markets that would otherwise experience significant increases in concentration (e.g., Liebersohn, 2020). Yet, it is unclear whether such divestitures enhance the welfare of depositors in a world where acquirers price uniformly across their branch networks. We consider a counterfactual in which acquirers are not forced to divest branches in certain markets to compare the resulting consumer welfare with the consumer-welfare outcome of the branch divestitures that the antitrust regulators requested during the sample period. This exercise shows that forced branch divestitures are not always welfare improving. When the acquirer offers worse deposit rates, branch divestitures benefit local consumers mostly because the bank that purchases the divested branch from the acquirer tends to practice better deposit rates. But when acquirers would have increased deposit rates because they set rates uniformly, forced branch divestitures are associated with an average consumer-welfare loss of approximately 7%. These differences in local consumer welfare are mostly explained by the fact that acquirers were forced to divest but would have actually set higher deposit rates than the banks to whom they sold the branches. Overall, our evaluation indicates that the uniform pricing practices of banks should be taken into account when considering divestitures.

Our study has direct implications for the design of antitrust regulations, an issue that concerns policy makers and researchers around the world (e.g., De Loecker and Eeckhout, 2017; Gutierrez and Philippon, 2017). A key debate is whether merger analyses based on market definition and concentration guidelines are effective starting points for detecting potential shifts in market power (e.g., Carlton, 2007; Miller et al., 2022). We contribute to this debate by highlighting the challenges and limitations of the market definition and concentration approach when demand is local but firms use uniform pricing. Our findings suggest that in such cases, antitrust regulators might want to supplement a local market concentration analysis with other analyses – including more sophisticated structural work – that are able to better capture the implications of a uniform pricing conduct for consumer welfare.

Our paper fits into an extensive literature about the relationship between deposit and loan interest-rate pricing and market concentration. The empirical findings in this literature vary depending on the banking products and outcomes considered. Azar, Raina and Schmalz (2019) and Hurst et al. (2016) do not find any significant association between measures of local market concentration and interest rates while Allen, Clark and Houde (2014), Scharfstein and Sunderam (2017), and Buchak and Jørring (2021) find that increased market concentration after mergers increases average rates and non-interest fees in the mortgage market. Hannan and Berger (1991), Neumark and Sharpe (1992), Driscoll and Judson (2013), and Drechsler, Savov and Schnabl (2017) document that deposit rates adjust slowly when the central bank raises interest rates and that the effect is more pronounced in concentrated markets. Hatfield and Wallen (2022) find that banks offer lower deposit rates when they compete against a consistent set of banks in multiple markets.[4] Our contribution lies in showing that banks' pricing policies play an important role in mediating the relationship between the market concentration and interest-rate pricing.

Our paper is also related to recent studies that estimate structural models of imperfect competition in the banking sector. Our banking model is most related to the work of Dick (2008), Ho and Ishii (2011) Abrams (2019), Xiao (2021), Wang et al. (2022), Mayordomo, Pavanini and Tarantino (2022), and Egan,

[4]Our paper also contributes to an extensive literature about the effects of bank mergers on lending outcomes and consumer welfare in general (e.g., Focarelli and Panetta, 2003; Sapienza, 2002; Garmaise and Moskowitz, 2006; Erel, 2011; Granja, Matvos and Seru, 2017; Liebersohn, 2020; Nguyen, 2019). Most of this literature focuses on understanding how efficiency gains, changes in organizational structure, and increased market power following a bank merger impact the prices and sizes of loans to commercial and industrial borrowers; retail lending has received less attention.

Hortaçsu and Matvos (2017). Egan, Hortaçsu and Matvos (2017) use their model to clarify the effects of banks' strategic interactions in the market for insured and uninsured deposits on overall financial stability. Dick (2008) and Abrams (2019) also use their models to evaluate the consumer-welfare effects of interventions that affect competition in the banking sector. Xiao (2021) and Wang et al. (2022) estimate structural models of the banking sector to study the transmission of monetary policy. We add to these studies by estimating a structural model to simulate post-merger equilibria under different bank pricing policies and to evaluate the impact of antitrust policies.

A growing literature on uniform pricing is also relevant for our paper. Nakamura (2008), Dellavigna and Gentzkow (2019), and Hitsch, Hortaçsu and Lin (2019) document that retail chains set the same or very similar prices for the same products across all their stores. In the banking industry many papers (e.g., Radecki, 1998; Heitfield, 1999; Biehl, 2002; Park and Pennacchi, 2009; Yankov, 2018; Dlugosz et al., 2019) have offered evidence that large banks use uniform pricing. We add to this literature by characterizing the evolution of uniform pricing practices in banking over time using a dataset with a broader and more comprehensive coverage of products and banks. Furthermore, we examine the implications of uniform pricing practices for the evolution of deposit and loan rates following a merger. A subsequent literature has engaged in a debate concerning the implications of uniform pricing for the deposit channel of monetary policy (see, Begenau and Stafford (2022), Drechsler (2022), and d'Avernas et al. (2023)). While we were the first to thoroughly report a high degree of uniform pricing in the RateWatch data, our goal is not to speak to this debate but rather to note that in the presence of uniform pricing, post-merger changes in local market concentration are weakly related to changes in interest rates following a merger.[5]

The rest of the paper proceeds as follows. We describe the data used in the paper in section 2. Section 3 documents the extent of uniform deposit-pricing practices among banks in the sample, section 4 provides descriptive statistics, and section 5 documents the convergence of deposit and loan rates offered by the branches involved in M&A deals and how changes in deposit rates prompted by uniform pricing affect branch deposits. Section 6 examines the relative roles that local market concentration and rate convergence play in the evolution of deposit rates. Section 7 reports our model of consumer welfare in the deposit market and our counterfactual analyses. Section 8 concludes.

[5]There are also some recent studies such as Oberfield et al. (2024) and Morelli, Moretti and Venkateswaran (2024) that take into account this high-prevalence of uniform pricing in their examinations of the patterns driving banks' spatial locations

## 2 Data Description

We obtain branch-level deposit and loan interest rates from RateWatch, which surveys over 100,000 bank branches weekly to collect advertised rates for new deposit accounts and loans.[6] Our sample includes all branches of commercial banks and Savings & Loans institutions with a valid FDIC identifier that report to RateWatch. RateWatch gathers rates for a wide range of standardized products, including checking accounts, savings products, CDs, mortgages, home equity lines of credit (HELOCs), auto loans, and personal unsecured loans. We focus our main analysis on four common deposit and loan products: the 12-month CD with a minimum account size of $10,000 ("12MCD10K"), the savings deposit account with a minimum account size of $100,000, the HELOC with a loan-to-value ratio up to 80% and a loan size of $20,000, and the personal unsecured loan. We confirm that our main results are robust to using other common deposit products such as 6-, 18-, 24-, and 36-month CDs with minimum account sizes of $10,000 and other loan products like new- and used-auto loans. We exclude mortgages due to the significant role of government involvement in this market.

The dataset covers a high percentage of all branches and depository institutions in the United States. We exclude single-branch banks because the aim of our work is to study the pricing policies of banks across their multiple branches. Table 1 shows the sample's coverage of branches across the four products that we examine in our main empirical analysis. The RateWatch data also includes branches' geographic characteristics, FDIC identifier, and the FDIC identifier of the institution that owns the branch. RateWatch has also compiled a list of all changes in FDIC bank identifiers of reporting branches whose ownership was transferred between two different depository institutions in the period 2006–2019. This list includes the month of the change in FDIC identifier, so we can date each deal in the data. We use data available from the National Information Center (NIC) to confirm that the branch ownership changes reported in this list correspond to effective bank mergers or branch acquisitions.

We distinguish between bank mergers and branch acquisitions in the RateWatch dataset by noting whether an entire branch network or only a portion was acquired. The NIC dataset on bank M&A includes around 7,000 transactions during the sample period, while RateWatch covers just over half of these deals (Figure 1) with 3,721 bank and branch M&As included. Because our main purpose is to understand the price dynamics around a merger event, we only consider deals for which we observe both the deposit rate of the acquired branch and the median deposit rate of the acquirer for twelve months around the merger event. These sample criteria affect the sample differently depending on the product. For CDs, the final

[6]Throughout the analysis, we use the average monthly APY at the branch level as our definition of "deposit rate."

sample includes 2,177 M&As involving 2,006 acquired banks and 1,131 acquiring banks and these deals cover 9,370 branches across 49 U.S. states.[7]

We use the Summary of Deposits (SOD) dataset collected by the FDIC to observe the quantity of deposits at the branch level. All commercial banks and Savings & Loans institutions report the amount of deposits held in each branch as of June 30 of each year. We combine the SOD and RateWatch datasets using the branch and bank FDIC identifiers.[8] We measure the deposit amounts of each acquired branch during the merger year as the level of deposits as of June 30 of the same year if the bank merger occurred after June 30. If the merger occurred before June 30 of a given year, we measure the deposit amount of the acquired branch during the merger year as the report from June 30 of the previous year. We also note the holding company of each branch from the SOD dataset, which we use to identify consolidations of depository institutions held by the same bank holding company. During our robustness analysis, we check the sensitivity of our results to eliminating these observations.

Finally, we complement the dataset with balance sheets and income statements from the quarterly Reports of Condition and Income (Call Reports) published on the Federal Financial Institutions Examination Council website.

## 3 Uniform Pricing in the Banking Sector

Previous research has established that banks tend to maintain similar deposit and loan rates across their branches (e.g., Radecki, 1998; Park and Pennacchi, 2009; Hurst et al., 2016; Yankov, 2018). In this section, we expand on prior studies by using RateWatch data to analyze the pricing practices of a broader range of banks and products over the past fifteen years. Our analysis reaffirms a notable degree of uniformity in how banks set deposit and loan rates across their branch networks. Additionally, we observe that uniform pricing practices have become more prevalent over time, and we explore factors contributing to variation in these practices across banks and periods.

We use two distinct approaches to compare the dispersion of interest rates *within* banks' branch networks to the dispersion of interest rates *across* branches from different banks. First, following Nakamura

[7]The RateWatch dataset reports deposit rates from depository institutions from January 1997 to December 2019. However, RateWatch started recording changes in branches' ownership only in December 2006. This limits the number of mergers in 2006 in our sample to 34. Moreover, we exclude from our sample mergers occurring during 2019 because we are not able to observe a complete 24-month window for these mergers.

[8]A few very large banks concentrate a significant fraction of their deposits in a few specific branches. These include online deposit accounts, and potentially include deposits made in local branches that were transferred to a central account. Since these branches do not have a tight link with local deposit demand, we exclude them from our analysis. Specifically, we exclude branches with deposit amounts 10 standard deviations above the mean.

(2008) and Hitsch, Hortaçsu and Lin (2019), we compute the proportion of total variation in deposit and loan rates across U.S. branches that can be explained by bank-fixed effects, banking-market-fixed effects, and zip-code-fixed effects. Specifically, for each period, we regress branch rates on these fixed effects separately. If banks set similar rates across their branches, bank-fixed effects will account for most of the total variance. In contrast, if banks adjust rates locally based on economic or competitive conditions, banking-market- and zip-code-fixed effects will explain a larger share of the variation.

Figure 2 plots the adjusted $R^2$ of these regressions over time. The red lines represent the adjusted $R^2$ of regressions of branch deposit and loan rates on bank-fixed effects, while the blue and green lines represent the adjusted $R^2$ using banking-market and zip-code fixed effects, respectively. The results suggest that, on average, bank fixed effects explain about 90% of the total variation in deposit and loan rates across U.S. branches.[9] This finding indicates that while rates can and do vary among branches of the same bank, the majority of rate variation occurs when comparing comparing branches across different banks. Banking-market fixed effects account, on average, for less than 30% of the total variance in deposit and loan rates in the banking sector. Thus, depositors likely encounter a range of rates when visiting branches of distinct banks within the same zip code or banking market but when they visit geographically distinct branches of the same bank, they often encounter the same deposit rates.

The findings from Figure 2 also suggest an increasing prevalence of uniform pricing practices over time. Between 2004 and 2006, around 20% of the total variation in 1-year CD deposit rates is attributable to differences among branches within the same bank. However, starting in 2006, the degree of uniform pricing in this deposit product began to rise until 2008. Since then, bank-fixed effects have explained over 95% of the variation in 1-year CD rates among U.S. branches.

A possible explanation for the rising prevalence of uniform pricing is that banks may have limited ability to adjust rates when interest rates are near the zero lower bound. While a plausible explanation, we believe that the proximity to the zero lower bound cannot fully explain the evolution of uniform pricing practices. First, the adjusted $R^2$ tied to bank fixed effects began increasing in 2006, a time of high rate dispersion that predated the zero lower bound period which started only in 2009. Additionally, the adjusted $R^2$ did not decline when the Federal Reserve raised rates between late 2015 and 2019, suggesting that large banks did not begin adjusting prices locally during that period of non-zero-lower-bound interest rates. Moreover, despite loan rates not approaching zero and maintaining or even increasing their dispersion during the zero lower bound period, uniform pricing practices have also become more common for loan

[9] Specifically, bank fixed effects explain, on average, 92.6%, 95.7%, 87.1%, and 89.6% of the variation in rates of the 1-year CD, savings product, HELOC, and personal unsecured loan, respectively.

products. These results suggest a weak relationship between the level and dispersion of interest rates and the degree of uniform pricing. Finally, if banks were unable to adjust rates due to the zero lower bound, they might resort to raising banking fees to adjust prices to local demand conditions. Yet, in the Internet Appendix A, we show that banks also apply near-uniform fees across branches for out-of-network ATM transactions, overdrafts, and monthly maintenance. Overall, the evidence suggests that the increasing prevalence of uniform pricing also reflects other factors beyond changes in monetary policy.

Interest rates at each branch are set by a small group of rate-setting branches. In Figure 3, we explore whether the rise in uniform pricing over time is due to greater rate uniformity within rate-setters or to an expansion of the coverage area of each rate-setter. In panel A, we replicate the analysis of Figure 2 using only the rate-setting branches for 1-year CDs. This subset shows lower within-bank uniformity than the full sample, with bank-fixed effects explaining only 64% of rate variation from 2004 to 2006 (compared to 78% for the full sample).[10] Nonetheless, uniform pricing has grown even among rate-setting branches, with bank-fixed effects explaining 89% of rate variation since 2008. Panels B and D show that uniform pricing is also increasing due to a centralization of rate-setting decisions. We compute a Herfindahl-like measure to assess this concentration and find that banks have centralized rate-setting more over time, though since 2017, there's been a slight decline in this concentration. Overall, the rise in uniform pricing is driven by both greater uniformity among rate-setters and increased centralization of rate-setting decisions.

In addition, to examining what is the total variation in interest rates explained by bank-fixed effects, we use an approach based upon the work of Dellavigna and Gentzkow (2019) to provide an alternative quantification of uniform pricing in the banking sector. We randomly draw 10,000 pairs of branches belonging to the same bank and another 10,000 pairs of branches of different banks and compute the absolute difference between the average quarterly deposit and loan rates of the two branches in each pair.[11] The solid blue bars in Figure 4 represent the distribution of the quarterly absolute deposit rate difference of same-bank branch pairs and the red hollow bars represent the same distribution for different-bank branch pairs. In line with the previous results, the histograms show that most of the quarterly absolute rate differences of the same-bank branch pairs are close to zero. By contrast, the distribution of the quarterly absolute rate differences of the different-bank branch pairs is more even.[12]

[10]This indicates that, before the Global Financial Crisis, there was significant variation among rate-setting branches to exploit within-bank rate differences, as in Drechsler, Savov and Schnabl (2017).

[11]We restrict the sample to pairs in which both branches reported rates for at least 24 consecutive months.

[12] We also compute histograms with the average quarterly rate differences both within and outside the zero lower bound period for pairs of branches belonging to similar and different banks. We find that pairs of branches belonging to the same bank practice substantially more similar rates both within and outside of the zero-lower-bound period. However, these histograms also show that there is a greater degree of uniform pricing during the zero lower bound period. These plots are presented in the Internet Appendix A.

In Internet Appendix A, we conduct additional tests to deepen our understanding and quantification of banks' uniform pricing practices. We observe a high degree of uniform pricing when we compute monthly rate correlations across pairs of branches of the same bank relative to pairs of branches of different banks. We show that greater geographic proximity between branches of the same bank compared to branches of other banks cannot fully account for the high degree of uniform pricing. We demonstrate similar patterns across various deposit and loan products, including products with longer maturities and different account sizes. Finally, we repeat our exercises using a balance sample to ensure that the evolution of uniform pricing practices is not explained by changes in RateWatch coverage or in the composition of the sample.

A thorough examination of the drivers behind uniform pricing practices is beyond the scope of our work. Nevertheless, we examine which bank characteristics correlate with uniform pricing in Internet Appendix B. An interesting and potentially important finding is that larger banks set prices less uniformly within their branch networks. It is possible that the scale of these banks' networks affords them more opportunity for varying prices. Interestingly, uniform pricing is less prevalent in banks whose deposits represent a larger share of their assets. This correlation could suggest that banks relying more on deposits are cautious about deviating from uniform prices, or it could reflect that larger banks are less dependent on deposits. We find no strong link between uniform pricing and profitability, and a negative correlation with capital ratios, which could be size-related as larger banks tend to hold less equity.

Given the importance of bank size, we replicate the analysis of Figure 2 by weighting banks by their total assets and deposits, allowing us to better quantify uniform pricing in the U.S. economy. Uniform pricing is less prevalent, though still predominant, in these size-weighted analyses. Moreover, in Figures A.6 and A.7, we restrict the sample to banks with assets over \$1 and \$10 billion and find that within-bank variation in 12-month CD rates increases when we use these samples composed of larger banks. Overall, we find that accounting for the size of banks in the computation of the degree of prevalence of uniform pricing increases the level of within-bank rate variation in the 2004–2006 period to 33% of the total rate variation as opposed to 20% in the full non-weighted sample used in Figure 2.

## 4 Summary Statistics

This section gives descriptive statistics of key variables used in the empirical analysis. Our main variables of interest are the differences between the 1-Year CD rate, savings deposit, HELOC, and personal loan rates set by the acquired branches in an M&A deal and the respective median rates of the acquirer bank.

Importantly, we compute the median rates of the acquiring bank using the network of branches that the acquirer operated twelve months prior to the merger date. By holding the pre-merger branch network of the acquirer constant, we avoid having the median rate of the acquirer contaminated by the acquisition of new branches following the merger.

In Figure 5, we present a histogram with the percent rate differences between the rates of the acquired branches and the median rate of the respective acquirer twelve months before (blue solid bars) and twelve months after (red hollow bars) the acquisition. The histogram indicates significant dispersion in the differences between the rates of the acquired and acquirer branches prior to the merger. We show that only 20% of acquired branches set deposit and loan product rates that are similar to those of the acquirer prior to the merger, while a substantial fraction of acquired branches set deposit and loan rates that are both significantly below and above the corresponding median rates of the acquirer. The rate differences mostly disappear following a merger, with approximately 80% of acquired branches practicing deposit rates similar to those practiced by the branches of the acquirer.[13]

To further understand the conditional distribution of the differences in rates, Table 2 reports the coefficients of bivariate regressions of the pre-merger percent difference between the rates set by acquirers and acquired branches on bank characteristics. The variables are normalized so that coefficients can be interpreted as the effect of a one-standard-deviation change in each characteristic. The results of Panels A and B of Table 2 indicate that when the acquired bank is larger it practices lower deposit rates relative to the acquirer. By contrast, larger deposit balances are associated with more positive differences between the deposit rates of acquired and acquirer, suggesting that acquired branches with larger deposit balances tend to set higher deposit rates prior to a merger. We also observe that thinly capitalized, low-profitability acquired banks set higher deposit rates relative to their acquirers, which is unsurprising given the findings in Acharya and Mora (2015) and Martin, Puri and Ufier (2018). Interestingly, these correlations have the opposite sign in Panel D, where we examine the associations between characteristics and the personal loan rate differences between acquirer and acquired branches prior to the merger. Finally, the table suggests that the bivariate correlations between acquirer characteristics and rate differences generally have the same sign but are weaker than the correlations between target characteristics and rate differences.

Overall, these bivariate regressions suggest that the differences in deposit and loan rates are correlated

[13] In the Internet Appendix D, we repeat this analysis using the raw difference between the rates set by the acquired branches in an M&A deal and the respective median rates of the acquirer bank. The analysis shows that the pre-merger rate differences for the 1-Year CD rate fall between -50 and 50 basis points twelve months before the merger whereas the pre-merger rate differences for the savings account product are mostly between -20 and 20 basis points. The rate differences for loan products show significant dispersion. The analysis also shows that the rate differences mostly disappear following the merger.

with observable characteristics of the banks involved in the merger. But despite these correlations, we show that a significant number of banks with both positive and negative pre-merger rate differences enter M&A deals. The next section will show that after the consummation of a merger, rates converge regardless of whether the acquired branch was setting higher or lower deposit rates than its acquirer.

# 5 Bank M&As and Pricing

## 5.1 Uniform Pricing and Convergence in Interest Rates after Bank M&As

In this section, we examine the evolution of deposit and loan rates around a merger and how this evolution depends on pre-merger rate differences between the acquirer and acquired banks. We begin by plotting the relative percent differences between the rates of an acquired branch and the median rates of its acquirer over a 24-month window around the merger event. Figure 6 shows significant dispersion in the percent differences between the rates of acquired branches and acquiring banks in the twelve months prior to the merger. For instance, at the 5th percentile, the 1-year CD rate of the acquired branches is about half the median CD rate of the acquirer, while at the 95th percentile, the CD rate of the acquired branch is roughly double the acquirer's median rate. The figure also shows that pre-merger percent rate differences remain largely stable throughout the pre-merger period.

Upon completion of the merger, rate differences converge substantially toward zero, though not entirely. For instance, the 25th and 75th percentiles of the percent difference in 1-year CD, savings deposit, and personal unsecured loan rates converge to zero within twelve months after a merger.[14] This convergence occurs regardless of whether acquired branches were setting rates above or below those of the acquirer in the twelve months that preceded the merger. The 10th and 90th percentiles of these deposit and loan products also substantially converge toward zero, though complete convergence is not achieved within twelve months. The absence of full convergence in interest rates at the 10th and 90th percentiles highlights that, despite a high prevalence of uniform pricing, some within-bank variation in rate-setting across branch networks persists.

Next, we quantify the impact of bank M&As on the evolution of deposit and loan rates using regression analysis. We estimate the following empirical specification using ordinary least squares (OLS):

$$Y_{i,t,s} = \gamma_{s,t} + \theta_i + \beta Post\text{-}Acquisition_{i,s} + \epsilon_{i,t,s} \quad (1)$$

[14] In the Internet Appendix D, we repeat this analysis using the raw difference between the rates set by the acquired branches in an M&A deal and find similar results.

where $Y_{i,t,s}$ measures the absolute raw and percent difference between the deposit and loan rates of the acquired branch $i$ and the median rate of the respective acquirer in month $t$ and $s$ months pre- and post-merger. $Post\text{-}Acquisition_{i,s}$ is a dummy variable that takes the value of one in the twelve months following the merger, $s \in \{0, 1, ..., 12\}$, and zero in the twelve months preceding the merger, $s \in \{-12, -11, ..., -1\}$. Our main coefficient of interest, $\beta$, measures the average impact of the M&A on the absolute difference between the rates set by the acquired and acquirer banks.

Our main specification includes state-by-month-fixed effects, $\gamma_{s,t}$, and branch-fixed effects, $\theta_i$. The state-by-month-fixed effects absorb state-level trends in the evolution of deposit and loan rates. The branch-fixed effects ensure that all results are estimated using *within*-branch variation in the absolute rate differences. We cluster all standard errors at the level of the merger. We cluster at this level because branches acquired in the same merger may not be able to independently set rates both before and after the merger and therefore the residuals may be highly correlated at this level.[15] The estimated coefficients are statistically significant when we cluster at other levels such as the level of the banking market.[16]

Table 3 reports the results of estimating the specification of equation (1). The results show strong evidence of rate convergence between the acquirer and acquired branches across all deposit and loan products. Columns (1) through (4) show that, after a merger event, the absolute differences between the CD, savings deposit, HELOC, and personal unsecured loan rates of the acquired and acquirer branches decline by approximately 11 bps, 3.7 bps, 43 bps, and 139 bps, on average. Considering that, prior to the merger, the average differences between the acquirer and acquired branch rates on these products were 25.7 bps, 6.6 bps, 85 bps, and 195 bps, respectively, our findings indicate that the differences in rates shrink by between 40 and 70 percent over the twelve-month period following a merger. Columns (5) and (8) repeat the empirical specification using the absolute percent rate difference as the dependent variable. Again, these results suggest substantial, albeit not complete, convergence, with absolute percent rate differences declining by 34 percentage points (p.p.), 56 p.p., 10 p.p., and 14 p.p. for CDs, savings deposits, HELOCs, and personal unsecured loans, respectively. Given that the pre-merger relative differences in rates were approximately 45%, 110%, 15%, and 20%, the percentage differences in rates shrink by 74, 47, 66 and 72 percent, respectively, over the twelve-months period following a merger. Thus, our findings indicate significant but not complete convergence in interest rates after a merger, which is consistent with a high,

[15]In the Internet Appendix D, we further examine this issue by collapsing the data at the bank-market level or even at the bank-level (Bertrand, Duflo and Mullainathan (2004)) and computing the difference between the median bank rates of acquirer and acquired branches.

[16]Regional Federal Reserve Banks define "banking markets". The geographic delimitation of each banking market is available online: https://cassidi.stlouisfed.org/index

albeit not full, prevalence of uniform pricing.

Next, we investigate whether the empirical patterns above can be directly linked to uniform pricing practices. We leverage the fact that not all banks apply uniform pricing across their entire branch network to the same degree (as shown in figure 4). We partition the sample based on the median of the standard deviation of acquirer's rates twelve months before the merger and assess whether rate convergence is stronger for acquirers with lower pre-merger rate dispersion across their branch networks. The results presented in Panel A of Table 4 support this conjecture. Across all deposit and loan products, convergence is stronger when the acquirer's pre-merger rate dispersion is below the median. This further suggests that the main empirical patterns are consistent with uniform pricing practices.

We also explore other potential explanations for post-merger rate convergence. One possibility is that the effects are entirely driven by cases where a large bank acquires a small, single-market bank. Since multi-market banks tend to set uniform rates across markets, it is likely that the smaller acquired bank adopts the larger bank's rates. However, when two similarly sized banks merge, it may be less likely that the acquired branches adopt the acquirer's rates. In Panel B of Table 4, we test whether our results are driven solely by large banks acquiring small ones. We split the sample based on whether the acquirer's total assets are larger or smaller than the acquired bank's assets twelve months before the merger. The findings show rate convergence in both subsamples, suggesting this pattern is not limited to large multi-market acquirers. Furthermore, in Internet Appendix C, we analyze mergers involving small banks (assets below $1 billion) acquiring other small banks, large banks acquiring small banks, and large banks acquiring other large banks. We also repeat the analysis of Table 3 after weighing acquired bank's branches by the total assets and deposits of the acquirer and acquired banks.[17] The results indicate that there is rate convergence among all of these subsamples and alternative weighting methods.

Another possible explanation for our results is that rates only converge when the branch networks of the acquirer and acquired banks overlap. Acquirers may not be able to offer different rates at branches within the same banking market, but they might retain the rates of acquired branches if the acquirer had no prior presence in the banking markets of the acquired bank.[18] In Panel C of Table 4, we partition the sample based on whether the acquirer had branches in the same market as the acquired branch before the merger. Our results indicate that, following a merger, the deposit and loan rates of acquirers and acquired

[17] We use the $1 billion threshold in asset size because it is the asset-size threshold used in the Community Reinvestment Act to define a small bank institution.

[18] Interview of industry participants in Dellavigna and Gentzkow (2019) indicate that brand-image concerns is an often-cited reason why retail chains price uniformly.

branches converge whether there is market overlap or not.[19]

We conduct multiple other robustness tests. In Internet Appendix C, we examine if the relation between the deposit and loan rates of the acquirer and acquired branches following the merger holds across various data splits. We exclude consolidations where the acquirer and acquired branches belong to the same bank holding company (BHC) and we separate the sample into bank mergers and branch acquisitions, finding similar convergence in both subsamples. We repeat the results after excluding failed banks from the sample to address concerns that our results are driven by the inefficiently high rates of failing banks (Martin, Puri and Ufier, 2018). We also stratify the sample based on whether the acquired branch keeps the same rate-setter branch or not and find that rates converge after a merger regardless of whether the acquirer changes the rate-setter of the acquired branch or not.

Finally, a potential concern with the event design presented above is that it relies only on variation in the timing of mergers across acquired branches. Borusyak, Jaravel and Spiess (2021), De Chaisemartin and D'haultfoeuille (2020), Goodman-Bacon (2021) and Sun and Abraham (2021) suggests that such regressions may not recover average treatment effects if there is treatment effect heterogeneity and staggered treatment adoption. Moreover, acquirers might target banks whose rates were temporarily higher or lower than optimal. In such cases, rates could revert to the mean or converge toward the rate of the acquirer even in the absence of a merger. To address this possibility, we create a matched sample of branches that practiced similar rates to the acquired branches and were located in the same regions but were not involved in a bank M&A. In Internet Appendix E, we use a differences-in-differences approach with this matched sample as a control group and we find similar results to our event study analysis.

### 5.2 Pre-merger Rate Differences and Post-merger Rate Adjustments

Next, we examine how acquirers adjust interest rates following a merger. Acquirers may align the rates of acquired branches with their own or adjust the rates within their pre-existing branch network to match the rates of the acquired branches. For this analysis, we partition our sample based on whether the acquired branch's rates were higher or lower than the acquirer's median rate in the pre-merger period. Columns (1) through (3) of Table 5 focus on acquired branches that set higher rates than their acquirers before the merger, while columns (4)–(6) examine those with lower pre-merger rates. The size of the subsamples is approximately the same across the deposit products, as we expect from the analysis in Figure 5.

The results in column (1) suggest, as expected, that the merger is associated with a reduction in

[19] We repeat the empirical analysis of 4 in Internet Appendix D using the absolute rate difference between the acquirer and acquired branches as the dependent variable. The results are similar when we use this alternative dependent variable.

rate differences when the rates of the acquired branches are higher than those of the respective acquirer. Columns (2) and (3) decompose the overall rate convergence, distinguishing adjustments made to the rates of acquired branches from those made to the acquirer's rates. We find that changes to the rates of acquired branches account for most of the decline in rate differences following the merger. For example, columns (2) and (3) of Table 5 indicate that, in this subsample, the CD rates of the acquired branches decrease by 12.2 bps, while the median deposit rates of the acquirers increase by 3.3 bps.

In columns (4) to (6) of the same table, we turn to the subsample of acquired branches that set lower deposit rates than their acquirers throughout the pre-merger period. This case is interesting because one might expect acquiring banks to hesitate in increasing deposit rates at acquired branches, potentially preferring to lower their own rates to match the acquired branches. The results of column (4) of Table 5 indicate that when acquired branches set lower rates than the acquirer before the merger, the rate difference becomes less negative afterward. Surprisingly, columns (5) and (6) reveal that most of the adjustment is again driven by changes in the deposit rates of the acquired branches. For instance, the deposit rates of 1-year CDs and savings accounts at acquired branches increase by 9.5 bps and 3.5 bps, respectively, while the median deposit rates decrease by 3 bps and 0.5 bps. We observe similar results across all columns when examining the post-merger adjustment of loan rates in Table 5.

Overall, these results are intriguing because acquirers could have lowered the deposit rates of acquired branches if acquired branches were offering better rates and reduced their own rates if their own branches were the ones offering relatively better rates to customers. Instead, most of the post-merger rate adjustments are driven by changes to the rates of the acquired branches. This suggests that clients of acquired branches may benefit when branches with relatively low deposit rates and high loan rates are acquired by banks offering higher deposit rates or lower loan rates. This finding is novel and has not been considered in prior work examining the impact of bank mergers on the evolution of deposit rates (e.g., Park and Pennacchi (2009) and Focarelli and Panetta (2003)).

### 5.3 Deposit Rate Convergence and changes in Branch Deposits after Bank M&As

In the previous section, we show evidence consistent with the possibility that a high-degree of uniform pricing practices induces significant changes in the deposit and loan rates of acquired branches following bank mergers. Here, we examine whether these changes in deposit rates affect the amount of branch deposits at acquired branches. The idea is to evaluate if acquired branches lose relatively more deposits when they practice higher rates than the acquirer prior to the merger, and vice versa.

To assess this possibility, we use the SOD dataset, which includes the deposit balances of each branch of all U.S. depository institutions as of June 30 each year. Unlike prior analyses, this dataset allows us to observe deposits only on an annual basis, so we focus on changes in deposits at acquired branches within a five-year window of the merger event. To quantify how pre-merger differences in deposit rates between the acquirer and acquired branches affect the evolution of deposits at acquired branches, we implement the following specification:

$$Y_{i,t,s} = \gamma_{s,t} + \theta_i + \beta_0 \textit{Post-Acq}_s + \beta_1 \textit{Post-Acq}_s \times \left(\frac{\textit{Acquired Branch Rate - Acquirer Rate}}{\textit{Acquirer Rate}}\right)_i^{Pre} + \epsilon_{i,t,s} \quad (2)$$

where $Y_{i,t,s}$ is the natural logarithm of total deposits at the acquired branch $i$ in year $t$, $s$ years around the merger event. *Post-Acq* is an indicator variable that takes the value of one after the branch is acquired. $\left(\frac{\textit{Acquired Branch Rate - Acquirer Rate}}{\textit{Acquirer Rate}}\right)_i^{Pre}$ measures the average difference in rates over the twelve months prior to the merger. The main coefficient of interest, $\beta_1$, measures the average percent change in branch deposits after the merger event when the pre-merger difference in deposit rates increases by one standard deviation, while $\beta_0$ represents the average percent change in branch deposits when the acquired branches practice similar deposit rates as acquirers prior to the merger.

We present estimated coefficients from this regression in Table 6 and in Figure 7 we examine the dynamic evolution of deposits by interacting a series of indicator variables representing the number of years elapsed since the merger with our pre-merger deposit rate difference variable. In Table 6 we find that acquired branches lose, on average, between 7 and 11% of their deposit volume when the acquired branches practice similar deposit rates as acquirers prior to the merger. Figure 7 shows that this loss in branch deposits equally affects banks with positive and negative pre-merger rate differences and occurs sharply around the year of the merger. We note that Benson et al. (2024) finds similar evidence that the deposits of acquired branches decline following a merger irrespective of the levels of local concentration and Vij (2019) documents a similar finding for a sample of acquired branches of failed banks. We interpret this finding as an indication that acquisitions, on average, drive customers away from the acquired branches because they value specific characteristics of the acquired bank or branch, such as their familiarity with personnel and relationship managers. Following a merger, some of the specific attributes valued by clients such as their relationship managers could be lost, leading to customer attrition.[20]

[20]Banks often discuss client attrition following bank mergers in conference calls with financial analysts. For instance, in the recent 2018:Q2 earnings conference call from First Financial Bancorp, a financial analyst asked the Chief Banking Officer

Figure 7 shows that after the merger, deposits gradually return to pre-merger levels, with faster recovery in branches where deposit rates increase due to negative pre-merger rate differences.[21] Table 6 indicates that a one standard deviation increase in pre-merger rate differences for 1-Year CDs and savings deposits is associated with a 2.5% and 3.8% decline in branch deposits, respectively. Columns (3) and (4) present similar results when we interact the post-acquisition dummy with a variable measuring the change in average deposit rate differences pre- and post-merger. Overall, this evidence suggests a positive deposit rate semi-elasticity, as branches with rising deposit rates experience smaller declines in deposits. In Internet Appendix G, we conduct additional analyses to further estimate the average deposit rate semi-elasticity induced by bank mergers.

# 6 Rate Convergence, Local Market Concentration, and the Evolution of Deposit and Loan Rates

The DoJ's merger review guidelines require a detailed review of the effects of proposed bank mergers when consummation of the merger is predicted to increase local market concentration levels by more than 200 points *and* when the local market concentration level is predicted to exceed 1,800 points after the merger. In these detailed reviews, antitrust regulators look for factors that might mitigate the adverse impact that a proposed merger would have on the local banking market. Based on their findings, regulators then decide whether to approve the merger or request branch divestitures in local banking markets whose competitiveness would potentially be most affected by the merger.

This focus on local market concentration is partly predicated on the belief that local market consolidation increases local market power and encourages acquirers to lower deposit rates and increase loan rates (e.g., Carlton, 2007). But if acquirers set prices uniformly across all their branches, they may be less inclined to significantly adjust prices in response to gains in local market share.

The evidence above suggests that pre-merger rate differences are a strong predictor of post-merger interest rate changes. It is nonetheless possible that pre-merger rate differences are less important in shaping interest rates when local market concentration increases substantially. The following analysis

of the company how were they doing in terms of post-merger customer and talent retention. The Chief Banking Officer responded: "We have been very intently focused on client retention. The number one driver of client retention is retaining our relationship managers, so I always put both of those as very, very high priorities. So we've had some success. We've had some regrettable turnover, I have to admit. But we feel good about where we are, and we continue to build the teams as we work with the larger company and move up market."

[21] In Internet Appendix F, we show that the deposit rate movements induced by uniform pricing practices persist for at least three years following a merger.

empirically evaluates the relative importance of increased local banking market concentration and pre-merger rate differences in explaining the cross-sectional variation in the impact of bank mergers on the rates of acquired branches.[22] We examine how predicted increases in local HHI compare with pre-merger rate differences in explaining cross-sectional variation in the impact of mergers on an acquired branch's deposit and loan rates.[23]

In Table 7, we examine whether predicted HHI increases above the 200-point threshold set by merger-review guidelines are linked to significant effects on deposit and loan rates at acquired branches. Specifically, we interact the post-merger indicator with three variables: $\mathbb{1}.(\Delta HHI = 0)$, representing acquired branches with no increase in local concentration (out-of-market mergers); $\mathbb{1}.\Delta HHI \in (0, 200)$, for branches with HHI increases below 200 points; and $\mathbb{1}.\Delta HHI \geq 200$, for branches in markets with HHI increases exceeding 200 points. Columns (3) and (4) of Table 7 suggest that when local market concentration increases by more than 200 points, 1-year CD rates at acquired branches decline by an average of 11 basis points, a statistically significant effect. However, these results do not hold across all deposit and loan products. For example, we do not find significant changes in savings deposit rates or personal unsecured loan rates for branches in markets with HHI increases over 200 points. Moreover, the incremental $R^2$ of these regressions are minimal when compared to specifications in columns (1) and (2), which include fixed effects but not the post-merger indicators.

In columns (5) and (6), we perform a similar analysis, interacting the post-merger indicator with five variables representing each quintile of pre-merger deposit-rate differences. The results show that the top 20% of acquired branches, which had higher pre-merger deposit rates than their acquirer, experience average declines of 29 bps in 1-year CD rates and 12 bps in savings account rates. Conversely, the bottom 20% of acquired branches, with lower pre-merger deposit rates, see increases of 24 bps and 7 bps in their 1-year CD and savings rates, respectively. The incremental $R^2$ of these empirical specifications relative to those in columns (1) and (2), is substantial, especially considering the high baseline $R^2$. For instance, the incremental $R^2$ of the regression of column (6) relative to that of column (2) suggests that the post-merger indicators interacted with the pre-merger deposit-rate differences quintiles explain more than a quarter

[22]We compute the changes in market concentration induced by bank mergers using the same definitions and process that regulators follow. Banking markets do not necessarily coincide with any standard geographic delineation. We searched for the current delineations of banking markets through the CASSIDI tool available from the website of the Federal Reserve Bank of St. Louis. For each acquired branch, we compute the predicted change in local banking market concentration that would be induced by the merger, which we take as the increase in the Herfindahl-Hirschman Index (HHI) after combining the pre-merger market shares of the acquirer and acquired banks in the respective local banking market.

[23]In the Internet Appendix F, we scatterplot the pre-merger rate differences and the predicted increases in local concentration to assess whether there the data suggests that mergers involving greater increases in local market concentration have systematically different pre-merger rate differences. The scatterplot does not suggest a strong association between these two characteristics.

$\frac{0.843-0.783}{1-0.783} = .276$ of the unexplained variation in column (2).

In columns (7) and (8) of the same table, we further compare the effects of changes in local banking market concentration and pre-merger differences on deposit rates. Overall, the results of these specifications suggest that cross-sectional variation in pre-merger differences in deposit rates explains more of the variation in the post-merger evolution of deposit rates than does cross-sectional variation in predicted changes in local market concentration. In Panel B of Table 7, we repeat the analyses for loan products and again we find that cross-sectional variation in pre-merger differences in loan rates are more powerful than predicted changes to local market concentration in determining the evolution of loan rates at acquired branches following a merger.

Next, we examine how pre-merger rate differences interact with predicted changes in local market concentration to influence post-merger deposit and loan rates at acquired branches. We estimate a flexible empirical specification to evaluate whether pre-merger rate differences impact post-merger deposit rates both in local banking markets that experience significant increases in local market concentration and in those that do not. Specifically, we extend the empirical analysis in Table 7 by including a full set of interactions between $\mathbb{1}.(\Delta HHI = 0)$, $\mathbb{1}.\Delta HHI \in (0, 200)$, and $\mathbb{1}.\Delta HHI \geq 200$ and the indicator variables representing the quintile sorts based on pre-existing deposit rate differences. We then plot the coefficients from estimating this regression using OLS in Figure 8. Our results show that when acquired branches had lower pre-merger rates than their acquirers, post-merger rates tend to increase, even in markets where concentration rises by more than 200 points. Moreover, we note that we observe significant post-merger changes in deposit rates even when concentration does not increase more than 200-point threshold. Overall, across all levels of HHI increases, deposit rates generally rise when acquired branches initially had lower rates and decrease when they had higher rates.

These findings have important implications for merger review analyses. Antitrust authorities focus on mergers that significantly increase local market concentration, often requiring remedies to address concerns about reduced competition in deposit markets. Our findings are novel because they reveal that in many mergers, acquirers set higher pre-merger deposit rates than targets, and post-merger rates at acquired branches tend to rise even in areas with substantial increases in concentration.[24] Additionally, by focusing solely on specific markets, antitrust authorities may overlook the broader impacts of a merger

[24] In the Internet Appendix F, we also address potential concerns that acquirers might be reluctant to change rates immediately after a merger. We implement an empirical specification that examines how variations in pre-merger rate differences and changes in concentration levels in the local banking markets explain variation in the post-merger rates of acquired branches two and three years after the merger, respectively. The results suggest that pre-merger rate differences are still the main driver of variation in post-merger deposit and loan rates, even at these longer horizons.

across all markets where the acquirer and acquired banks operate. These results underscore the limitations of merger evaluations that rely solely on local concentration measures, such as the deposit-HHI, which may fail to capture the full effects of a merger.

A potential concern about the empirical analysis presented above is that we do not observe how bank mergers would have impacted the deposit rates of acquired branches in cases where authorities recommended divestitures. The results in Panel A of Table 7 could, therefore, significantly understate the negative impact of above-threshold increases in local market concentration on local deposit rates because antitrust interventions preclude us from observing the evolution of rates in banking markets in which increased market concentration would have had the most-negative consequences on deposit rates.

We follow Liebersohn (2020) in devising an empirical strategy that partly addresses this concern. The strategy relies on the fact that antitrust review guidelines only require detailed merger reviews when the post-merger local market concentration measure lies above 1,800. The frequency of antitrust intervention is nearly zero below the threshold and rises discontinuously when the 1,800 threshold is breached (Liebersohn, 2020). We thus repeat our analysis with a subsample of bank mergers whose predicted post-merger HHI was between 1,300 and 1,800. These are local markets whose concentration indices are slightly below the threshold of 1,800 set forth in the review guidelines and are not subject to antitrust intervention even when the local banking market concentration increases substantially more than 200 points.

The results in Table 8 indicate that the pre-merger rate differences have a strong impact in explaining the post-merger evolution of interest rates even in this subsample. Figure 9 continues to suggest that rate convergence between acquirers and acquired banks can lead to rate improvements following mergers, even in markets experiencing increases in concentration exceeding 200 points. The results, nevertheless, provide some empirical support for the idea that antitrust interventions can weaken the link between rising local market concentration and price increases. For instance, column (1) of Table 8, indicates that, in this subsample, a concentration increase of more than 200 points is associated with a statistically significant 13 bps decline in deposit rates at acquired branches, compared to a 11 bps decline in the main sample.

Overall, the findings of this section indicate that pre-merger differences in deposit and loan rates explain a significant fraction of the cross-sectional heterogeneity in the impact of bank mergers on local deposit and loan rates. This is true even in areas where the DoJ merger guidelines compel antitrust authorities to review the proposed mergers in detail and potentially force acquirers to divest branches. Our results are consistent with banks engaging in uniform pricing across their branch networks. However, our findings are also consistent with the possibility that interest rates set by banks reflect the quality of their service and that these quality attributes are transferred to the newly-acquired branches at the time of the merger. Thus, the post-merger rate changes we observe could be due to shifts in branch quality. In the next section, we develop and estimate a model that helps us understand the importance of uniform pricing in shaping post-merger interest rate evolution while formally taking into account the impact that convergence in branch quality could play the post-merger evolution of deposit rates.

# 7 Model

In this section, we develop and estimate a structural model of deposits in the U.S. consumer banking sector. We model both the demand and supply of deposits. On the demand side, depositors derive utility from the deposit rate offered by a branch and from non-price characteristics and services offered at both the branch and bank level, including a measure of overall unobserved bank quality that is captured by bank-specific fixed effects. On the supply side, we consider two opposite pricing strategies: *local pricing*, where banks optimally choose interest rates for each market that maximize local profits; and *uniform pricing*, where banks set a unique rate for all their branches that maximize overall bank's profits.

Despite its simplicity, the model helps us determine whether the interest rate convergence following a merger is at least partly driven by banks' uniform pricing practices or simply reflects convergence in quality. Specifically, we run two set of counterfactuals, simulating all mergers in the sample and computing the model-implied equilibrium deposit rates following a transfer of ownership of the acquired branches to the acquirer. In one counterfactual, we assume that banks optimally choose deposit rates based on *local pricing*, while in the second, we assume banks follow *uniform pricing*. Importantly, in both counterfactuals, we assume that acquirers make changes at the acquired branches to align their quality with what the acquirer offers elsewhere. Thus, since both counterfactuals incorporate quality convergence, the differences between the two reflect only differences in bank pricing conduct rather than changes in branch quality associated with the merger. We then ask which of the two counterfactual exercises delivers post-merger equilibrium prices that are more consistent with the empirical patterns observed in the post-merger data. Finally, we use the model to better understand the effects of mergers when acquirers set uniform prices among their branches and to evaluate the consumer welfare impact of past antitrust decisions forcing acquirers to divest branches.

### 7.1 Consumer Demand

Time is discrete. In each period, each consumer chooses a local branch at which to deposit their savings among the set of branches available in their market.[25] Depositors derive utility from the services provided by differentiated branches. This feature captures the persistent and large differences in branches' shares of the deposit market. We model demand for deposits at the branch level because we want to consider a branch as a product. This choice allows us to simulate equilibrium changes in deposit rates when branches (products) change ownership while holding constant the set of branches (products) that is available in a given market.

**Depositor Preferences** The utility that depositors derive from banking with a given branch depends on the deposit rate offered by that branch and on the non-price characteristics and services offered at both the branch and bank level. In each period, consumers face an idiosyncratic utility shock for each individual branch. The total indirect utility that consumer $i$ derives from depositing their savings with branch $j$, located in zip code $z$ of banking market $m$ and belonging to bank $b$ is represented by:

$$u_{i,j,z,m,b,t} = V_{j,z,m,b,t} + \epsilon_{i,j,t}$$

where $V_{j,z,m,b,t}$ denotes the common indirect utility function and $\epsilon_{i,j,t}$ is a time-varying individual-branch utility shock that captures unobserved matching factors that might exist between consumer $i$ and branch $j$. The common indirect utility function, $V_{j,z,m,b,t}$, is defined as:

$$V_{j,z,m,b,t} = \alpha_m r_{j,t} + \beta_0 X_{j,t} + \beta_1 H_{b,m,t} + \beta_2 W_{b,t} + \xi_b + \gamma_z \tag{3}$$

Consumers derive utility $\alpha_m r_{j,t}$ from the deposit rate at branch $j$, where $\alpha_m$ represents the deposit-rate sensitivity of consumers in market $m$.[26] Depositors' utility also depends on observable branch

[25] We consider that demand for deposits is locally segmented because consumers consider only banks with branches in their local banking market (e.g., Abrams, 2019; Honka, Hortaçsu and Vitorino, 2017). Using recent data from the 2019 Survey of Consumer Finances, we assess whether this assumption remains reasonable in more recent times. In the Internet Appendix F, we provide a histogram with the minimum distance between a household and the closest branch of their bank in 2019. The histogram shows that 75% of the households surveyed still deposit with a financial institution that operates a branch less than five miles away from the household's address and only a small fraction of less than 5% of households hold all their deposits with financial institutions whose nearest branch is more than 100 miles away. This evidence suggests that the assumption of local demand segmentation is reasonable even given the recent rise of online banking and non-banks.

[26] To measure the deposit interest rate offered by each branch, we take the simple average of the deposit rates for a savings account with balance of $2.500, money-market deposit account with account balance of $25,000, and 12- and 36-month CDs with account sizes of $10,000. We use this average of deposit rates of distinct deposit products because the SOD does not break down the total deposits held in each branch by type. The average deposit rate is thus intended to be more representative of the overall composition of deposits than what it would be if we used only one of these components. Since the model is

characteristics, $X_{j,t}$, such as a branch's age, which is included in the model to capture the value of a branch's local relationships and customer capital. We include zip-code fixed effects, $\gamma_z$, to capture unobserved characteristics of the area surrounding the branch. All else equal, branches located in more-populated areas or in business districts might hold more deposits than branches in less-populated areas. Depositors also derive utility from the quality of service offered by the bank in each market, which we represent with $H_{b,m,t}$. The vector $H_{b,m,t}$ includes the total number of branches operated by the bank in a given market to capture the spatial density of branches, which consumers value for convenience. We also include the number of years a bank has operated in a market to represent the bank's experience in that market. We also consider other observable time-varying bank characteristics, $W_{b,t}$, such as the size of the bank as measured by total assets and loans, bank performance and profitability proxied by return on assets (ROA), non-performing loans as a fraction of total assets (NPL), and the Tier 1 Capital Ratio. Finally, we control for unobservable bank characteristics by including bank-specific fixed effects, $\xi_b$, that capture differentiation in services offered, brand image, and quality.[27]

**Demand for Deposits** Depositors choose among the branches available in market $m$ at time $t$, taking as given the deposit rates, branch and bank characteristics, and the utility shock, $\epsilon_{i,j,t}$. Following the standard procedure for discrete-choice demand models (e.g., Berry, Levinsohn and Pakes, 1995), we assume that utility shock $\epsilon_{i,j,t}$ is individual and time *i.i.d.* with an Type-1 extreme-value distribution. Under these assumptions, a consumer's optimal choice implies the following aggregate demand functions expressed in terms of each branch's share $j$ of market $m$:

$$s_{j,z,m,b,t} = \frac{\exp\left(V_{j,z,m,b,t}\right)}{\sum_{k\in\Gamma^m}\exp\left(V_{k,z,m,b,t}\right) + \exp\left(V_{O,m,t}\right)} \tag{4}$$

where $V_{j,z,m,b,t}$ is defined in equation (3). $V_{O,m,t}$ denotes the value of the outside option in each market. We normalize the value of the outside option to zero, $\xi_O = 0$. $\Gamma^m$ corresponds to the set of branches in market $m$.

estimated at annual frequency, we compute each branch's deposit rate as the average deposit rate reported to RateWatch over the first six months of each year.

[27]The model could also include branch-fixed effects to capture differences in branch quality that affect consumer preferences. We choose not to include branch-fixed effects in our estimation because these fixed effects would subsume most of the variation that we use to estimate bank-specific fixed effects. The bank-specific fixed effects are crucial for our counterfactual analyses because they allow us to measure the quality of each bank as perceived by consumers. We can then account for how a change in perceived bank quality associated with a branch's *owner* affects equilibrium deposit rates after a bank merger.

## 7.2 Demand Estimation

We follow the procedure of Egan, Hortaçsu and Matvos (2017) to estimate the utility parameters in equation (3). By taking logarithms of the share of each branch and subtracting the log share of the outside option, we can write the logit demand system as a linear specification:

$$\ln s_{j,z,m,b,t} - \ln s_{O,m,t} = \alpha_m \left(r_{j,t} - r_{O,t}\right) + \beta_0 X_{j,t} + \beta_1 \left(H_{b,m,t} - H_{O,m,t}\right) + \xi_b + \gamma_z$$

In our estimation, we consider banks that report deposit rates to RateWatch and designate all other banks with active branches as the outside good. Given that the deposit rates and characteristics of the outside option, $r_{O,t}$ and $H_{O,m,t}$, are not observable, we follow Egan, Hortaçsu and Matvos (2017) and include year-market fixed effects, $\chi_{m,t}$. This term absorbs the outside option and collapses the logit demand system to the following specification:

$$\ln s_{j,z,m,b,t} = \sum_m \left(\alpha_m r_{j,t} \times I_m\right) + \beta_0 X_{j,t} + \beta_1 H_{b,m,t} + \xi_b + \gamma_z + \chi_{m,t} \tag{5}$$

where $I_m$ is a set of indicator variables that take the value of one if the branch is located in market $m$. With the inclusion of $I_m$, we are able to estimate market-specific deposit rate semi-elasticities. This approach departs from much of the existing literature, which typically assumes a common semi-elasticity across all markets (e.g., Abrams, 2019). We consider that allowing for heterogeneity in deposit rate semi-elasticities is important in light of evidence that differences in the demographic composition and sophistication of the depositor clientele creates heterogeneity in rate semi-elastiticies across banking markets (e.g., Xiao, 2021, Avramidis and Pennacchi, 2024, and Bhutta, Fuster and Hizmo, 2024).

To address potential endogeneity of deposit rates, we instrument the branch-level deposit rate, $r_{j,t}$, with the average rate of the bank's branches in other markets. The instrumental variables approach introduced by Hausman (1996) uses the prices of a product in other markets as instruments. This approach has been used extensively in the literature (e.g., Nevo, 2001; Dellavigna and Gentzkow, 2019) and as Dellavigna and Gentzkow (2019) point out, it is particularly compelling for the study of sectors in which uniform pricing practices are strong because prices are unlikely to respond to local demand shocks in such industries. As described in section 3, branches of the same bank not only offer similar rates, but they also adjust rates at similar times, suggesting that rate changes are not driven by local demand shocks.

**Results of the Demand model:** We estimate the specification of equation (5) using an instrumental-variable approach. Because the standard errors of the estimated market-specific deposit rate semi-elasticities can be quite large for smaller banking markets, we restrict our sample to banking markets with at least 200 observations. To further adjust for sampling error, we follow Dellavigna and Gentzkow (2019) and use an empirical Bayes procedure that shrinks deposit rate semi-elasticities to their sample mean and then winsorize the deposit rate elasticities at 0.025 and 0.6.

Figure 10 shows the distribution of the empirical-Bayes adjusted and winsorized market-level deposit rate semi-elasticities. The average market-level deposit rate semi-elasticity is approximately 0.134 with a standard deviation of 0.111. This average semi-elasticity is lower than that reported in other studies using RateWatch data to estimate deposit demand (e.g., Egan, Hortaçsu and Matvos, 2017; Abrams, 2019). Notably, Abrams (2019), using a similar instrument, estimates a deposit rate semi-elasticity of about 0.3, more than twice our estimate, while Egan, Hortaçsu and Matvos (2017) employs an instrument based on the bank-specific pass-through of monetary policy to deposit rates, yielding a semi-elasticity ranging from 0.16 to 0.6, depending on whether insured or uninsured deposits are considered.

Differences in sample selection and in the unit of observation used in the empirical analysis partly explain our lower estimates of the deposit rate semi-elasticity. We estimate our model using 580 distinct banking markets, each with at least 200 observations, while Egan, Hortaçsu and Matvos (2017) and Abrams (2019) focus on the largest sixteen and twenty U.S. banking markets, respectively. Additionally, our analysis is conducted at the branch level, in contrast to the market or bank level analyses in Abrams (2019) and Egan, Hortaçsu and Matvos (2017), respectively. In unreported analyses, we find similar estimates to Abrams (2019) when conducting the analysis at the bank-market level for the 20 largest banking markets and assuming a common semi-elasticity across markets. This finding further underscores the significant heterogeneity in deposit rate semi-elasticities across markets, likely due to different depositor clienteles with varying sensitivities to deposit rates (e.g., Xiao, 2021; Avramidis and Pennacchi, 2024). This heterogeneity supports our choice to estimate market-specific elasticities in our demand analysis. In the Internet Appendix G, we explore an alternative method for estimating a deposit rate semi-elasticity based on changes in deposit rates induced by mergers, which results in a greater semi-elasticity of 0.1855, though still smaller than those in the aforementioned studies.[28]

Our estimated coefficients also suggest that non-price attributes play an important role in determining a bank's market share. Depositors value relationships at the branch office and the bank's experience in the market, as evidenced by the fact that a branch's age and the operating institution's age are associated

[28] In the Internet Appendix G we assess the sensitivity of our model results to calibrating the deposit rate semi-elasticities to values that are twice, three, and even four times as large as those that we estimate.

with greater market share. Branches of banks with a denser network of branches within a market also hold greater market share, which suggests that depositors value convenient access to banking services. Our approach also gives us estimates of bank fixed-effects that we interpret, similarly to Egan, Hortaçsu and Matvos (2017), as a measure of the quality of the bank services that is not captured by branch network, bank size, deposit rates, among other observable attributes included in our model.

### 7.3 Supply

We now turn to describing the supply of bank deposits in our model. We consider the profit-maximization problem for a multi-market bank under two competing models of pricing behavior – with banks setting branch prices independently across banking markets, and with banks using uniform pricing.

**Bank Model**

Consider a monopolistic-competitive bank $b$ that owns branches, indexed by $j$, across various local markets indexed by $m$. Let $\Omega_b$ define the set of local markets where the bank operates. We abstract away from modeling the endogenous decision of whether to enter or exit a market and take this set as given. Banks maximize profits while taking the downward sloping demand schedule of equation (4) and the pricing constraints as given. Each branch pays a marginal cost $c_b$ that we assume to be constant across branches of a given bank and a branch fixed cost, $C_{jbm}$, that may vary across branches. $\tilde{R}_{b,m}$ denotes the bank $b$'s returns on each unit of deposits which can vary across markets. We define $R_{b,m} = \tilde{R}_{b,m} - c_b$ as the bank-market returns net of marginal costs.

**Local Pricing** When a bank sets deposit rates independently in each local market, it will choose a set of optimal branch-level deposit rates, $r_{jbm}$ that solve:

$$\Pi_b = \sum_{m \in \Omega_b} \sum_{j \in m} \{(R_{bm} - r_{jbm}) s_{jbm} D_m - C_{jbm}\} \tag{6}$$

where $D_m$ is the total amount of deposits held in the market and $s_{jbm}$ is the branch-level demand schedule defined in equation (4). $s_{jbm}$ depends on the branch's own deposit rates and non-price attributes as well as the deposit rates of all the branch's competitors in the market.[29]

We assume that bank returns are common across all of a bank's branches within a given market, leading the bank to optimally set the same deposit rate for all its branches in that market, i.e., $r_{jbm} = r_{bm}$.

[29] We assume that demand for deposits is segmented across markets and that changes in deposit rates do not affect the total amount of deposits in a market.

The first-order condition of the profit maximization problem for bank $b$ in local market $m$ determines that the optimal deposit rate of the bank in that market will be such that the inverse of the deposit-demand semi-elasticity of the bank's local demand equals its local deposit spread:

$$R_{bm} - r_{bm} = \frac{1}{\alpha_m \left(1 - s_{bm}\left(r_{bm}, \mathbf{r}_{b'm}\right)\right)} \tag{7}$$

where $s_{bm}\left(r_{bm}, \mathbf{r}_{b'm}\right)$ is the total market share held by bank $b$ in market $m$ and $\mathbf{r}_{b'm}$ is a vector of the deposit rates offered by all competitors in the market.

**Uniform Pricing** When a bank prices deposit interest rates uniformly, it will choose a single deposit rate that will be offered at all of its branches. The profit-maximization problem of uniform pricing banks is to maximize profits as defined in equation (6) subject to the constraint that the deposit rate must be the same across all markets, $r_{jbm} = r_b$. If, for the sake of simplicity, we assume that all deposits offer a common return $R_b$, the optimal uniform-pricing deposit rate satisfies:

$$R_b - r_b = \frac{1}{\sum_{m \in \Omega_b} \alpha_m \left(1 - s_{bm}\left(r_b, \mathbf{r}_{b'}\right)\right) \xi_{b,m}} \tag{8}$$

which means that in case of uniform pricing, the bank's deposit spread equals the inverse of the weighted average of the local deposit-rate semi-elasticities. The weights are the share of the market's total deposits held by bank $b$, $\xi_{b,m} = \frac{s_{bm} D_m}{\sum_{m \in \Omega_b} s_{bm} D_m}$.

The bank's first-order conditions under both local and uniform pricing models indicate that changes in branch ownership and quality following a merger will lead to adjustments in interest rates at acquired branches, though the intensity of this pricing adjustment varies depending on the model. The mergers will also have starkly different pricing implications for the acquirer's pre-merger network of branches, depending on the pricing model. For instance, under local pricing, we expect no changes in deposit rates for acquirer branches in markets where the two banks do not overlap. This is because those branches' quality and local market shares are unaffected by the merger, leaving their rate-maximization problem unchanged. In contrast, the uniform pricing model predicts that the merger will result in changes in the entire network of acquirer branches, even those that do not geographically overlap with the acquired branches.

In Internet Appendix F, we conduct two reduced-form exercises to test whether the post-merger evolution of interest rates broadly aligns with what might be expected under the first-order conditions of the uniform pricing model. We find that the post-merger evolution of rates at acquirer branches that do not geographically overlap with the acquired branches are consistent with a uniform pricing model. We also show that the post-merger rates at acquired branches converge more closely to a weighted-average pre-merger rate across all branches of the combined bank as predicted by equation (8), rather than to the acquirer's pre-merger rates, as we might expect if the rate changes reflected only convergence in branch quality. In the next session, we move beyond these reduced-form exercises and we use the framework developed above to simulate all mergers and compute equilibrium post-merger deposit rates. This exercise allows us to quantitatively assess which model better fits the observed data while more formally taking into account how changes in branch quality affect the equilibrium deposit rates after a merger.

### 7.4 Model Results

In this section, we simulate all mergers in the sample and compare the model-implied equilibrium post-merger deposit rates, under local and uniform pricing, with the observed changes in deposit interest rates following actual bank mergers. We determine the post-merger equilibrium deposit rates in several steps. First, using data from the year prior to the merger, we recover the bank returns net of marginal costs, aligning them with the banks' first-order conditions. Then, we set up the profit-maximization problem for all banks after the ownership change, with acquired branches now owned by the acquiring bank. Finally, we solve the system of first-order conditions under the new ownership structure for local pricing (equation 7) and uniform pricing (equation 8), computing post-merger equilibrium deposit rates based on bank returns and estimated demand parameters. Importantly, our simulations for both pricing models account for the fact that acquired branches adopt the non-price characteristics and institutional quality of the acquirer. As both models consider the convergence in deposit rates induced by quality convergence, the differences in predicted equilibrium deposit rates isolate the differences in pricing behavior.

After computing the equilibrium changes in deposit rates predicted by the local and uniform pricing models, we compare them with the observed changes in deposit rates during the first six months following each merger. Figure 11 presents the results of this analysis. Panel A examines the relationship between the simulated changes in equilibrium deposit rates and the observed changes for all branches that merged during the sample period. We compute the standardized change in deposit interest rates for all branches of the merging banks in the six months post-merger. These branches are then partitioned into bins based on the magnitude of their observed changes, and we plot these against the standardized average equilibrium changes in deposit rates predicted by uniform and local pricing. The plot indicates that the changes predicted by the uniform pricing model exhibit a much stronger and statistically significant correlation with the observed changes in deposit rates for all merged branches.

In Panel B of Figure 11, we focus on the acquired branches that shared a local market with a branch of the acquirer before the merger. This group is particularly interesting for our analysis because the pricing implications of the two models are very different. In both cases, these branches adopt the quality characteristics of their acquirers, which affect their post-merger equilibriun deposit rates. But, under uniform pricing, we also expect the deposit rates at acquired branches to align with the acquirer's equilibrium uniform rate. By contrast, under local pricing, we anticipate that acquirers will lower deposit rates to leverage their increased market power in local markets where they gain market share. The results plotted in Panel B again suggest a stronger relationship between the changes in equilibrium deposit rates and observed rates under uniform pricing.

Finally, in Panel C of Figure 11 we examine the acquiring branches that did not compete directly with acquired branches before the merger. Here, the local pricing model does not predict any change in the equilibrium deposit rates practiced by acquiring branches for this group, while the uniform pricing model predicts that the acquirer will adjust rates across its entire branch network according to the pricing formula in equation (8). The results of Panel C are significant because they reveal that not only are there changes in the observed deposit rates of this group of branches but also that these observed changes in deposit rates are positively correlated with the post-merger equilibrium changes predicted by the uniform pricing model. By definition, the local pricing model does not predict any change in this group of acquiring branches, which is not in accordance with our observations.

Overall, the results suggest that quality changes at acquired branches impact the observed behavior of deposit interest rates following a merger. However, they also suggest that a simple, stylized model of uniform pricing helps explain the evolution of deposit rate changes beyond what can be accounted for by convergence in branch quality and local pricing. Notably, only the uniform pricing model can explain some of the observed variation in deposit rates for acquiring branches that do not geographically overlap with the acquired bank.

In the Internet Appendix G, we conduct sensitivity analyses to assess the robustness of our model results under different calibrations. We demonstrate that the uniform pricing model continues to outperform the local pricing model when the deposit rate semi-elasticity is calibrated to be higher than the one estimated using our demand procedure. We also evaluate a model that applies uniform pricing at the regional level rather than nationally.

### 7.5 Branch Divestitures

A key benefit of developing a structural model is the ability to conduct counterfactual analysis. Here, we examine forced branch divestitures. Between 1991 and 2020, antitrust authorities reviewed thousands of proposed bank mergers. While no mergers were outright blocked during this period, divestitures were mandated for deals that would have increased local market concentration by over 200 points or beyond a total of 1,800 points. In total, authorities requested more than 800 branch divestitures based on merger reviews that did not consider uniform pricing.

Yet, if banks used uniform pricing, deposit spreads might not have increased in such markets. It is possible that antitrust authorities forced acquirers to divest branches in local markets that could have experienced increases in post-merger deposit rates, potentially benefiting consumer welfare more if regulators had not intervened.

We use our model to simulate two counterfactual scenarios under the assumption that all banks set uniform deposit rates. In the first scenario, we evaluate the case in which antitrust authorities do not require any branch divestitures for merger approval. In the second, we simulate the merger with the branch divestitures that antitrust authorities actually requested. We focus on banking markets where authorities mandated branch divestitures and compute the resulting welfare outcomes.

We simulate the two counterfactuals for each local market and each M&A deal that involved a divestiture. We then compute the overall difference in welfare in market $m$ if the deal was approved without divestitures, relative to the scenario in which the deal did not occur, denoted as $\Delta\mathcal{W}_m^{NoDivestitures} = \mathcal{W}_m^{Merger} - \mathcal{W}_m^{NoMerger}$. We also measure the difference in welfare in market $m$ when an M&A deal occurred with one or more branches divested, relative to the scenario where the deal was approved without any remedy, represented as $\Delta\mathcal{W}_m^{Divestitures} = \mathcal{W}_m^{MergerDivest} - \mathcal{W}_m^{Merger}$. To calculate the welfare measure for each counterfactual, we first determine the equilibrium interest rates under uniform pricing, following the procedure outlined above. In each case, the acquired branches adopt the non-price characteristics and institutional quality of the final acquirer, ensuring that welfare changes are not mechanically driven by pre-merger rate differences.

We follow Small and Rosen (1981), who show that for this class of models the change in consumer welfare induced by a policy intervention is as follows:

$$\Delta\mathcal{W}_m = \ln\left(\sum_{j\in\Gamma_m^{post}} \exp V_j^{post}\right) - \ln\left(\sum_{j\in\Gamma_m^{pre}} \exp V_j^{pre}\right)$$

In our first counterfactual exercise, $V_j^{pre}$ is the indirect utility function associated with branch $j$ in case that no merger occurs and $V_j^{post}$ is the corresponding utility function in case that the merger goes forward without divestitures. In our second counterfactual, $V_j^{pre}$ is the indirect utility function with no divestitures and $V_j^{post}$ is the indirect utility function in case that the deal was approved conditional on divestitures. We should stress here that changes in consumer welfare within a market are not mechanically correlated with predicted changes in equilibrium deposit interest rates. Several factors other than the deposit rates vary across the scenarios. In particular, unobservable differences in bank quality, for which we proxy with bank-fixed effects, considerably affect consumer welfare in a particular market.

Table 9 reports the average changes in welfare for both counterfactuals, calculated for all banking markets in which authorities forced branch divestitures. First, we focus on the subset of banking markets where uniform pricing would have increased deposit rates for consumers if the deals had proceeded without divestitures; specifically, markets where the deposit interest rates of the acquired branches were lower than those of the acquirer prior to the merger. Our results suggest that consumer welfare in these local markets would have, on average, increased by 0.77% if the deals were approved without remedy. Forced divestitures, however, reduced consumer welfare by 7.2%, relative to the no-divestiture case. Table 9 shows that these losses in consumer welfare are partly driven by the fact that the acquired branches would have offered higher deposit rates had they remained within the acquirer's network.

In cases where uniform pricing would lower the deposit rates of acquired branches, consumer welfare would decrease as a result of a merger without divestitures. In such situations, branch divestitures effectively increase consumer welfare, partly because banks acquiring the divested branches offer higher deposit rates than the acquiring bank. However, these results should be interpreted with caution, as we have a limited set of markets where deals required branch divestitures and the acquirer set lower deposit rates compared to the acquired branches.

Overall, these two counterfactual exercises suggest that forced branch divestitures can hinder consumer welfare when the acquirer offered better deposit rates than the acquired branches prior to the merger. Our estimates indicate that in this subset of proposed merger deals, deposit consumers would have been better served had authorities not mandated branch divestitures.

# 8 Conclusion

Prior work (e.g., Radecki, 1998; Park and Pennacchi, 2009; Yankov, 2018) has shown that uniform pricing rules are widespread in retail banking. We show that these rules have an important role in determining the post-merger evolution of interest rates at acquired branches. Uniform pricing practices drive the convergence in the rates of acquired branches toward those of the respective acquirers after a bank M&A deal. The pre-merger differences between the deposit and loan rates of the acquired branches and the median rates of the respective acquirers are far more consequential to post-merger deposit and loan rates than are the predicted changes in local market concentration.

We develop and estimate a structural model of deposit demand to shed light on the role that uniform pricing practices play in shaping the welfare effects of bank mergers and antitrust policy. Our headline finding is that a merger-approval order requiring acquires to divest branches is associated with an average loss of approximately 7% of consumer welfare in cases when deposit rates at the acquired branches would have increased because of uniform pricing. These results raise the question of whether regulators should base their merger-approval decisions on indices of local market concentration alone. Without considering uniform pricing in their merger-review analyses, antitrust authorities risk challenging proposed mergers when consumers would in fact benefit more if the deal were approved without intervention.

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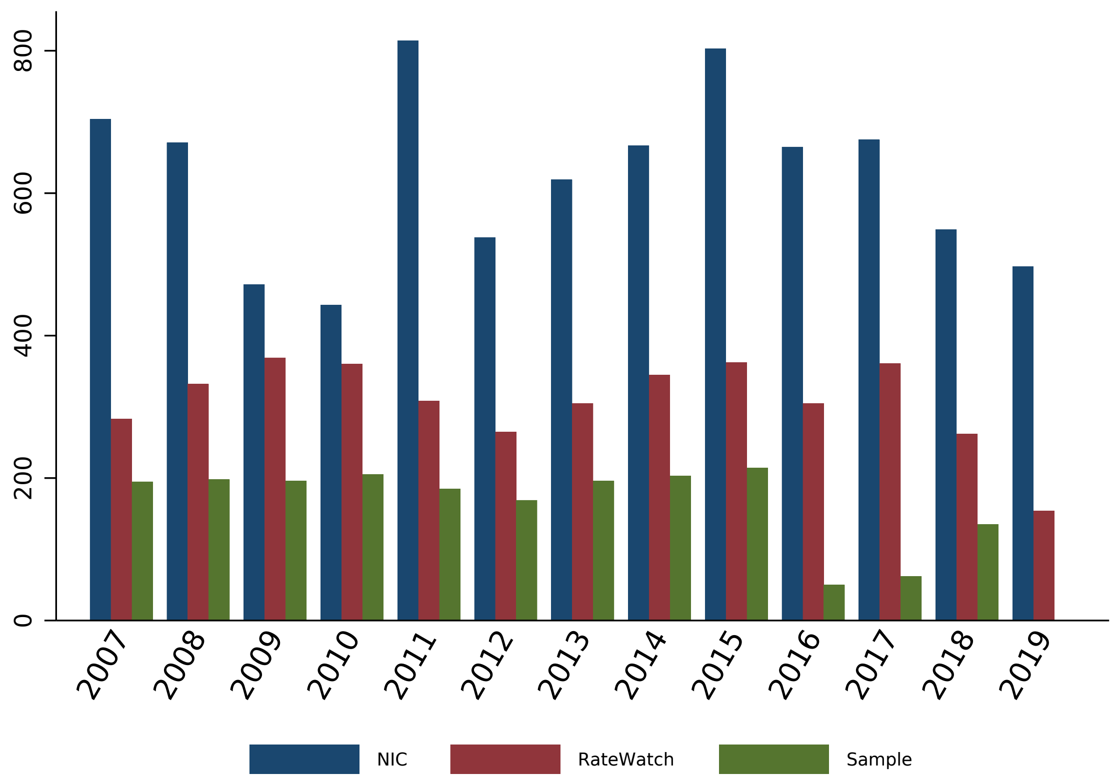
Figure 1: Number of Mergers

Figure 1 represents the annual number of bank mergers over the sample period. The blue bars represent the annual number of bank mergers obtained from the National Information Center (NIC) bank merger dataset. The red bars represent the number of bank mergers covered in the RateWatch sample. The green bars represent the annual number of bank mergers included in our final sample after imposing the selection criteria.



# Figure 2: Adjusted $R^2$ of Interest Rate on Fixed Effects

Figure 2 plots the adjusted $R^2$ from a monthly series of ordinary least squares (OLS) regression of the 12-month certificate of deposit rate with a minimum account size of \$10,000 (12MCD10K), savings deposits account rate with a minimum size of \$100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal) on bank fixed effects (solid red line), banking market fixed effects (dashed blue line) and zip code fixed effects (short dashed green line). For each month, we run an OLS regression of the product rate practiced by each branch in the respective month on each set of fixed effects and we plot the respective $R^2$ over time. Data is from RateWatch.

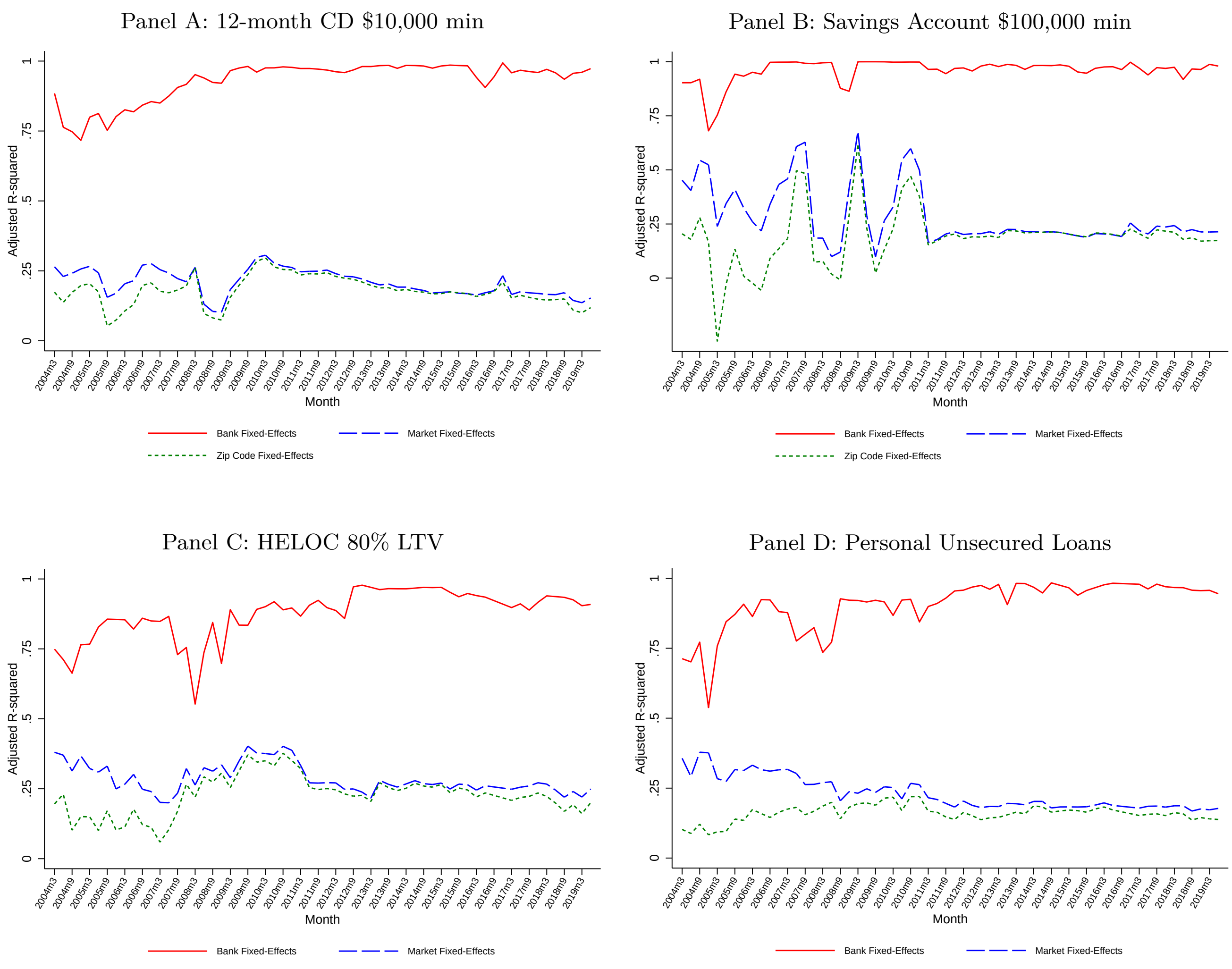
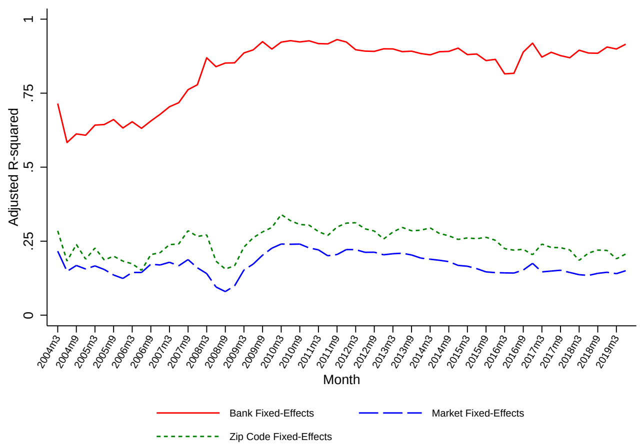


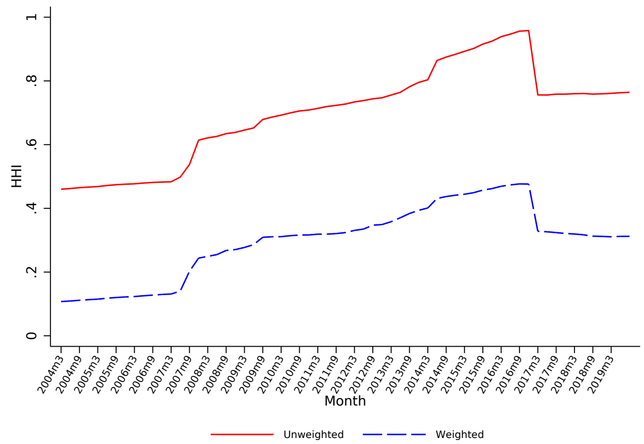
Figure 3: Adjusted $R^2$ of Rate-Setters and Rate-Setting Coverage

Figure 3 examines if the evolution of uniform pricing practices is explained by changes in uniform pricing practices within the group of rate-setter branches or by changes in the branch coverage of each rate-setter. Panels A and C repeat the exercise of Figure 2 for the group of rate-setter branches using as outcome variables the 12-month certificate of deposit rate with a minimum account size of \$10,000 (Panel A) and the HELOC rate with a LTV up to 80% (Panel C). Panels B and D plot the average of an Herfindahl measure of concentration of rate-setting for each bank for 1-Year CD product (Panel B) and for the HELOC product (Panel D). Data is from RateWatch.

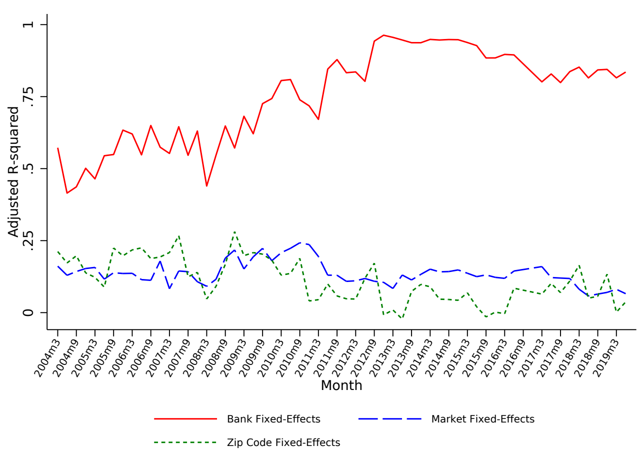
Panel A: 12-month CD - Adjusted-$R^2$ Rate-Setters




Panel B: 12-month CD - HHI rate-setter coverage




Panel C: HELOC 80% LTV - Adjusted-$R^2$ Rate-Setters




Panel D: HELOC 80% LTV - HHI rate-setter coverage

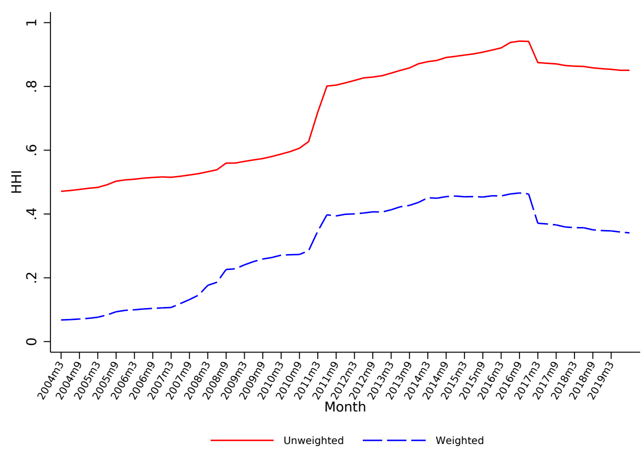


Figure 4: Quarterly Absolute Rate Differences: Same Bank vs. Different Bank Comparisons

Figure 4 presents histograms of the average quarterly absolute rate differences of 10,000 randomly drawn pairs of branches of the same bank (solid blue bars) and 10,000 randomly drawn pairs of different banks (hollow red bars). The histograms are built using the 12-month certificate of deposit rate with a minimum account size of \$10,000 (12MCD10K), savings deposits account rate with a minimum size of \$100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). Data is from RateWatch.

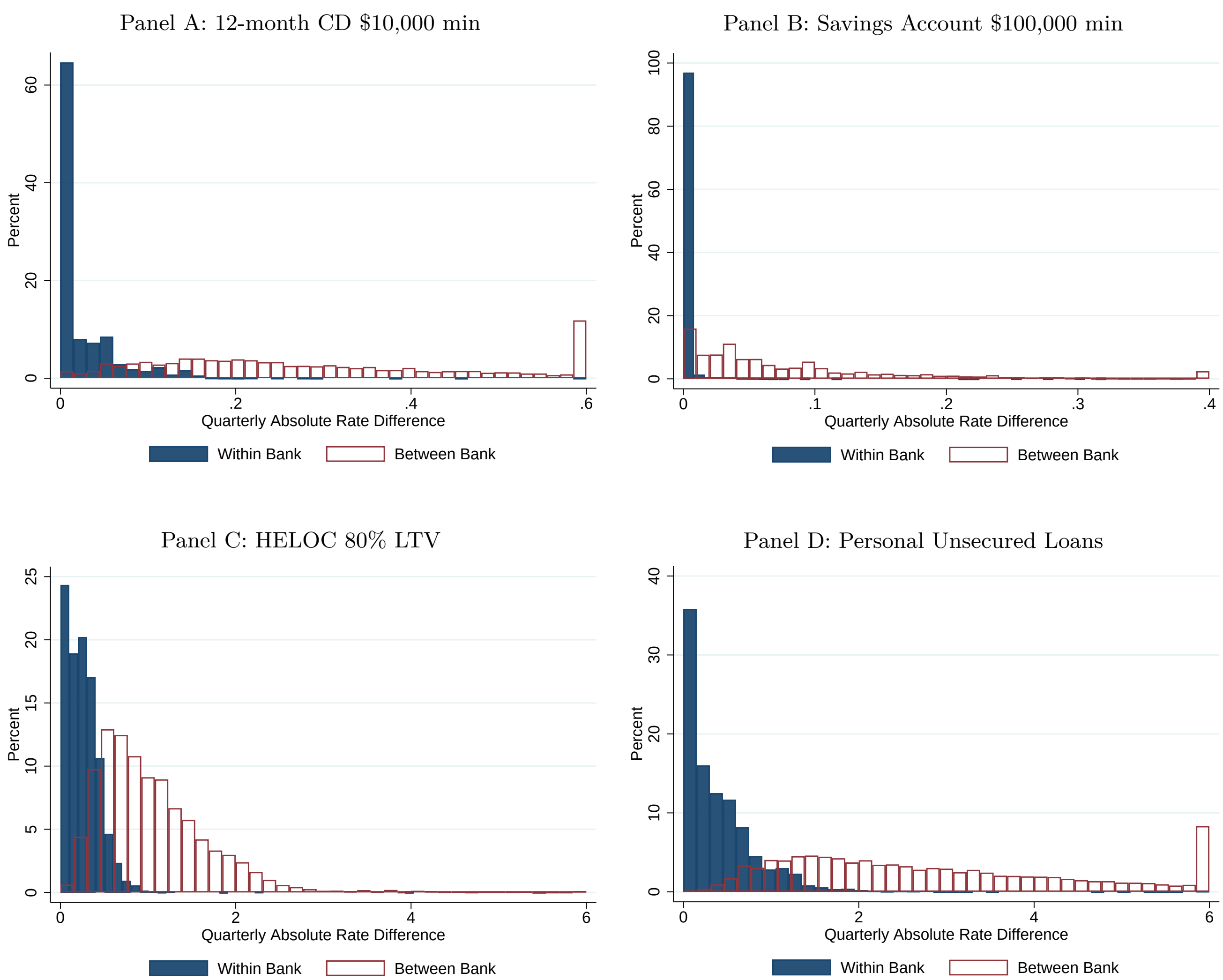


Figure 5: Distribution Relative Percent Difference between Acquired Branch Rates and Median Rate of Acquirer

Figure 5 plots the histogram of the percent differences in the rates set by an acquired branch and the respective median acquirer rate one year before the merger and one year after the merger. The percent difference is defined as $\frac{\text{Branch Rate - Med. Acq. Rate}}{\text{Med. Acq. Rate}}$. We report the percent rate differences for the 12-month certificate of deposit rate with a minimum account size of \$10,000 (12MCD10K), savings deposits account rate with a minimum size of \$100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). Data is from RateWatch.

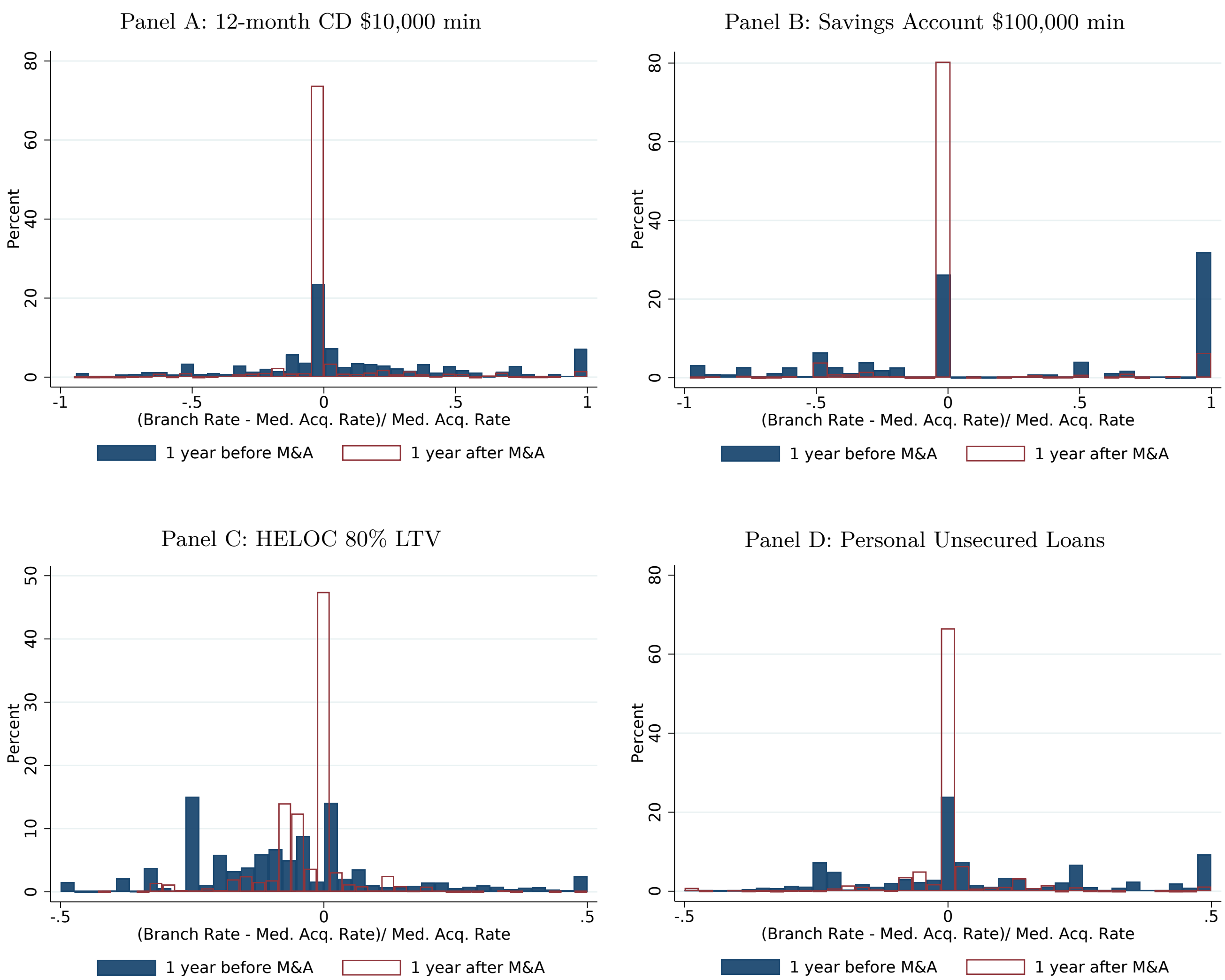
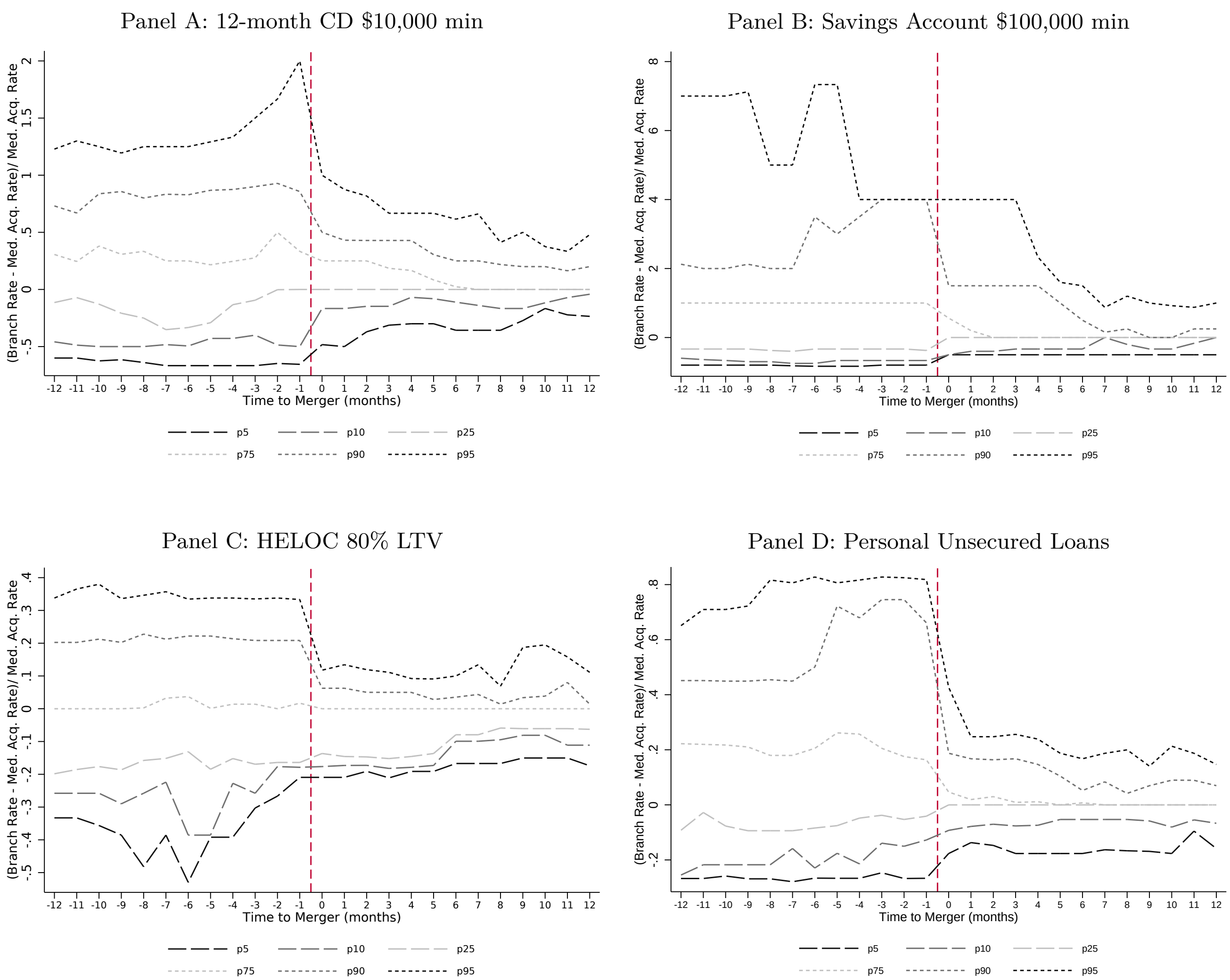


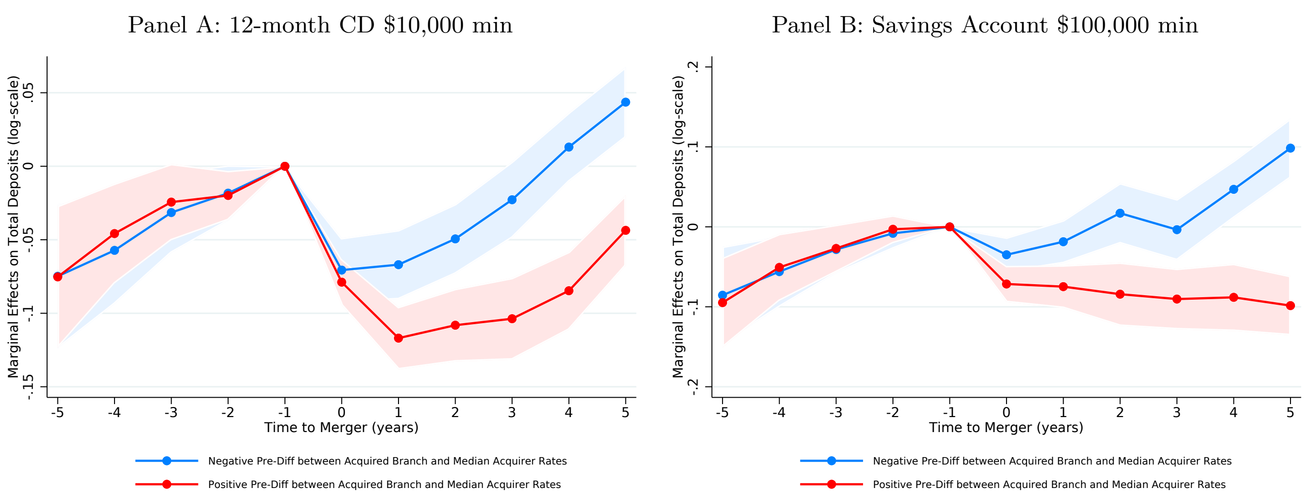
Figure 6: Relative Percent Difference between Branch Rate and Median Rate of Acquirer in Event Time

Figure 6 plots the distribution of the percent differences in the rates set by an acquired branch and the respective acquirer's median rate around the merger. The percent difference is defined as $\frac{\text{Branch Rate - Med. Acq. Rate}}{\text{Med. Acq. Rate}}$. The lines represent the 5th, 10th, 25th, 75th, 90th, and 95th percentile of the distribution of this difference over event time. We report the percent rate differences for the 12-month certificate of deposit rate with a minimum account size of \$10,000 (12MCD10K), savings deposits account rate with a minimum size of \$100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). Data is from RateWatch.



# Figure 7: Evolution of Branch Deposits following M&A

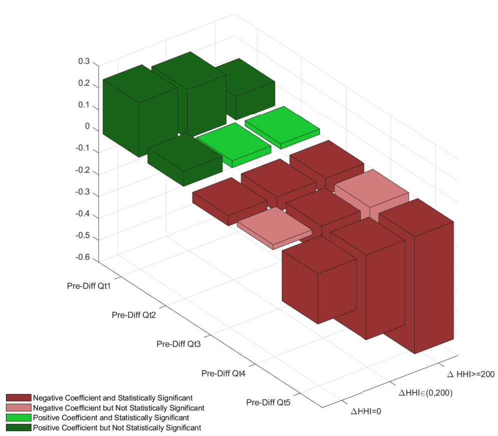
Figure 7 plots the evolution of the deposits held by acquired branches in the years around the merger event. The blue (red) line represents the marginal impact of the merger over time on the natural logarithm of the acquired-branch deposits when the pre-merger difference between the deposit rate of the acquired branch and the median deposit rate of the acquirer is negative (positive). Specifically, we estimate the following model specification using OLS: $Y_{i,t,s} = \gamma_{s,t} + \theta_i + \sum_{s=-5}^{s=5} \beta_s \delta_s + \sum_{s=-5}^{s=5} \lambda_s \delta_s \times \left(\frac{\textit{Branch Rate - Acq. Med. Rate}}{\textit{Acq. Med. Rate}}\right)_i^{Pre} + \epsilon_{i,t,s}$, where $Y_{i,t,s}$ represents either the natural logarithm of branch deposits in year $t$, $s$ years prior (after) the merger event, $\gamma_{s,t}$ are state-by-year fixed effects, $\theta_i$ are branch fixed effects, and $\delta_s$ are merger-event dummies. Marginal effects are computed using the event time coefficients of the dependent variable with respect to the merger event dummies $\beta_s$ and the merger event time coefficients, $\lambda_s$, which represent the effect of the merger event interacted with the pre-merger percent differences in deposit rates, $\left(\frac{\textit{Branch Rate - Acquirer Median Rate}}{\textit{Acquirer Median Rate}}\right)^{Pre}$. Specifically, for each s={-5,-4,...,4,5}, we plot $\beta_s + \lambda_s \delta_s \times \left(\frac{\textit{Branch Rate - Acquirer Median Rate}}{\textit{Acquirer Median Rate}}\right)^{Pre}$ for an acquired branch with $\left(\frac{\textit{Branch Rate - Acquirer Median Rate}}{\textit{Acquirer Median Rate}}\right)^{Pre}$ two standard deviations below the mean (blue line) and for an acquired branch with $\left(\frac{\textit{Branch Rate - Acquirer Median Rate}}{\textit{Acquirer Median Rate}}\right)^{Pre}$ two standard deviations above the mean (red line). The blue and red shaded areas are 95% confidence intervals. In Panel A we consider the pre-merger rate difference of the 12-month certificate of deposit (CD) rate with a minimum account size of $10,000 and in Panel B the pre-merger rate difference of savings deposit Account rate with a minimum size of $100,000. Data for this figure comes from the Summary of Deposits (SOD) dataset and RateWatch.



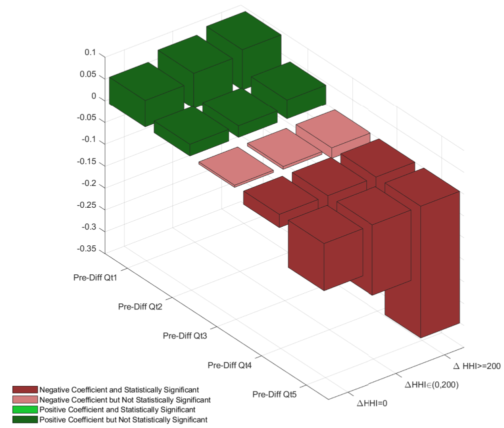
## Figure 8: Impact of M&A on Branch Rates by Pre-merger Rate Differences Quintiles and Partitions of Predicted HHI change

Figure 8 plots the estimated impact of the merger event on the rates of the acquired branch for different levels of predicted changes in local deposit HHI and for each quintile of pre-merger rate difference of the 12-month certificate of deposit rate with a minimum account size of \$10,000 (12MCD10K), savings deposits account rate with a minimum size of \$100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). Specifically, we estimate the following model specification using OLS: $Y_{i,t,s} = \gamma_{s,t} + \theta_i + \sum_{s=1}^{s=5} \sum_{k=1}^{k=3} \beta_{s,k} \text{Post-Acq}_i \times \mathbb{1}.\text{Pre-rate Difference Qt}_{i,s} \times \mathbb{1}.\Delta HHI_{i,k} + \epsilon_{i,t,s}$, where $Y_{i,t,s}$ represents the rate of the acquired branch $i$ in year $t$, $\gamma_{s,t}$ are state-by-year fixed effects and $\theta_i$ are branch fixed effects. Post-Acq$_i$ is a dummy variable that takes the value one in the twelve months after the merger. $\mathbb{1}$.Pre-rate Difference Qt$_{i,s}$ are dummy variables for each quintile of the percent differences in pre-merger rates between acquired branch and median acquirer rate, $\frac{(Branch\ Rate\ \text{-}\ Acq.\ Med.\ Rate)}{Acq.\ Med.\ Rate}^{Pre}$. $\mathbb{1}.\Delta HHI_{i,k}$ are dummy variables for different levels of the potential change in the local banking market deposit-HHI that would be induced by the merger if the entities were combined and the banking market share of deposits of both acquirer and target banks remained at their pre-merger level in the following year. $\mathbb{1}.\Delta HHI_{i,1}$ equals one if $\Delta HHI_i = 0$, $\mathbb{1}.\Delta HHI_{i,2}$ equals one if $\Delta HHI_i \in (0, 200)$ and $\mathbb{1}.\Delta HHI_{i,3}$ equals one if $\Delta HHI_i \geq 200$. Each bar corresponds to the marginal impact of the merger event on the rate of the branch acquired, $\beta_{s,k}$, for each combination of pre-rate difference quantile and each partition of the predicted change in local HHI. The dark-green color bars identify marginal effects that are positive and statistically significant at 10% level and light-green color bars identify positive but not statistically significant marginal effects. Similarly, dark-red color bars identify marginal effects that are negative and statistically significant at 10% level and light-red color bars identify negative but not statistically significant marginal effects.

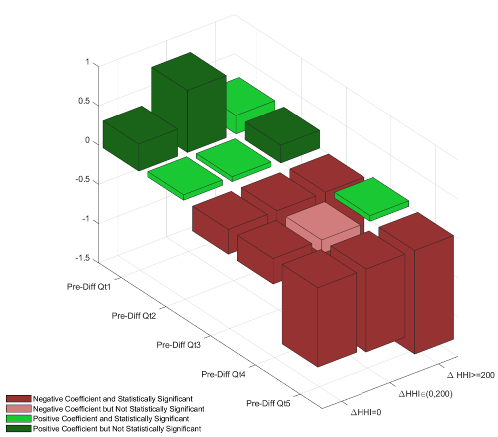
Panel A: 12-month CD \$10,000 min




Panel B: Savings Account \$100,000 min




Panel C: HELOC 80% LTV




Panel D: Personal Unsecured Loans

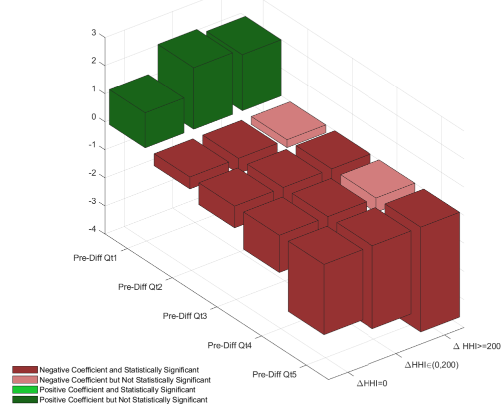
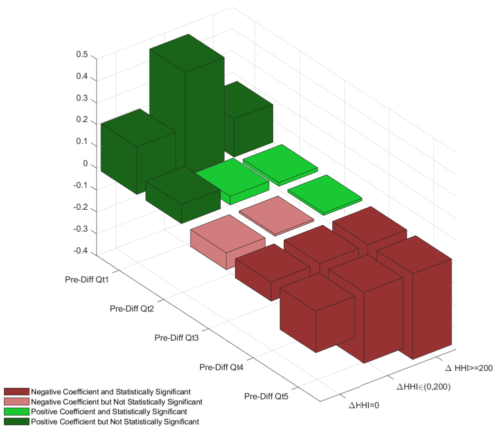


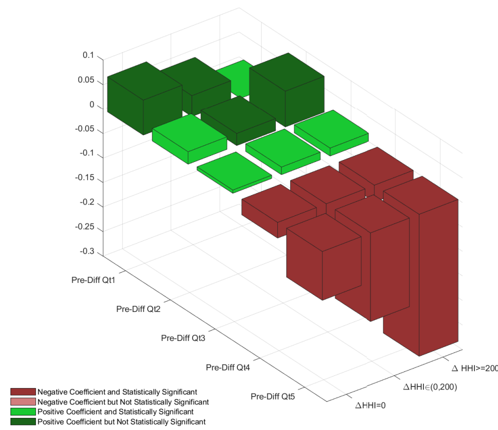
Figure 9: Impact of M&A on Branch Rates by Pre-merger rate Differences Quintiles and Partitions of Predicted HHI change for M&A with Post-Merger Predicted HHI between 1,300 and 1,800

Figure 9 repeats the analysis of Figure 8 for bank mergers whose predicted post-merger HHI level was between 1,300 and 1,800. All variables and empirical specifications have similar definitions to those of Figure 8. Data is from RateWatch and SOD.

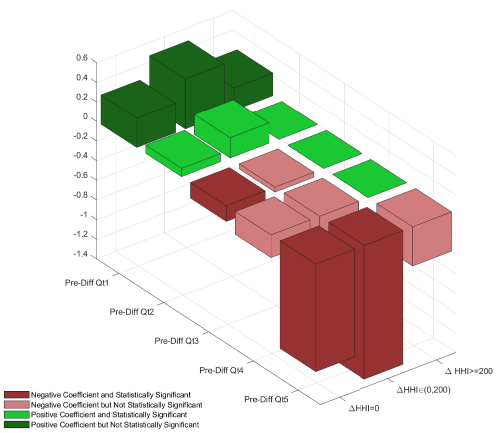
Panel A: 12-month CD $10,000 min




Panel B: Savings Account $100,000 min




Panel C: HELOC 80% LTV




Panel D: Personal Unsecured Loans

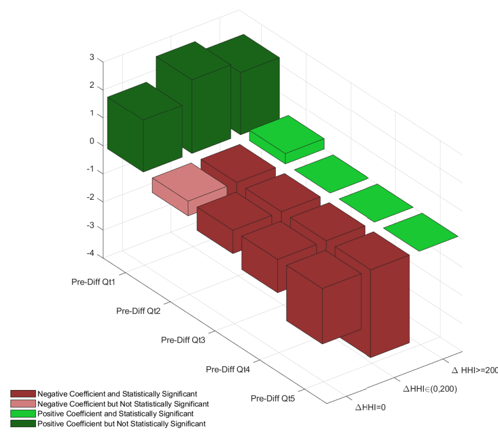
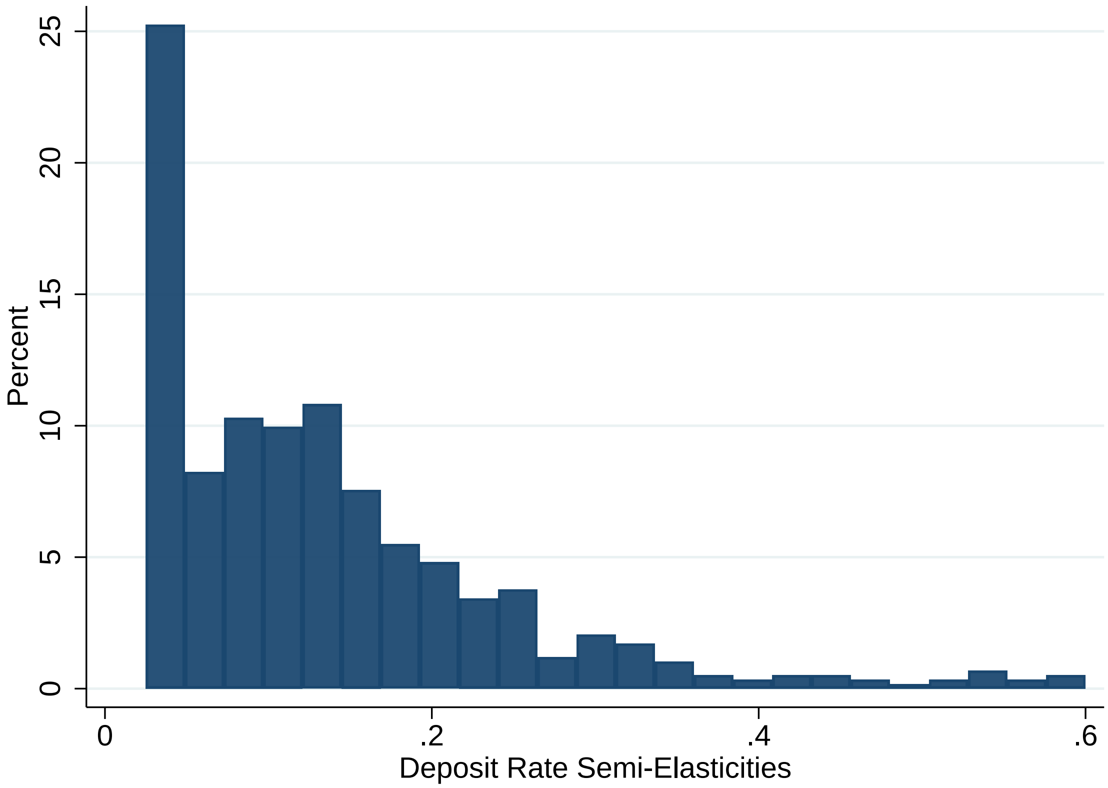


Figure 10: Deposit Rate Elasticities

Figure 10 plots a histogram of the market-specific local deposit rate elasticities. These elasticities have been shrunk via an empirical Bayes procedure to reduce the effect of sampling error and are winsorized at 0.025 and .6.

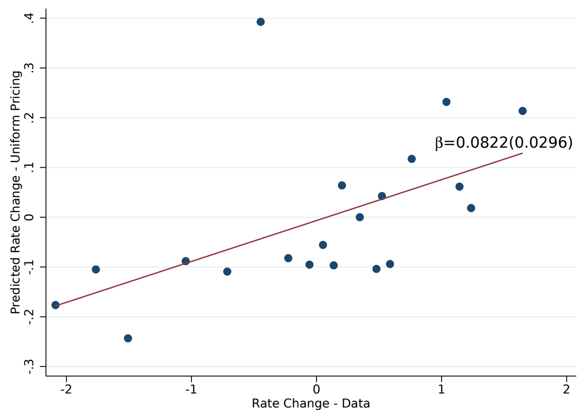


## Figure 11: Comparing Equilibrium Changes versus observed changes in deposit rates

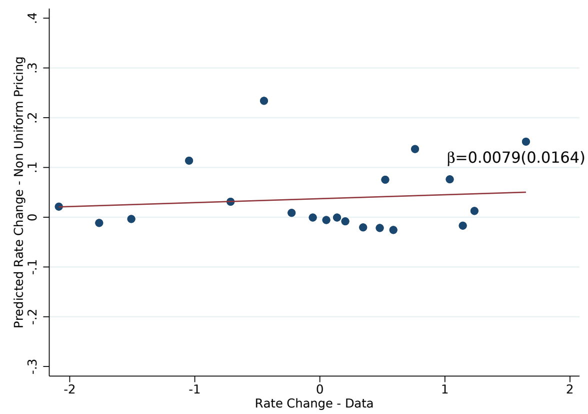
Figure 11 stratifies branches involved in banks merger in 20 bins based on their observed change in deposit rate (standardized) in the six months following a merger. Panel A plots for each bin the average standardized change in post-merger equilibrium rate predicted by the uniform pricing model (left figure) and local pricing model (right figure) for all branches in the sample. Panel B repeats the analysis focusing on the subset of acquired branches that overlap with the branches of the acquirer and Panel C repeats the analysis focusing on the subset of acquirer branches that does not overlap with the branches of the target bank.

### Panel A. All acquirer and acquired branches involved in mergers

Uniform Pricing

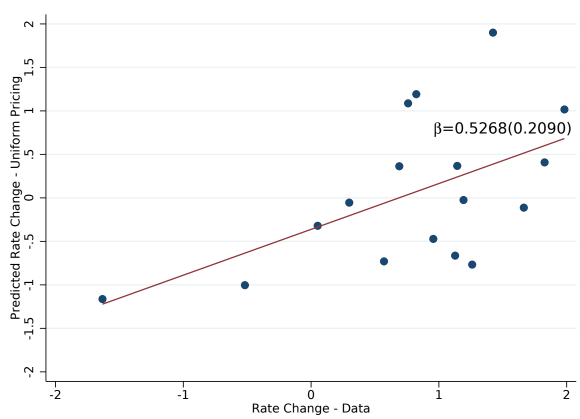



Local Pricing

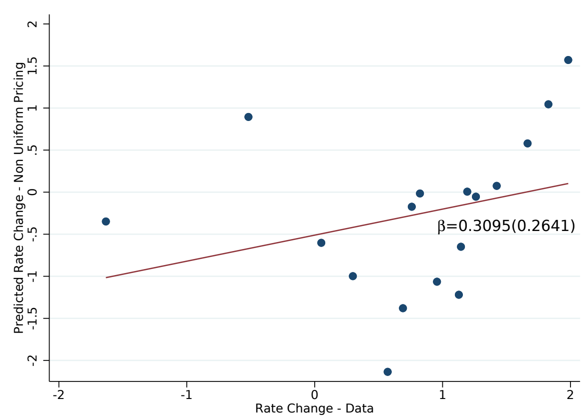



### Panel B. Only Acquired Branches in Overlapping Markets

Uniform Pricing

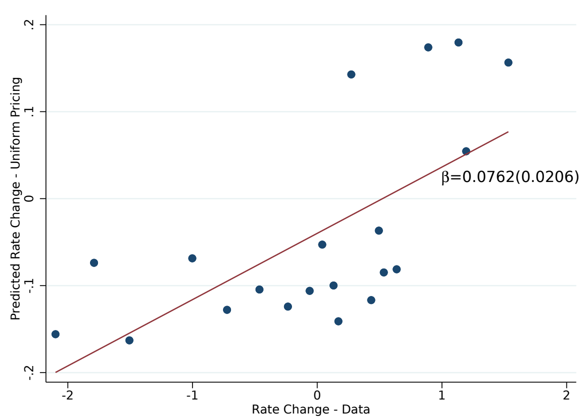



Local Pricing

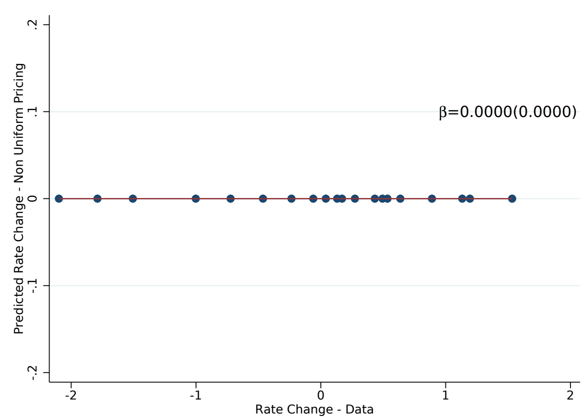



### Panel C. Acquirer Branches in non-overlapping markets

Uniform Pricing




Local Pricing



## Table 1: Sample Formation and Summary Statistics

Table 1 describes the sample selection for the banks and branches used in each of the following samples: 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). Data is from RateWatch.

| | No. Branches | No. Rate-Setters | No. Banks | No. States | No. Zips |
|---|---|---|---|---|---|
| **12MCD10K** | | | | | |
| All Branches | 100906 | 15332 | 8206 | 49 | 20134 |
| Branches present for >=2 years | 89321 | 9873 | 6892 | 49 | 19391 |
| Acquired Branches | 9405 | 2204 | 2007 | 49 | 6027 |
| **SAV100K** | | | | | |
| All Branches | 94517 | 8871 | 6410 | 49 | 19642 |
| Branches present for >=2 years | 81270 | 7482 | 5352 | 49 | 18793 |
| Acquired Branches | 2588 | 856 | 774 | 47 | 2132 |
| **HELOC** | | | | | |
| All Branches | 70098 | 7318 | 3449 | 49 | 16128 |
| Branches present for >=2 years | 63223 | 4106 | 2671 | 49 | 15630 |
| Acquired Branches | 7311 | 488 | 472 | 49 | 4809 |
| **Personal** | | | | | |
| All Branches | 63375 | 7281 | 3737 | 49 | 16320 |
| Branches present for >=2 years | 54507 | 4096 | 2803 | 49 | 15614 |
| Acquired Branches | 5666 | 481 | 444 | 47 | 4005 |

Table 2: Correlates of Percentage Rate Difference between Branch Rates and Median Acquirer Rate

Table 2 presents bivariate regressions of the pre-merger relative rate difference between acquired and acquirer branches on bank characteristics of the acquirer and acquired banks. All variables are residualized with respect to year dummies. Put differently, we run bivariate regressions of the form: $\frac{\text{(Branch - Acq. Med. Rate)}}{\text{Acq. Med. Rate)}}^{Pre} = \beta x + \gamma_t + \epsilon$. Variables have been normalized, so the coefficients can be interpreted as a one-standard deviation change in $x$ produces a $\beta$-standard deviation change in pre-merger relative rate difference between acquired and acquirer branches, where $\beta$ is the reported coefficient. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

| | **Acquired Bank Characteristics** | | | **Acquirer Characteristics** | | |
|---|---|---|---|---|---|---|
| | Coefficient | $R^2$ | N | Coefficient | $R^2$ | N |
| | | | Panel A: 12MCD10K | | | |
| Assets | -.2884 | .0268 | 7660 | -.0771863 | .0027 | 9355 |
| Deposits | .1452 | .0102 | 7660 | .0592 | .0026 | 9355 |
| Tier 1 ratio | -.0201 | .0005 | 7660 | -.0671 | .0044 | 9355 |
| ROA | -.1272 | .0076 | 7660 | -.0941 | .0032 | 9355 |
| ROE | -.1782 | .01 | 7660 | -.0841 | .0019 | 9355 |
| | | | Panel B: SAV100K | | | |
| Assets | -.1568 | .0234 | 2592 | .19667 | .0167 | 2612 |
| Deposits | .1736 | .0182 | 2592 | .072 | .0029 | 2612 |
| Tier 1 ratio | -.1075 | .0078 | 2592 | -.1192 | .0099 | 2612 |
| ROA | -.1451 | .0157 | 2592 | -.0527 | .001 | 2612 |
| ROE | -.1061 | .0077 | 2592 | -.0568 | .0005 | 2612 |
| | | | Panel C: HELOC | | | |
| Assets | -.0327 | .0004 | 7580 | -.6822819 | .2148 | 7707 |
| Deposits | .1163 | .0093 | 7580 | -.0976 | .0076 | 7707 |
| Tier 1 ratio | .2261 | .0242 | 7580 | .296 | .0519 | 7707 |
| ROA | -.148 | .0146 | 7580 | -.2604 | .0249 | 7707 |
| ROE | -.1703 | .01 | 7580 | -.3031 | .0333 | 7707 |
| | | | Panel D: Personal | | | |
| Assets | .1834 | .0267 | 5631 | .0202784 | 0 | 5829 |
| Deposits | -.1728 | .0238 | 5631 | -.013 | 0 | 5829 |
| Tier 1 ratio | .0728 | .0035 | 5631 | .0359 | .0008 | 5829 |
| ROA | .3309 | .1051 | 5631 | .0822 | .0026 | 5829 |
| ROE | .2124 | .0333 | 5631 | .013 | -.0001 | 5829 |

## Table 3: Effects of M&A on Absolute Difference between Branch Rates and Median Acquirer Rates (Pre-Post Analysis)

Table 3 reports the coefficients of OLS regressions investigating the effect of a merger on the absolute difference between the rates of the acquired branch and the median rate of the acquirer for the 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). The dependent variable in columns (1) to (4), |Branch Rate - Acquirer Median Rate|, is the absolute difference between the rate of the acquired branch and the median rate of the acquirer. The dependent variable in columns (5) to (8), $\left|\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right|$, is the absolute percent difference between the rate of the acquired branch and the median rate of the acquirer. The main variable of interest, *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event. All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.



| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | \|Branch Rate - Acquirer Median Rate\| | | | | $\left\|\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\|$ | | | |
| | 12MCD10K | SAV100K | HELOC | Personal | 12MCD10K | SAV100K | HELOC | Personal |
| Post-Acquisition | -0.108*** | -0.037*** | -0.429*** | -1.385*** | -0.337*** | -0.557*** | -0.103*** | -0.143*** |
| | (0.009) | (0.003) | (0.047) | (0.142) | (0.031) | (0.069) | (0.011) | (0.015) |
| Observations | 246206 | 65363 | 195564 | 149664 | 246206 | 65363 | 195541 | 149356 |
| Adjusted $R^2$ | 0.757 | 0.716 | 0.852 | 0.821 | 0.582 | 0.743 | 0.797 | 0.829 |
| State × Month FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table 4: Effects of M&A on Rate Convergence between Acquired Branch and Median Acquirer Rate: Heterogeneity across Size, Branch Network Overlap and Dispersion of Acquirer Deposit Rate

Table 4 reports the coefficients of OLS regressions investigating the effect of a merger on the absolute difference between the rates of the acquired branch and the median rate of the acquirer for the 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). We stratify the sample based on the strength of the uniform pricing practices of the acquirer as measured by standard deviation of the 12MCD10K deposit rates across the acquirer's branch network twelve months before the merger (Panel A), based on whether the total assets of the acquirer bank exceed the total assets of the acquired banks twelve months prior to the merger (Panel B), and based on whether the branch network of acquirer bank overlaps with the acquired branch (Panel C). The dependent variable, $\frac{|BranchRate - Acq.Med.Rate|}{Acq.Med.Rate}$, is the absolute difference between the rate of the acquired branch and the median rate of the acquirer divided by median rate of the acquirer. The main variable of interest, *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event. All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.



Panel A: Partitioning Based on the Dispersion of Acquirer Deposit Rates

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| **Dep. Variable:** $\left\lvert\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\rvert$ | 12MCD10K | | SAV100K | | HELOC | | Personal | |
| | Below Med | Above Med | Below Med | Above Med | Below Med | Above Med | Below Med | Above Med |
| Post-Acquisition | -0.490*** | -0.135*** | -0.452*** | -0.339* | -0.108*** | -0.043** | -0.207*** | 0.008 |
| | (0.059) | (0.046) | (0.069) | (0.180) | (0.015) | (0.021) | (0.025) | (0.027) |
| Observations | 107349 | 112240 | 35322 | 20927 | 91256 | 90510 | 67224 | 67783 |
| Adjusted $R^2$ | 0.484 | 0.833 | 0.649 | 0.908 | 0.780 | 0.958 | 0.865 | 0.937 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table 4: Effects of M&A on Rate Convergence between Acquired Branch and Median Acquirer Rate: Heterogeneity across Size, Branch Network Overlap and Dispersion of Acquirer Deposit Rate **(cont'd)**

Panel B: Partitioning Based on Acquirer Size

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| **Dep. Variable:** $\left\lvert \frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}} \right\rvert$ | 12MCD10K | | SAV100K | | HELOC | | Personal | |
| | Larger Acq. | Smaller Acq. | Larger Acq. | Smaller Acq. | Larger Acq. | Smaller Acq. | Larger Acq. | Smaller Acq. |
| Post-Acquisition | -0.363*** | -0.316*** | -0.509*** | -0.908*** | -0.078*** | -0.120*** | -0.108*** | -0.229*** |
| | (0.035) | (0.093) | (0.093) | (0.312) | (0.012) | (0.039) | (0.018) | (0.076) |
| Observations | 135163 | 43261 | 47005 | 15490 | 94612 | 85211 | 98761 | 33875 |
| Adjusted $R^2$ | 0.706 | 0.539 | 0.791 | 0.721 | 0.796 | 0.940 | 0.899 | 0.793 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Panel C: Partitioning Based on Banking Market Overlap

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| **Dep. Variable:** $\left\lvert \frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}} \right\rvert$ | 12MCD10K | | SAV100K | | HELOC | | Personal | |
| | Overlap | No Overlap | Overlap | No Overlap | Overlap | No Overlap | Overlap | No Overlap |
| Post-Acquisition | -0.479*** | -0.230*** | -0.634*** | -0.382*** | -0.124*** | -0.055*** | -0.193*** | -0.090*** |
| | (0.065) | (0.025) | (0.106) | (0.078) | (0.015) | (0.013) | (0.031) | (0.020) |
| Observations | 76943 | 159735 | 26776 | 35958 | 69116 | 121971 | 50923 | 94135 |
| Adjusted $R^2$ | 0.464 | 0.733 | 0.677 | 0.830 | 0.861 | 0.840 | 0.853 | 0.868 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table 5: Decomposing the Convergence in Interest Rates: Changes in Acquired Branch Rates vs Changes in Median Deposit Rates of Acquirer

Table 5 reports the coefficients of OLS regressions investigating the effect of a merger on the acquired branch rates and respective median rate of the acquirer separately for each of the samples: 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). We stratify each sample sample based on pre-merger difference between the rate of the acquired branch and the median rate of the acquirer. Columns (1)–(3) report results for the subsample of acquired branches with a positive pre-merger rate difference and columns (4)–(6) present results for the subsample of acquired branches with a negative pre-merger rate difference. The dependent variable in columns (1) and (4), *Branch - Acq. Med. Rate*, is the difference between the rate of the acquired branch and respective median interest rate of the acquirer, the dependent variable in columns (2) and (5), *Branch Rate* is the rate of the acquired branch, and the dependent variable in columns (3) and (6), *Acq. Med. Rate*, is the median rate of the acquirer. The main variable of interest, *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event. All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively. Data is from RateWatch.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | (Branch - Acq. Med. Rate)$^{Pre} > 0$ | | | (Branch - Acq. Med. Rate)$^{Pre} < 0$ | | |
| | Branch - Acq. Med. Rate | Branch Rate | Acq. Med. Rate | Branch - Acq. Med. Rate | Branch Rate | Acq. Med. Rate |
| **12MCD10K** | | | | | | |
| Post-Acquisition | -0.155*** | -0.122*** | 0.033*** | 0.124*** | 0.095*** | -0.029*** |
| | (0.014) | (0.015) | (0.008) | (0.011) | (0.012) | (0.010) |
| Observations | 127165 | 127165 | 127165 | 105356 | 105356 | 105356 |
| Adjusted $R^2$ | 0.712 | 0.981 | 0.989 | 0.885 | 0.983 | 0.990 |
| **SAV100K** | | | | | | |
| Post-Acquisition | -0.051*** | -0.049*** | 0.002 | 0.040*** | 0.035*** | -0.005** |
| | (0.007) | (0.007) | (0.001) | (0.004) | (0.004) | (0.002) |
| Observations | 29955 | 29955 | 29955 | 26212 | 26212 | 26212 |
| Adjusted $R^2$ | 0.746 | 0.836 | 0.939 | 0.799 | 0.887 | 0.944 |
| **HELOC** | | | | | | |
| Post-Acquisition | -0.720*** | -0.687*** | 0.034 | 0.332*** | 0.208*** | -0.124** |
| | (0.075) | (0.073) | (0.032) | (0.109) | (0.075) | (0.058) |
| Observations | 47863 | 47863 | 47863 | 134138 | 134138 | 134138 |
| Adjusted $R^2$ | 0.850 | 0.937 | 0.952 | 0.924 | 0.963 | 0.979 |
| **Personal** | | | | | | |
| Post-Acquisition | -1.732*** | -1.448*** | 0.284** | 1.073*** | 1.094*** | 0.021 |
| | (0.250) | (0.285) | (0.114) | (0.186) | (0.207) | (0.096) |
| Observations | 86707 | 86707 | 86707 | 50760 | 50760 | 50760 |
| Adjusted $R^2$ | 0.891 | 0.941 | 0.969 | 0.852 | 0.943 | 0.975 |
| State × Month FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch FEs | Yes | Yes | Yes | Yes | Yes | Yes |

## Table 6: Effects of Merger on the Evolution of Branch Deposits

Table 6 reports the coefficients of OLS regressions investigating the effect of a merger on the evolution of the natural logarithm of deposits at the acquired branch. The dependent variable, *Ln(Total Branch Deposits)*, is the natural logarithm of the total deposits reported by the branch in the SOD dataset. For mergers occurring in the first six months of the year, the dependent variable in the merger year is measured on June 30th of the previous year. For mergers occurring in the last six months of the year, the dependent variable in the merger year is measured on June 30th of the same year. *Post-Acquisition* is a dummy variable that takes the value of one in the years following the merger event and zero otherwise. $\left(\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right)^{Pre}$ is the average of the pre-merger percent difference between the deposit rate of the acquired branch and the median deposit rate of the acquirer. $\Delta^{Pre-Post}\frac{\text{(Branch Rate - Acq. Med. Rate)}}{\text{Acq. Med. Rate}}$ is the difference between the post-merger and pre-merger average percent difference between the deposit rate of the acquired branch and the median deposit rate of the acquirer. In columns (1) and (3) we consider the pre-merger percent rate difference of the 12-month certificates of deposit with a minimum account size of $10,000 (12MCD10K) and in columns (2) and (4) we consider the pre-merger percent rate difference of the savings deposit accounts with a minimum size of $100,000 (SAV100K). All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Ln(Total Branch Deposits) | | | |
| | 12MCD10K | SAV100K | 12MCD10K | SAV100K |
| Post-Acquisition | -0.112*** | -0.072*** | -0.110*** | -0.064*** |
| | (0.012) | (0.014) | (0.012) | (0.014) |
| Post-Acquisition × $\frac{\text{(Branch Rate - AMR)}}{\text{AMR}}^{Pre}$ | -0.028*** | -0.038*** | | |
| | (0.010) | (0.014) | | |
| Post-Acquisition × $\Delta^{Pre-Post}\ \frac{\text{(Branch Rate - AMR)}}{\text{AMR}}$ | | | 0.020** | 0.017** |
| | | | (0.009) | (0.007) |
| Observations | 81485 | 22388 | 81485 | 22388 |
| Adjusted $R^2$ | 0.872 | 0.881 | 0.872 | 0.881 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes |

# Table 7: Market Concentration and Rate Convergence in the Evolution of Interest Rates

Table 7 reports coefficients of OLS regressions investigating the roles of market concentration and rate convergence induced by uniform pricing in the evolution of interest rates of the acquired branch following a M&A. Panel A considers the 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). *Post-Acquisition* is a dummy variable that takes the value of one in the twelve months following the merger event and zero otherwise. $\left(\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right)^{Pre}$ is the average of the pre-merger percent difference between the rate of the acquired branch and the median rate of the acquirer. $\Delta HHI$ is the potential change in the local banking market deposit Herfindahl-Hirschmann Index that would be induced by the merger if the entities were combined and the banking market share of deposits of both acquirer and target banks remained at their pre-merger level. $\mathbb{1}.(\Delta HHI = 0)$ is a dummy variable that takes the value of one if $\Delta HHI = 0$, $\mathbb{1}.(\Delta HHI \in (0, 200))$ is a dummy variable that takes the value of one if $\Delta HHI \in (0, 200)$ and $\mathbb{1}.(\Delta HHI \geq 200)$ is a dummy variable that takes the value of one if $\Delta HHI \geq 200$. For each of the five quintiles of the pre-merger rate difference, $\left(\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right)^{Pre}$, we define a dummy variable *Pre-Difference - Qt*. All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

## Panel A: 12MCD10K and SAV100K

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Branch Rate | | | | | | | |
| | 12MCD10K | SAV100K | 12MCD10K | SAV100K | 12MCD10K | SAV100K | 12MCD10K | SAV100K |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI = 0)$ | | | -0.007 | -0.005 | | | 0.076*** | 0.009** |
| | | | (0.014) | (0.004) | | | (0.020) | (0.005) |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \in (0, 200))$ | | | -0.085*** | -0.006 | | | | |
| | | | (0.017) | (0.006) | | | | |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \geq 200)$ | | | -0.113*** | 0.012 | | | | |
| | | | (0.043) | (0.021) | | | | |
| Post-Acquisition × Pre-Difference Rate - Qt1 | | | | | 0.242*** | 0.067*** | | |
| | | | | | (0.031) | (0.007) | | |
| Post-Acquisition × Pre-Difference Rate - Qt2 | | | | | 0.056*** | 0.027*** | | |
| | | | | | (0.018) | (0.006) | | |
| Post-Acquisition × Pre-Difference Rate - Qt3 | | | | | -0.051** | -0.006 | | |
| | | | | | (0.022) | (0.005) | | |
| Post-Acquisition × Pre-Difference Rate - Qt4 | | | | | -0.049* | -0.042*** | | |
| | | | | | (0.026) | (0.006) | | |
| Post-Acquisition × Pre-Difference Rate - Qt5 | | | | | -0.285*** | -0.121*** | | |
| | | | | | (0.026) | (0.011) | | |
| Post-Acquisition | | | | | | | -0.077*** | -0.013*** |
| | | | | | | | (0.016) | (0.005) |
| Post-Acquisition × Δ HHI | | | | | | | -0.004 | 0.001* |
| | | | | | | | (0.004) | (0.001) |
| Post-Acquisition × $\frac{\text{(Branch Rate - AMR)}}{\text{AMR}}^{Pre}$ | | | | | | | -0.098*** | -0.053*** |
| | | | | | | | (0.020) | (0.006) |
| Observations | 207853 | 61568 | 207853 | 61568 | 207853 | 61568 | 207853 | 61568 |
| Adjusted $R^2$ | 0.971 | 0.783 | 0.972 | 0.783 | 0.975 | 0.843 | 0.973 | 0.833 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table 7: Market Concentration and Rate Convergence in the Evolution of Interest Rates (Cont'd)

Panel B: HELOCs and Personal Unsecured Loans

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | | | | Branch Rate | | | | |
| | HELOC | Personal | HELOC | Personal | HELOC | Personal | HELOC | Personal |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI = 0)$ | | | -0.232*** | -0.569** | | | -0.029 | -0.285** |
| | | | (0.066) | (0.237) | | | (0.028) | (0.122) |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \in (0, 200))$ | | | -0.059 | -0.295 | | | | |
| | | | (0.133) | (0.275) | | | | |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \geq 200)$ | | | -0.584*** | -0.258 | | | | |
| | | | (0.177) | (0.528) | | | | |
| Post-Acquisition × Pre-Difference Rate - Qt1 | | | | | 0.459** | 1.487*** | | |
| | | | | | (0.204) | (0.293) | | |
| Post-Acquisition × Pre-Difference Rate - Qt2 | | | | | 0.072 | -0.414 | | |
| | | | | | (0.085) | (0.358) | | |
| Post-Acquisition × Pre-Difference Rate - Qt3 | | | | | -0.352* | -0.770*** | | |
| | | | | | (0.209) | (0.281) | | |
| Post-Acquisition × Pre-Difference Rate - Qt4 | | | | | -0.302* | -1.176*** | | |
| | | | | | (0.173) | (0.224) | | |
| Post-Acquisition × Pre-Difference Rate - Qt5 | | | | | -1.032*** | -2.662*** | | |
| | | | | | (0.110) | (0.418) | | |
| Post-Acquisition | | | | | | | -0.044 | -0.213 |
| | | | | | | | (0.050) | (0.222) |
| Post-Acquisition × Δ HHI | | | | | | | -0.005 | -0.017 |
| | | | | | | | (0.010) | (0.023) |
| Post-Acquisition × $\frac{\text{(Branch Rate - AMR)}}{\text{AMR}}^{Pre}$ | | | | | | | -0.767*** | -1.944*** |
| | | | | | | | (0.056) | (0.194) |
| Observations | 132018 | 133051 | 132018 | 133051 | 132018 | 133051 | 132018 | 133051 |
| Adjusted $R^2$ | 0.923 | 0.907 | 0.924 | 0.907 | 0.940 | 0.932 | 0.963 | 0.943 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table 8: Market Concentration and Rate Convergence in the Evolution of Interest Rates - Post-Merger Predicted HHI between 1,300 and 1,800

Table 8 repeats the analysis of Table 7 in the subsample of bank mergers whose predicted post-merger HHI level was between 1,300 and 1,800. We refer to Table 7 for variable definitions. Data is from RateWatch and SOD. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A: 12MCD10K and SAV100K

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Branch Rate | | | | | | | |
| | 12MCD10K | SAV100K | 12MCD10K | SAV100K | 12MCD10K | SAV100K | 12MCD10K | SAV100K |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI = 0)$ | | | -0.029 | -0.000 | | | -0.057 | 0.011 |
| | | | (0.018) | (0.006) | | | (0.067) | (0.009) |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \in (0, 200))$ | | | 0.007 | -0.017* | | | | |
| | | | (0.052) | (0.010) | | | | |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \geq 200)$ | | | -0.112* | -0.032 | | | | |
| | | | (0.058) | (0.045) | | | | |
| Post-Acquisition × Pre-Difference Rate - Qt1 | | | | | 0.276*** | 0.064*** | | |
| | | | | | (0.062) | (0.010) | | |
| Post-Acquisition × Pre-Difference Rate - Qt2 | | | | | 0.078*** | 0.029** | | |
| | | | | | (0.027) | (0.012) | | |
| Post-Acquisition × Pre-Difference Rate - Qt3 | | | | | -0.059 | 0.009 | | |
| | | | | | (0.042) | (0.011) | | |
| Post-Acquisition × Pre-Difference Rate - Qt4 | | | | | -0.090*** | -0.034*** | | |
| | | | | | (0.026) | (0.008) | | |
| Post-Acquisition × Pre-Difference Rate - Qt5 | | | | | -0.233*** | -0.129*** | | |
| | | | | | (0.031) | (0.023) | | |
| Post-Acquisition | | | | | | | 0.029 | -0.016* |
| | | | | | | | (0.058) | (0.008) |
| Post-Acquisition × Δ HHI | | | | | | | -0.036 | 0.004 |
| | | | | | | | (0.028) | (0.010) |
| Post-Acquisition × $\frac{\text{(Branch Rate - AMR)}}{\text{AMR}}^{Pre}$ | | | | | | | -0.069** | -0.065*** |
| | | | | | | | (0.029) | (0.011) |
| Observations | 39528 | 15425 | 39528 | 15425 | 39528 | 15425 | 39528 | 15425 |
| Adjusted $R^2$ | 0.980 | 0.851 | 0.980 | 0.852 | 0.983 | 0.897 | 0.981 | 0.903 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table 8: Market Concentration and Rate Convergence in the Evolution of Interest Rates - Post-Merger Predicted HHI between 1,300 and 1,800 (Cont'd)

Panel B: HELOCs and Personal Unsecured Loans

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Branch Rate | | | | | | | |
| | HELOC | Personal | HELOC | Personal | HELOC | Personal | HELOC | Personal |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI = 0)$ | | | -0.234*** | 0.029 | | | -0.039 | -0.222 |
| | | | (0.083) | (0.228) | | | (0.057) | (0.161) |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \in (0, 200))$ | | | -0.091 | 0.329 | | | | |
| | | | (0.157) | (0.330) | | | | |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \geq 200)$ | | | -0.299** | 0.990 | | | | |
| | | | (0.115) | (0.634) | | | | |
| Post-Acquisition × Pre-Difference Rate - Qt1 | | | | | 0.354*** | 2.065*** | | |
| | | | | | (0.107) | (0.340) | | |
| Post-Acquisition × Pre-Difference Rate - Qt2 | | | | | 0.117 | -0.493 | | |
| | | | | | (0.076) | (0.354) | | |
| Post-Acquisition × Pre-Difference Rate - Qt3 | | | | | -0.137** | -0.871*** | | |
| | | | | | (0.065) | (0.267) | | |
| Post-Acquisition × Pre-Difference Rate - Qt4 | | | | | -0.268** | -1.083*** | | |
| | | | | | (0.114) | (0.328) | | |
| Post-Acquisition × Pre-Difference Rate - Qt5 | | | | | -1.166*** | -2.376*** | | |
| | | | | | (0.134) | (0.499) | | |
| Post-Acquisition | | | | | | | -0.026 | 0.171 |
| | | | | | | | (0.055) | (0.242) |
| Post-Acquisition × Δ HHI | | | | | | | -0.011 | 0.031 |
| | | | | | | | (0.013) | (0.041) |
| Post-Acquisition × $\frac{\text{(Branch Rate - AMR)}}{\text{AMR}}^{Pre}$ | | | | | | | -0.721*** | -2.040*** |
| | | | | | | | (0.091) | (0.211) |
| Observations | 35837 | 33416 | 35837 | 33416 | 35837 | 33416 | 35837 | 33416 |
| Adjusted $R^2$ | 0.953 | 0.952 | 0.953 | 0.952 | 0.967 | 0.972 | 0.971 | 0.976 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table 9: Welfare Impact of Mergers and Branch Divestitures

Table 9 reports the average counterfactual welfare change of mergers in markets where anti-trust authorities imposed branch divestitures. $\Delta\mathcal{W}^{NoDivestitures}$ denote the average welfare difference between mergers without branch divestitures and a no merger scenario across markets across markets where branches were divested. $\Delta\mathcal{W}^{Divestitures}$ report the average welfare difference between mergers that occurred and one or more branches were divested and a counterfactual scenario of mergers without branch divestitures. Welfare differences are measured in percent terms (%). We split the markets in the analysis in two groups. Pre-Merger Rate Dif $< 0$ corresponds to the markets where divested branches were offering deposit rate lower than the median acquirer rate prior to the merger. Pre-Merger Rate Dif $> 0$ indicates markets where the pre-merger rate difference between the divested branch and median acquirer rate was positive. The last column, *Num Div Branches* indicates the number of divested branches included in each group.

| | Welfare Difference | | Pre-Rate Dif | Rate Difference | | Bank FE Difference | | Num Div Branches | Num Markets |
|---|---|---|---|---|---|---|---|---|---|
| | No Div | Div | | No Div | Div | No Div | Div | | |
| Pre-Merger Rate Dif<0 | .768 | -7.209 | -3.094 | 3.145 | 1.048 | -.352 | -.404 | 137 | 39 |
| Pre-Merger Rate Dif>0 | -.48 | 2.626 | 2.255 | -2 | -1.349 | -.027 | -.05 | 25 | 5 |

# FOR ONLINE PUBLICATION

# Internet Appendix for "Bank Consolidation and Uniform Pricing"

## Table of Contents:

# A Additional Analyses of Uniform Pricing Practices

In this section, we conduct further empirical analyses focusing on the uniform pricing practices of U.S. banks. In Figure A.1, we repeat the approach of Figure 4 in the main draft but compute the monthly rate correlation between the branches in each pair rather than their quarterly absolute rate differences. The results show that branches within the same bank have almost perfectly correlated rates and that branches of different banks have rates that are much less correlated.

We also examine if the similarity in the rates set by branches of the same bank is explained by greater geographic proximity. To address this concern, we repeat the method of Dellavigna and Gentzkow (2019) while imposing additional geographic restrictions on the pairs of branches. Specifically, in Table A.1, we require the 10,000 randomly drawn pairs of branches to come from the same state and from the same banking market. If the greater price similarity of same-bank branch pairs was an artifact of geographic proximity, we would expect that the similarity in the deposit rates of different-bank pairs would increase once we restrict the analysis to branch pairs from the same state or banking market. Instead, Table A.1 shows that the rate differences between pairs of branches of the same bank located in different markets or states (Panels D and E) are significantly smaller than the rate differences between pairs of branches of different banks located in the same market or state (Panels B and C).

In Figure A.2, we examine the uniform pricing practices of banks across a broader set of deposit and loan products. Figure A.2 analyzes uniform pricing practices in the rates of 24-month CDs (Panel A), 12-month CDs with a \$100,000 minimum amount (Panel B), money market accounts with a minimum deposit of \$25,000 (Panel C), and new auto loans rates (Panel D). The bank fixed effects explain a large fraction of the total variation in rates across all these alternative deposit and loan products. The county- and zip-fixed effects explain a much smaller fraction of the total variation in the rates of these alternative products. These findings are indicative that uniform pricing practices are not specific to a few deposit and loan products.

In Figure A.3, we examine if the main results in the paper generalize to non-interest fees that banks charge for some of their services. Specifically, we focus on four different types of non-interest fees: the monthly fee on interest checking accounts, stop payment fees, Automated Teller Machines (ATM) out-of-network transaction fees, and overdraft fees. These fee products are not only important components of the non-interest revenue business of banks but are also well populated in our sample.[30] The results again

[30] Most banks do not report these fees monthly. To increase the power of our analysis, we assume that the branch rates that each bank reports is constant for eight months since the bank last reported that specific fee to RateWatch.

suggest that bank fixed effects explain a large fraction of the variation in branch fees, thus indicating that banks are not using their fee income to price discriminate across regions.

In Figures A.4 and A.5 we weight branches by their banks' total assets and deposits. This ensures that each bank's branches are given a weight proportional to their relative size in the banking system. The size-weighted results of Figure 2 suggest that uniform pricing practices are slightly less prevalent when banks with greater assets and deposits are given more weight. For example, the adjusted $R^2$ for bank fixed-effect regressions falls below 70% between 2004 and 2005, compared to approximately 75% in the unweighted regressions during the same period. We also observe a rise in uniform pricing after 2006, consistent with the non-weighted results in Figure 2. Overall, the size-weighted findings still indicate a high degree of uniform pricing, albeit slightly less than in the main analysis.

The slightly reduced predominance of uniform pricing observed in the size-weighted regressions of Figures A.4 and A.5 suggests that larger banks may employ uniform pricing to a lesser extent. To further explore this, Figures A.6 and A.7 repeat the analysis of Figure 2, focusing only on banks with assets over \$1 billion and \$10 billion, respectively. The results from these plots confirm that larger banks engage in uniform pricing to a lesser degree. For instance, in Figure A.7, the adjusted $R^2$ for bank fixed effects ranges from 50% to 75% between 2004 and September 2007, after which uniform pricing becomes more prevalent and remains elevated. These findings support the hypothesis that larger banks use uniform pricing less, likely due to their broader geographic coverage and greater potential for spatial price discrimination.

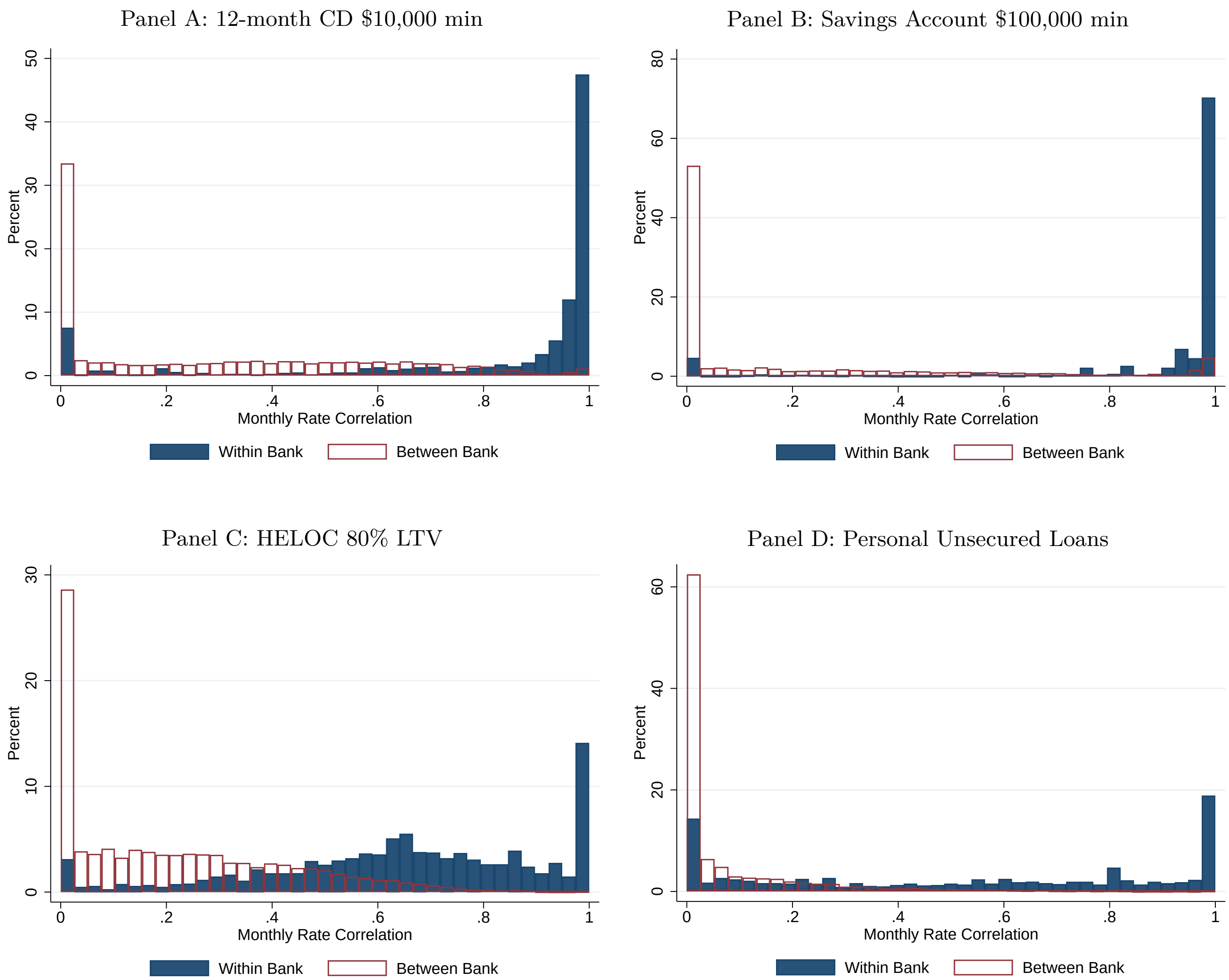
We also investigate if the rise in the prevalence of uniform pricing practices observed between 2006 and 2008 could be attributed to the expanded RateWatch coverage of smaller banks, which tend to employ greater uniform pricing. To that effect, we repeat the analysis of Figure 2 within the subsample of banks that are covered by RateWatch throughtout the entire sample period. The results illustrated in Figure A.8 exhibit similar patterns to those of Figure 2, thereby suggesting that the observed evolution of uniform pricing practices over the sample period is not attributable to changes in the sample composition.

In Figure A.9, we repeat the analysis of Figure 4 after partitioning the sample between the zero lower bound period (2009–2015) and the period outside of the zero lower bound (2004–2009 and 2015–2019). The figure indicates that uniform pricing practices were more intense during the zero lower bound period. Having said that, it is clear from the analysis that during both periods branch pairs belonging to the same bank practiced rates that were substantially more similar to each other than those of branch pairs not belonging to the same bank. This evidence further suggests that uniform pricing is a staple of the entire sample period and not just an artifact of the zero lower bound.

Finally, in Figure A.10 we repeat the analysis of Figure 4 focusing exclusively on the subset of rate-setter branches. These histograms further reinforce the idea that pairs of rate-setting branches practiced rates that were substantially more similar to each other than those of branch pairs not belonging to the same bank.

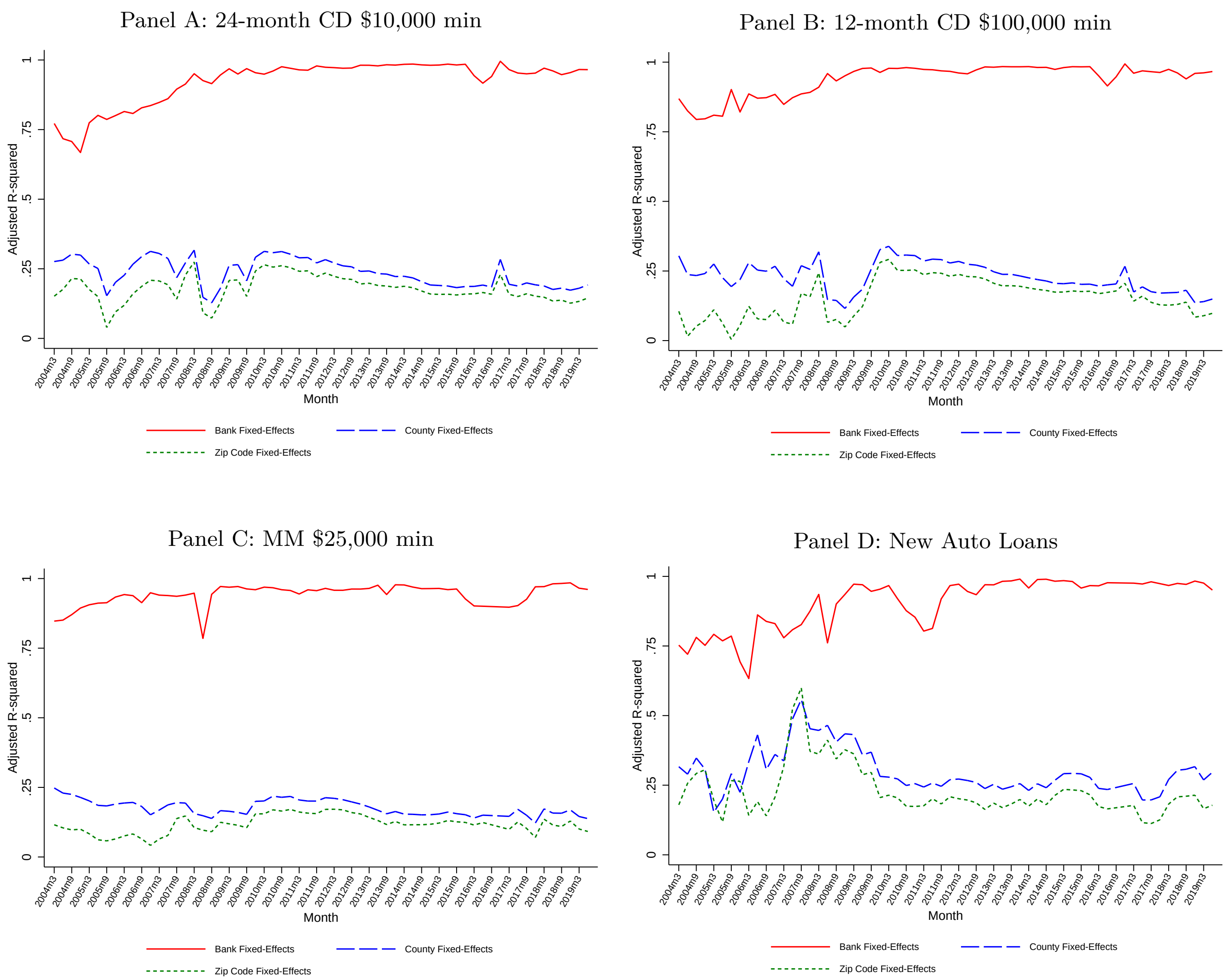
Figure A.1: Average Monthly Rate Correlation: Same Bank vs. Different Bank Comparisons

Figure A.1 presents histograms of the average monthly rate correlation for 10,000 randomly drawn pairs of branches of the same bank (solid blue bars) and 10,000 randomly drawn pairs of different banks (hollow red bars). The histograms are built using the 12-month certificate of deposit rate with a minimum account size of \$10,000 (12MCD10K), savings deposits account rate with a minimum size of \$100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). Data is from RateWatch.



## Figure A.2: Adjusted $R^2$ of Interest Rate on Fixed Effects

Figure A.2 plots the adjusted $R^2$ from a monthly series of ordinary least squares (OLS) regression of the 24-month certificate of deposit (CD) rate with a minimum account size of \$10,000 (Panel A), the 12-month CD rate with a minimum account size of \$100,000 (Panel B), Money Market account (MM) rate with a minimum account size of \$25,000 (Panel C) and New Auto Loan rate for 100% Finance (Panel D) on bank fixed effects (solid red line), county fixed effects (dashed blue line) and zip code fixed effects (short dashed green line). For each month, we run an OLS regression of the product rate practiced by each branch in the respective month on each set of fixed effects and we plot the respective $R^2$ over time. Data is from RateWatch.



# Figure A.3: Adjusted $R^2$ of Fees on Fixed Effects

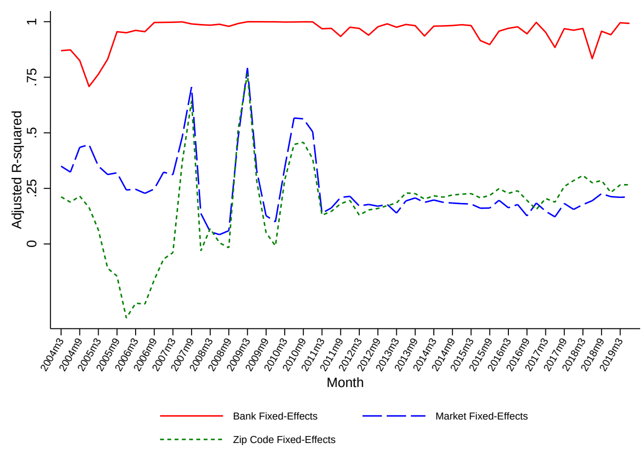
Figure A.3 plots the adjusted $R^2$ from a monthly series of ordinary least squares (OLS) regression of the monthly fee on interest checking accounts (Panel A), fee on payment stops (Panel B), ATM Out of Network Transaction Fee (Panel C) and overdraft fee on returned deposit items (Panel D) on bank fixed effects (solid red line), county fixed effects (dashed blue line) and zip code fixed effects (short dashed green line). For each month, we run an OLS regression of the product rate practiced by each branch in the respective month on each set of fixed effects and we plot the respective $R^2$ over time. Data is from RateWatch.

## Figure A.4: Adjusted $R^2$ of Interest Rate on Fixed Effects - Weighted by Assets per Branch

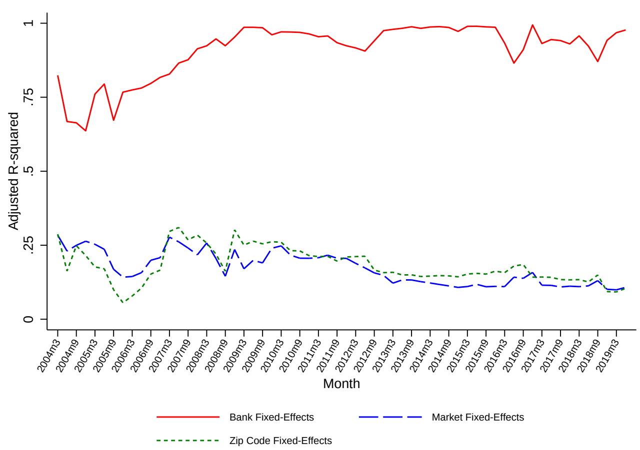
Figure A.4 repeats the analysis of Figure 2 after weighing each branch by the amount of total assets per branch of the respective bank.

Panel A: 12-month CD $10,000 min


Panel B: Savings Account $100,000 min




Panel C: HELOC 80% LTV

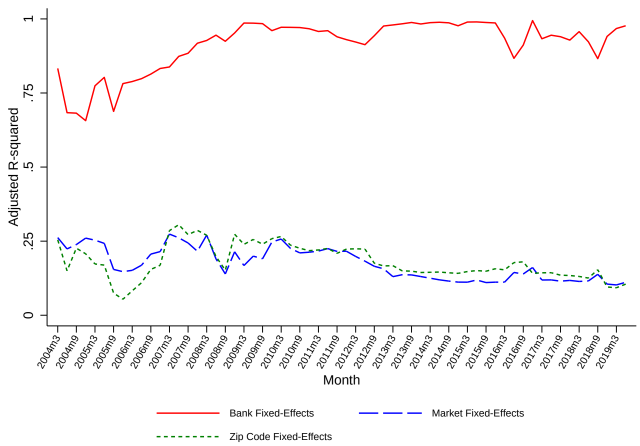



Panel D: Personal Unsecured Loans

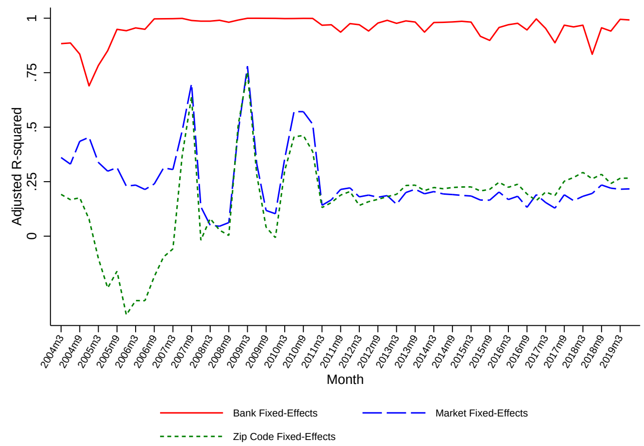
Figure A.5: Adjusted $R^2$ of Interest Rate on Fixed Effects - Weighted by Deposits

Figure A.5 repeats the analysis of Figure 2 after weighing each branch by the amount of total deposits per branch of the respective bank.

Panel A: 12-month CD $10,000 min




Panel B: Savings Account $100,000 min




Panel C: HELOC 80% LTV


Panel D: Personal Unsecured Loans

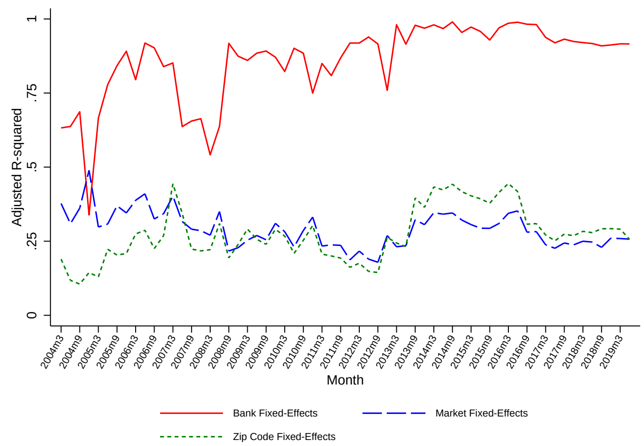


Figure A.6: Adjusted $R^2$ of Interest Rate on Fixed Effects - Banks with assets above \$1 billion

Figure A.6 repeats the analysis of Figure 2 in the subset of banks whose total assets exceed \$1 billion.

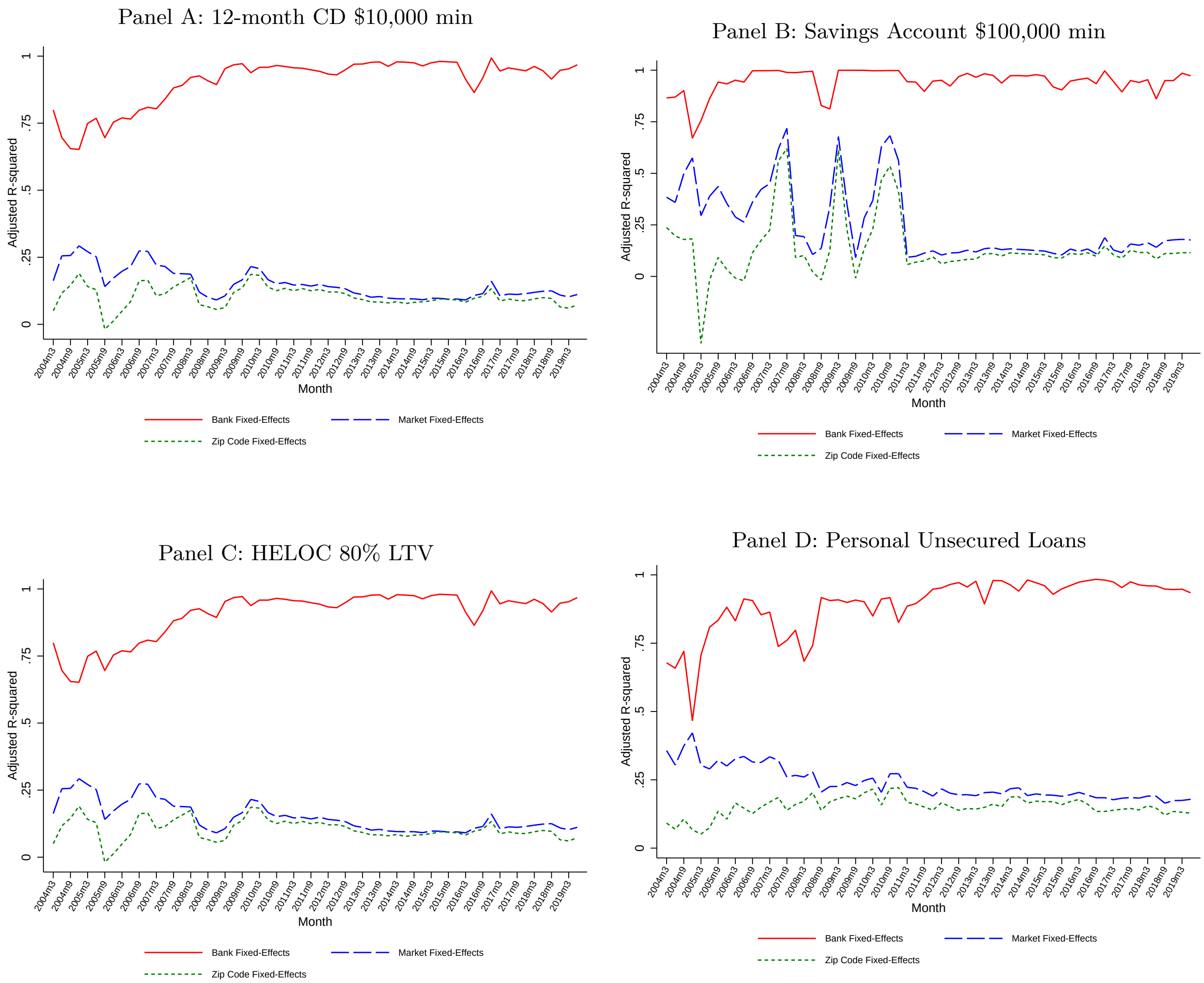


Figure A.7: Adjusted $R^2$ of Interest Rate on Fixed Effects - Banks with assets above \$10 billion

Figure A.7 repeats the analysis of Figure 2 in the subset of banks whose total assets exceed \$10 billion.

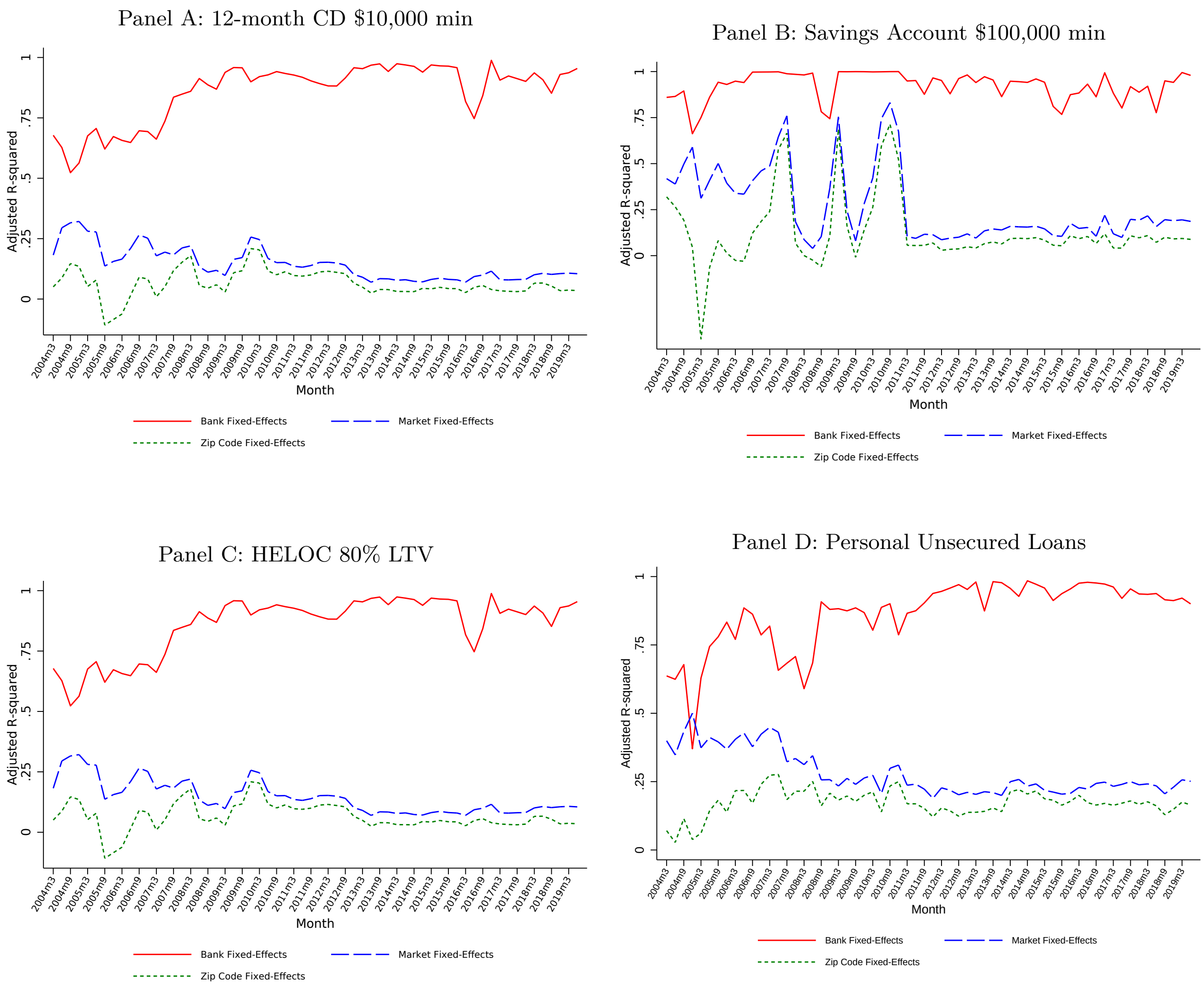


Figure A.8: Adjusted $R^2$ of Interest Rate on Fixed Effects - Balanced Sample

Figure A.8 repeats the analysis of Figure 2 using a balanced sample of banks that are followed throughout the entire sample period.

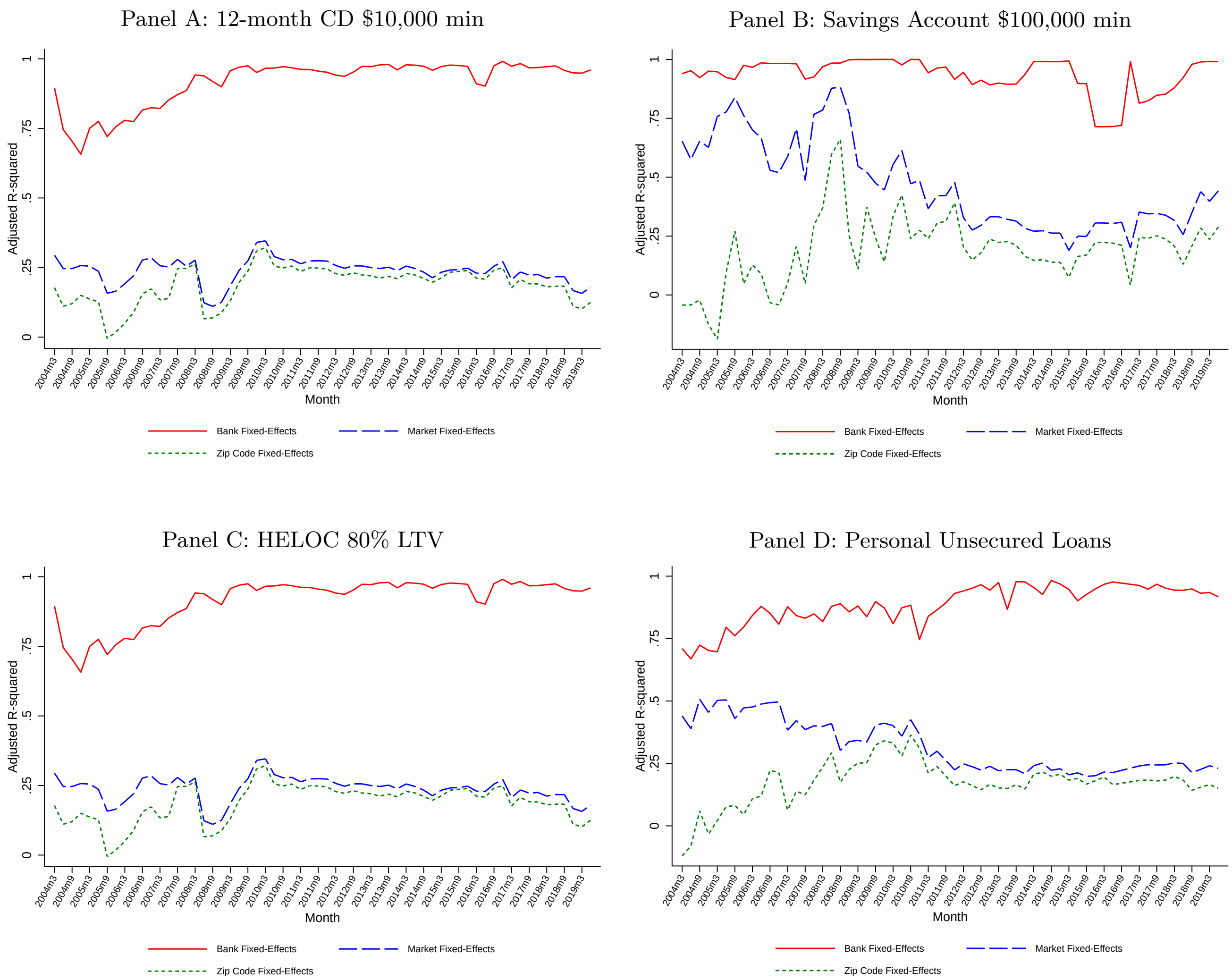
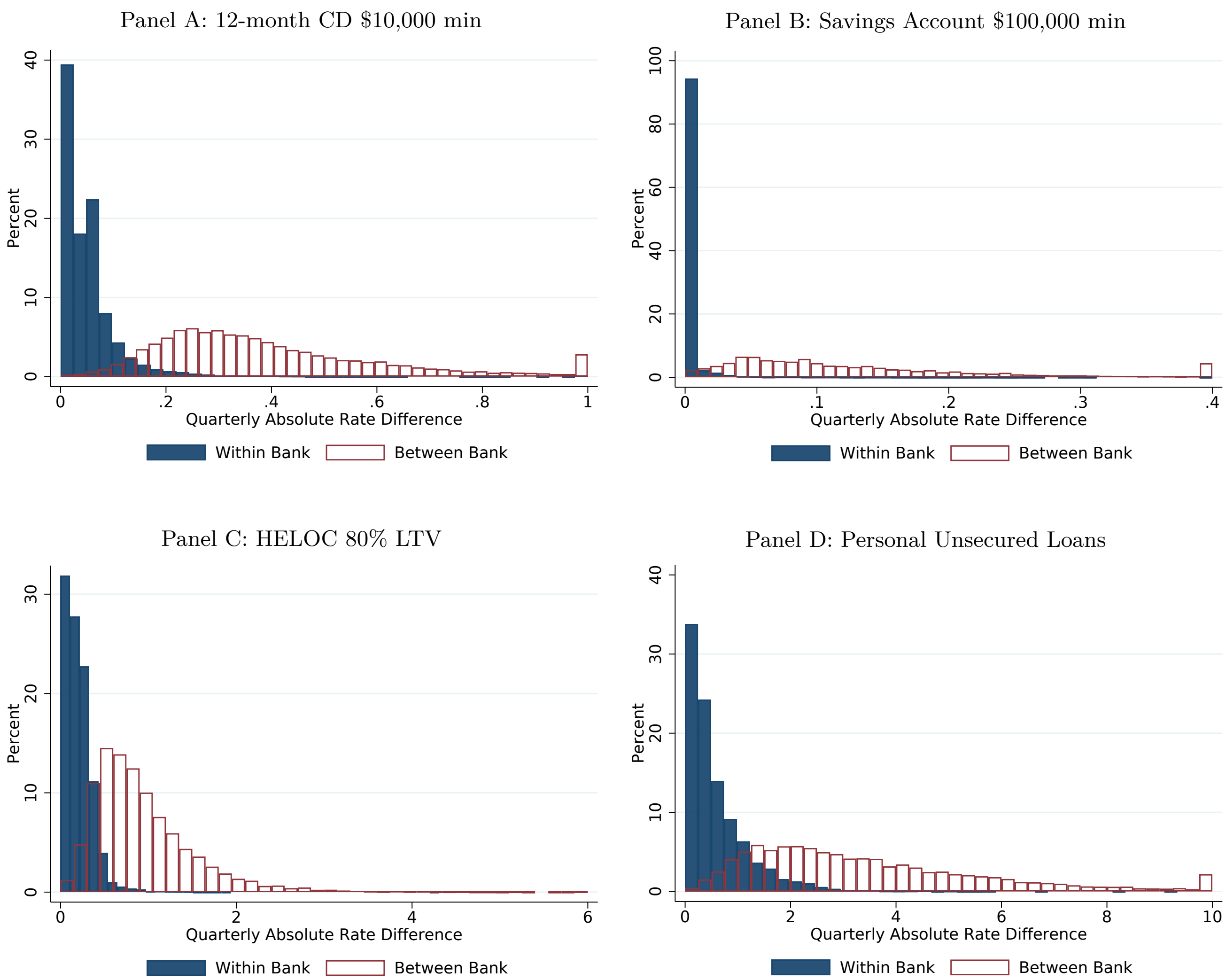


Figure A.9: Absolute Quarterly Rate Difference within and outside of Zero Lower Bound Period

Figure A.9 repeats the empirical analysis of Figure 4 within and outside the zero lower bound period. We define the zero lower bound period as the period between 2009 and 2015.

# Figure A.10: Absolute Quarterly Rate Difference: Rate-Setter Only Sample

Figure A.10 presents histograms of the average monthly rate correlation for 20,000 randomly drawn pairs of rate-setter branches of the same bank (solid blue bars) and 20,000 randomly drawn pairs of rate-setter branches of different banks (hollow red bars). The rate-setter branches are branches that have autonomy to set their own deposit and loan rates as well as the rates of other branches of the same bank that fall in their area of influence. Data is from RateWatch.



## Table A.1: Similarity Rates

Table A.1 provides simple descriptive statistics on the similarity between interest rates practiced within branches of the same bank and between branches of different banks. For a large number of randomly drawn branch pairs, we compute the *Quarterly Absolute Rate Difference* that we define as the average absolute difference in interest rates during a quarter of the two branches in a branch-pair and we compute the *Monthly Rate Correlation*, which we define as the coefficient of correlation between the average monthly interest rates of the two branches in each branch-pair. In Panel A we draw 10,000 random pairs of branches within the same bank and 10,000 random pairs of branches of different banks from the entire sample. In Panel B we draw 10,000 random pairs of branches within the same bank and 10,000 random pairs of branches of different banks from the subsample of branches located in the same state. In Panel C we draw 10,000 random pairs of branches within the same bank and 10,000 random pairs of branches of different banks from the subsample of branches located in the same county. In Panel D we draw 10,000 random pairs of branches within the same bank and 10,000 random pairs of branches of different banks from the subsample of branches located in different states. In Panel E we draw 10,000 random pairs of branches within the same bank and 10,000 random pairs of branches of different banks from the subsample of branches located in different counties. For each branch pair we compute the Quarterly Absolute Rate Difference and the Monthly Rate Correlation for the 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal).

| | **Quarterly Absolute Rate Difference** | | **Monthly Rate Correlation** | |
|---|---|---|---|---|
| | Same Bank | Different Bank | Same Bank | Different Bank |
| | | Panel A: All Branches | | |
| 12MCD10K | .023 | .306 | .798 | .28 |
| SAV100K | .001 | .087 | .903 | .13 |
| HELOC | .25 | 1.058 | .645 | .186 |
| Personal | .405 | 2.929 | .518 | .02 |
| | | Panel B: Branches Pairs in the same State | | |
| 12MCD10K | .004 | .278 | .921 | .276 |
| SAV100K | 0 | .076 | .97 | .145 |
| HELOC | .017 | .972 | .943 | .185 |
| Personal | .038 | 2.965 | .942 | .032 |
| | | Panel C: Branches Pairs in the same Market | | |
| 12MCD10K | .002 | .305 | .927 | .239 |
| SAV100K | .001 | .078 | .977 | .129 |
| HELOC | .049 | 1.002 | .911 | .209 |
| Personal | .031 | 2.865 | .952 | .034 |
| | | Panel D: Branches Pairs in different States | | |
| 12MCD10K | .025 | .306 | .784 | .29 |
| SAV100K | .001 | .085 | .896 | .122 |
| HELOC | .282 | 1.052 | .6 | .189 |
| Personal | .479 | 2.887 | .439 | .022 |
| | | Panel E: Branches Pairs in different Market | | |
| 12MCD10K | .024 | .304 | .794 | .289 |
| SAV100K | .001 | .085 | .902 | .138 |
| HELOC | .261 | 1.048 | .631 | .193 |
| Personal | .423 | 2.922 | .502 | .018 |

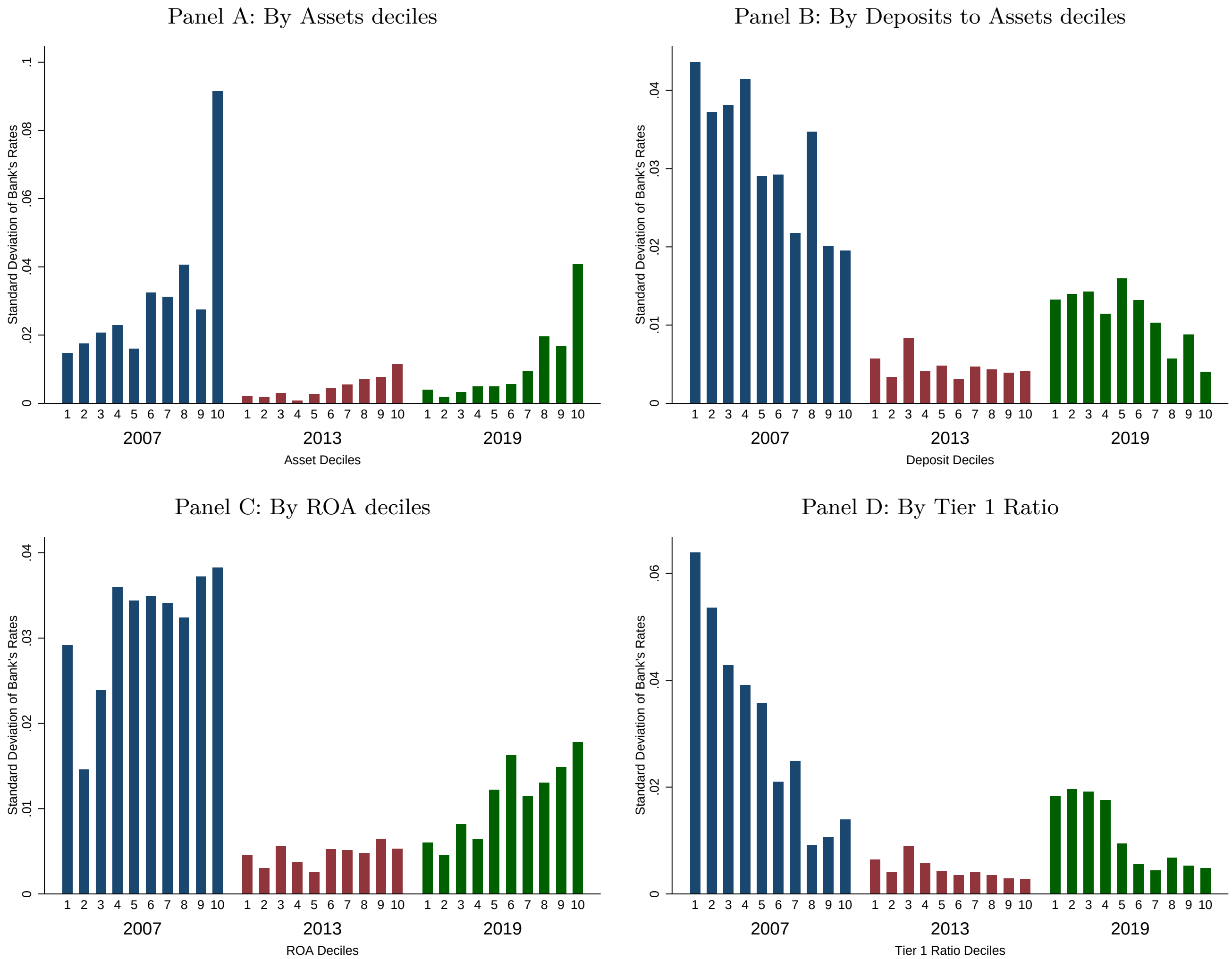
# B Correlates of Bank Uniform Pricing Practices

This Appendix investigates what bank characteristics correlate more strongly with with dispersion in deposit and loan rates within a bank's branch network. Specifically, we split our sample of banks on deciles based on the following bank characteristics: total assets (Panel A), deposits-to-assets ratio (Panel B), profitability as measured by ROA (Panel C), and Tier 1 Capital Ratios (Panel D).

Our results suggest that the standard deviation on deposit and loan rates within a bank's branch networks declined significantly between 2007 and 2013–2019. This is consistent with lower scope for dispersion is branch rates given greater proximity to the zero lower bound during this period. Nevertheless, the Panel A of all figures suggest that dispersion in branch rates increases with bank asset sizes across all years. These results are suggestive that larger banks have greater scope to set different rates across their branch networks and use this greater scope to practice some price differentiation. In Panel B, we find that banks with greater reliance on deposit financing as proxied by the ratio of deposits to assets have stronger uniform pricing practices. The results of Panel C are interesting because they do not indicate a strong relation between the strength of uniform pricing practices and profitability. This is interesting because one might think that banks could increase their profits if they took advantage of opportunities to price discriminate across space. Instead, the findings do not suggest that the most profitable banks are setting different prices across branches. Finally, Panel D of all Figures suggest that thinly capitalized banks have greater standard deviation of rates in their branch networks. This could be consistent with the idea that distressed banks want to extract rents from the deposit insurance fund and practice different rates in some branches but could also be interpreted as a size effect given the larger banks' propensity to hold lower Tier 1 Capital ratios.

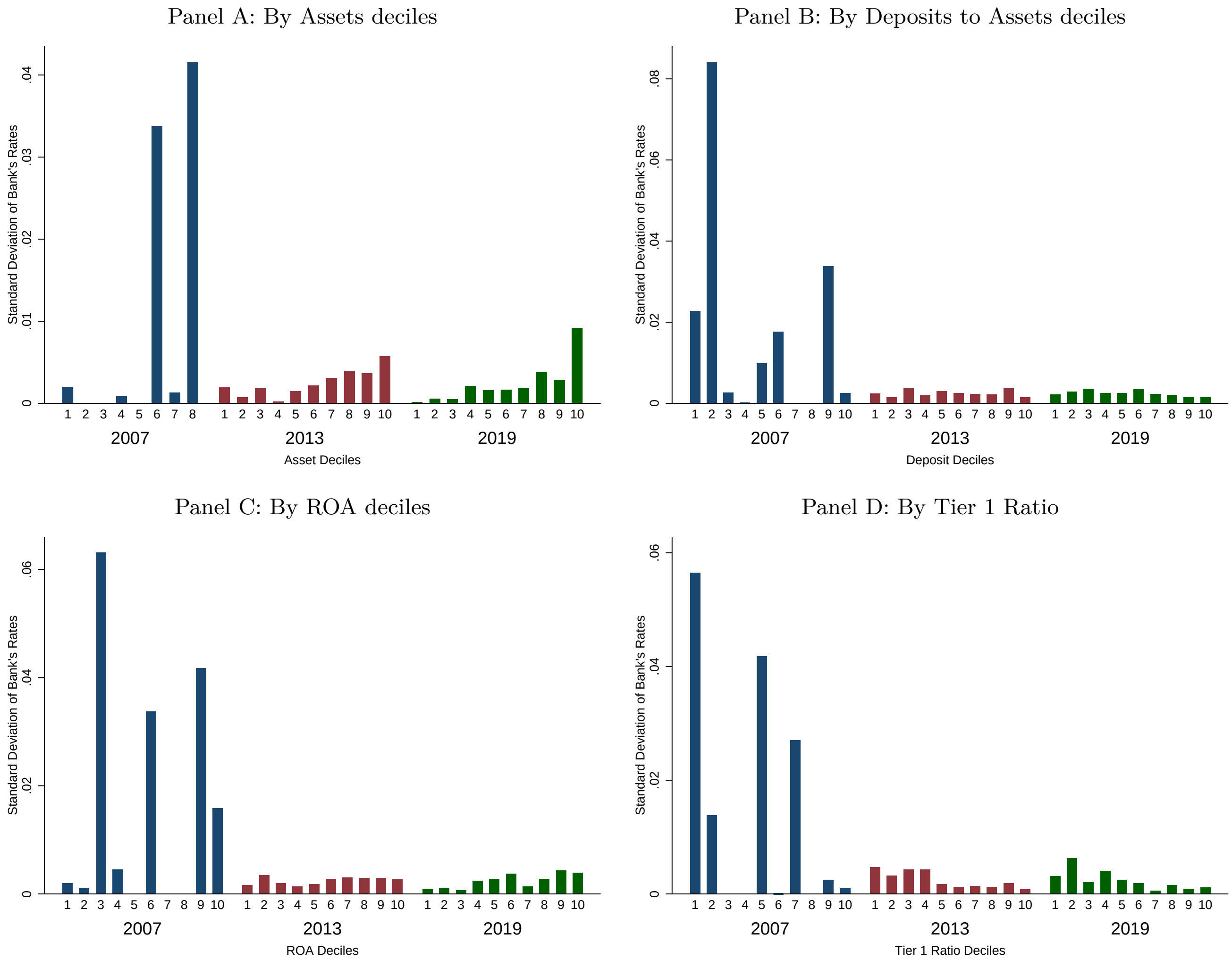
Figure B.1: Correlates of the Standard Deviation of Bank's Deposit rates (12MCD10K)

Figure B.1 plots the average of the within-bank standard deviation of the 1-year CD rate for 2007, 2013, and 2019 by asset deciles (panel A), deposits-to-assets ratio deciles (panel B), ROA deciles (panel C) and Tier1 deciles (panel D). Data is from RateWatch and Summary of Deposits (SOD).



## Figure B.2: Correlates of the Standard Deviation of Bank's Deposit rates (SAV100K)

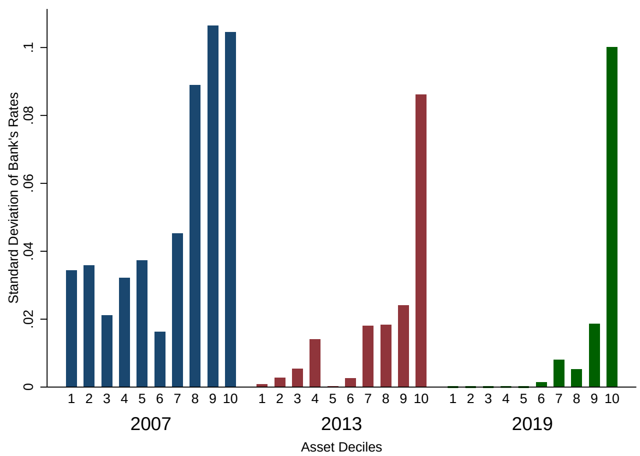
Figure B.2 plots the average of the within-bank standard deviation of the savings deposit rate for 2007, 2013, and 2019 by asset deciles (panel A), deposits-to-assets ratio deciles (panel B), ROA deciles (panel C) and Tier1 deciles (panel D). Data is from RateWatch and Summary of Deposits (SOD).



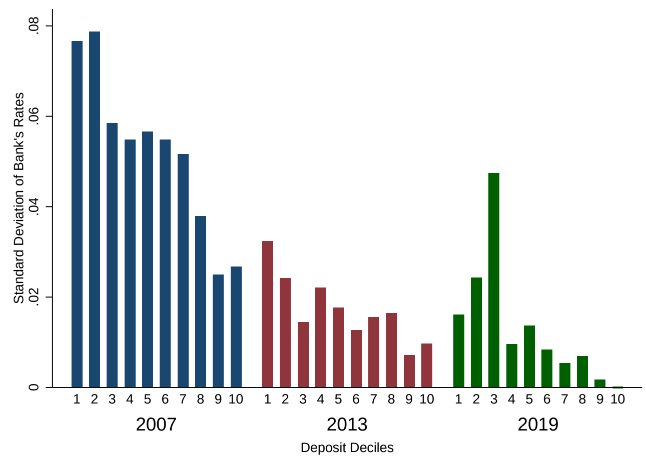
## Figure B.3: Correlates of the Standard Deviation of Bank's Loan rates (HELOC)

Figure B.3 plots the average of the within-bank standard deviation of the HELOC rate for 2007, 2013, and 2019 by asset deciles (panel A), deposits-to-assets ratio deciles (panel B), ROA deciles (panel C) and Tier1 deciles (panel D). Data is from RateWatch and Summary of Deposits (SOD).

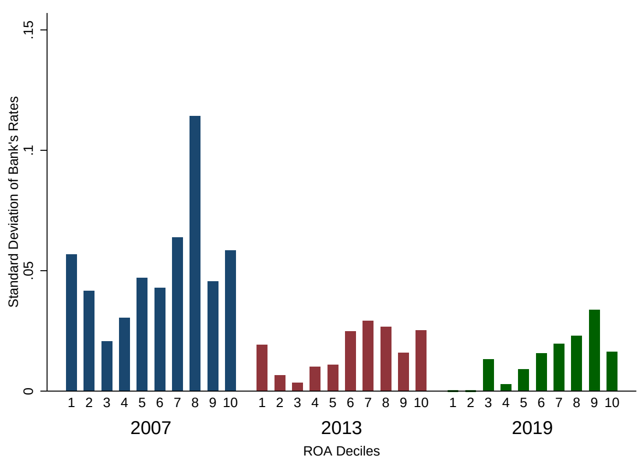
Panel A: By Assets deciles



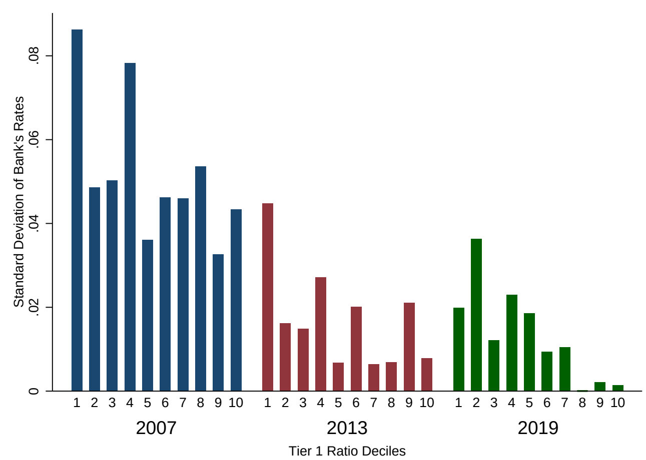

Panel B: By Deposits to Assets deciles




Panel C: By ROA deciles

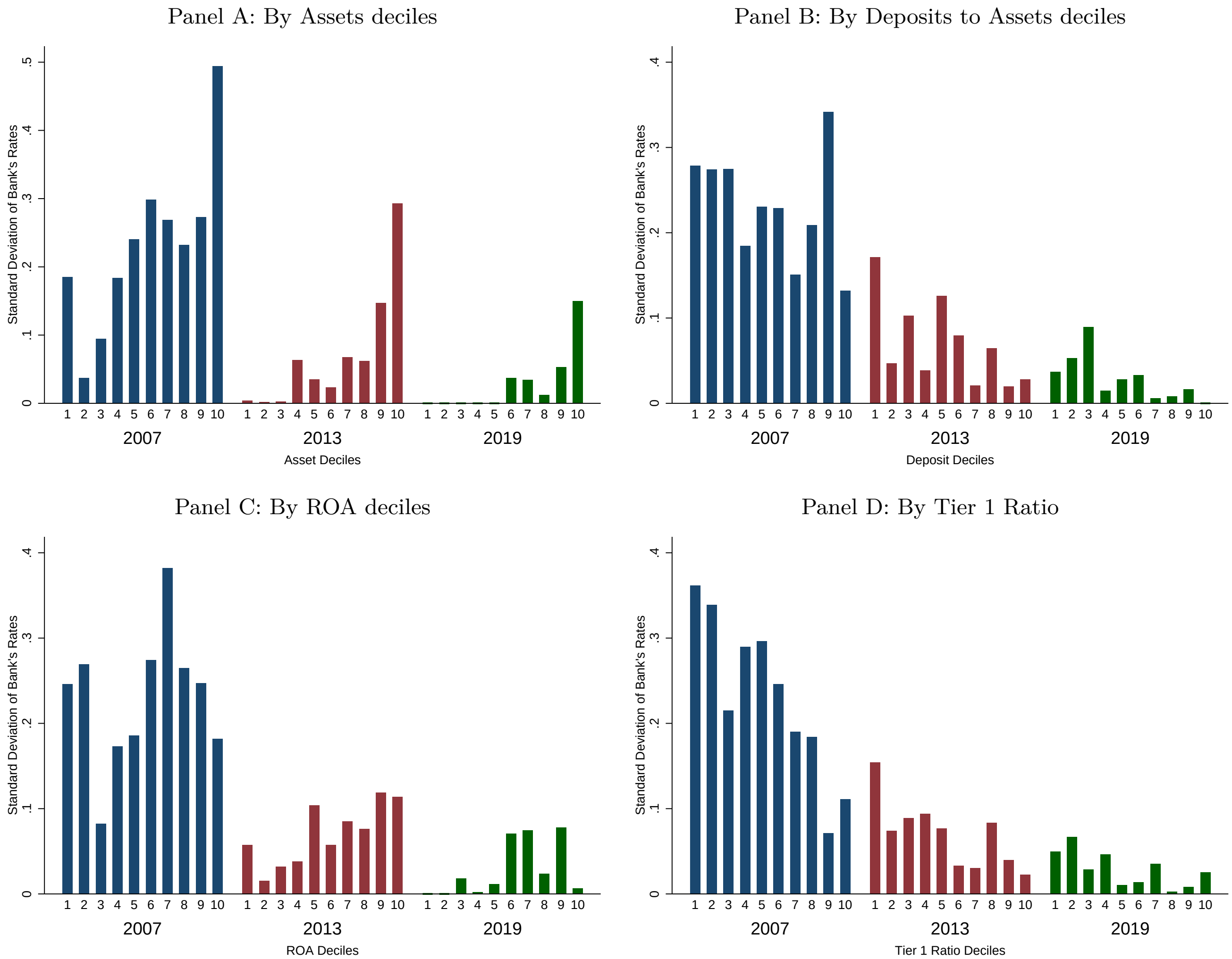



Panel D: By Tier 1 Ratio



## Figure B.4: Correlates of the Standard Deviation of Bank's Loan rates (Personal)

Figure B.4 plots the average of the within-bank standard deviation of the personal unsecured loan rate for 2007, 2013, and 2019 by asset deciles (panel A), deposits-to-assets ratio deciles (panel B), ROA deciles (panel C) and Tier1 deciles (panel D). Data is from RateWatch and Summary of Deposits (SOD).



# C Cross-Sectional Heterogeneity in Rate Convergence across Mergers

In this Appendix, we examine if the relation between the interest rates of the acquirer and acquired banks following the merger holds with various ways to split the data. In Table C.1 we examine whether the results vary depending on whether the acquirer buys a whole bank or just a portion of the branch network of the bank that sells the branches. The results suggest that rates converge in both a whole bank acquisition and in a partial bank acquisition. In Table C.2, we examine whether the rate convergence following a merger is more pronounced when the acquirer changes the rate-setter of the acquired branch. The results suggest convergence is more pronounced when the rate-setter branch of an acquired branch changes. Nevertheless, we find that the rate convergence following a merger is still statistically significant even when the rate-setter branch of an acquired branch remains the same. This result suggests that an acquired branch aligns their rates more closely with those of acquirer banks even when it retains their ability to set rates autonomously. In Table C.3, we exclude consolidations in which acquirer and acquired belong to the same bank holding company (BHC) and find that the results hold when we exclude these consolidations. In Table C.4 we assess whether our results are robust to excluding thinly-capitalized or failed banks. The concern is that these banks are practicing sub-optimal deposit and loan rates to attract depositors and that following a merger, rates at those branches will naturally converge to a more optimal level. The results indicate that the rate convergence results do not depend on the inclusion of failed banks in the sample, suggesting that our main results are not driven by suboptimal rates at acquired banks that failed or are near-failure. In Table C.5 we expand the analysis in Panel B of Table 4 by further partitioning the bank mergers into those in which large banks acquire small banks, small banks acquire small banks, and large banks acquires small banks. The concern is that the convergence results are only present in subsamples in which large banks acquire small banks and that in situations in which large banks acquire other large banks or in which small banks acquire other small banks there is no post-merger convergence in deposit and loan rates. The results further supports our assertion that the convergence in interest rates is a phenomenon that does not depend on the size of acquirer and acquired banks. Finally, in Tables C.6–C.9, we repeat the main analysis of Table 3 after weighting a banks' acquired branches by the total assets and total deposits of the acquirer and acquired banks. The main results are not sensitive to weighting the observations by the size of the merging entities.

Table C.1: Effects of M&A on Rate Convergence between Acquired Branch and Median Acquirer Rate: Bank vs Branch Acquisition

Table C.1 reports the coefficients of OLS regressions investigating the effect of a merger on the difference between the rates of the acquired branch and the median rate of the acquirer for 12-month certificates of deposit with a minimum account size of $10,000 (12MCD10K), Savings Accounts with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). We stratify the sample based on the merger being a bank merger or a branch acquisition. The dependent variable, $\frac{|BranchRate-Acq.Med.Rate|}{Acq.Med.Rate}$, is the absolute difference between the rate of the target branch and the median rate of the acquirer divided by median rate of the acquirer. The main variable of interest, *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event. All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| **Dep. Variable:** $\left\|\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\|$ | 12MCD10K | | SAV100K | | HELOC | | Personal | |
| | Bank M&A | Branch Acq. | Bank M&A | Branch Acq. | Bank M&A | Branch Acq. | Bank M&A | Branch Acq. |
| Post-Acquisition | -0.274*** | -0.385*** | -0.661*** | -0.407*** | -0.080*** | -0.100*** | -0.088*** | -0.161*** |
| | (0.022) | (0.063) | (0.100) | (0.086) | (0.011) | (0.016) | (0.016) | (0.034) |
| Observations | 85257 | 159917 | 20276 | 44482 | 42722 | 152078 | 44639 | 103745 |
| Adjusted $R^2$ | 0.653 | 0.616 | 0.755 | 0.800 | 0.782 | 0.856 | 0.854 | 0.876 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table C.2: Effects of M&A on Rate Convergence between Acquired Branch and Median Acquirer Rate: Keep Same Rate-Setter (RS) vs Change Rate-Setter

Table C.2 reports the coefficients of OLS regressions investigating the effect of a merger on the difference between the rates of acquired branch and the median rate of the acquirer for 12-month certificates of deposit with a minimum account size of $10,000 (12MCD10K), Savings Accounts with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). We stratify the sample based on whether the acquired branch retains the same rate-setter branch or not . The dependent variable, $\frac{|BranchRate - Acq.Med.Rate|}{Acq.Med.Rate}$, is the absolute difference between the rate of the target branch and the median rate of the acquirer divided by median rate of the acquirer. The main variable of interest, *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event. All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the branch banking market. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| **Dep. Variable:** $\left\lvert\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\rvert$ | 12MCD10K | | SAV100K | | HELOC | | Personal | |
| | Keeps RS | Changes RS | Keeps RS | Changes RS | Keeps RS | Changes RS | Keeps RS | Changes RS |
| Post-Acquisition | -0.242*** | -0.498*** | -0.326*** | -0.812*** | -0.027*** | -0.138*** | -0.016 | -0.228*** |
| | (0.042) | (0.042) | (0.076) | (0.119) | (0.008) | (0.019) | (0.018) | (0.024) |
| Observations | 172058 | 73074 | 28760 | 36013 | 116445 | 78327 | 79097 | 69487 |
| Adjusted $R^2$ | 0.642 | 0.645 | 0.871 | 0.756 | 0.878 | 0.825 | 0.906 | 0.858 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table C.3: Effects of M&A on Rate Convergence between Acquired Branch and Median Acquirer Rate: Excluding same Bank Holding Company consolidations

Table C.3 reports the coefficients of OLS regressions investigating the effect of a merger on the difference between the rate of the acquired branch and the median rate of the acquirer when both acquired and acquirer do not belong to the same Bank Holding Company. We consider the following deposit and loan products: 12-month certificates of deposit with a minimum account size of $10,000 (12MCD10K), Savings Accounts with a minimum size of $100,000 (SAV100K), Personal Unsecured Loans (Personal) and Home Equity Lines of Credit rate with a LTV up to 80% (HELOC). The dependent variable in columns (1) to (4), |Branch Rate - Acquirer Median Rate|, is the absolute difference between the interest rate of the acquired branch and the median rate of the acquirer. The dependent variable in columns (5) to (8), $\left|\frac{\text{|Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right|$, is the absolute difference between the interest rate of the acquired branch and the median rate of the acquirer divided by median rate of the acquirer. The main variable of interest, *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event. All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | \|Branch Rate - Acquirer Median Rate\| | | | | $\left\|\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\|$ | | | |
| | 12MCD10K | SAV100K | Personal | HELOC | 12MCD10K | SAV100K | Personal | HELOC |
| Post-Acquisition | -0.140*** | -0.042*** | -0.478*** | -1.792*** | -0.442*** | -0.650*** | -0.117*** | -0.185*** |
| | (0.009) | (0.004) | (0.056) | (0.152) | (0.039) | (0.097) | (0.013) | (0.017) |
| Observations | 116553 | 50851 | 103466 | 92424 | 116553 | 50851 | 103443 | 92169 |
| Adjusted $R^2$ | 0.694 | 0.721 | 0.819 | 0.845 | 0.619 | 0.751 | 0.788 | 0.842 |
| State $\times$ Month Fixed-Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed-Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table C.4: Effects of M&A on Absolute Difference between Branch Deposit and Loan Rates and Median Acquirer Rates (Excluding Acquired Banks with Low Tier1 Ratio and Bank Failures)

Table C.4 reports the coefficients of OLS regressions investigating the effect of a merger on the difference between the rate of the acquired branch and the median rate of the acquirer excluding banks with low levels of Tier 1 Capital and bank failures. We consider the following deposit and loan products: 12-month certificates of deposit with a minimum account size of $10,000 (12MCD10K), Savings Accounts with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). The dependent variable, $\frac{|BranchRate - Acq.Med.Rate|}{Acq.Med.Rate}$, is the absolute difference between the rate of the acquired branch and the median rate of the acquirer divided by median rate of the acquirer. The main variable of interest, *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event. All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the branch banking market. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Excluding Acq. Low Tier1 | | | | Excluding Bank Failures | | | |
| | 12MCD10K | SAV100K | HELOC | Personal | 12MCD10K | SAV100K | HELOC | Personal |
| Post-Acquisition | -0.345*** | -0.509*** | -0.098*** | -0.155*** | -0.355*** | -0.503*** | -0.058*** | -0.082*** |
| | (0.031) | (0.071) | (0.011) | (0.018) | (0.038) | (0.090) | (0.010) | (0.016) |
| Observations | 204352 | 52759 | 161696 | 121999 | 159231 | 49463 | 162162 | 119910 |
| Adjusted $R^2$ | 0.560 | 0.777 | 0.812 | 0.854 | 0.686 | 0.782 | 0.837 | 0.893 |
| State × Month Fixed-Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed-Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table C.5: Effects of M&A on Absolute Relative Percent Difference between Branch Deposit and Loan Rates and Median Acquirer Rates

Table C.5 repeats the analysis of Panel B of Table 4 for subsamples in which large banks acquire small banks, small banks acquire small banks, and a large bank acquires a small bank. We use the asset-size threshold of $1 billion in the Community Reinvestment Act to define small and intermediate small bank and savings association.

| | Panel A: 12MCD10K | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| **Dep. Variable:** $\left\lvert \frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}} \right\rvert$ | Byr Above 1bi<br>Trgt Above 1bi | Byr Below 1bi<br>Trgt Below 1bi | Byr Above 1bi<br>Trgt Below 1bi |
| Post-Acquisition | -0.307*** | -0.257*** | -0.404*** |
| | (0.082) | (0.055) | (0.062) |
| Observations | 108643 | 38461 | 26431 |
| Adjusted $R^2$ | 0.703 | 0.471 | 0.766 |
| State × Month Fixed-Effects | Yes | Yes | Yes |
| Branch Fixed-Effects | Yes | Yes | Yes |

| | Panel B: SAV100K | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| **Dep. Variable:** $\left\lvert \frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}} \right\rvert$ | Byr Above 1bi<br>Trgt Above 1bi | Byr Below 1bi<br>Trgt Below 1bi | Byr Above 1bi<br>Trgt Below 1bi |
| Post-Acquisition | -0.213 | -0.448*** | -0.716*** |
| | (0.146) | (0.079) | (0.144) |
| Observations | 32307 | 16132 | 11667 |
| Adjusted $R^2$ | 0.859 | 0.686 | 0.823 |
| State × Month Fixed-Effects | Yes | Yes | Yes |
| Branch Fixed-Effects | Yes | Yes | Yes |

| | Panel C: HELOC | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| **Dep. Variable:** $\left\lvert \frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}} \right\rvert$ | Byr Above 1bi<br>Trgt Above 1bi | Byr Below 1bi<br>Trgt Below 1bi | Byr Above 1bi<br>Trgt Below 1bi |
| Post-Acquisition | -0.096*** | -0.090*** | -0.170*** |
| | (0.018) | (0.014) | (0.030) |
| Observations | 163391 | 6386 | 13497 |
| Adjusted $R^2$ | 0.884 | 0.828 | 0.838 |
| State × Month Fixed-Effects | Yes | Yes | Yes |
| Branch Fixed-Effects | Yes | Yes | Yes |

| | Panel D: Personal | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| **Dep. Variable:** $\left\lvert \frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}} \right\rvert$ | Byr Above 1bi<br>Trgt Above 1bi | Byr Below 1bi<br>Trgt Below 1bi | Byr Above 1bi<br>Trgt Below 1bi |
| Post-Acquisition | -0.134*** | -0.069** | -0.215*** |
| | (0.030) | (0.032) | (0.039) |
| Observations | 116697 | 5051 | 14016 |
| Adjusted $R^2$ | 0.889 | 0.904 | 0.885 |
| State × Month Fixed-Effects | Yes | Yes | Yes |
| Branch Fixed-Effects | Yes | Yes | Yes |

Table C.6: Effects of M&A on Absolute Difference between Branch Rates and Median Acquirer Rates (Pre-Post Analysis) Weighted by Acquirer's Total Assets

Tables C.6 and C.7 repeat the analysis of Table 3 weighting the acquired branches of each bank by the total assets of the acquirer bank and acquired bank, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | \|Branch Rate - Acquirer Median Rate\| | | | | $\left\lvert\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\rvert$ | | | |
| | 12MCD10K | SAV100K | HELOC | Personal | 12MCD10K | SAV100K | HELOC | Personal |
| Post-Acquisition | -0.091*** | -0.035*** | -0.361*** | -1.260*** | -0.329*** | -0.605*** | -0.085*** | -0.129*** |
| | (0.012) | (0.003) | (0.053) | (0.173) | (0.043) | (0.093) | (0.012) | (0.019) |
| Observations | 233130 | 64817 | 192011 | 145587 | 233130 | 64817 | 191988 | 145279 |
| Adjusted $R^2$ | 0.851 | 0.732 | 0.899 | 0.859 | 0.583 | 0.760 | 0.853 | 0.850 |
| State × Month FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table C.7: Effects of M&A on Absolute Difference between Branch Rates and Median Acquirer Rates (Pre-Post Analysis) - Weighted by Target's Total Assets

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | \|Branch Rate - Acquirer Median Rate\| | | | | $\left\lvert\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\rvert$ | | | |
| | 12MCD10K | SAV100K | HELOC | Personal | 12MCD10K | SAV100K | HELOC | Personal |
| Post-Acquisition | -0.129*** | -0.037*** | -0.554*** | -2.475*** | -0.369*** | -0.622*** | -0.137*** | -0.278*** |
| | (0.011) | (0.003) | (0.070) | (0.659) | (0.038) | (0.102) | (0.016) | (0.076) |
| Observations | 190868 | 64297 | 188868 | 140684 | 190868 | 64297 | 188845 | 140558 |
| Adjusted $R^2$ | 0.829 | 0.748 | 0.901 | 0.873 | 0.545 | 0.753 | 0.865 | 0.850 |
| State × Month FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table C.8: Effects of M&A on Absolute Difference between Branch Rates and Median Acquirer Rates (Pre-Post Analysis) - Weights Deposists (CR) per Branch Buyer

Tables C.8 and C.9 repeat the analysis of Table 3 weighting the acquired branches of each bank by the total deposits of the acquirer bank and acquired bank, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | \|Branch Rate - Acquirer Median Rate\| | | | | $\left\lvert\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\rvert$ | | | |
| | 12MCD10K | SAV100K | HELOC | Personal | 12MCD10K | SAV100K | HELOC | Personal |
| Post-Acquisition | -0.093*** | -0.035*** | -0.372*** | -1.300*** | -0.356*** | -0.610*** | -0.087*** | -0.134*** |
| | (0.011) | (0.003) | (0.052) | (0.170) | (0.047) | (0.092) | (0.012) | (0.018) |
| Observations | 233130 | 64817 | 192011 | 145587 | 233130 | 64817 | 191988 | 145279 |
| Adjusted $R^2$ | 0.841 | 0.734 | 0.895 | 0.856 | 0.578 | 0.757 | 0.847 | 0.849 |
| State × Month FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |



Table C.9: Effects of M&A on Absolute Difference between Branch Rates and Median Acquirer Rates (Pre-Post Analysis) - Weights Deposists per Branch Target

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | \|Branch Rate - Acquirer Median Rate\| | | | | $\left\lvert\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\rvert$ | | | |
| | 12MCD10K | SAV100K | HELOC | Personal | 12MCD10K | SAV100K | HELOC | Personal |
| Post-Acquisition | -0.131*** | -0.037*** | -0.548*** | -2.415*** | -0.379*** | -0.626*** | -0.135*** | -0.270*** |
| | (0.011) | (0.003) | (0.068) | (0.619) | (0.038) | (0.101) | (0.015) | (0.071) |
| Observations | 190868 | 64297 | 188868 | 140684 | 190868 | 64297 | 188845 | 140558 |
| Adjusted $R^2$ | 0.814 | 0.746 | 0.899 | 0.868 | 0.538 | 0.753 | 0.862 | 0.847 |
| State × Month FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

# D Alternative Definitions of the Dependent Variable

In this section, we conduct additional empirical tests that address concerns about the robustness of the main empirical analysis to alternative definitions of the main dependent variable. For parsimony, we did not provide results for Figures 4, 5, and Table 5 of the main document using both the raw and percent differences between the rates of the acquired branches and the median rate of the acquirer. The raw difference measure is more difficult to compare across deposit and loan products because the dispersion in rates across deposit and loan products is very different. On the other hand, this measure is not affected by a potential small denominator problem that might inflate this measure especially for transaction deposit accounts that yielded very small interest during the zero-lower bound period. Here, we provide results empirical analyses using the raw differences measure.

Figure D.1 repeats the analysis of Figure 4 using the raw difference measure. The results confirm the idea that prior to the merger there is significant dispersion in the differences between the rates of the acquired branches and the median rates of the acquirer across all deposit and loan products that we study. Panel A of Figure D.1 shows that prior to the merger the differences between the 12-month CD rates of the acquired and acquirer branches range between -50 and 50 basis points. For the savings product in Panel B of Table D.1, these raw differences range mostly between -20 and 20 basis points, which is smaller in magnitude but still reasonably large especially when we consider that this is a transactional deposit product. Finally, panels C and D of the same table show significant dispersion for the loan products using this raw difference measure. The dispersion in these raw rate differences declines substantially after the merger. In Figure D.2, we repeat the analysis of Figure 5 using the raw difference measure. Similar to the results of Figure 5, we see substantial convergence in deposit and loan rates that occurs mostly after the merger.

Finally, in Table D.1 we repeat the analysis of Table 4 using the absolute rate differences variable. The results are again similar to those presented in the main tables. Panel A shows that the convergence in interest rates is more pronounced for acquirers with stronger uniform pricing practices and Panels B and C show that the rate convergence does not depend on the relative size of the parties involved in the merger or on the degree of market overlap between them.

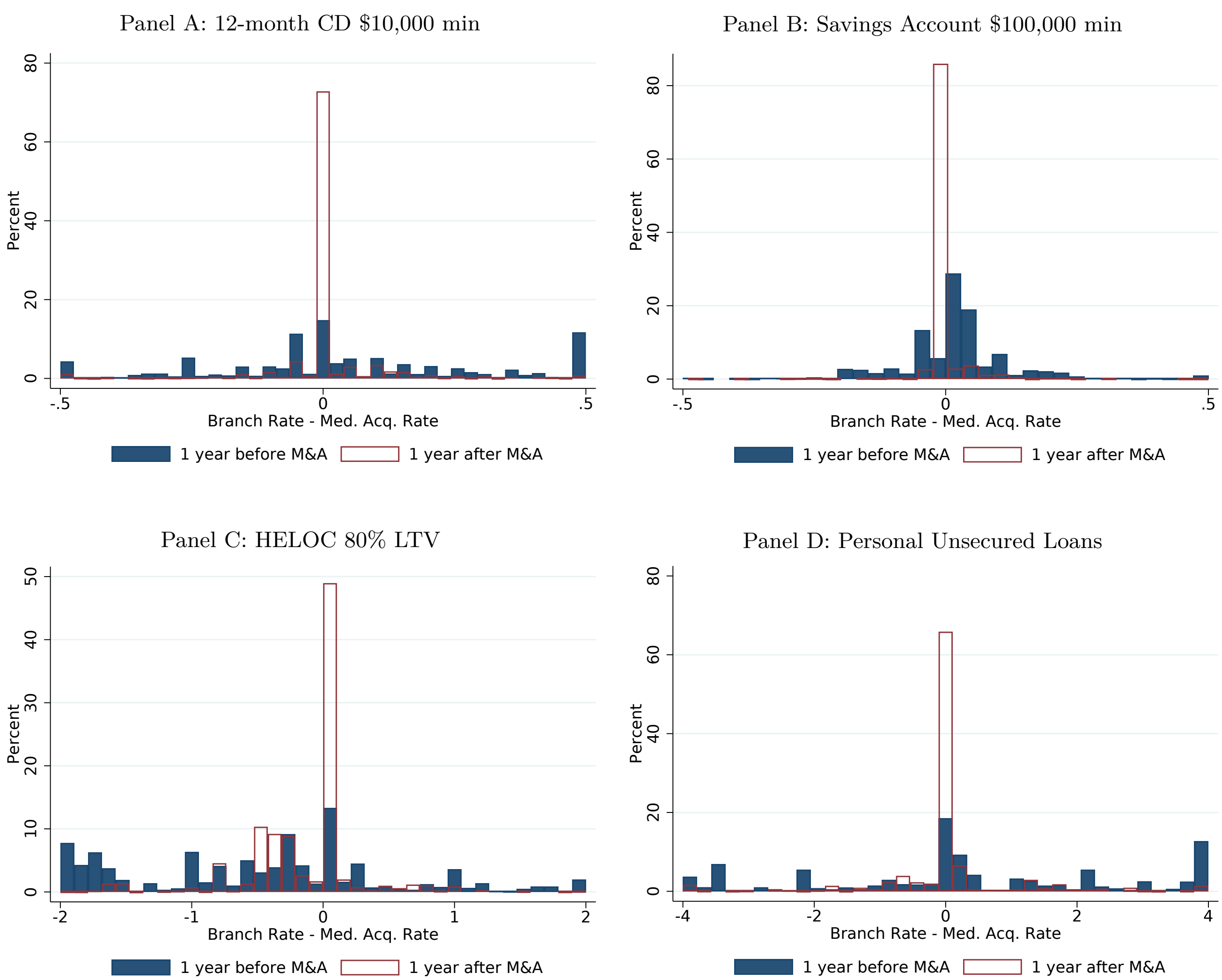
Another concern with the empirical analysis presented in the main document is that branches of the same bank in the same market are highly likely to make similar rate decisions, so that their observations are not really unique and residuals will not be independent. In the main document we deal with this empirical challenge by clustering standard errors at the level of the merger such that the acquired branches in a merger are not treated as independent. Here, we take this analysis one step further by conducting the analysis and acquired bank-market and at the acquired bank level. Specifically in Tables D.2 and D.3, we collapse the observations to the acquired bank-market and the acquired bank level and we compute the main dependent variable as the difference between the median rate of the acquired bank or the acquired bank in a market and the median rate of the acquirer. The results reported in these Tables show similar rates of convergence for the deposit products. For the loan products, however, we do not find statistically significant convergence in rates when using this procedure.

We also examine if the rate convergence results are robust to using interest rates on other deposit and loan products or non-interest deposit and loan fees as outcome variables. In Figure D.3 and Table D.4, we repeat the analysis of Figure 6 and examine if the acquiree and acquirer rates of 24-month CDs (Panel A), 12-month CDs with a \$100,000 minimum amount (Panel B), money market accounts with a minimum deposit of \$25,000 (Panel C), and new auto loans rates (Panel D) also converge following a merger. The results suggest that the post-merger convergence between the rates of target and acquirer branches occurs across a broad array of deposit and loan products.

Finally, in Figure D.4, we further show that the deposit and loan fees of target and acquirer branches also converge following the consummation of the merger event and in Table D.5, we show that this convergence is statistical significant even after controlling for branch and state-by-month fixed effects. Overall, these results suggest that the uniform pricing results are robust to using other approaches to measuring uniform pricing, different period of analysis and a broad set of banking products.

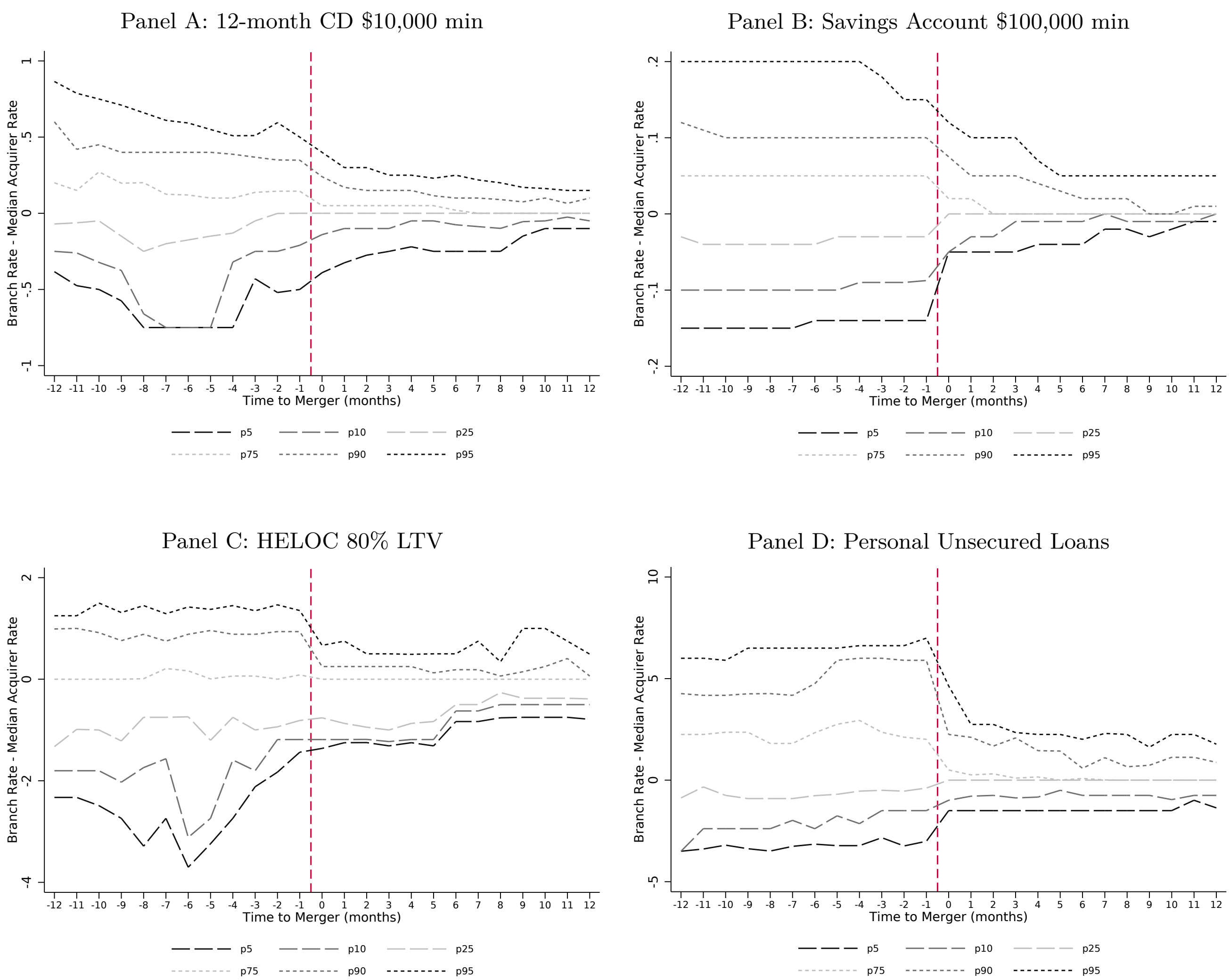
## Figure D.1: Distribution of differences between Acquired Branch Rate and Median Rate of Acquirer

Figure D.1 plots the histogram of the differences in the rates set by an acquired branch and the respective median acquirer rate one year before the merger and one year after the merger. The difference is defined as (Branch Rate - Med. Acq. Rate). We report the percent rate differences for the 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). Data is from RateWatch.



## Figure D.2: Difference between Branch Rate and Median Rate of Acquirer in Event Time

Figure D.2 plots the distribution of the differences in the rates set by an acquired branch and the respective acquirer's median rate around the merger. The difference is defined as (Branch Rate - Med. Acq. Rate). The lines represent the 5th, 10th, 25th, 75th, 90th, and 95th percentile of the distribution of this difference over event time. We report the percent rate differences for the 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). Data is from RateWatch.



## Figure D.3: Relative Percent Difference between Branch Rates and Median Rate of Acquirer in Event Time

Figure D.3 plots the distribution of the percent differences in the rates practiced by a target branch and the respective median acquirer rate around the merger. The percent difference is defined as $\frac{\text{Branch Rate - Med. Acq. Rate}}{\text{Med. Acq. Rate}}$. The lines represent the 5th, 10th, 25th, 75th, 90th, and 95th percentile of the distribution of this difference over event time. We report the percent rate differences for the the 24-month certificate of deposit (CD) rate with a minimum account size of \$10,000 (Panel A), the 12-month CD rate with a minimum account size of \$100,000 (Panel B), Money Market account (MM) rate with a minimum account size of \$25,000 (Panel C) and New Auto Loan rate for 100% Finance (Panel D). Data is from RateWatch.

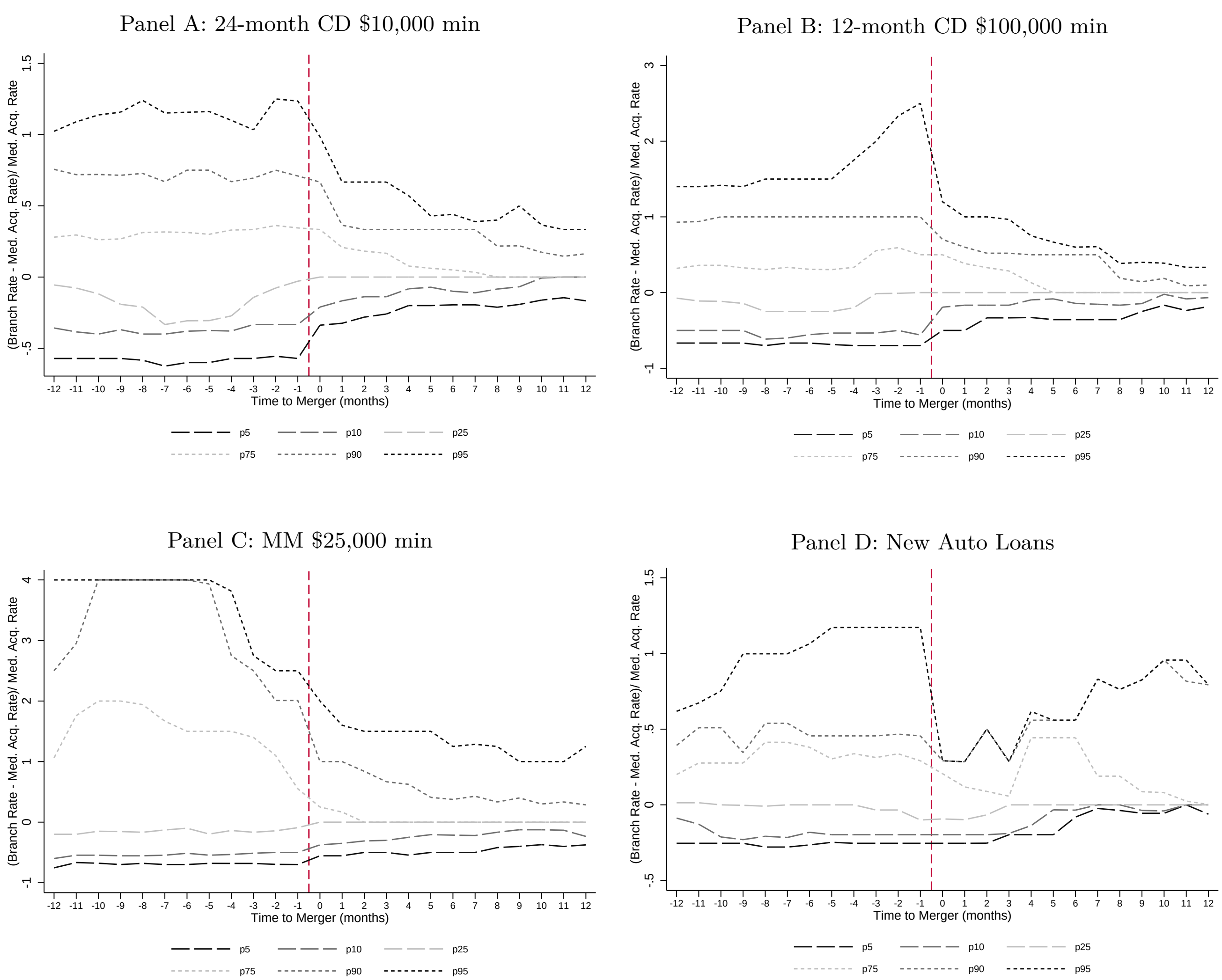


Figure D.4: Relative Percent Difference between Branch Fees and Median Fees of Acquirer in Event Time

Figure D.4 plots the distribution of the percent differences in the fees practiced by a target branch and the respective median acquirer fee around the merger. The percent difference is defined as $\frac{\text{Branch Fee - Med. Acq. Fee}}{\text{Med. Acq. Fee}}$. The lines represent the 5th, 10th, 25th, 75th, 90th, and 95th percentile of the distribution of this difference over event time. We report the percent fee differences for the monthly fee on interest checking accounts (Panel A), fee on payment stops (Panel B), ATM Out of Network Transaction Fee (Panel C) and overdraft fee on returned deposit items (Panel D). Data is from RateWatch.

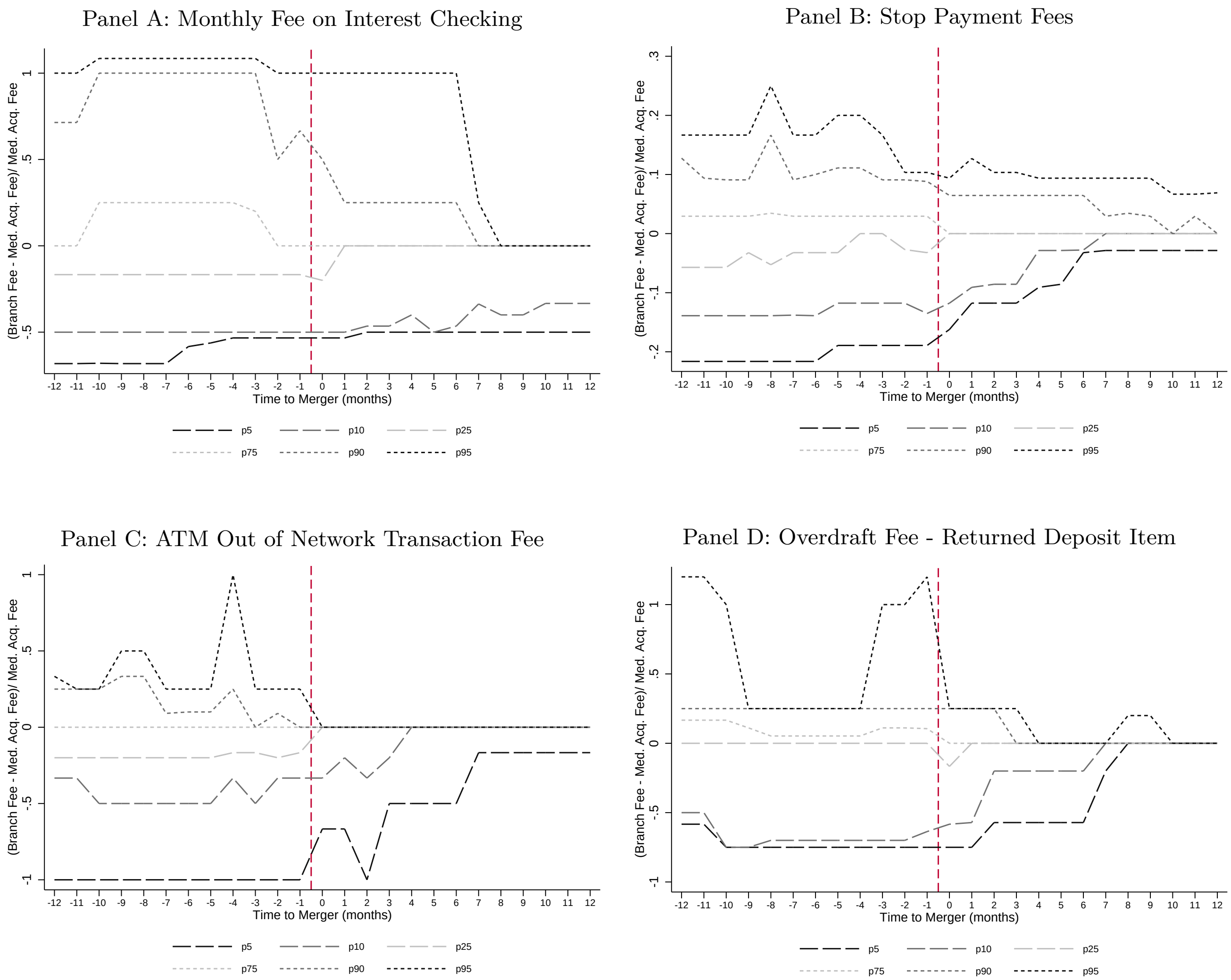


Table D.1: Effects of M&A on Rate Convergence between Acquired Branch and Median Acquirer Rate: Heterogeneity across Size, Branch Network Overlap and Dispersion of Acquirer Deposit Rate

Table D.1 reports the coefficients of OLS regressions investigating the effect of a merger on the difference between the rates of the acquired branch and the median rate of the acquirer for the 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). We stratify the sample based on the strength of the uniform pricing practices of the acquirer as measured by standard deviation of the 12MCD10K deposit rates across the acquirer's branch network twelve months before the merger (Panel A), based on whether the total assets of the acquirer bank exceed the total assets of the acquired banks prior to the merger (Panel B), and based on whether the branch networks of the merged entities overlap in the banking market where the acquired branch is located (Panel C). The dependent variable, |Branch Rate - Acq. Med. Rate|, is the absolute difference between the rate of the acquired branch and the median rate of the acquirer. The main variable of interest, *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event. All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A: Partitioning Based on the Dispersion of Acquirer Deposit Rates

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| **Dep. Variable:** \|Branch Rate - Acq. Med. Rate\| | 12MCD10K | | SAV100K | | HELOC | | Personal | |
| | Below Med | Above Med | Below Med | Above Med | Below Med | Above Med | Below Med | Above Med |
| Post-Acquisition | -0.128*** | -0.075*** | -0.036*** | -0.028*** | -0.414*** | -0.242** | -1.987*** | 0.064 |
| | (0.009) | (0.029) | (0.004) | (0.007) | (0.063) | (0.114) | (0.256) | (0.363) |
| Observations | 107349 | 112240 | 35322 | 20927 | 91279 | 90510 | 67697 | 67788 |
| Adjusted $R^2$ | 0.698 | 0.872 | 0.703 | 0.861 | 0.814 | 0.967 | 0.856 | 0.912 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table D.1: Effects of M&A on Rate Convergence between Acquired Branch and Median Acquirer Rate: Heterogeneity across Size, Branch Network Overlap and Dispersion of Acquirer Deposit Rate **(cont'd)**

Panel B: Partitioning Based on Acquirer Size

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| **Dep. Variable:** \|Branch Rate - Acq. Med. Rate\| | 12MCD10K | | SAV100K | | HELOC | | Personal | |
| | Larger Acq. | Smaller Acq. | Larger Acq. | Smaller Acq. | Larger Acq. | Smaller Acq. | Larger Acq. | Smaller Acq. |
| Post-Acquisition | -0.128*** | -0.117*** | -0.034*** | -0.052*** | -0.301*** | -0.506*** | -1.186*** | -1.829*** |
| | (0.012) | (0.018) | (0.004) | (0.008) | (0.052) | (0.157) | (0.173) | (0.590) |
| Observations | 135163 | 43261 | 47005 | 15490 | 94612 | 85233 | 99408 | 33878 |
| Adjusted $R^2$ | 0.708 | 0.943 | 0.730 | 0.837 | 0.830 | 0.965 | 0.872 | 0.843 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Panel C: Partitioning Based on Banking Market Overlap

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| **Dep. Variable:** \|Branch Rate - Acq. Med. Rate\| | 12MCD10K | | SAV100K | | HELOC | | Personal | |
| | Overlap | No Overlap | Overlap | No Overlap | Overlap | No Overlap | Overlap | No Overlap |
| Post-Acquisition | -0.147*** | -0.086*** | -0.040*** | -0.029*** | -0.513*** | -0.224*** | -1.725*** | -0.915*** |
| | (0.010) | (0.011) | (0.004) | (0.004) | (0.059) | (0.062) | (0.223) | (0.207) |
| Observations | 76943 | 159735 | 26776 | 35958 | 69133 | 121976 | 51068 | 94628 |
| Adjusted $R^2$ | 0.651 | 0.863 | 0.713 | 0.769 | 0.885 | 0.895 | 0.867 | 0.847 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table D.2: Effects of M&A on Absolute Difference between Median Rate of Acquired Branches in a Banking Market and Median Acquirer Rate (Pre-Post Analysis)

Table D.2 reports the coefficients of OLS regressions investigating the effect of a merger on the difference between the median rates of the acquired bank in a given banking market and the median rate of the acquirer for the 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). The dependent variable in columns (1) to (4), |Median Acq. Branch Rate - Acquirer Median Rate|, is the absolute difference between the median rate of the acquired bank in a banking market and the median rate of the acquirer. The dependent variable in columns (5) to (8), $\left|\frac{\text{Median Acq. Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right|$, is the absolute percent difference between the median rate of the acquired bank and the median rate of the acquirer. The main variable of interest, *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event. All specifications include state-by-month and bank-market fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | \|Median Acq. Branch Rate - Acquirer Median Rate\| | | | | $\left\|\frac{\text{Median Acq. Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\|$ | | | |
| | 12MCD10K | SAV100K | HELOC | Personal | 12MCD10K | SAV100K | HELOC | Personal |
| Post-Acquisition | -0.129*** | -0.016* | -0.028 | 0.018 | -0.288*** | -0.410** | 0.002 | 0.002 |
| | (0.007) | (0.009) | (0.032) | (0.068) | (0.021) | (0.184) | (0.003) | (0.002) |
| Observations | 90043 | 31026 | 32850 | 30789 | 90043 | 31026 | 32845 | 30682 |
| Adjusted $R^2$ | 0.647 | 0.751 | 0.908 | 0.929 | 0.538 | 0.786 | 0.966 | 0.966 |
| Month FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Bank-Market FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table D.3: Effects of M&A on Absolute Difference between Median Rate of Acquired Branches and Median Acquirer Rate (Pre-Post Analysis)

Table D.3 reports the coefficients of OLS regressions investigating the effect of a merger on the difference between the median rates of the acquired bank and the median rate of the acquirer for the 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). The dependent variable in columns (1) to (4), |Median Acq. Branch Rate - Acquirer Median Rate|, is the absolute difference between the median rate of the acquired bank and the median rate of the acquirer. The dependent variable in columns (5) to (8), $\left|\frac{\text{Median Acq. Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right|$, is the absolute percent difference between the median rate of the acquired bank and the median rate of the acquirer. The main variable of interest, *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event. All specifications include state-by-month and bank fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | \|Median Acq. Branch Rate - Acquirer Median Rate\| | | | | $\left\|\frac{\text{Median Acq. Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\|$ | | | |
| | 12MCD10K | SAV100K | HELOC | Personal | 12MCD10K | SAV100K | HELOC | Personal |
| Post-Acquisition | -0.192*** | -0.025*** | 0.009 | -0.081 | -0.400*** | -0.788*** | 0.006* | 0.001 |
| | (0.007) | (0.008) | (0.027) | (0.059) | (0.021) | (0.175) | (0.003) | (0.002) |
| Observations | 54375 | 20575 | 13208 | 12038 | 54375 | 20575 | 13187 | 11973 |
| Adjusted $R^2$ | 0.582 | 0.685 | 0.737 | 0.817 | 0.438 | 0.685 | 0.916 | 0.928 |
| Month FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Bank FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

## Table D.4: Effects of M&A on Absolute Difference between Branch rates and Median Acquirer Rate: Other Deposit and Lending Products

Table D.4 reports the coefficients of OLS regressions investigating the effect of a merger on the absolute difference between the rate of the acquired branch and the median rate of the acquirer for the following deposit and loan products: 24-month certificate of deposit (CD) rate with a minimum account size of $10,000 (24MCD10K), 12-month CD rate with a minimum account size of $100,000 (12MCD100K), Money Market account rate with a minimum account size of $25,000 (MM25K) and New Auto Loans 100% Finance (Auto). The dependent variable in columns (1) to (4), |Branch Rate - Acquirer Median Rate|, is the absolute difference between the rate of the acquired branch and the median rate of the acquirer. The dependent variable in columns (5) to (8), $\left|\frac{\text{|Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right|$, is the absolute difference between the rate of the acquired branch and the median rate of the acquirer divided by median rate of the acquirer. The main variable of interest, *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event. All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | \|Branch Rate- Acq. Med. Rate\| | | | | $\left\|\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\|$ | | | |
| | 24MCD10K | 12MCD100K | MM25K | Auto | 24MCD10K | 12MCD100K | MM25K | Auto |
| Post-Acquisition | -0.136*** | -0.095*** | -0.077*** | -0.670*** | -0.226*** | -0.367*** | -0.434*** | -0.184*** |
| | (0.010) | (0.009) | (0.010) | (0.125) | (0.022) | (0.042) | (0.040) | (0.032) |
| Observations | 239259 | 181237 | 222853 | 138492 | 239259 | 181237 | 222853 | 138492 |
| Adjusted $R^2$ | 0.761 | 0.751 | 0.829 | 0.897 | 0.645 | 0.652 | 0.740 | 0.890 |
| State × Month Fixed-Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed-Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

## Table D.5: Effects of M&A on Absolute Difference between Branch Fees and Median Acquirer Fees

Table D.5 reports the coefficients of OLS regressions investigating the effect of a merger on the difference between the fees of the target branch and the median fee of the acquirer for the monthly fee on interest checking accounts (Panel A), fee on payment stops (Panel B), ATM Out of Network Transaction Fee (Panel C) and overdraft fee on returned deposit items (Panel D). The dependent variable in columns (1) to (4), |Branch Fee - Acquirer Median Fee|, is the absolute difference between the fee of the target branch and the median fee of the acquirer. The dependent variable in columns (5) to (8), $\left|\frac{\text{|Branch Fee - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right|$, is the absolute difference between the fee of the target branch and the median fee of the acquirer divided by median fee of the acquirer. The main variable of interest, *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event. All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | \|Branch Fee - Acquirer Median Fee\| | | | | $\left\|\frac{\text{Branch Fee - Acq. Med. Fee}}{\text{Acq. Med. Fee}}\right\|$ | | | |
| | Int. Check | Stop Pay | ATM | Overdraft | Int. Check | Stop Pay | ATM | Overdraft |
| Post-Acquisition | -1.356*** | -0.763*** | -0.181*** | -0.342 | -0.141*** | -0.021*** | -0.107*** | -0.041 |
| | (0.489) | (0.254) | (0.043) | (0.314) | (0.052) | (0.007) | (0.031) | (0.030) |
| Observations | 66547 | 66912 | 64324 | 44316 | 66443 | 66802 | 63328 | 43803 |
| Adjusted $R^2$ | 0.962 | 0.895 | 0.867 | 0.932 | 0.900 | 0.880 | 0.877 | 0.946 |
| State × Month FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

# E Differences-in-Differences Analysis

A potential concern with the pre-post event design of the previous section is that it relies only on variation in the timing of mergers across acquired branches. Borusyak, Jaravel and Spiess (2021), De Chaisemartin and D'haultfoeuille (2020), Goodman-Bacon (2021) and Sun and Abraham (2021) show that the estimated coefficients obtained from such regressions might not recover the average treatment effects if there is treatment effect heterogeneity and staggered treatment adoption. Moreover, it is also possible that some acquired branches were practicing rates that were temporarily higher or lower than optimal; in such a case rates would revert to the mean even in the absence of a merger.

To address these concerns, we create a matched control group of branches. For each acquired branch, we select the set of branches that were *not* subject to a merger, were located in the same state as the acquired branch, and practiced the most-similar rates to those of the acquired branch in the twelve months prior to the merger. By including this matched control group of branches that took no part in any merger during the sample period, we limit concerns about the possibility that the main results of the previous section reflect biases associated with the two-way fixed-effect differences-in-differences estimator.[31] Moreover, if the results were a pure artifact of reversion to the mean, we would also expect to see significant convergence in the deposit and loan rates of the sample of matched control branches.

Figure E.1 suggests that the distribution of the percent differences between the rates of the matched control branches and the median rate of the respective acquirer remains stable over the 24-month window around a merger event. If anything, the percent differences diverge slightly after the respective acquired branch finishes its merger.

We estimate the following differences-in-differences specification using OLS:

$$Y_{i,s,t} = \gamma_{s,t} + \theta_i + \beta_0 \textit{Post-Acquisition}_s + \beta_1 \textit{Post-Acquisition}_s \times \textit{Acquired Branch}_i + \epsilon_{i,s,t} \tag{9}$$

where *Acquired Branch*$_i$ takes the value of one if the branch was acquired in a merger and zero if the branch is in the matched control group. The dependent variables are defined as those in (1) except that in the case of a matched control branch, the dependent variable is the absolute percent difference between the rate of the matched control branch and the median rate of the acquirer of the matched acquiree. All other variables are defined as in equation (1). In this empirical specification, the main coefficient of interest is $\beta_1$,

[31] We exclude branches belonging to the treated bank and branches that at some point in time were acquired. When many potential control branches have the same difference in interest rate relative to the acquired branch, we randomly select 5 branches to serve as matched controls. The control group has 10,083 branches from 2,249 different banks.

which measures the decrease in the absolute rate difference variable relative to a control group of matched branches that practiced similar pre-merger deposit rates but that was not acquired in a bank merger.

We present the results of this analysis in Table E.1, and they support the idea that the rate convergence following bank merger is driven by uniform pricing practices. Columns (1) through (8) indicate even stronger deposit- and loan-rate convergence in the differences-in-differences analysis, relative to the empirical specifications of the previous sections. Columns (1) through (4) indicate a decrease in the absolute difference between CD, savings deposit, HELOC and personal unsecured loan rates of the acquired branches relative to the control group by 14 bps, 4 bps, 49 and 154 bps, respectively. Columns (5) and (8) repeat the empirical specification using the absolute percent rate difference as the dependent variable and indicate that an M&A changes percent rate differences by 45%, 70%, 11%, and 17% for CDs, savings deposits, HELOCs and personal unsecured loans, respectively.

If rate convergence is driven by uniform pricing practices, we would expect to see the rates converge mostly around the time of the completion of the merger, rather than well before or after the merger. To find out whether or not this is the case, we extend the model of equation (9) to examine the dynamics of rate convergence before and after a bank merger. Accordingly, we estimate the following specification using OLS:

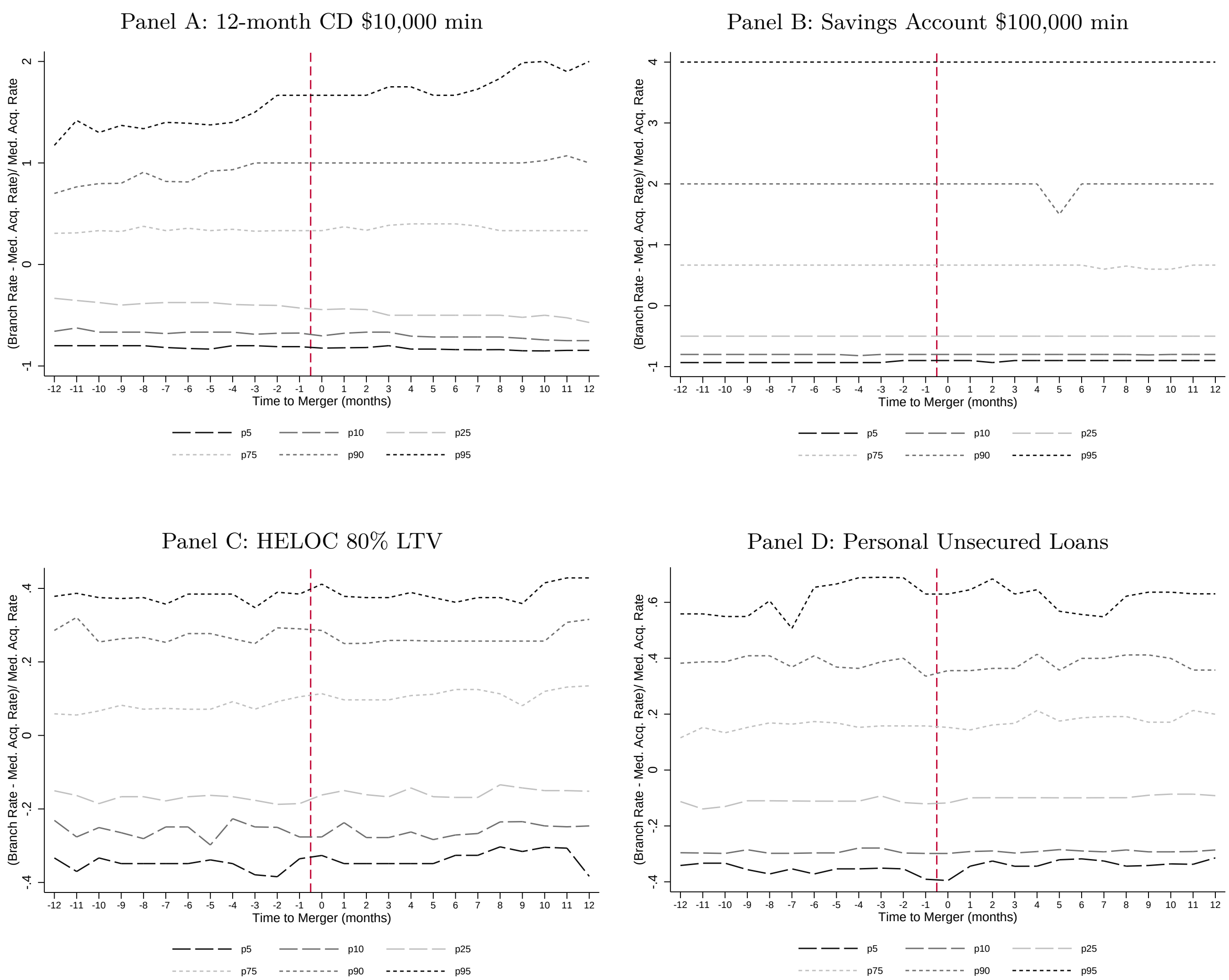
$$Y_{i,t,s} = \gamma_{s,t} + \theta_i + \sum_{s=-12}^{s=12} \beta_s Acquired\ Branch_i \times \delta_s + \epsilon_{i,t,s} \tag{10}$$

where $\delta_s$ is an indicator variable that equals one $s$ months before or after the merger event. All other variables are defined as in the previous equations.

Figure E.2 plots the series of coefficients, $\beta_s$, and respective standard errors from estimating equation (10) using OLS. The plots suggest that the merger affects both deposit and loan rates most in the months immediately after the deal closes. We see that, across all deposit and loan products in the analysis, at least 50% of the first twelve months' convergence occurs in the initial two months. The impact of the merger on rate convergence continues to increase at a lower rate after the first few months. This pattern suggests either that some acquired branches take more time than others to adjust their deposit and loan rates or that the adjustment in deposit and loan rates is gradual over time for a large fraction of acquired branches. More importantly, we do not see a significant trend before the merger event, which suggests that the results are not an artifact of mean reversion or other statistical anomalies or confounds.

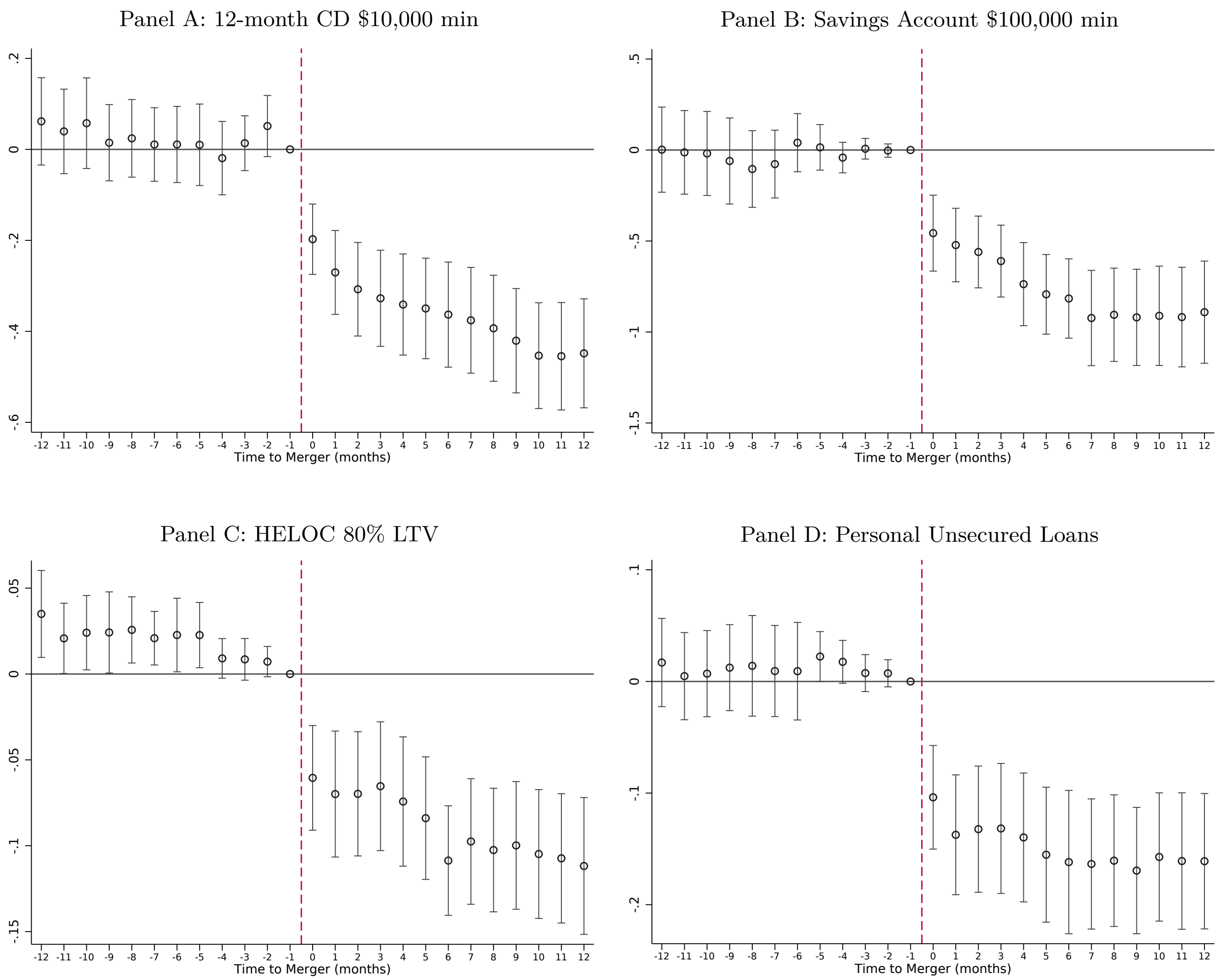
Figure E.1: Relative Percent Difference between Matched Control Branch Rate and Median Acquirer Rate in Event Time

Figure E.1 plots the distribution of the percent differences in the rates set by matched control branches and the respective acquirer's median rate around the merger. The matched sample of control branches is obtained by selecting a set of branches in the same state with the closest rates to that of an acquired branch 12 months before the merger. The percent difference is defined as $\frac{\text{Branch Rate - Med. Acq. Rate}}{\text{Med. Acq. Rate}}$. The lines represent the 5th, 10th, 25th, 75th, 90th, and 95th percentile of the distribution of this difference over event time. We report the percent rate differences for the 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). Data is from RateWatch.



## Figure E.2: Treatment Effects over Event Time

Figure E.2 plots the estimated impact of the merger event on the percent absolute difference between the acquired branch rates and respective median rate of the acquirer. We consider the 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). Shallow circles represent the series of coefficients $\beta_s$ from estimating an OLS regression of this percent absolute rate difference on a set of dummy variables representing twelve leads and lags of a dummy variable that takes the value of one twelve months after the merger and zero twelve months before. Specifically, we implement the specification of equation (10), where $Y_{ist}$ represents the absolute percent difference between the rate of acquired branch $i$ and the median rate of the acquirer, $\left|\frac{BranchRate - AcquirerMedianRate}{AcquirerMedianRate}\right|$. The vertical bands represent 95% confidence intervals for the point estimates in each quarter. Data is from RateWatch.



# Table E.1: Effects of Merger on Absolute Difference between Branch Rate and Median Acquirer Rate (Differences-in-Differences Analysis)

Table E.1 reports the coefficients of differences-in-differences regressions investigating the effect of a merger on the difference between the rate of the acquired branch and the median rate of the acquirer 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). Each of these samples employed in this analysis include acquired branches (treated observations) and a matched control sample of branches located in the same state as the respective treated acquired branches and with the closest rates to that of an acquired branch twelve months prior to the merger. The dependent variable in columns (1) to (4), |Branch Rate - Acquirer Median Rate|, is the absolute difference between the rate of the acquired branch and the median rate of the acquirer. The dependent variable in columns (5) and (8), $\left|\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right|$, is the absolute difference between the rate of the acquired branch and the median rate of the acquirer divided by median rate of the acquirer. The main variable of interest, *Acquired-Branch* × *Post-Acquisition*, is a dummy variable that takes the value of one in the twelve months following the merger event for the acquired branches. All specifications include state-by-month and branch fixed effects. Standard errors are presented in parentheses, and are clustered at the level of the merger. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | \|Branch Rate - Acquirer Median Rate\| | | | | $\left\|\frac{\text{Branch Rate - Acq. Med. Rate}}{\text{Acq. Med. Rate}}\right\|$ | | | |
| | 12MCD10K | SAV100K | HELOC | Personal | 12MCD10K | SAV100K | HELOC | Personal |
| Post-Acquisition | 0.028*** | 0.003* | 0.030 | 0.158 | 0.067* | 0.027 | 0.004 | 0.020 |
| | (0.006) | (0.001) | (0.045) | (0.128) | (0.037) | (0.039) | (0.010) | (0.015) |
| Acquired-Branch × Post-Acquisition | -0.144*** | -0.044*** | -0.485*** | -1.545*** | -0.451*** | -0.704*** | -0.108*** | -0.170*** |
| | (0.011) | (0.004) | (0.064) | (0.183) | (0.040) | (0.075) | (0.015) | (0.022) |
| Observations | 498459 | 195766 | 295977 | 208222 | 498459 | 195766 | 295953 | 207771 |
| Adjusted $R^2$ | 0.739 | 0.838 | 0.824 | 0.802 | 0.619 | 0.862 | 0.809 | 0.793 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

# F Supplemental Analysis

In this section, we conduct a battery of supplemental empirical tests that complement some of our main analyses.

An important assumption of our empirical and theoretical work is that the demand for deposits is local even though large multi-market banks price uniformly across markets. This assumption is supported by the work of Abrams (2019) and Honka, Hortaçsu and Vitorino (2017) who find that depositors' consideration sets include only banks located within a few miles of their home. To further probe this assumption, we collected data from the 2019 Survey of Consumer Finances (SCF) on the distance between the household address of each survey respondent and the closest branch location of their retail banks. Figure F.1 is a histogram with the distribution of this distance between the household address of SCF survey respondents and closest branches of respective banks. The histogram suggests that more than 75% of households are located within 5 miles of a branch of their bank in 2019 and more than 90% of households have a branch of their bank within 20 miles of their home address. The histogram suggests that less than 5% of households bank with a financial institution whose closest physical location in more than 100 miles away from their household. These result suggests that despite the growing importance of internet banking, the market for deposits is still mostly local in nature.

In Figure F.2, we examine the correlation between the predicted increase in local market concentration and the pre-merger rate difference between acquirer and acquired branches. A positive association between the predicted change in local Herfindahl-Hirschman Index (HHI) and the pre-merger rate difference could emerge if acquirers search for acquired branches with abnormally high deposit rates in areas where they acquire significant market share. In this case, it might be hard to discriminate between the effect of gains in local market share and uniform pricing as they would be positively correlated. In Figure F.2, we present a scatterplot of the predicted increase in the local banking market concentration induced by bank mergers and the respective pre-merger rate differences. The figure indicates no strong sorting pattern. Changes in the HHI seem independent of pre-merger rate differences.

Another possible explanation for our main empirical results is that, following a merger, bank clients perceive that the quality of the acquired branches converges to the quality of the acquirer and that this convergence in qualities, rather than the uniform pricing practices, drives the deposit rates of the acquirer and target branches closer together. In the paper, we develop a structural model of the deposit market to better discern if the observed data is consistent with quality convergence alone or if uniform pricing also plays a role in driving convergence in deposit and loan rates. Here, we implement some reduced-form empirical tests to further examine whether uniform pricing matters for the convergence in deposit and loan rates following a merger.

We start by levering the idea that branch quality likely does not change substantially at the acquirer's pre-merger network of branches following the merger. Nevertheless, in the uniform pricing model, equation (8) implies that we should observe changes in interest rates at the "old" branches of the acquirer in the direction of the rates that the target was practicing prior to the merger.

We implement a regression framework similar to the one in column (5) of Table 7 to examine whether interest rates at the acquirer's pre-merger branches increased when the acquired bank's rates were higher, and decreased when the acquired bank's rates were lower. In particular, we partition the acquirer's pre-merger branches into five bins based on the difference between their rates and those of the acquired branches. The bottom quintile represents acquirer branches with the lowest pre-merger rates relative to their acquired banks, while the top quintile includes acquirer branches with the highest rates relative to their acquired banks.

We present the results in Table F.1. The results in columns (1)–(4) show that following the merger, rates at "old" acquirer branches tend to increase if they are in the bottom quintile and decrease if they are in the upper quintile of the pre-merger rate distribution. For example, column (1) shows that 12-month CD rates increase by 6 basis points for acquirer branches in the bottom quintile of rate differences and decrease by 6 basis points for those in the top quintile. Hence, consistent with uniform pricing, rates at old acquirer branch are moving in the direction of the rates that were practiced by the target bank prior to the merger. We note that these effects are much smaller than those in column (5) of Table 7, consistent with most of the adjustment occurring through the adjustment of rates at the acquired branches.

We repeat the above empirical tests restricting our attention to acquirer branches that do not overlap geographically with the branches of the respective target. The branch quality of this group of branches is even less likely to change because their local branch network is not expanded by the acquisition of new branches and because local market power is unchanged for these branches. In columns (5)–(8), we show that the results are similar for this group of acquirer branches that do not geographically overlap with the branches of the target, thus further suggesting that uniform pricing practices are driving the empirical results.

To further assess whether rate convergence is driven by uniform pricing or quality convergence, we test whether post-merger rates at acquired branches align more closely with a weighted average of pre-merger rates across all branches, as formally expressed in equation 8 of the uniform pricing model. Alternatively, if the rate adjustment reflects quality convergence at the acquired branches, we could expect the converged rate to be closer to the average pre-merger rate of the acquirer's branch network.

Our measure of the distance between the converged branch rate and the weighted-average pre-merger rate among all branches (acquired and acquirer) is the absolute difference between the rate at the acquired branch twelve months after the merger and the weighted-average pre-merger rate among all branches, divided by the weighted-average pre-merger rate among all branches of the bank. Similarly, our measure of the distance to the pre-merger rates of the acquirer is the absolute difference between the rate at the acquired branch twelve months after the merger and the acquirer's average pre-merger rate, divided by the acquirer's average pre-merger rate.

We present the results in Table F.2. The results indicate that twelve months after the merger, the converged branch rate is closer, on average, to the pre-merger weighted average of the acquirer branch and the target than to the pre-merger average of the "old" acquirer branches. These results are suggestive that convergence in branch quality alone is not able to rationalize the observed interest rates dynamics after a merger, and that uniform pricing forces, consistent with equation (8), may play an important role.

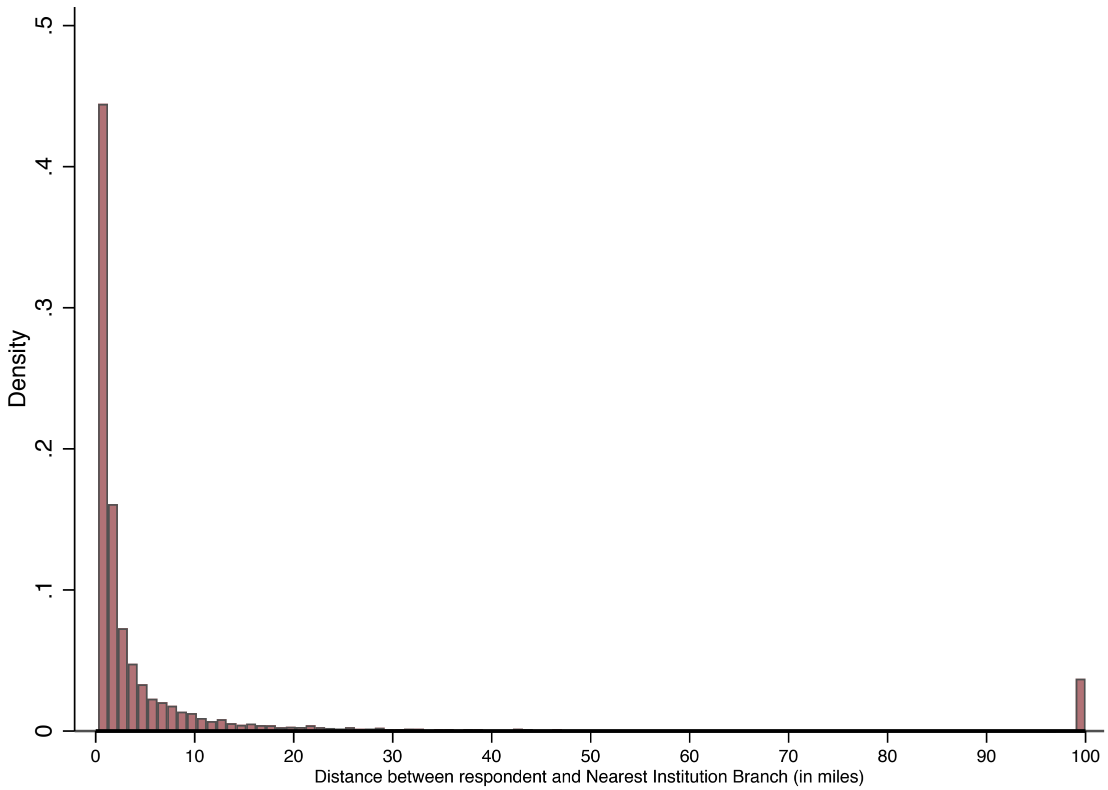
After estimating the demand model in equation (5) of the paper, we obtain a set of bank fixed effects that capture a measure of average quality at the bank level. We then repeat the exercise of Table 5 after further partitioning the sample between the mergers in which the acquirer has better or worse quality than the target (as measured by their respective bank fixed effects). If the results are driven by acquired branches taking the bank quality characteristics of the acquirer, then we would expect that deposit rates at the acquired branches would fall when the acquirer has better bank quality than the target and, conversely, that deposit rates at the acquired branches would rise when the acquirer has lower bank quality than the target.

The results that we report in Tables F.3–F.6 do not support the idea that the convergence in rates could be driven by convergence in the bank quality characteristics of the acquired branches. For instance, the results in Table F.3 show that when the pre-merger rate differences are positive, the convergence in deposit rates is explained by decreases in the deposit rates of the acquired branches both when the target has better bank quality than the acquirer (Panel A) and when the acquirer has better bank quality than the target (Panel B). If the results were explained by changes in the bank quality characteristics of the acquired branches, we would instead expect that the deposit rates of the acquired branches would rise when they are acquired by banks whose perceived quality is lower than that of the target. Similarly, we also see that deposit rates of acquired branches adjust upward when pre-merger rate differences are negative regardless of the differences in bank quality characteristics between the acquirer and acquired branches. The other tables examine other deposit and loan products and show similar patterns.

In Tables F.7 and F.8, we investigate if our results persist over a longer post-merger horizon. It is possible that acquirers are reluctant to take advantage of their incremental market power immediately after acquiring a new bank and, therefore, wait more than a year to start taking advantage of their increase in market power to set lower deposit rates and higher loan rates. On the other hand, it is possible that certain cost efficiencies that might be passed on to customers take time to realize (e.g., Focarelli and Panetta, 2003) and that over time, the impact of the pre-merger rate differences will wane. The results of Tables F.7 and F.8 indicate that even two and three years after the merger, the pre-merger rate differences explain much more of the variation in the rates of target branches than changes in local market concentration at the time of the merger.

Figure F.1: Distance between Household Address and nearest branch of its bank

Figure F.1 provides a histogram of the distance between the home address of a household and the nearest branch of a bank with which the household holds a deposit account. Data is from 2019 Survey of Consumer Finances.



## Figure F.2: Sorting of Pre-merger Differences in Rates and Local Market Concentration

Figure F.2 gives a scatterplot (blue dots) and a linear fit (red line) representing the relation between the pre-merger difference between the rate of the acquired branch and the median rate of the acquirer on the x-axis and the potential change in the local banking market Herfindahl-Hirschmann Index (in logs) on the y-axis. We consider the pre-merger rate differences for the 12-month certificate of deposit rate with a minimum account size of $10,000 (12MCD10K), savings deposits account rate with a minimum size of $100,000 (SAV100K), HELOC rate with a LTV up to 80% (HELOC) and personal unsecured loans rate (Personal). The potential change in the local banking market's Herfindahl-Hirschmann Index is the change in the local banking market HHI that would be induced by the merger if the entities were combined and banking market share of deposits of both the acquirer and acquiree banks remained at their pre-merger level in the following year. Data is from the Summary of Deposits (SOD) dataset and RateWatch.

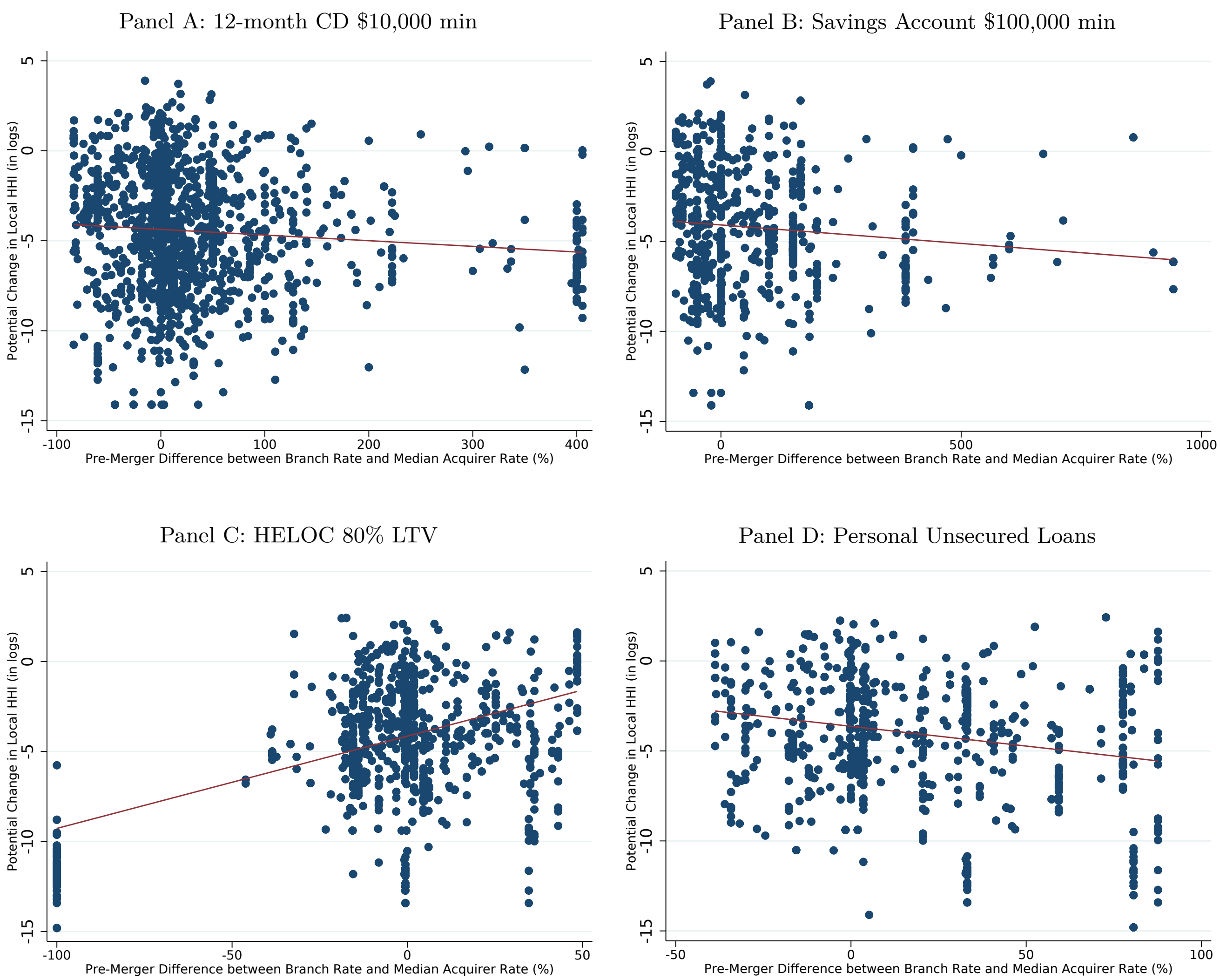


Table F.1: Impact of M&A on interest rates of the existing branches of the acquirer

Table F.1 reports coefficients of OLS regressions investigating the role of rate convergence induced by uniform pricing practices in the evolution of interest rates practiced by the existing branches of the acquirer after a merger. We exclude branch acquisitions as the acquired branches usually represent a small fraction of the acquirer's branch network in these transactions. Columns (1)–(4) include all pre-existing branches of the acquirer and columns (5)–(8) include only pre-existing branches of the acquirer that are located in local markets where the respective target bank does not operate any branch. *Post-Acq.* is a dummy variable that takes the value of one in the twelve months following the merger event and zero otherwise. We define dummy variables, *Pre-Diff. - Qt.*, representing each of the five quintiles of the pre-merger rate difference between the acquirer branches and the median rates of the target, $\frac{Acq.BranchRate-Target.Med.Rate}{Target.Med.Rate}$. We include state-by-month and acquirer branch fixed effects.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | All Markets | | | | NO Overlap Markets | | | |
| | 12MCD10K | SAV100K | HELOC | Personal | 12MCD10K | SAV100K | HELOC | Personal |
| Post-Acq. × Pre-Diff Rate - Qt1 | 0.059** | 0.012** | 0.113 | -0.007 | 0.055* | 0.013*** | 0.211*** | -0.006 |
| | (0.028) | (0.005) | (0.070) | (0.048) | (0.029) | (0.004) | (0.060) | (0.048) |
| Post-Acq. × Pre-Diff Rate - Qt2 | 0.018* | 0.013** | 0.054 | 0.125** | 0.023** | 0.015*** | 0.126** | 0.117** |
| | (0.010) | (0.006) | (0.064) | (0.047) | (0.010) | (0.005) | (0.062) | (0.045) |
| Post-Acq.× Pre-Diff Rate - Qt3 | 0.006 | 0.028*** | -0.095 | -0.417** | 0.006 | 0.029*** | -0.048 | -0.411** |
| | (0.009) | (0.007) | (0.065) | (0.153) | (0.010) | (0.006) | (0.072) | (0.158) |
| Post-Acq.× Pre-Diff Rate - Qt4 | -0.002 | 0.007 | -0.231 | -0.965*** | -0.001 | 0.007 | -0.266 | -0.902*** |
| | (0.013) | (0.007) | (0.245) | (0.263) | (0.013) | (0.009) | (0.171) | (0.281) |
| Post-Acq. × Pre-Diff Rate - Qt5 | -0.058** | -0.014* | 0.019 | -1.661*** | -0.050* | -0.011 | -0.001 | -1.679*** |
| | (0.027) | (0.007) | (0.097) | (0.239) | (0.027) | (0.010) | (0.086) | (0.211) |
| Observations | 765339 | 144521 | 210395 | 219648 | 656156 | 87396 | 189259 | 202081 |
| Adjusted $R^2$ | 0.984 | 0.984 | 0.974 | 0.953 | 0.986 | 0.986 | 0.977 | 0.950 |
| State × Month FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Acquirer Branch FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

## Table F.2: Distance of Converged Branch Rate to pre-merger rates

Table F.2 reports a simple average of the absolute relative difference between the converged branch rates and the average pre-merger rate of the acquirer's pre-existing branches ("B" columns) and a simple average of the absolute relative difference between the converged branch rates and the weighted-average pre-merger rate among all of the acquirer bank's branches (old and new) ("B & T" columns). We measure the converged branch rate as the interest rate set by target branches twelve months after the merger. The pre-merger branch rate of the acquirer bank's branches used in the "B" columns is the average rate of the "old" branches of the acquirer one month prior to the merger. In the "B & T" columns, the pre-merger rate is the weighted average rate of the branches of the acquirer and target one month prior to the merger. We report simple averages of these absolute differences for the full sample of acquired branches and for the subset of deals that involved acquirers and targets with more than 10 branches.

| | $\lvert\frac{TrgtBranchRate_{+12}-PreRate_{-1}}{PreRate_{-1}}\rvert$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 12MCD10K | | SAV100K | | HELOC | | Personal | |
| Pre-merger rate is: | B | B & T | B | B & T | B | B & T | B | B & T |
| All branches | | | | | | | | |
| Average rel. difference in rates | .398 | .25 | .337 | .042 | .131 | .103 | 1.219 | .07 |
| Excluding deals with fewer than 10 branches | | | | | | | | |
| Average rel. difference in rates | .395 | .207 | .3 | .039 | .132 | .102 | .99 | .058 |

Table F.3: Decomposing the Convergence in Deposit Rates: Pre-merger rate differences and Differences in Bank Quality (12-Months Certificate of Deposit)

Table F.3 repeats the empirical specifications of Table 5 after partitioning the sample based on the bank fixed effects obtained from estimating the demand model in the paper. Panel A reports results for the subsample of bank mergers in which the bank fixed effect of the target is lower than that of the acquirer and Panel B reports results for the subsample of bank mergers in which the bank fixed effect of the target is greater than that of the acquirer. All other variables are defined as in Table 5 of the main draft.

| | | | | | | |
|---|---|---|---|---|---|---|
| **Panel A: Bank Quality Target > Bank Quality Acquirer** | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | (Branch - Acq. Med. Rate)$^{Pre} > 0$ | | | (Branch - Acq. Med. Rate)$^{Pre} < 0$ | | |
| **Deposit Product: 12MCD10K** | | | | | | |
| | Branch - Acq. Med. Rate | Branch Rate | Acq. Med. Rate | Branch - Acq. Med. Rate | Branch Rate | Acq. Med. Rate |
| Post-Acquisition | -0.148*** | -0.154*** | -0.005 | 0.147*** | 0.132*** | -0.015 |
| | (0.020) | (0.023) | (0.008) | (0.015) | (0.020) | (0.014) |
| Observations | 65082 | 65082 | 65082 | 42070 | 42070 | 42070 |
| Adjusted $R^2$ | 0.850 | 0.982 | 0.991 | 0.956 | 0.991 | 0.996 |
| **Panel B: Bank Quality Target < Bank Quality Acquirer** | | | | | | |
| **Deposit Product: 12MCD10K** | | | | | | |
| Post-Acquisition | -0.143*** | -0.177*** | -0.034 | 0.115*** | 0.107*** | -0.009 |
| | (0.027) | (0.020) | (0.024) | (0.033) | (0.027) | (0.016) |
| Observations | 21949 | 21949 | 21949 | 12870 | 12870 | 12870 |
| Adjusted $R^2$ | 0.843 | 0.987 | 0.988 | 0.836 | 0.994 | 0.997 |
| State × Month FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch FEs | Yes | Yes | Yes | Yes | Yes | Yes |

## Table F.4: Decomposing the Convergence in Deposit Rates: Pre-merger rate differences and Differences in Bank Quality (Savings Account)

Table F.4 repeats the empirical specifications of Table 5 after partitioning the sample based on the bank fixed effects obtained from estimating the demand model in the paper. Panel A reports results for the subsample of bank mergers in which the bank fixed effect of the target is lower than that of the acquirer and Panel B reports results for the subsample of bank mergers in which the bank fixed effect of the target is greater than that of the acquirer. All other variables are defined as in Table 5 of the main draft.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | (Branch - Acq. Med. Rate)$^{Pre} > 0$ | | | (Branch - Acq. Med. Rate)$^{Pre} < 0$ | | |
| **Panel A: Bank Quality Target > Bank Quality Acquirer** | | | | | | |
| **Deposit Product: SAV100K** | | | | | | |
| | Branch - Acq. Med. Rate | Branch Rate | Acq. Med. Rate | Branch - Acq. Med. Rate | Branch Rate | Acq. Med. Rate |
| Post-Acquisition | -0.024** | -0.023** | 0.001 | 0.030*** | 0.029*** | -0.001 |
| | (0.011) | (0.009) | (0.003) | (0.006) | (0.005) | (0.005) |
| Observations | 17205 | 17205 | 17205 | 14299 | 14299 | 14299 |
| Adjusted $R^2$ | 0.890 | 0.932 | 0.961 | 0.852 | 0.952 | 0.959 |
| **Panel B: Bank Quality Target < Bank Quality Acquirer** | | | | | | |
| **Deposit Product: SAV100K** | | | | | | |
| Post-Acquisition | -0.026** | -0.027** | -0.001 | 0.048*** | 0.031*** | -0.018*** |
| | (0.012) | (0.012) | (0.001) | (0.008) | (0.010) | (0.005) |
| Observations | 6038 | 6038 | 6038 | 6461 | 6461 | 6461 |
| Adjusted $R^2$ | 0.941 | 0.971 | 0.948 | 0.881 | 0.958 | 0.984 |
| State × Month FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch FEs | Yes | Yes | Yes | Yes | Yes | Yes |

Table F.5: Decomposing the Convergence in Loan Rates: Pre-merger rate differences and Differences in Bank Quality (HELOCs)

Table F.5 repeats the empirical specifications of Table 5 after partitioning the sample based on the bank fixed effects obtained from estimating the demand model in the paper. Panel A reports results for the subsample of bank mergers in which the bank fixed effect of the target is lower than that of the acquirer and Panel B reports results for the subsample of bank mergers in which the bank fixed effect of the target is greater than that of the acquirer. All other variables are defined as in Table 5 of the main draft.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| **Panel A: Bank Quality Target > Bank Quality Acquirer** | | | | | | |
| | (Branch - Acq. Med. Rate)$^{Pre} > 0$ | | | (Branch - Acq. Med. Rate)$^{Pre} < 0$ | | |
| **Loan Product: HELOC** | | | | | | |
| | Branch - Acq. Med. Rate | Branch Rate | Acq. Med. Rate | Branch - Acq. Med. Rate | Branch Rate | Acq. Med. Rate |
| Post-Acquisition | -1.034*** | -0.947*** | 0.087*** | 0.198 | 0.139 | -0.059 |
| | (0.092) | (0.090) | (0.021) | (0.131) | (0.090) | (0.057) |
| Observations | 25753 | 25753 | 25753 | 108579 | 108579 | 108579 |
| Adjusted $R^2$ | 0.908 | 0.957 | 0.973 | 0.940 | 0.968 | 0.986 |
| **Panel B: Bank Quality Target < Bank Quality Acquirer** | | | | | | |
| **Loan Product: HELOC** | | | | | | |
| Post-Acquisition | -0.705*** | -0.695*** | 0.010 | 0.390*** | 0.269** | -0.121* |
| | (0.210) | (0.243) | (0.060) | (0.104) | (0.125) | (0.073) |
| Observations | 9695 | 9695 | 9695 | 12810 | 12810 | 12810 |
| Adjusted $R^2$ | 0.966 | 0.995 | 0.988 | 0.946 | 0.993 | 0.993 |
| State × Month FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch FEs | Yes | Yes | Yes | Yes | Yes | Yes |

Table F.6: Decomposing the Convergence in Loan Rates: Pre-merger rate differences and Differences in Bank Quality (Personal Unsecured)

Table F.6 repeats the empirical specifications of Table 5 after partitioning the sample based on the bank fixed effects obtained from estimating the demand model in the paper. Panel A reports results for the subsample of bank mergers in which the bank fixed effect of the target is lower than that of the acquirer and Panel B reports results for the subsample of bank mergers in which the bank fixed effect of the target is greater than that of the acquirer. All other variables are defined as in Table 5 of the main draft.

| | | | | | | |
|---|---|---|---|---|---|---|
| **Panel A: Bank Quality Target > Bank Quality Acquirer** | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | (Branch - Acq. Med. Rate)$^{Pre} > 0$ | | | (Branch - Acq. Med. Rate)$^{Pre} < 0$ | | |
| **Loan Product: Personal** | | | | | | |
| | Branch - Acq. Med. Rate | Branch Rate | Acq. Med. Rate | Branch - Acq. Med. Rate | Branch Rate | Acq. Med. Rate |
| Post-Acquisition | -2.270*** | -2.197*** | 0.073 | 0.598 | 0.558 | -0.039 |
| | (0.393) | (0.469) | (0.168) | (0.430) | (0.342) | (0.162) |
| Observations | 55572 | 55572 | 55572 | 30733 | 30733 | 30733 |
| Adjusted $R^2$ | 0.920 | 0.948 | 0.984 | 0.885 | 0.947 | 0.983 |
| **Panel B: Bank Quality Target < Bank Quality Acquirer** | | | | | | |
| **Loan Product: Personal** | | | | | | |
| Post-Acquisition | -0.916 | -1.200 | -0.284** | 0.086 | 0.924* | 0.838*** |
| | (0.710) | (0.733) | (0.114) | (0.710) | (0.500) | (0.213) |
| Observations | 12268 | 12268 | 12268 | 11053 | 11053 | 11053 |
| Adjusted $R^2$ | 0.967 | 0.983 | 0.981 | 0.964 | 0.988 | 0.991 |
| State × Month FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch FEs | Yes | Yes | Yes | Yes | Yes | Yes |

Table F.7: Market Concentration and Rate Convergence in the Evolution of Deposit Rates 12-25 months after

This Table repeats the results of Table 7 but focuses on a post-merger window of 12 to 25 months.

Panel A: 12MCD10K and SAV100K

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Branch Rate | | | | | | | |
| | 12MCD10K | SAV100K | 12MCD10K | SAV100K | 12MCD10K | SAV100K | 12MCD10K | SAV100K |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI = 0)$ | | | 0.007 | -0.020** | | | 0.117*** | 0.009 |
| | | | (0.021) | (0.008) | | | (0.027) | (0.007) |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \in (0, 200))$ | | | -0.105*** | -0.020** | | | | |
| | | | (0.027) | (0.009) | | | | |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \geq 200)$ | | | -0.152** | 0.001 | | | | |
| | | | (0.067) | (0.032) | | | | |
| Post-Acquisition × Pre-Difference Rate - Qt1 | | | | | 0.203*** | 0.078*** | | |
| | | | | | (0.039) | (0.009) | | |
| Post-Acquisition × Pre-Difference Rate - Qt2 | | | | | 0.121*** | 0.023*** | | |
| | | | | | (0.034) | (0.009) | | |
| Post-Acquisition × Pre-Difference Rate - Qt3 | | | | | 0.008 | -0.018* | | |
| | | | | | (0.030) | (0.011) | | |
| Post-Acquisition × Pre-Difference Rate - Qt4 | | | | | 0.039 | -0.052*** | | |
| | | | | | (0.040) | (0.012) | | |
| Post-Acquisition × Pre-Difference Rate - Qt5 | | | | | -0.299*** | -0.164*** | | |
| | | | | | (0.032) | (0.017) | | |
| Post-Acquisition | | | | | | | -0.105*** | -0.025*** |
| | | | | | | | (0.026) | (0.008) |
| Post-Acquisition × Δ HHI | | | | | | | -0.002 | 0.002** |
| | | | | | | | (0.004) | (0.001) |
| Post-Acquisition × $\frac{\text{(Branch Rate - AMR)}}{\text{AMR}}^{Pre}$ | | | | | | | -0.084*** | -0.067*** |
| | | | | | | | (0.021) | (0.009) |
| Observations | 177889 | 41492 | 177889 | 41492 | 177889 | 41492 | 177889 | 41492 |
| Adjusted $R^2$ | 0.962 | 0.769 | 0.962 | 0.769 | 0.966 | 0.846 | 0.963 | 0.839 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table F.7: Market Concentration and Rate Convergence in the Evolution of Deposit Rates 12-25months after (Cont'd)

Panel B: HELOCs and Personal Unsecured Loans

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | | | | Branch Rate | | | | |
| | HELOC | Personal | HELOC | Personal | HELOC | Personal | HELOC | Personal |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI = 0)$ | | | -0.249 | -0.847* | | | -0.007 | -0.297* |
| | | | (0.160) | (0.463) | | | (0.038) | (0.163) |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \in (0, 200))$ | | | -0.070 | -0.519 | | | | |
| | | | (0.243) | (0.493) | | | | |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \geq 200)$ | | | -0.412* | -1.104* | | | | |
| | | | (0.219) | (0.648) | | | | |
| Post-Acquisition × Pre-Difference Rate - Qt1 | | | | | 0.471* | 1.039** | | |
| | | | | | (0.262) | (0.480) | | |
| Post-Acquisition × Pre-Difference Rate - Qt2 | | | | | 0.187 | -0.817 | | |
| | | | | | (0.197) | (0.593) | | |
| Post-Acquisition × Pre-Difference Rate - Qt3 | | | | | -0.400 | -1.310*** | | |
| | | | | | (0.292) | (0.502) | | |
| Post-Acquisition × Pre-Difference Rate - Qt4 | | | | | -0.430* | -1.445*** | | |
| | | | | | (0.239) | (0.429) | | |
| Post-Acquisition × Pre-Difference Rate - Qt5 | | | | | -1.143*** | -3.254*** | | |
| | | | | | (0.181) | (0.492) | | |
| Post-Acquisition | | | | | | | -0.011 | -0.392 |
| | | | | | | | (0.110) | (0.318) |
| Post-Acquisition × Δ HHI | | | | | | | -0.003 | -0.021 |
| | | | | | | | (0.012) | (0.032) |
| Post-Acquisition × $\frac{\text{(Branch Rate - AMR)}}{\text{AMR}}^{Pre}$ | | | | | | | -0.769*** | -2.156*** |
| | | | | | | | (0.065) | (0.152) |
| Observations | 110136 | 113869 | 110136 | 113869 | 110136 | 113869 | 110136 | 113869 |
| Adjusted $R^2$ | 0.926 | 0.918 | 0.926 | 0.918 | 0.947 | 0.940 | 0.972 | 0.954 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table F.8: Market Concentration and Rate Convergence in the Evolution of Interest Rates 25-37 months after

This Table repeats the results of Table 7 but focuses on a window of 25 to 37 months after the merger.

Panel A: 12MCD10K and SAV100K

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Branch Rate | | | | | | | |
| | 12MCD10K | SAV100K | 12MCD10K | SAV100K | 12MCD10K | SAV100K | 12MCD10K | SAV100K |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI = 0)$ | | | 0.090** | -0.014 | | | 0.161*** | 0.006 |
| | | | (0.035) | (0.012) | | | (0.034) | (0.009) |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \in (0, 200))$ | | | -0.059 | -0.010 | | | | |
| | | | (0.040) | (0.015) | | | | |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \geq 200)$ | | | -0.104 | -0.002 | | | | |
| | | | (0.069) | (0.037) | | | | |
| Post-Acquisition × Pre-Difference Rate - Qt1 | | | | | 0.254*** | 0.077*** | | |
| | | | | | (0.051) | (0.013) | | |
| Post-Acquisition × Pre-Difference Rate - Qt2 | | | | | 0.216*** | 0.017* | | |
| | | | | | (0.041) | (0.009) | | |
| Post-Acquisition × Pre-Difference Rate - Qt3 | | | | | 0.040 | -0.030** | | |
| | | | | | (0.057) | (0.015) | | |
| Post-Acquisition × Pre-Difference Rate - Qt4 | | | | | 0.134** | -0.063*** | | |
| | | | | | (0.057) | (0.013) | | |
| Post-Acquisition × Pre-Difference Rate - Qt5 | | | | | -0.311*** | -0.167*** | | |
| | | | | | (0.044) | (0.020) | | |
| Post-Acquisition | | | | | | | -0.053 | -0.023** |
| | | | | | | | (0.038) | (0.011) |
| Post-Acquisition × Δ HHI | | | | | | | -0.002 | 0.002** |
| | | | | | | | (0.004) | (0.001) |
| Post-Acquisition × $\frac{\text{(Branch Rate - AMR)}}{\text{AMR}}^{Pre}$ | | | | | | | -0.131*** | -0.077*** |
| | | | | | | | (0.037) | (0.012) |
| Observations | 154865 | 24497 | 154865 | 24497 | 154865 | 24497 | 154865 | 24497 |
| Adjusted $R^2$ | 0.962 | 0.736 | 0.963 | 0.736 | 0.969 | 0.823 | 0.965 | 0.815 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table F.8: Market Concentration and Rate Convergence in the Evolution of Interest Rates 25-37 months after (Cont'd)

Panel B: HELOCs and Personal Unsecured Loans

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Branch Rate | | | | | | | |
| | HELOC | Personal | HELOC | Personal | HELOC | Personal | HELOC | Personal |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI = 0)$ | | | -0.832*** | -0.931 | | | 0.017 | -0.331* |
| | | | (0.304) | (0.708) | | | (0.043) | (0.194) |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \in (0, 200))$ | | | -0.602* | -0.562 | | | | |
| | | | (0.341) | (0.742) | | | | |
| Post-Acquisition × $\mathbb{1}.(\Delta HHI \geq 200)$ | | | -1.050*** | -0.807 | | | | |
| | | | (0.370) | (0.829) | | | | |
| Post-Acquisition × Pre-Difference Rate - Qt1 | | | | | 0.423 | 0.637 | | |
| | | | | | (0.422) | (0.620) | | |
| Post-Acquisition × Pre-Difference Rate - Qt2 | | | | | -0.195 | -1.312* | | |
| | | | | | (0.280) | (0.756) | | |
| Post-Acquisition × Pre-Difference Rate - Qt3 | | | | | -0.709 | -1.523** | | |
| | | | | | (0.432) | (0.736) | | |
| Post-Acquisition × Pre-Difference Rate - Qt4 | | | | | -0.634** | -0.868 | | |
| | | | | | (0.294) | (0.772) | | |
| Post-Acquisition × Pre-Difference Rate - Qt5 | | | | | -1.211*** | -3.129*** | | |
| | | | | | (0.233) | (0.730) | | |
| Post-Acquisition | | | | | | | -0.215 | -0.962* |
| | | | | | | | (0.138) | (0.501) |
| Post-Acquisition × Δ HHI | | | | | | | -0.010 | 0.006 |
| | | | | | | | (0.015) | (0.037) |
| Post-Acquisition × $\frac{\text{(Branch Rate - AMR)}}{\text{AMR}}^{Pre}$ | | | | | | | -0.723*** | -2.031*** |
| | | | | | | | (0.077) | (0.185) |
| Observations | 86161 | 96506 | 86161 | 96506 | 86161 | 96506 | 86161 | 96506 |
| Adjusted $R^2$ | 0.940 | 0.922 | 0.941 | 0.922 | 0.955 | 0.938 | 0.977 | 0.952 |
| State × Month Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Branch Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

# G Model Appendix

In this section we conduct a battery of robustness analyses that gauge the sensitivity of our estimate of the deposit rate semi-elasticity and of the counterfactuals in our model to alternative methodologies and assumptions.

First, we evaluate the sensitivity of our estimate of the deposit rate semi-elasticity to alternative estimation procedures. Specifically, we develop a two-step procedure akin to that in Dellavigna and Gentzkow (2019) that combines the convergence results in Table 7 with the quantity results in Table 6 to derive a deposit rate semi-elasticity.

In the first step of this two-step estimation procedure, we partition all acquired branches into 50 bins based on pre-merger rate differences relative to their acquirers. We then use the following empirical specification to estimate the average post-merger evolution of deposit rates and quantities in each bin:

$$Y_{i,t,s}^{outcome} = \gamma_{s,t} + \theta_i + \sum_b \beta_b^{outcome} \textit{Post-Acquisition}_{i,s} \times \textit{PreRateGroup}_i + \epsilon_{i,t,s}$$

where $Y_{i,t,s}^{outcome}$ is the variable of interest for each outcome in branch $i$ located in state $s$ during period $t$, which could be deposit rates $p$ or branch deposits $q$. $Post - Acquisition_{i,s}$ is a dummy variable that takes the value of one in the twelve months following the merger and $PreRateGroup_i$ are dummy variables indicating the bin to which the acquired branch belongs based on its pre-merger deposit rate difference relative to the acquirer. The specification also includes state $\times$ year and branch fixed effects as in other specifications.

From these empirical specifications, we obtained a series of coefficients, $\{\beta_b^p\}$ and $\{\beta_b^q\}$, which represent an average post-merger changes in deposit rates and the natural logarithm of branch deposits in each bin. We plot the coefficients $\{\beta_b^p\}$ and $\{\beta_b^q\}$ for each bin in Panels A and B of Figure G.1. Consistent with the results in Table 7, we find that bins with lower pre-merger rate differences see deposit rates rise after a merger, while acquired branches in bins with higher pre-merger rate differences experience a decline in deposit rates. This pattern suggests that pre-merger rate differences are a strong instrument for the evolution of deposit rates following a merger. Similarly, Panel B shows the coefficients of the post-merger change in the natural logarithm of deposits for each bin defined by the pre-merger rate difference. These coefficients indicate that branch deposits decline most at branches with greater pre-merger rate differences, although the differences in effects across bins are less pronounced for this outcome.

In the second step of our procedure, we plot the pairs $(\beta_b^p, \beta_b^q)$ for each bin and we interpret the regression slope of ($\beta_b^q$) on ($\beta_b^p$) as the relevant deposit rate semi-elasticity implied by the mergers. We present this result in the binscatter of Panel C of Figure G.1. The binscatter shows that the deposit rate semi-elasticity obtained using this procedure is 0.1855 (s.e. 0.1186), slightly higher than the average semi-elasticity of 0.134 derived from our demand estimation model in equation (5). The difference could reflect a composition effect, where larger banking markets with higher deposit rate semi-elasticities are over-represented in the merger sample.

The average deposit rate semi-elasticities that we estimate using our demand estimation procedure is 0.134, which is lower than the deposit rate semi-elasticities estimates of other studies such as Egan, Hortaçsu and Matvos (2017) and Abrams (2019) and also lower than our own estimated deposit rate semi-elasticity using variation in deposit rates induced by mergers. Next, we consider whether the uniform pricing model also outperforms the local pricing model in explaining changes in observed post-merger deposit rates if the deposit rate semi-elasticities used to simulate counterfactual post-merger deposit rates were calibrated to be twice, three times, and four times as large as those estimated using our demand procedure. Put differently, we evaluate the sensitivity of our model results to different calibrations of the deposit rate semi-elasticity.

We present the results of these analyses in Figures G.2, G.3, and G.4. Our findings suggest that the uniform pricing model continues to outperform the local pricing model when the deposit rate semi-elasticities are calibrated higher than those estimated under our demand model. In particular, Panel B of these figures shows that the simulated counterfactual rates of the acquired branches in overlapping markets under the uniform pricing model better match the observed rate changes relative to the benchmark set by our estimated deposit rate semi-elasticity in Figure 11. Panel C also shows an improved fit for the uniform pricing model in explaining deposit rate changes in acquirer branches in non-overlapping markets, especially in Figures G.2 and G.3. Thus, if anything, increasing the deposit rate semi-elasticities enhances the uniform pricing model's fit relative to the local pricing model.

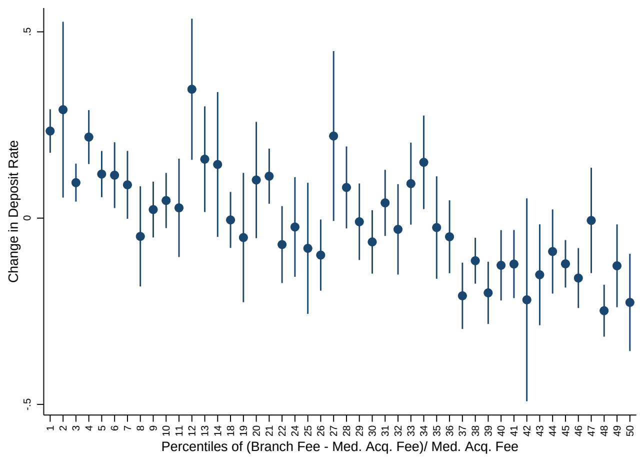
Finally, we evaluate the sensitivity of our results using an alternative pricing model where banks set uniform deposit rates within each U.S. Census region (Northeast, Midwest, South, and West) or division (New England, Middle Atlantic, East North Central, etc.), rather than nationally. This exercise aims to determine whether a regional pricing model better fits the observed data, given evidence of within-bank variation in rate setting.

We present the results of this analysis in Figure G.5. Despite evidence that uniform pricing is incomplete and that there is some within-bank variation in deposit rates, the regional uniform pricing model outperforms the local pricing model but does not fit the observed rate changes as well as the complete uniform pricing model. We speculate that this may be due to our inability to define rate-setting areas that accurately reflect the spatial boundaries used by banks in their pricing decisions.

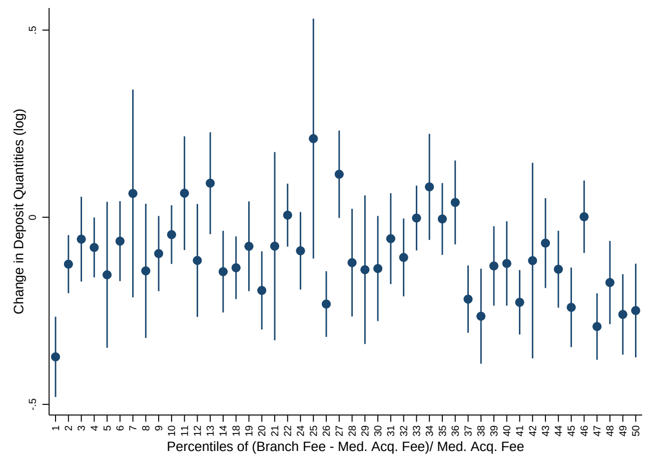
## Figure G.1: Deposit rate semi-elasticity implied by mergers

Figure G.1 uses the merger events as an alternative procedure to estimate an average deposit rate semi-elasticity. We partition the sample of acquired branches in 50 bins according to the pre-merger rate difference between acquired branches and acquirer. We then run regressions of the form: $Y_{i,t,s}^{outcome} = \gamma_{s,t} + \theta_i + \sum_b \beta_b^{outcome} \textit{Post-Acquisition}_{i,s} \times \textit{PreRateGroup}_i + \epsilon_{i,t,s}$, where $Y_{i,t,s}^{outcome}$ is the variable of interest for each outcome in branch $i$ located in state $s$ during period $t$, which could be deposit rates $p$ or branch deposits $q$, $Post - Acquisition_{i,s}$ is a dummy variable that takes the value of one in the twelve months following the merger, $PreRateGroup_i$ are dummy variables indicating the bin to which the acquired branch belongs based on its pre-merger deposit rate difference relative to the acquirer. The specification also includes state $\times$ year and branch fixed effects as in other specifications. In Panels A and B, we plot the coefficients (and respective standard errors) in each bin for the regressions that use deposit rates and the natural logarithm of branch deposits, respectively. In Panel C, we binscatter the pairs $(\beta_b^p, \beta_b^q)$ and the slope of the red line represents relevant deposit rate semi-elasticity implied by the mergers.

Panel A: Change in Deposit Rates by Bin




Panel B: Change in Log Branch Deposits by Bin




Panel C: Deposit Rate semi-elasticity

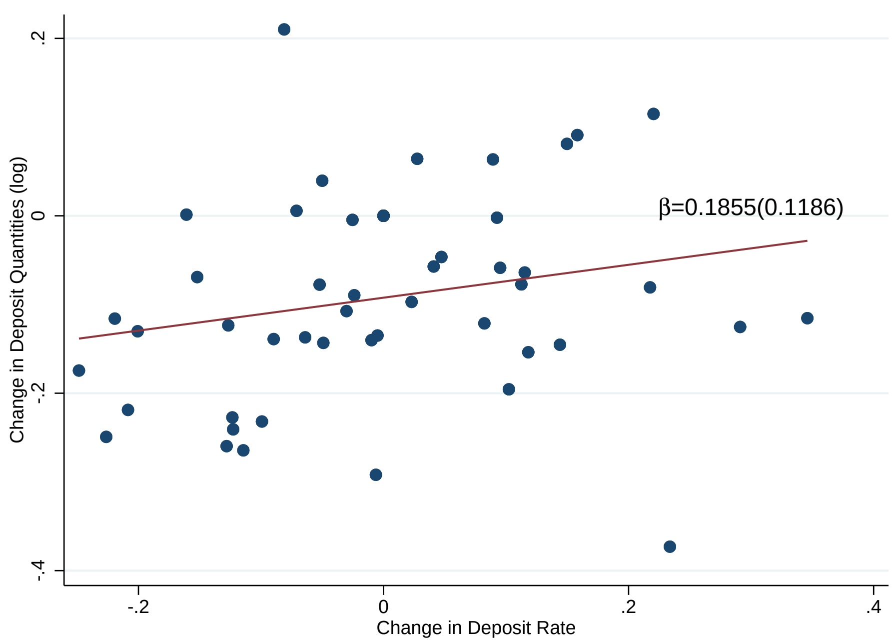
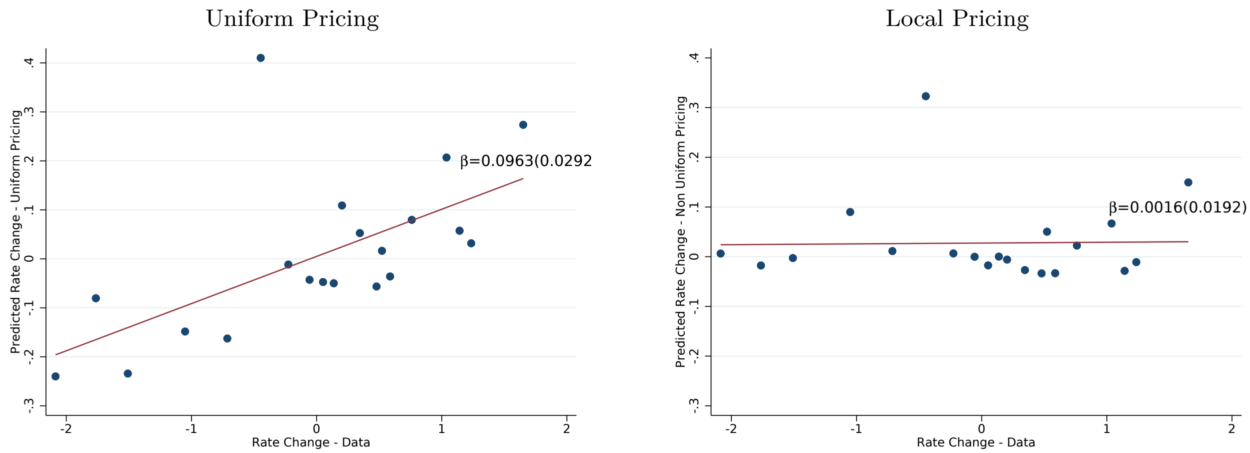


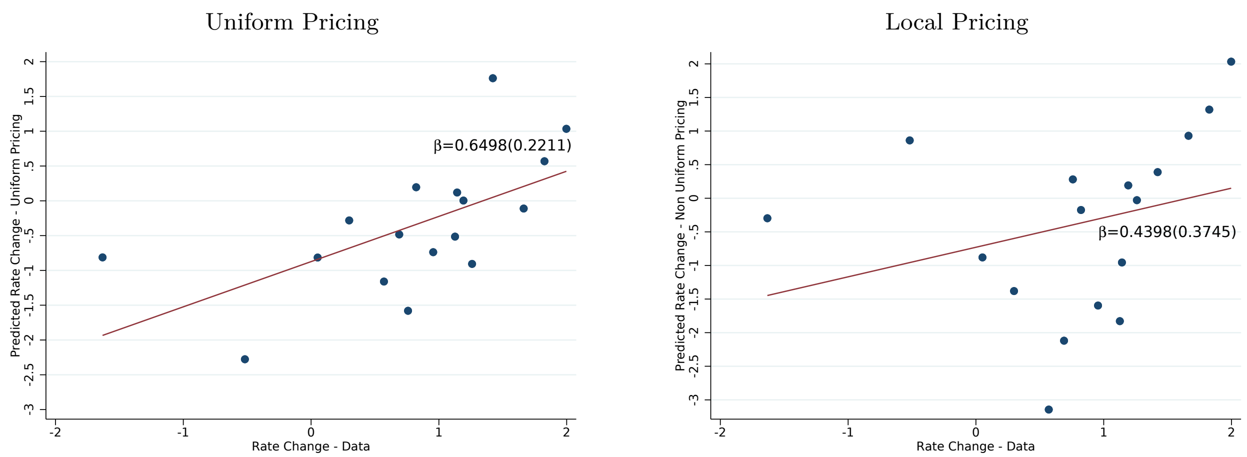
Figure G.2: Comparing Equilibrium Changes versus observed changes in deposit rates - 2× Deposit Rate Semi-elasticity

Figure G.2 repeats the analysis of Figure 11 after calibrating the deposit rate semi-elasticity used to compute the simulated post-merger equilibrium deposit rates to be twice as large as those estimated using our demand estimation procedure.

Panel A. All acquirer and acquired branches involved in mergers




Panel B. Only Acquired Branches in Overlapping Markets




Panel C. Acquirer Branches in non-overlapping markets

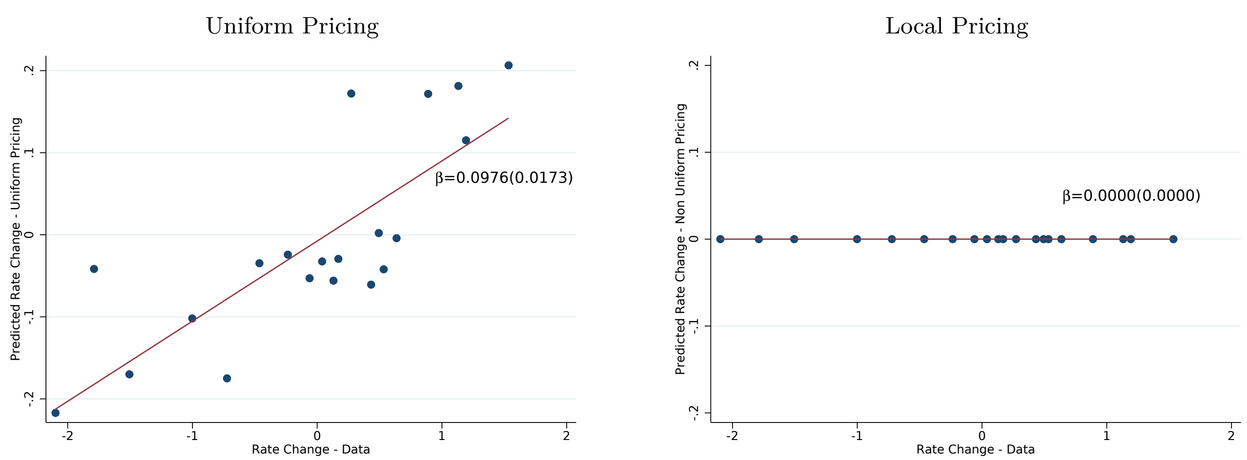
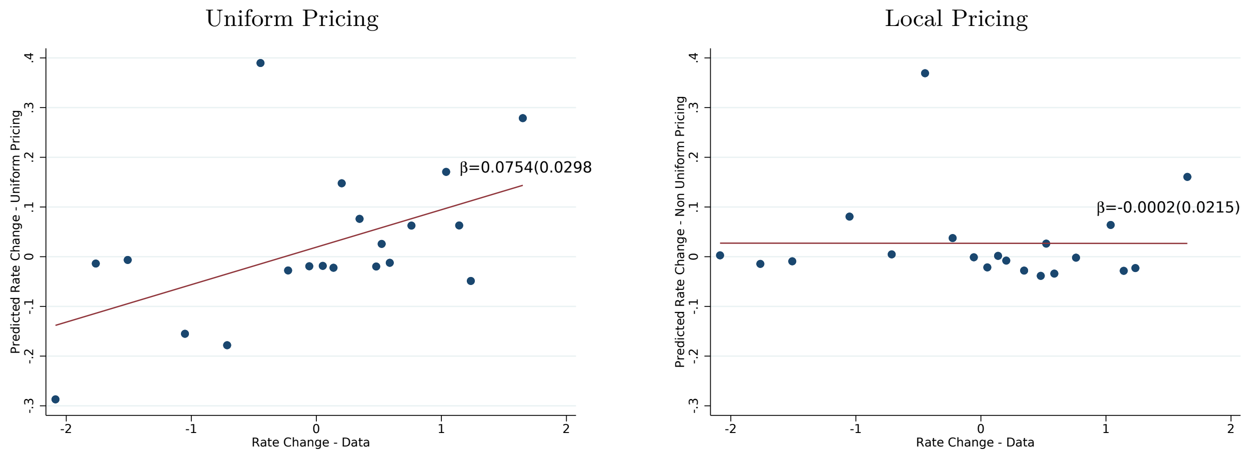


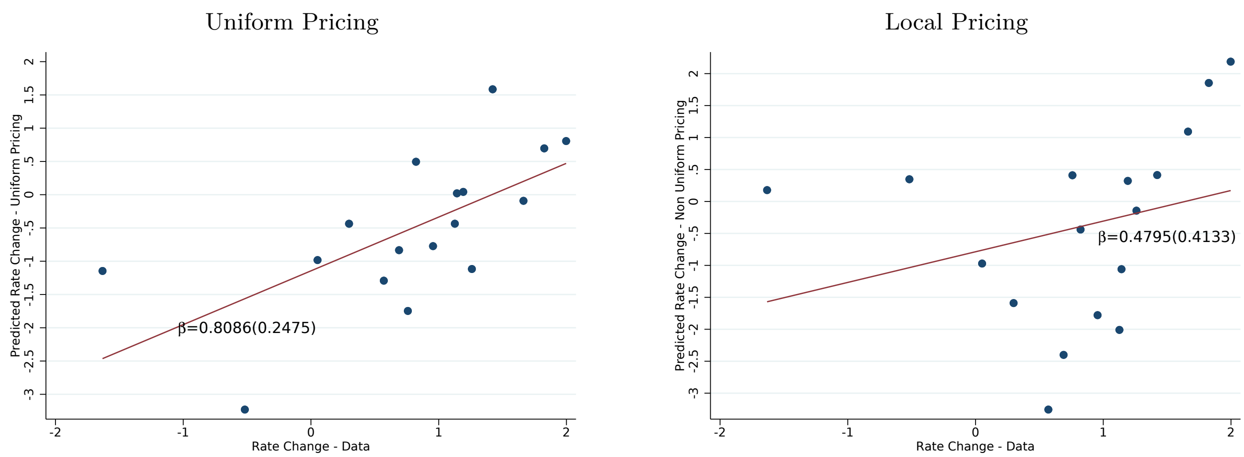
Figure G.3: Comparing Equilibrium Changes versus observed changes in deposit rates - 3× Deposit Rate Semi-elasticity

Figure G.3 repeats the analysis of Figure 11 after calibrating the deposit rate semi-elasticity used to compute the simulated post-merger equilibrium deposit rates to be three times as large as those estimated using our demand estimation procedure.

Panel A. All acquirer and acquired branches involved in mergers




Panel B. Only Acquired Branches in Overlapping Markets




Panel C. Acquirer Branches in non-overlapping markets

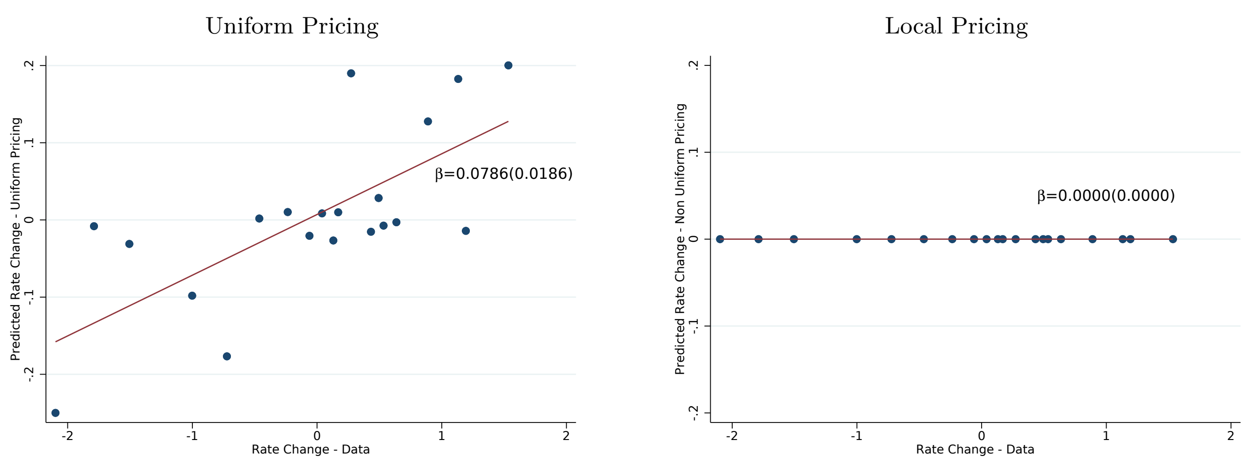
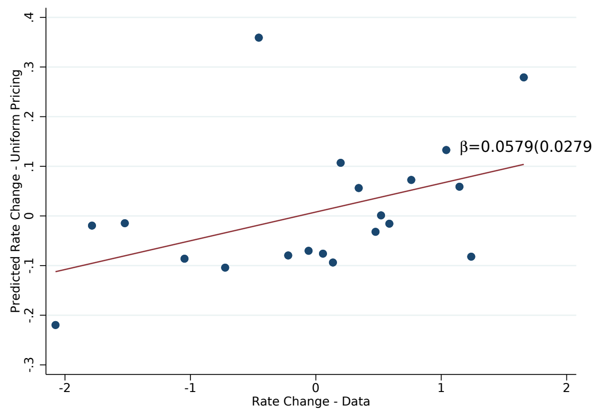


Figure G.4: Comparing Equilibrium Changes versus observed changes in deposit rates - 4× Deposit Rate Semi-elasticity

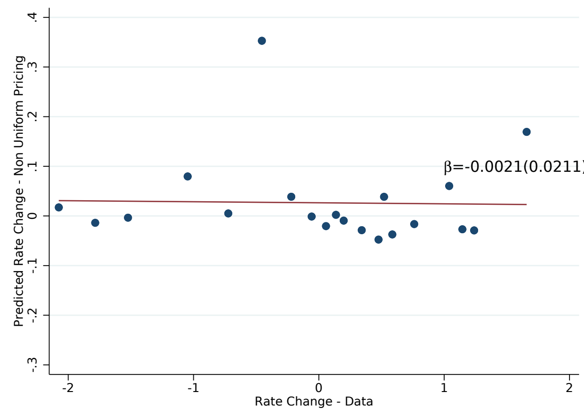
Figure G.4 repeats the analysis of Figure 11 after calibrating the deposit rate semi-elasticity used to compute the simulated post-merger equilibrium deposit rates to be four times as large as those estimated using our demand estimation procedure.

Panel A. All acquirer and acquired branches involved in mergers

Uniform Pricing

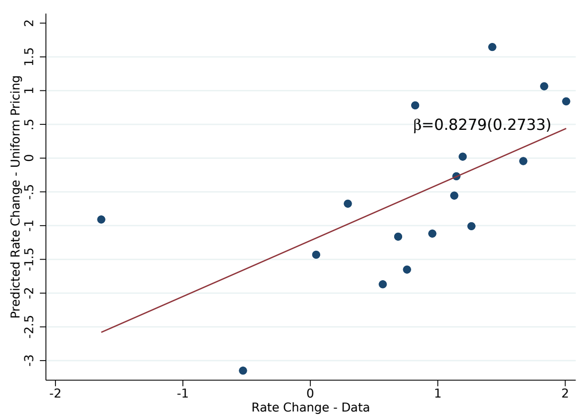



Local Pricing

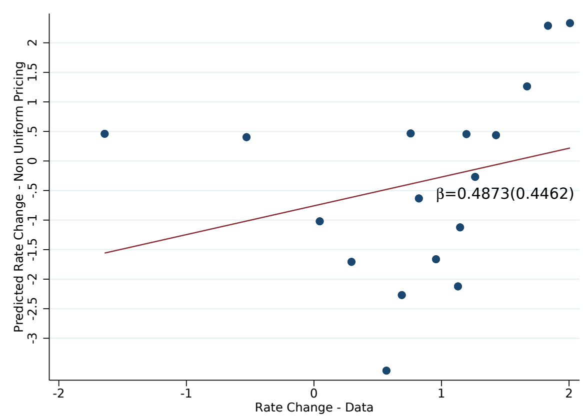



Panel B. Only Acquired Branches in Overlapping Markets

Uniform Pricing

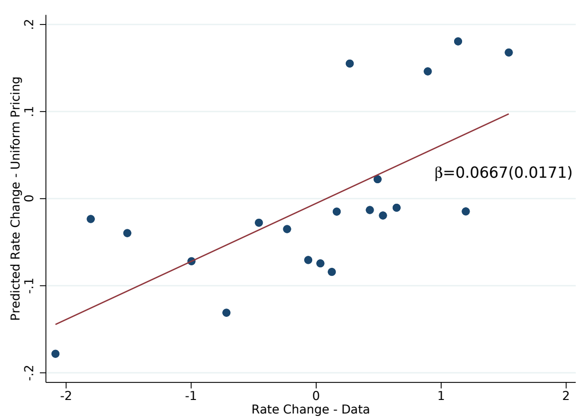



Local Pricing




Panel C. Acquirer Branches in non-overlapping markets

Uniform Pricing




Local Pricing

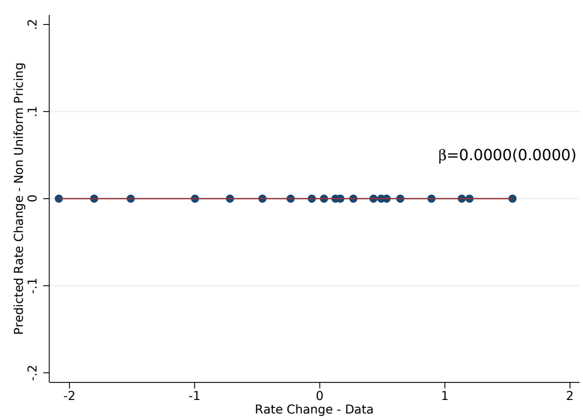
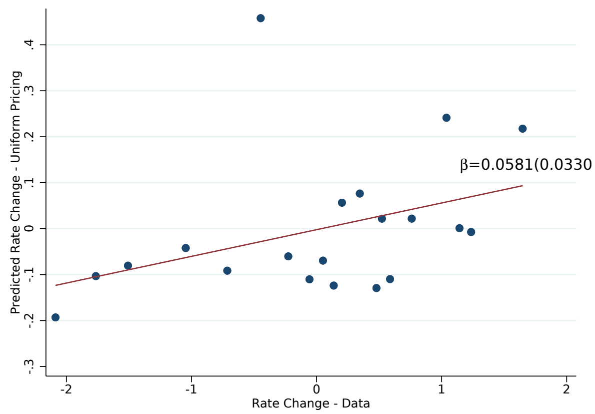


Figure G.5: Comparing Equilibrium Changes versus observed changes in deposit rates - Regional Uniform Pricing Models

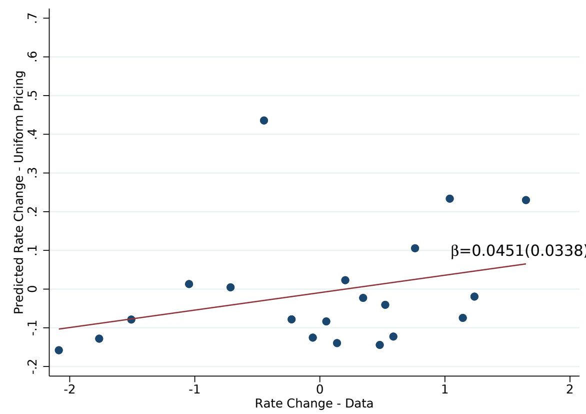
Figure G.5 repeats the analysis of Figure 11 but instead simulates counterfactual post-merger deposit rates assuming that banks set rates uniformly within each U.S. Census region (Northeast, Midwest, South, and West) or within each U.S. census division (New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific) but not necessarily across these regions or divisions.

## Panel A. All acquirer and acquired branches involved in mergers

Uniform Pricing - Regions

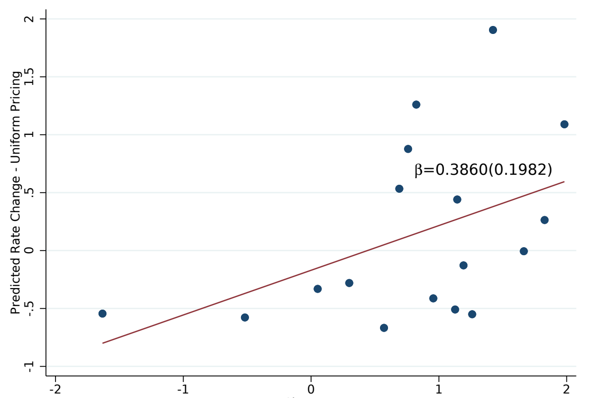



Uniform Pricing - Divisions

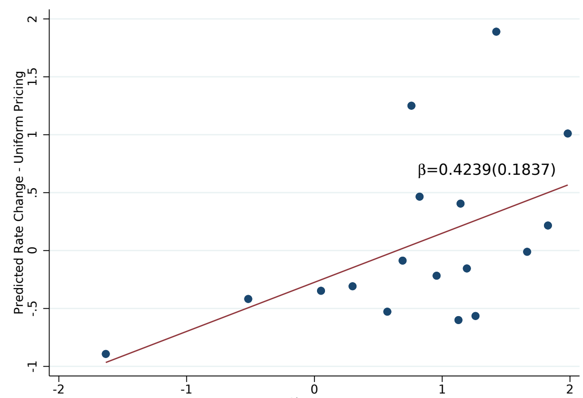



## Panel B. Only Acquired Branches in Overlapping Markets

Uniform Pricing - Regions

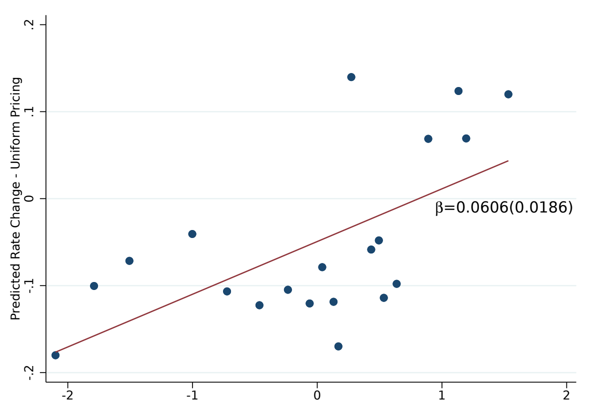



Uniform Pricing - Divisions




## Panel C. Acquirer Branches in non-overlapping markets

Uniform Pricing - Regions




Uniform Pricing - Divisions