Size-Based Regulation and Bank Fragility: Evidence from the Wells Fargo Asset Cap *

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March 8, 2024

Abstract

We argue that heightened regulation on large banks contributed to the rise in fragility in regional banks revealed by the 2023 regional bank crisis. In 2018, U.S. regulators restricted Wells Fargo from growing beyond $1.95 trillion in assets. Wells Fargo gave up large uninsured deposits to stay under the asset cap. We find that smaller and less regulated banks stepped in to fill the gap. Banks more geographically proximate to Wells Fargo experienced an influx of flighty uninsured deposits, particularly during the COVID-19 period. In turn, these banks experienced higher deposit outflows once monetary tightening commenced, and had lower equity returns following the collapse of Silicon Valley Bank. Additional analyses show that the deposit reallocation is not driven by local demand or general proximity to large banks.

JEL Codes: G01, G21, G28, G32, E44, E58.

Keywords: Too-Big-to-Fail, Banking Fragility, Wells Fargo, Asset Cap, Regional Bank Crisis, COVID-19, Monetary Tightening

*We thank Iftekhar Hasan, Karsten Müller, Alexi Savov, Philipp Schnabl, and Amit Seru for their insightful comments. We are grateful to seminar participants at Fudan University, National University of Singapore, Tsinghua University, University of Georgia, and Zhejiang University, as well as conference participants at the NYU Stern WAPFIN Conference and VINS Annual Conference for their helpful comments. Ruan acknowledges financial support from the Singapore Ministry of Education AcRF Tier 1 Research Grant No. A-8000757-00-00. All errors are our own.

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1 Introduction

Following the Global Financial Crisis, the regulatory framework governing U.S. banks was overhauled to emphasize the role of size. Large banks were subject to more stringent regulation due to too-big-to-fail (TBTF) and systemic risk concerns.[1] While evidence indicates that such regulations have been successful in reducing the TBTF subsidy enjoyed by large banks (Berndt et al., 2019), an enduring concern is that these restrictions have unintended consequences for other parts of the banking system. An important question is whether size-based regulation leads to a reallocation of banking activity to smaller, less-regulated banks and the associated implications for financial stability.[2]

We study the financial stability implications of a unique regulatory action that constrained the growth of one of the largest U.S. banks, Wells Fargo and Company (WFC). Following a series of scandals involving fraudulent account openings in its retail bank (Tayan, 2019), the Federal Reserve restricted Wells Fargo from growing beyond $1.95 trillion in assets. We find that this hard asset cap, effective since February 2018, has led to a reallocation of flighty uninsured deposits to other banks. This asset cap contributed to the rise in fragility in regional banks revealed by the 2023 regional bank crisis, the most significant U.S. banking stress since the GFC.

The crisis, precipitated by the collapse of Silicon Valley Bank (SVB), saw a run by uninsured depositors,[3] concerned by an increase in banks' unrealized asset losses due to a rise in interest rates (Jiang et al., 2023b; Drechsler et al., 2023b). But *why* did some banks, like SVB, receive a massive influx of flighty uninsured deposits? We argue a contributing factor was their geographic proximity to Wells Fargo which led them to absorb uninsured

[1] Examples include provisions on stress testing and capital and liquidity requirements in the Dodd-Frank Act of 2010.

[2] Several papers document that banking regulation leads to a reallocation of risky activity to non-bank intermediaries, aka shadow banks (e.g., Acharya et al. (2013); Buchak et al. (2018); Irani et al. (2021); Begenau and Landvoigt (2022)). Begley and Srinivasan (2022) find that post-GFC regulatory burden on large banks leads to increased lending by small banks.

[3] The deposit insurance limit is $250,000 per depositor per bank. Uninsured depositors are, thus, those with more than $250,000 deposited in a single bank.

deposits Wells Fargo could not due to the asset cap. We document that banks more proximate to Wells Fargo experienced higher growth in uninsured deposits *and* higher stress in 2023Q1. Figure 1 presents this finding graphically: Banks with higher pre-asset cap proximity to Wells Fargo experienced higher stress, as reflected in more negative cumulative returns, during the run period from March 6 to March 14, 2023 (following Cookson et al. (2023)). This phenomenon is driven by smaller and less regulated banks, representing the spillover effects of tighter regulation on largest banks.

The asset cap on Wells Fargo, still in place, is a direct and unprecedented act limiting the growth of a TBTF institution. To the best of our knowledge, we are the first to systematically analyze the effects of the asset cap both on Wells Fargo and its competitors. We begin by showing that the asset cap substantially affected Wells Fargo's operations, particularly during the COVID-19 period when the aggregate banking sector saw significant growth owing to an inflow of deposits. While the other three of the Big-4 American banks–Bank of America, JP Morgan, and Citigroup–have seen cumulative growth between 30%-50% since 2017, Wells Fargo has been forced to stay at the same size. We estimate that if Wells Fargo had grown at the same rate as the overall U.S. commercial banking sector, it would have had $414.19 billion in additional deposits by the time the Fed commenced monetary tightening in early 2022. This gap alone is larger than the asset size of the all but the nine largest bank holding companies in the U.S.

The composition of this deposit gap is driven by the differing nature of insured and uninsured deposits. The former are stickier than the latter, i.e., they are less responsive to market conditions such as interest rates (Drechsler et al., 2023b). Given this higher stability, we expect Wells Fargo to prioritize maintaining insured deposits relative to uninsured deposits. In its annual reports, Wells Fargo indicates that it gave up large corporate deposits, likely uninsured, to stay under the asset cap.

We verify this in the data by using a novel approach to proxy for retail and business deposits at a granular level. Specifically, we geo-code central business districts (CBDs)

(Holian and Kahn, 2012) and take deposits in branches located in CBDs and main offices as a proxy for business deposits. Based on this proxy, we confirm that Wells Fargo gave up large business deposits. We next turn to the allocation of these deposits among other banks.

Since bank competition has a strong local component (e.g., Petersen and Rajan (1994); Berger and Udell (1995); Drechsler et al. (2017, 2021)), we hypothesize that banks geographically proximate to Wells Fargo are more more active in filling the gap left by Wells Fargo than distant banks. To operationalize this idea, we measure Wells Fargo's presence at the local market level (in our case, a zip code) in 2017, just before the asset cap came into effect. We say Well Fargo was present in a zip code if it had at least one physical branch in the zip code in 2017. We then compute the proximity of other banks to Wells Fargo as the fraction of their deposits in 2017 that belonged to zip codes in which Wells Fargo was present. We find that for higher-proximity banks, business deposits grow faster than retail deposits following the imposition of the asset cap. The reverse is true for lower-proximity banks.

Motivated by this descriptive evidence, we examine the relationship between proximity to Wells Fargo and bank-level uninsured deposit growth in a difference-in-differences (DiD) design. In panel regressions, we control for time-varying bank characteristics, bank fixed effects, as well as bank size-group-specific time fixed effects. We find that the growth of uninsured deposits does not differ significantly between higher- and lower-proximity banks in the four quarters before the asset cap, indicating that these two groups of banks were not on different paths prior to the asset cap. After the asset cap was put in place, higher-proximity banks grew their uninsured deposits significantly faster than lower-proximity banks, especially during the COVID-19 pandemic. As the Fed started to tighten monetary policy in 2022, higher-proximity banks saw larger uninsured deposit outflows than lower-proximity banks. The outflow was exacerbated during the first quarter of 2023, when the failure of SVB triggered a wider run in the banking sector.

As Wells Fargo gave up large, uninsured deposits, other banks faced a stronger demand for these products. Consistent with this demand shift, we find that banks more proximate to Wells Fargo paid lower interest on deposits, or equivalently, charged higher spreads (relative to the market rate) on deposits, than more distant banks after the enactment of the Wells Fargo asset cap. This effect is heightened during the COVID-19 pandemic when the overall banking sector experienced a large inflow of deposits. As the Fed started to tighten monetary policy in 2022, higher-proximity banks experienced a more rapid increase in the interest expense on deposits than lower-proximity banks. Such differential pricing further widened during the regional bank crisis of 2023.

The preceding results of higher deposit quantities and higher deposit prices (spreads) at proximate banks indicate an increase in household/firm demand for deposits rather than a shift in banks' supply of deposits. By contrast, a supply shift would cause quantities and prices to move in opposite directions. Thus, supply-based explanations such as bank investment opportunities or the deposits channel of monetary policy (Drechsler et al., 2021) do not explain our results. The asset cap effect, on the other hand, would predict higher demand at proximate banks as households/firms relocate their deposits away from Wells Fargo.

In order to rule out other demand-based explanations such as local economic growth, we conduct tests of deposit flows at the local deposit market level which allows us to control for local economic conditions. In our empirical model, we can compare outcomes for two branches belonging to the same bank in the same county in the same year but in different zip codes. We find that branches that belong to a zip code where Wells Fargo was present saw higher deposit growth than other branches of the same bank in the same county in the same year. These effects are driven by community and regional banks. Furthermore, our finding of higher deposit growth for branches in the same zip code as Wells Fargo is concentrated in counties with part or whole of a CBD within them, corroborating that the effect of the asset cap is stronger for uninsured deposits. We also show that the results are not merely driven by the tech sector or the idiosyncratic features of Silicon Valley Bank.

We further rule out several alternative explanations for the observed deposit growth in bank branches proximate to Wells Fargo. We undertake falsification tests using other large banks as being fictitiously treated by an asset cap. By construction, branches close to these fictitiously treated large banks are similarly proximate to large banks as branches close to Wells Fargo, and their deposit growth provides a useful placebo for the impact of being proximate to large banks in general. We find that the branches close to other large banks do not experience higher deposit growths than other branches in the post-2018 period. This provides reassurance that the deposit growth response of branches close to Wells Fargo is unlikely to be driven by proximity to large banks in general. In addition, we reject the hypothesis that the observed deposit growth could be random using a bootstrap falsification test.

Finally, we perform back-of-the-envelope calculations to quantify the magnitude of uninsured deposits that Wells Fargo lost to other banks due to the asset cap. We estimate that if Wells Fargo had grown at the same rate as the overall U.S. commercial banking sector, it would have had $231.25 billion in additional uninsured deposits by the time the Fed started the monetary tightening in early 2022. Over the same period, banks proximate to Wells Fargo jointly enjoyed an excess of $235.99 billion in uninsured deposits. We also use our micro-level estimate as well as banks' pre-existing size and proximity to Wells Fargo to calculate how much of each bank's uninsured deposit growth in the period of 2020–2022Q1 can be attributed to filling the gap left by Wells Fargo. According to our calculation, SVB experienced an increase of $118 bn in uninsured deposits in the period from 2020 to 2022Q1, $11 bn or 9.07% of which came from filling the gap left by Wells Fargo. Another failed bank, First Republic Bank, saw a similar level of its uninsured deposit increase attributable to filling the Wells Fargo gap.

Related Literature

Our study contributes to several strands of literature. First, we contribute to understanding the causes of the 2023 regional banking crisis. As monetary policy tightened through 2022 and early 2023, banks saw large unrealized losses on their asset portfolios (Jiang et al., 2023b). At the same time, uninsured deposits flowed out as bank deposit rates did not keep pace with interest rates (Koont et al., 2023). Drechsler et al. (2023b) highlight that heavy reliance on uninsured deposits can lead to a bank run during periods of rising rates. This is compounded by banks not hedging their interest rate risk exposure (Jiang et al., 2023a; McPhail et al., 2023), reclassifying securities as held-to-maturity to avoid loss recognition (Granja, 2023), and through concentrated depositor networks (Cookson et al., 2023). A natural question is why some banks came to rely more heavily on flighty uninsured deposits than other banks. Gelman et al. (2023) and Benmelech et al. (2023) show that these banks experienced high deposit inflows during the COVID-19 pandemic period. Our paper pinpoints one novel channel explaining this phenomenon – a redistribution of uninsured deposits induced by the Wells Fargo asset cap.

We also contribute to the burgeoning literature on size-based regulation in banking. Following the Global Financial Crisis, there was renewed recognition that too-big-to-fail guarantees create distortion (Iyer et al., 2019) and the social costs of bank failures were increasing in bank size. This prompted an approach of tiered regulation, best encapsulated in the Dodd-Frank Act, where the degree of oversight increases with bank size, with the largest banks facing the most stringent scrutiny. Prior work analyzing the effects of these changes has focused on the $10 billion asset size threshold for tighter regulation specified in the Dodd-Frank Act (Alvero et al., 2022; Bouwman et al., 2018). This literature has focused on how bank behavior changes as they approach the size threshold. In comparison to the size threshold studied by these papers, the asset cap we analyze is binding and targets one of the largest banks in the world. We analyze the effects of this unique regulatory experiment on other banks that are proximate to Wells Fargo. The substantial spillover effects we document supports the notion that idiosyncratic shocks to large firms can lead to nontrivial aggregate impacts (Gabaix, 2011; Gabaix and Koijen, 2024). Our findings also shed light on the design of policy to solve the too-big-to-fail conundrum (Philippon and Wang, 2023) by documenting that asset caps have spillover effects that need to be accounted for.

More broadly, our results speak to a fundamental tension in financial regulation. Banks are widely documented to alter their structure and risk profile to circumvent regulations imposed on them (Acharya et al., 2013; Begley et al., 2017; Behn et al., 2022). Constraints on traditional depository institutions can also lead to a reallocation of risky activities to less-regulated entities rather than to their suppression. Prior work has focused on how regulatory arbitrage has spurred the rise of shadow banking (e.g., Buchak et al. (2018); Irani et al. (2021); Begenau and Landvoigt (2022)). We show that the migration of risks exists even within the confines of the traditional banking system. Increased regulation on Wells Fargo in the form of the asset cap led to the reallocation of risky uninsured deposits to smaller banks that faced lower regulation and supervision.

The rest of the paper proceeds as follows. In Section 2, we describe the asset cap in detail and spell out our hypotheses; in Section 3, we describe our data sources as well as the construction of key variables; Section 4 describes our results on the reallocation of uninsured deposits; Section 5 presents a branch-level analysis of deposit flows to address endogeneity concerns; Section 6 discusses the policy and aggregate implications of the asset cap; and Section 7 concludes.

2 Background and Hypotheses

2.A Institutional Setting

In the second half of 2016, Wells Fargo became embroiled in what came to be known as the "cross-selling scandal" (Tayan, 2019). For several years, employees in the company's community banking division had been fraudulently creating additional accounts for existing customers without their knowledge. In response to the scandal, the courts and regulators imposed significant monetary and operational penalties on the bank.

On February 2, 2018, the Federal Reserve entered into a Consent Order with Wells Fargo (available here). As part of the regulatory action, Wells Fargo agreed to limit the total asset size of its holding company to the value at the end of the fourth quarter of 2017. This asset cap of $1.952 trillion would stay in place until the Federal Reserve determined the bank had made significant improvements to its corporate governance and risk management practices. In the words of the Wall Street Journal, the Federal Reserve had "..never before imposed such a broad restriction as part of an enforcement action" (Wall Street Journal, 2018). Market reaction to the news of the Consent Order was sharp and swift as Wells Fargo stock fell 9.2%, its worst day since April 2009. At the time of the asset cap, Wells Fargo was the third largest bank in the U.S. and accounted for 10.5% of total banking assets. The asset cap on Wells Fargo is a direct way of limiting a too-big-to-fail institution.

As of this writing, the asset cap remains in place. Figure 2 shows how the asset cap has affected Wells Fargo's growth in relation to Bank of America, JP Morgan, and Citigroup - the other three of the "Big 4" of American banking. While the other three banks have seen aggregate growth between 30%-50%, Wells Fargo has been forced to stay at the same size.

2.B Commercial Banking from 2018–2023Q1

The asset cap on Wells Fargo has been in place since early 2018. Over this period, there have been several distinct phases of banking sector evolution. In the first two years of the asset cap, the overall banking sector grew modestly at a rate similar to that in the preceding years. During the COVID-19 period, the aggregate banking sector saw significant growth owing to an inflow of deposits. Castro et al. (2022) show that the rise in aggregate deposits in 2020 and 2021 is outsized compared to any period in the past 30 years. They document four factors explaining this historic growth in aggregate deposits: (1) the initial spike in commercial and industrial (C&I) credit line drawdowns at the onset of the pandemic; (2) asset purchases by the Federal Reserve; (3) large fiscal transfers to households more likely to hold savings in the form of deposits; and (4) a higher personal savings rate.

The growth in aggregate deposits started to reverse once the Fed started to tighten monetary policy in early 2022. Figure 3 presents the weekly Fed Funds rate and the aggregate deposits in the U.S. banking sector from data in Fed Board Releases H.15 and H.8. It shows that the aggregate deposits started to reverse its previous growth at precisely the same time as the Fed started to increase the target Fed Funds rate at the end of March 2022, consistent with the deposits channel of monetary policy (Drechsler et al., 2017). The deposit outflow was exacerbated in March 2023, when the failure of SVB triggered a wider run on the banking sector.

Decomposing total deposits into insured and uninsured deposits reveals substantial differences during this period. Using the call report data[4], we calculate insured and uninsured deposits based on the deposit insurance limits and then sum across all filing banks to obtain the aggregate insured and uninsured deposits for the overall banking sector. We explain the detailed calculations for insured and uninsured deposits in Section 3.B. This comparison is done at the quarterly frequency as the call reports are filed quarterly. Figure 4 shows the quarterly dynamics of Fed Funds rate and cumulative growth of insured and uninsured deposits in the U.S. banking sector. It shows that the growth of uninsured deposits during the COVID-19 pandemic is more pronounced than the corresponding growth of insured deposits. Since the Fed started to tighten monetary policy and in particular during the regional bank crisis, there was substantial outflow of uninsured deposits from the banking sector. In contrast, insured deposits were relatively stable during the same period. This comparison suggests that, in the aggregate level, the deposit outflow

[4]Fed Board Release H.8 reports deposit breakdown by product type (e.g., checking, saving, time) and hence does not allow a decomposition into insured and uninsured deposits as deposit insurance limit is based on total balance across deposit products per depositor per bank.

during the monetary policy cycle is driven entirely by the outflow of uninsured deposits.

2.C Effects of the Asset Cap on Wells Fargo

Clearly, the asset cap has had an impact on Wells Fargo's operations, particularly during the COVID-19 period when the aggregate banking sector saw significant growth owing to an inflow of deposits. Figure 5 shows that the deposit growth of Wells Fargo slowed down relative to the other three largest BHCs since 2020. If Wells Fargo had grown at the same speed as the overall U.S. commercial banking sector, it would have had 414.19 billion additional deposits by the time the Fed started the monetary tightening in early 2022.

As for the asset side of the balance sheet, we compare the growth of loans and securities, two major types of assets, of Wells Fargo versus the other three large banks in Figure 6. As can be seen from this figure, although Wells Fargo experienced lower growth for both types of assets, it is the growth of securities that is significantly inferior compared to the other three large banks. Such a pattern is consistent with the notion that time deposits are used to fund loans while checking and savings deposits are used to fund securities Supera (2021). As is noted by Drechsler et al. (2023a), the recent increase in uninsured deposits is mostly in the form of checking and savings deposits. As a result, we expect the effects on other banks' lending to be muted.

We examine the evolution of Wells Fargo's geographic presence over this period in three key functions: deposit taking, small business lending, and mortgage lending. Data sources are the Community Reinvestment Act (CRA) data for small business lending, the Home Mortgage Disclosure Act (HMDA) data for mortgage lending, and the FDIC Summary of Deposits (SOD) data for deposit-taking. For each function, we count the number of counties that Wells Fargo was present in each year and scale the number of counties to the level in 2017. Figure 7 shows how Wells Fargo's geographic presence evolved over time using the common time period from the publicly released versions of the 3 data sources. We find that the geographic presence contracted for deposit-taking but stayed relatively constant for both small business and mortgage lending. Despite being constrained from asset growth, Wells Fargo was not forced to lend to fewer counties in either small business or mortgage lending, as high degrees of securitization and government support implies little balance sheet capacity is needed to make these loans. Such a pattern is consistent with our previous analyses showing that Wells Fargo appeared to be more constrained in taking deposits than in making loans. Therefore, in subsequent analyses on the spillover effects to other banks, we focus on deposit funding as opposed to lending.

2.D Potential Spillover Effects on other Banks

Since Wells Fargo is forbidden from growing its balance sheet beyond a certain level, it is forced to reduce its provision of banking services relative to what it would have been without the asset cap. We expect other banks to step in to fill the gap left by Wells Fargo. Motivated by prior literature that shows bank competition has a strong local component (e.g., Petersen and Rajan (1994); Berger and Udell (1995); Drechsler et al. (2017, 2021)), we expect banks more proximate to Wells Fargo at the time of the regulation to be more active in filling the gap than distant banks.

More specifically, the effect of the asset cap on other banks depends on the nature of the deposit gap left by Wells Fargo. A close examination of the behavior of Wells Fargo reveals that the gap mostly takes the form of *uninsured* deposits. Insured deposits are more stable than uninsured deposits. Conceptually, it makes sense for Wells Fargo to cut uninsured deposit funding when facing a constraint on asset growth. In addition, turning away a few large depositors may be operationally easier than turning away many small deposits to manage under a nominal asset cap. Wells Fargo's actions to manage under the asset cap, based on its annual reports, pertain to decreasing large business deposits. In 2020 and 2021, Wells Fargo stated in its annual reports that its efforts to manage under the asset cap involve decreasing business deposits. Such actions continued till early 2022. Compared to household deposits, business deposits are more likely to be uninsured due to their size. Therefore, Wells Fargo's description of its actions to manage under the asset cap provides specifics about how it reduces uninsured deposit funding. We verify this in the data by using a novel approach to proxy for retail and business deposits in a granular level. We focus our analysis on deposit funding as opposed to lending as the constraint faced by Wells Fargo is concentrated in the former function.

Given the deposit gap left by Wells Fargo in uninsured deposits, we expect that banks that are more geographically proximate to Wells Fargo grow their uninsured deposits faster than more distant banks following the asset cap, in particular during the COVID-19 pandemic. We also expect the additional growth of uninsured deposits enjoyed by more proximate banks to reverse course during the monetary tightening, especially during the regional bank crisis.

As Wells Fargo gave up large, uninsured deposits, other banks face a stronger demand for their deposits, particularly from uninsured depositors. Consistent with this demand shift, we expect banks that are more geographically proximate to Wells Fargo to pay lower interest on deposits than more distant banks following the asset cap, in particular during the COVID-19 pandemic. We also expect this lower deposit interest expense enjoyed by more proximate banks to reverse course during the monetary tightening and especially during the regional bank crisis.

In forthcoming sections, we test these predictions in the data.

3 Data and Variables

3.A Data Sources

To study the effect of the asset cap on Wells Fargo and its banking competitors, we combine a variety of data sets from public or standard sources:

Bank Financials: Quarterly data on the financial position of individual banks comes from the Reports of Condition and Income (aka 'Call Reports'). The Call Reports have income statement and balance sheet data on all U.S. depository institutions. For analyses at the holding company level, we use data from Form FR Y-9C. Both sets of data are available from the website of the Federal Financial Institutions Examination Council.

Local Deposits: Data on deposits at the branch level is obtained from the FDIC Summary of Deposits (SOD). The SOD covers the universe of U.S. bank branches at an annual frequency, and data is as of June 30 each year. The data includes the dollar amount of deposits at each branch, the physical location, and the identity of the bank that owns the branch.

Stock Returns: We get stock return data from CRSP. To obtain a comprehensive list of publicly traded banks, we start with the CRSP-FRB link available from the Federal Reserve Bank of New York.[5]. We merge this set with the list of banks obtained using the methodology of Gandhi and Lustig (2015). We include all banks that appear on both lists. For banks appearing on only one of the lists, we manually confirm that it is a commercial bank or bank holding company during our sample period.

3.B Sample and Key Variables

The asset cap on Wells Fargo is effective at the top-tier holding company level. In what follows, our sample of banks include all banks whose regulatory high-holder is not Wells Fargo & Company and file call reports and report to SOD.

For quarterly analysis using the Call Reports, our sample period starts from the first quarter of 2013 and runs through the first quarter of 2023. This period covers 20 quarters before the asset cap became effective (2013Q1 to 2017Q4) and 21 quarters after the asset cap became effective (2018Q1 to 2023Q1). For annual-frequency analysis using the SOD

[5] Available at `https://www.newyorkfed.org/research/banking_research/datasets.html`

data, our sample period covers the 10 years from 2013 to 2022, with 5 years before the asset cap (2013 to 2017) and 5 years after (2018 to 2022).

The first measure of funding fragility we use in our analysis is the fraction of deposits in the form of uninsured deposits. The regional bank crisis of 2023 saw a run by uninsured depositors concerned by an increase in banks' unrealized asset losses due to a rise in interest rates (Jiang et al., 2023b; Drechsler et al., 2023b). We calculate insured and uninsured deposits based on the deposit insurance limits. The Federal Deposit Insurance Corporation (FDIC) provides deposit insurance in order to guarantee the safety of deposits in member banks. Last changed in 2008, the FDIC insurance limits are constant throughout our sample period. Schedule RC-O "Other Data for Deposit Insurance and FICO Assessments" of the Call Reports (FFIEC 031 and 041) reports the total amount and number of deposit accounts for those above and below the FDIC limits in its Memoranda item 1. Following Bai et al. (2018), we calculate insured deposits as the combination of (i) all deposits lower than the FDIC limit of $250,000 and (ii) the first $250,000 dollar amount in the accounts above the limit multiplied by the number of such deposit accounts. Uninsured deposits are calculated as all deposits greater than the FDIC limit $250,000 minus the insured portion of these large deposit accounts. Using the same data in Schedule RC-O, we also calculate the total number and average size of deposit accounts.

We also use uninsured leverage as another measure for funding fragility. Following Jiang et al. (2020, 2023b), uninsured leverage is defined as uninsured debt funding to assets, where uninsured debt consists of uninsured deposits, foreign deposits, repos, other borrowed money, and subordinated debt.

To measure deposit pricing, we rely on the reported interest expense from the Call Reports. We calculate the deposit interest expense as the quarterly interest expense on domestic deposits divided by the quarterly average of domestic deposits, multiplied by 4 to obtain an annual deposit rate, and then multiplied by 100 to yield a percentage point interpretation. This measure reflects the average deposit rate a bank pays on its deposits including both insured and uninsured deposits. The Call Reports also contain a decomposition of deposit interest expense by type (e.g., checking, savings, and time deposits) but do not contain any breakdown corresponding to insured and uninsured deposits. As uninsured deposits can be from any of these types[6], we believe that the overall deposit interest expense is best suited for the analysis of the pricing of uninsured deposits.[7]

During our sample period, the severity of U.S. bank regulation relies on nominal size thresholds and the exact regulation imposed on banks in a size group can change over time (Alvero et al., 2022).[8] Since the Dodd-Frank Act applies to the highest holding entity, we use the consolidated total assets of the regulatory high holder to construct the size groups. Specifically, for commercial banks that are not part of a bank holding company, we use the consolidated total assets of the banks; for banks that belong to a bank holding company, we use the consolidated total assets of their top-tier bank holding companies. We follow Alvero et al. (2022) to use the quarter-end assets to construct the size groups.[9]

For other variables we use in our analysis, we follow Drechsler et al. (2017, 2021) to form consistent time-series data.

[6]Other than the large-denomination time deposits, large corporate checking and savings accounts may constitute the bulk of uninsured deposits for some banks, such as in the case of Silicon Valley Bank (SVB).

[7]An alternative data source that has been used in the empirical literature to measure deposit pricing is the RateWatch data, which reports the weekly branch-level deposit rates on new accounts by product. Although the RateWatch data offers higher frequency and more granularity measures, its coverage is mostly limited to retail deposit products (e.g., Drechsler et al., 2017, 2021). Also, it only covers new accounts. As such, it is not useful to reflect the pricing of uninsured deposits that mostly consist of large, business deposits.

[8]For instance, in the original formulation of the Dodd-Frank Act, banks with more than \$10 billion in assets are subject to stress tests. In 2018, the U.S. Congress passed the Economic Growth, Regulatory Relief, and Consumer Protection Act, partially reversing some regulations of the Dodd-Frank Act. As a result, banks with more than \$10 billion in assets are no longer required to conduct stress tests except for those whose assets are greater than \$250 billion.

[9]Alvero et al. (2022) show that this simple measure of size is useful to analyze the impact of size-based bank regulation, although The Dodd-Frank Act does not provide a uniform methodology to determine bank size for regulatory purposes and separate rulemaking processes use slightly different methodologies to determine bank size.

3.C Measuring Proximity to Wells Fargo

We measure proximity to Wells Fargo from the geographic distribution of bank branches across granular local deposit markets using the FDIC SOD data. We measure Wells Fargo presence in 2017, just before the asset cap came into effect, as the presence of a physical deposit-taking branch. We create a zip-code level indicator that equals 1 if the zip code contains a Wells Fargo branch in 2017 and 0 if the zip code contains bank branches in 2017 but not of Wells Fargo. Figure 8 shows the distribution of this measure of zip-code level Wells Fargo presence across the United States. The map shows that Wells Fargo has a national presence, with particular strength in the Western and Southeastern United States.

Armed with this granular measure of Wells Fargo presence, we compute the bank-level proximity to Wells Fargo based on the following formula:

$$\text{Proximity}_b = \frac{\sum_z \text{Deposits}_{b,z} \times \text{WFC}_z}{\sum_z \text{Deposits}_{b,z}} \tag{1}$$

The proximity of bank b is the fraction of its deposits in 2017 ($\text{Deposits}_{b,z}$) that are in zip codes that also have a Wells Fargo branch in 2017 (WFC_z). In computing *Proximity* using 1, we exclude the deposits in the bank's main office in the calculation. This is because banks are allowed to allocate to the main office deposits that they cannot categorize geographically. As such, deposits in the main branch may not reflect the true deposits in that location.

3.D Summary Statistics

We report the summary statistics for bank size, treatment intensity, and deposit composition and pricing in Table 1. The sample includes all non-Wells Fargo banks in the call report data for the period from 2013 to 2023:Q1. Size groups of banks are defined using nominal size thresholds following the regulatory practices of the Dodd-Frank Act:

Community banks are banks with quarter-end assets not exceeding $10 billion; regional banks are defined as the banks with quarter-end assets above $10 billion but not exceeding $250 billion; and national banks are defined as banks with quarter-end assets above $250 billion.

Consistent with the size skew in U.S. bank sizes, over 96% of banks are categorized as community banks while only 0.3% are national. The mean of the proximity measure is 0.247 but the median bank has a proximity measure of 0, indicating that none of its branches share a zip code with a Wells Fargo branch.

4 Reallocation of Uninsured Deposits due to the Asset Cap

4.A Descriptive Evidence

The distinction between household and corporate depositors maps naturally to that between insured and uninsured depositors given the existing deposit insurance limit of $250,000. Household deposits are mostly "sleepy" insured deposits due to limited financial sophistication (Drechsler et al., 2017) and size. On the other hand, business deposits are more likely to be uninsured due to their size, and more volatile due to firms' risk-taking & reaching for yield (e.g., Duchin et al. (2017)). To test this, however, is challenging as there does not exist a reliable measure of household and business deposits at the local level. To overcome this challenge, we introduce a novel proxy for business deposits.

Drawing on the insights from the urban economics literature, we define the central business district (CBD) for each metropolitan statistical area (MSA). Following the literature (e.g. Holian and Kahn (2012)), we collect the latitude and longitude output by Google's Geocoding API when just the name of an MSA's primary city is input. The MSA's CBD is then defined as the area within a 1 kilometer radius of this central point (Conwell et al., 2023). As branches located in CBDs are most likely to cater to business clients, we can use deposits in these branches to proxy for business deposits.

We validate the measurement of business branches using CBD branches in several ways. Firstly, CBD branches are large branches – they account for 3% of branches but 20% of deposit amount. Main offices, where large corporate deposits are likely to be registered in the SOD data are likely to be CBD branches. Secondly, CBD branches are roughly twice as likely as average branches to report business deposit products. In what follows, we refer to the CBD branches and main offices collectively as "business branches" and the other branches as "retail branches".

Figure 9 shows that Wells Fargo gives up large business deposits while keeps experiencing growth in retail deposits. Figure 10 compares the composition of deposit growth of higher- and lower-proximity banks side by side. Overall, higher-proximity banks experience a more substantial cumulative deposit growth than lower-proximity banks, consistent with their more active role in filling the Wells Fargo gap due to geographic proximity. The composition of deposit growth also shows higher-proximity banks' active role in filling the gap in uninsured deposits: For higher-proximity banks, deposits in business branches grow faster than deposits in retail branches. The reverse is true for lower-proximity banks.

Figure 11 compares the cumulative growth of the fraction of uninsured deposits in total deposits among higher- versus lower-proximity banks. For each bank, we normalize the fraction of uninsured deposits to the 2017:Q4 level and then average the normalized fraction across banks in the groups of higher- and lower-proximity banks separately. The figure shows that the share of uninsured deposits increased for both groups till the Fed started monetary tightening in early 2022. The effect is particularly stark during the COVID-19 pandemic, consistent with the larger increase in aggregate uninsured deposits during the same period in Figure 4. The difference between the two groups, however, was minimal before the asset cap on Wells Fargo was enacted suggesting they were on parallel trends. After the asset cap was imposed on Wells Fargo, the two groups still behaved similarly in the unconditional comparison for approximately two years. Once the COVID-19 pandemic started in 2020:Q1, the two groups started to diverge – higher-proximity banks experienced a faster increase in the share of uninsured deposits than lower-proximity banks. Such a pattern is consistent with our earlier findings using business branches to proxy for large corporate deposits. Since the Fed's monetary tightening in early 2022, the growth in uninsured deposits appeared to come to a stop, before turning negative during the regional bank crisis in March 2023. During the run, higher-proximity banks experienced a greater outflow of uninsured deposits than lower-proximity banks.

4.B Empirical Strategy

To test the relationship between proximity to Wells Fargo and bank outcome, we estimate the following regression via OLS:

$$y_{b,t} = \mu_b + \pi_{s,t} + \beta_{pre} \cdot (Proximity_b \times \mathbb{1}(Pre)_t) + \sum_T \beta_{post,T} \cdot (Proximity_b \times \mathbb{1}_{t,T}) + \varepsilon_{b,t} \tag{2}$$

The outcome variable is a characteristic of bank b at year-quarter t. $Proximity_b$ is bank b's overall proximity to Wells Fargo, calculated as averaged across all branches that the bank operated in as of 2017. $\mathbb{1}(Pre)_t$ is an indicator variable equal to 1 for the four quarters in 2017, the year before the asset cap was imposed on Wells Fargo. The sub-period indicators $\mathbb{1}_{t,T}$ for $g \in \{1, 2, \ldots, 4\}$ indicate the four sub-periods since the asset cap was imposed in the first quarter of 2018: the first sub-period is the first two years of the asset cap and includes a total of 8 quarters in 2018 and 2019; the second sub-period corresponds to the COVID-19 pandemic and includes a total of 9 quarters from 2020 to the first quarter of 2022; the third sub-period denotes the monetary tightening in 2022 and includes the 3 quarters from 2022Q2 to 2022Q4; and the fourth and last sub-period contains 2023Q1 and corresponds to the regional bank crisis in 2023.

In this dynamic specification, the independent variables of interest are the interaction terms of $Proximity_b$ and the time-period indicators. The omitted baseline period is the period of 2013 to 2016, up to two years prior to the imposition of asset cap on Wells Fargo.

$\beta_{post,T}$ captures the response in the behaviors in the sub-period T after the imposition of the asset cap compared to the baseline period. β_{pre} measures the response in the behaviors in the year before the imposition of the asset cap relative to the baseline period. For our difference-in-differences design to be valid, we would expect a statistically insignificant and economically small β_{pre} (i.e., parallel trends in the pre-treatment period).

Bank fixed effects μ_b control for time-invariant bank-specific factors. Time fixed effects $\pi_{s,t}$ neutralize the impact of aggregate dynamics and all other time-series fluctuations. To fully control for the impact of the time-varying bank regulation based on nominal size thresholds (Alvero et al., 2022), we include a separate set of time fixed effects for each nominal size group (hence the subscript s). Since the Dodd-Frank Act applies to the highest holding entity, we use the consolidated total assets of the regulatory high holder to construct the size groups, as detailed in Section 3.B.

By comparing changes in the behaviors across banks with varying degrees of pre-deteremined proximity to Wells Fargo, our empirical approach can be described as a difference-in-differences (DiD) design with continuous treatment intensity. We cluster standard errors by bank.

4.C Results

We test the spillover effects of the asset cap on Wells Fargo in the sample of all banks whose regulatory high-holder is not Wells Fargo & Company using the call report data. Table 2 shows the relationship between the proximity to Wells Fargo and the growth rate of the fraction of uninsured deposits in total deposits. The outcome variable is multiplied by 100 to yield a percentage point interpretation. Column (1) reports the estimates obtained in the sample of all non-Wells Fargo banks. The growth of uninsured deposits did not differ significantly between higher- and lower-proximity banks in the four quarters before the asset cap, validating the parallel trends assumption. The parallel pre-trends suggest that any reputation damage that Wells Fargo may have experienced as a result of the cross-selling scandal did not materially lead to a reallocation of deposits before the asset cap was imposed. In the first two years after the asset cap was put in place, higher-proximity banks started to grow their uninsured deposits significantly faster than lower-proximity banks. The difference in uninsured deposit growth widened during the COVID-19 pandemic. As the Fed started to tighten monetary policy in 2022, higher-proximity banks saw a larger uninsured deposit outflow than lower-proximity banks. The outflow was exacerbated during the first quarter of 2023, when the failure of SVB triggered a wider run in the banking sector.

Columns (2) to (4) repeat the same analysis in three sub-samples of banks of different size: community banks, defined as the banks with quarter-end assets not exceeding $10 billion; regional banks, defined as the banks with quarter-end assets above $10 billion but not exceeding $250 billion; and national banks, defined as banks with quarter-end assets above $250 billion. Column (2) indicates that, among the sample of community banks, high-proximity banks see a significant increase in uninsured deposit funding during the first two years of the asset cap as well as the pandemic relative to low-proximity banks. During the monetary tightening, the difference is insignificant but during the first quarter of 2023, high-proximity community banks did experience higher outflows.

Column (3) shows that, among regional banks, the effect of proximity only becomes significant during the pandemic period. However, the magnitude of the effect is larger than among community banks. During the monetary tightening and run period, high-proximity banks experience significantly larger outflows. For the smaller sample of national banks (Column (4)), the results are only significant during the run period.

Table 3 shows the impact of proximity to Wells Fargo on deposit pricing. We use the overall deposit interest expense rate as it comprehensively reflects the average deposit rate a bank pays on its deposits including both insured and uninsured deposits. Column (1) reports the estimates obtained in the sample of all non-Wells Fargo banks. We find that higher-proximity banks are able to pay lower deposit rates than lower-proximity banks after the enactment of the asset cap on Wells Fargo, particularly during the COVID-19 pandemic when the overall banking sector experienced a large inflow of deposits. A lower deposit rate corresponds to a higher deposit spread, i.e., the difference between a competitive open-market rate such as the Fed funds rate and the deposit rate, all else equal. The deposit spread represents the opportunity cost of holding deposits (Drechsler et al., 2017), hence, our estimates suggest that deposits in higher-proximity banks become relatively more expensive for depositors, particularly during the COVID-19 pandemic. The asset cap on Wells Fargo appears to shift the demand for uninsured deposits for banks geographically proximate to Wells Fargo rather than their supply of uninsured deposits. This follows from the fact that prices (deposit spreads) and quantities (uninsured deposit growth) move in the same direction. By contrast, a shift in supply would cause the prices and quantities to move in opposite directions. As the Fed started to tighten monetary policy in 2022, higher-proximity banks experienced a more rapid increase in the interest expense on deposits than lower-proximity banks. Such differential pricing further widened during the regional bank crisis of 2023. Columns (2) to (4) repeat the same analysis for the respective samples of community, regional, and national banks.

Table 4 shows the relationship between the proximity to Wells Fargo and alternative measures for the growth of uninsured deposits. In Column (1), the outcome variable is the growth rate of uninsured leverage (Jiang, Matvos, Piskorski, and Seru, 2020, 2023a), multiplied by 100 to yield a percentage point interpretation. The estimates show that the growth of uninsured leverage exhibits a similar pattern as that of the fraction of uninsured deposits in total deposits (Column 1 of Table 2). In Columns (2) and (3), we examine the impact on the number and size of deposit accounts. Banks proximate to Wells Fargo started to gain depositors after the asset cap on Wells Fargo. The average balance per depositor in these banks did not respond significantly during the first two years of the asset cap, but increased during the COVID-19 pandemic. Since the monetary tightening in 2022, the average balance per depositor reversed its previous increasing trend and started to decrease in these banks. Such a decrease was more pronounced during the regional bank crisis of 2023. Overall, the dynamic pattern of average size of deposit accounts presents a consistent picture as the dynamics of the fraction of uninsured deposits: Banks proximate the Wells Fargo started gain large uninsured depositors after the asset cap on Wells Fargo, particularly during the COVID-19 pandemic when the banking sector experienced large deposit inflows. The trend reversed since the Fed started to tighten monetary policy in 2022 and the reversal became more acute during the first quarter of 2023, when the failures of SVB triggered a wider run in the banking sector.

5 The Wells Fargo Asset Cap and Local Deposits

5.A Empirical Strategy

In the preceding analysis, we show that banks more proximate to Wells Fargo saw a greater increase in uninsured deposits once the asset cap was put in place, particularly during the pandemic period. However, ascribing causality to those results is challenging. The reason is due to the problem of omitted variables. It is possible there is a factor correlated both with a bank competing with Wells Fargo ('proximity') and it receiving an influx of uninsured deposits during the pandemic. An example would be demand factors local to the banking markets that Wells Fargo serves.

In order to assuage some of these identification concerns, we utilize branch deposit data from the Summary of Deposits. We undertake a standard difference-in-differences analysis at the level of the bank branch to test if bank branches proximate to Wells Fargo branches experience higher deposit growth following the imposition of the asset cap. We use OLS to estimate the following linear model at the branch-year level:

$$y_{i,b,z,t} = \mu_{bz} + \pi_{bct} + \beta \cdot (Treat_z \times Post_t) + \varepsilon_{i,z,b,t} \tag{3}$$

The outcome variable is the growth rate of deposits at branch i owned by bank b

located in zip code z from year $t-1$ to year t. The independent variable of interest, $Treat_z \times Post_t$, is the interaction of two indicator variables. $Treat_z$ takes the value 1 if zip code z has a Wells Fargo branch in 2017, and 0 otherwise. $Post_t$ takes the value 1 if year t is 2018 or later. Bank×Zip fixed effects account for any time-invariant local economic factor that is correlated with the presence of bank b in zip code z. In our tightest specification, we include Bank×County×Year fixed effects. This specification not only accounts for any time-varying local economic factors at the county level, it also accounts for time-varying bank activity at the county level. Our empirical model compares outcomes for two branches belonging to the *same* bank operating in the *same* county in the *same* year. We cluster standard errors by zip code since our treatment is at that level.

5.B Results

Table 5 reports the estimates from equation (3) in Column (1). It shows that branches directly competing with Wells Fargo saw higher deposit growth than other branches of the same bank. In Column (2), we additionally control for time-varying zip-code level economic indicators and obtain similar results. The coefficient implies a higher deposit growth of about 0.4%, which is substantial given the sample mean deposit growth of around 10%. In Columns (3) to (6), we repeat the analysis for subsamples of banks with different size. As before, we distinguish community and regional banks (banks with total assets below $250 billion) from national banks (banks with total assets at least $250 billion). We find that the effects are driven by smaller banks.

If the effect of the Wells Fargo asset cap is stronger for uninsured deposits, we expect the results to be stronger for those regions which include central business districts. We split our sample into CBD and non-CBD counties where the former includes all counties that have part or whole of a CBD within them. Table 6 reports the estimates for these two sub-samples. In CBD counties, the deposit growth for other banks, when they overlap with Wells Fargo, is stronger than in the baseline. In non-CBD counties, the effect is substantially smaller in magnitude, and statistically insignificant.

Table 7 reports the estimates when we exclude certain areas from our analyses. In Columns (1) and (2), we repeat the analyses by excluding bank branches located in the Silicon Valley area.[10] The estimates remain virtually unchanged, implying that our results are not merely driven by the tech sector or the idiosyncratic features of the Silicon Valley Bank. In Columns (3) and (4), we exclude bank branches located in New York City and find that the estimates become stronger. This could be due to the fact that large banks are over-represented in bank branches in New York City than elsewhere. As we show in Table 5, the observed higher deposit growth among bank branches proximate to Wells Fargo branches is primarily driven by smaller banks.

5.C Addressing Threats to Identification

We perform two falsification tests to further address concerns about spurious correlations between proximity to Wells Fargo branches and other covariates of deposit growth.

In the first test, we test for whether proximity to large banks in general can qualify as an explanation for our findings. Specifically, we assume each of the 25 largest bank holding companies was treated[11], i.e., subject to the "asset cap" and examine whether other banks' branches close to the fictitiously treated large bank grows deposits faster than other branches of the same banks in the same county in the same year using equation (3). By construction, branches close to these fictitiously treated large banks are similarly proximate to large banks as branches close to Wells Fargo, and their deposit growth provide a useful reference for the impact of being proximate to large banks in general. The results from this falsification test is presented in Figure 12: The coefficient on the DID variable is plotted on the x-axis, and the corresponding t-statistic is plotted on the y-axis. The size of

[10]Specifically, we exclude bank branches in the two MSAs containing San Francisco and San Jose–the San Francisco-Oakland-Berkeley, CA or the San Francisco-Oakland-Hayward, CA MSA, and the San Jose-Sunnyvale-Santa Clara, CA MSA–from the analyses.

[11]For this test, we set a condition that each bank exists for the entirety of the sample period. This restriction leads to the exclusion of Suntrust, which merged with BB&T in 2019. The resulting bank, Truist, took BB&T's bank identifiers.

the bubble indicates the relative size of the treated bank. In the figure, we also mark the four large bank holding companies–JP Morgan ("JPM"), Bank of America ("BAC"), Wells Fargo ("WFC"), and Citigroup ("C"). The graph shows that only when Wells Fargo is the treated bank is the t-statistic above 1.96 (5% significance). In particular, Wells Fargo's estimated spill-over effect is substantially different from those of other three of the Big-4 of American banking. This falsification test rules out the proximity to large banks in general as the alternative explanation for our findings.

In the second test, treatment is randomly assigned to zip codes with the total number of treated zip codes being 4,373 (the number of zip codes with Wells Fargo presence in 2017). 500 such random permutations of treated zip codes are created and the baseline analysis is conducted on each of these permutations. A histogram of the resulting DID coefficent is plotted in Figure 13. The dashed red line indicates the coefficient with the actual Wells Fargo-treated zip codes. The estimated increase in deposit growth in Wells Fargo zip codes, 0.4214 percentage points (Column 1, Table 5) is larger than all but one of the bootstrapped coefficients in the 500 iterations. In other words, this bootstrap test rejects the hypothesis that the observed deposit growth response could simply be random.

6 Discussion

6.A Aggregate Implications of the Asset Cap

We perform back-of-the-envelope calculations to quantify the aggregate implications of the asset cap on Wells Fargo.

In Table 8, we compare the magnitude of deposits that Wells Fargo could not acquire due to the asset cap with that of the additional deposits that banks with positive proximity to Wells Fargo took. We use the growth rate of the entire commercial banking sector as a counterfactual growth rate. Building on our earlier findings, we trace through four distinct periods: first 2 years of the asset cap (2018–2019), COVID-19 pandemic (2020–2022Q1), monetary tightening in 2022 (2022Q2–2022Q4), and the crisis period (2023Q1).

For Wells Fargo, the deposit gap equals the counterfactual deposit amount minus the actual deposit amount in each period. For banks with positive proximity to Wells Fargo, the deposit excess equals the actual deposit amount minus the counterfactual deposit amount in each period. We also calculate the cumulative gap and excess over the periods. Based on this stylized calculation, Wells Fargo's deposit growth rate fell behind the overall banking sector in the first 2 years of the asset cap and the difference widened during the COVID-19 pandemic. During the same periods, the deposit growth rate of banks with positive proximity to Wells Fargo outpaced the sector-wide growth rate. By 2022Q1, Wells Fargo's deposit gap amounted to 414.19 billion, while positive-proximity banks jointly enjoyed a deposit excess of 477.30 billion. During the monetary tightening in 2022, Wells Fargo actually experienced faster deposit outflow than the banking sector as a whole, resulting in its deposit gap widening to 448.21 billion by the end of 2022 (relative to a deposit excess of 465.49 billion for positive-proximity banks). During the run period in 2023Q1, Wells Fargo experienced a slower deposit outflow than the overall banking sector, while positive-proximity banks experienced faster deposit outflows than the banking sector.

Table 9 repeats the analysis for uninsured deposits. By 2022Q1, Wells Fargo's uninsured deposit gap amounted to 231.25 billion, while banks with positive proximity to Wells Fargo jointly enjoyed an uninsured deposit excess of 235.99 billion.

In Figure 14, we present results from a separate analysis that quantifies how much of the inflow in total deposits at positive-proximity banks can be attributed to Wells Fargo. This analysis assumes that the deposits are divided based on the bank's pre-existing size and magnitude of geographic proximity to Wells Fargo. As expected, the results show that high-proximity banks have a higher percentage of new deposits attributable to Wells Fargo than low-proximity banks. We also indicate where the two failed regional banks, Silicon Valley Bank (SVB) and First Republic Bank (FRC), are located in the distribution.

Figure 15 presents the analogous analysis for uninsured deposits. The differences between high- and low-proximity banks resembles those in the previous figure: high-proximity banks have a higher percentage of new uninsured deposits attributable to Wells Fargo than low-proximity banks. For example, SVB is at 9.07% in this figure since it had an increase of $118 bn in uninsured deposits in the period from 2020 to 2022Q1, of which our weighting scheme suggests about $11 bn came from filling the gap left by Wells Fargo. Another failed bank, First Republic Bank (FRC), saw a similar level of its uninsured deposit increase attributable to filling the Wells Fargo gap.

6.B Policy Implications

The asset cap is an example of a regulation targeting an institution rather than an activity (Farhi and Tirole, 2020). But because it binds, it de facto regulates an activity; in this case, the provision of uninsured deposits. The policy is akin to imposing different marginal tax rates on the same activity across different institutions (Greenwood et al., 2017), creating a distortion. Of course it can be argued that, ex-ante, it is unclear *which* activity will suffer the distortion. However, given the key role of deposits on the bank's balance sheet and the relative ease of adjusting uninsured deposits, this was perhaps not that difficult to guess ex-ante.

Our results also have implications for the oversight of smaller banks. The failure of SVB presents an example of overlooked fragility due to more relaxed regulation faced by non-systemically important banks (non-SIBs). Despite being the 16$^{\text{th}}$ largest bank in the US prior to its abrupt failure in March 2023, SVB was not subject to the Liquidity Coverage Ratio (LCR) rule (Davies, 2023). Feldberg (2023) analyzes SVB's public financial information and concludes that its LCR would have been 75% in 2022 if it were subject to the rule, substantially below the minimum threshold of 100%. Our results show that flighty uninsured deposits accumulate at smaller banks due to the gap left by Wells Fargo.

More broadly, size-based bank regulation has the capacity to create constraints on large banks, particularly during periods of growth. This, in turn, leads to a reallocation to smaller banks who grow faster and take on risks that later metastasize (Gelman et al., 2023). This tension at the heart of size-based bank regulations only promises to grow more relevant as policymakers contemplate actions similar to the Wells Fargo asset cap in the future.[12]

7 Conclusion

The Wells Fargo asset cap is a unique regulatory experiment – a hard constraint on the size of a TBTF institution. In this paper, we provide the first systematic analysis of the cap's impact on Wells Fargo and its competitors. Following the cap's imposition, Wells Fargo contracted geographically, and experienced sluggish deposit growth relative to its peers. Deposits, particularly uninsured deposits, were redistributed to banks geographically proximate to Wells Fargo. In turn, these banks experienced higher deposit outflows once monetary tightening commenced, and had lower equity returns during the regional bank crisis of 2023.

While we do not undertake a complete welfare analysis of the asset cap, our results point to several dimensions along which the asset cap's influence can be measured. On the one hand, our aggregate results indicate that the Wells Fargo deposit "gap" was filled within the banking system itself. This is, perhaps, the reason we do not uncover much impact on the lending side. On the other hand, the banks that filled the gap were not Wells Fargo's peers but smaller, less regulated banks. Given that the deposit mix was weighted towards uninsured deposits, this allowed fragility to accumulate in places with potentially less oversight. With asset caps having the potential to be part of the regulatory toolkit going forward, our results point to the key role that bank geographic structure still plays in the transmission of the effects of regulatory action.

As for the current tale, the Wells Fargo asset cap remains in place as of this writing. An interesting avenue for future research would be the reaction of Wells Fargo and its

[12] A recent example is the OCC forbidding Citigroup from undertaking acquisitions starting in October 2020.

competitors once the cap is lifted. Will there be a sharp increase in Wells Fargo's growth, at the expense of its proximate banks, or is the business it lost gone for good? The answer to this question will provide the necessary epilogue to this tale.

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Figure 1: **Proximity to Wells Fargo and Stock Returns during the Run**

This figure uses a binscatter plot to depict the relationship between proximity to Wells Fargo and the stock returns during the run period in the sample of publicly listed bank holding companies and banks. Following Cookson et al. (2023), we consider the period from March 6 to March 14, 2023 to be the run period. We report the β coefficient and t-statistic from the underlying regression of returns on proximity. Data on returns is from CRSP. The bank-level *Proximity to Wells Fargo* is the fraction of the bank's deposits in 2017 that are in zip codes that also have a Wells Fargo branch in 2017, computed using using Equation 1 from the FDIC SOD data. To obtain a comprehensive list of publicly traded bank holding companies and banks, we start with the CRSP-FRB link available from the Federal Reserve Bank of New York. We merge this set with the list of banks obtained using the methodology of Gandhi and Lustig (2015). We include all banks that appear on both lists. For banks appearing on only one of the lists, we manually confirm that it is a commercial bank or bank holding company.

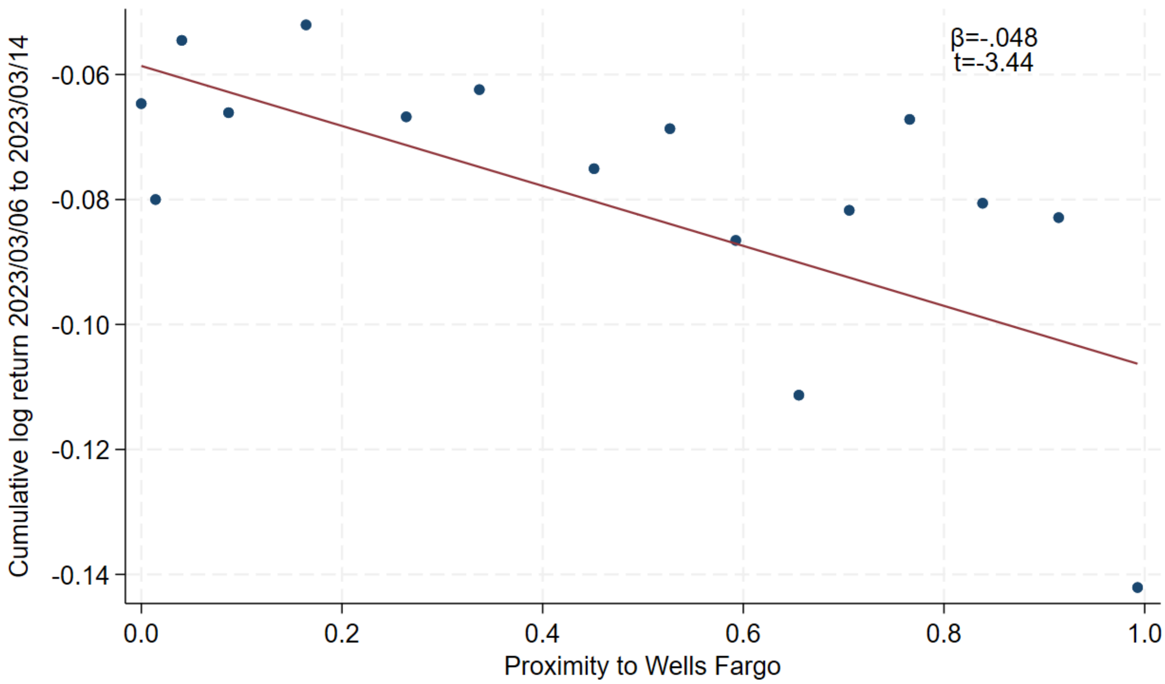


Figure 2: **Asset Growth of Top 4 Bank Holding Companies**

This figure compares the asset growth of the top 4 U.S. bank holding companies– JP Morgan, Bank of America, Citigroup, and Wells Fargo. We normalized the total assets of the 4 bank holding companies to their respective levels in 2017:Q4. The vertical line indicates 2017:Q4.

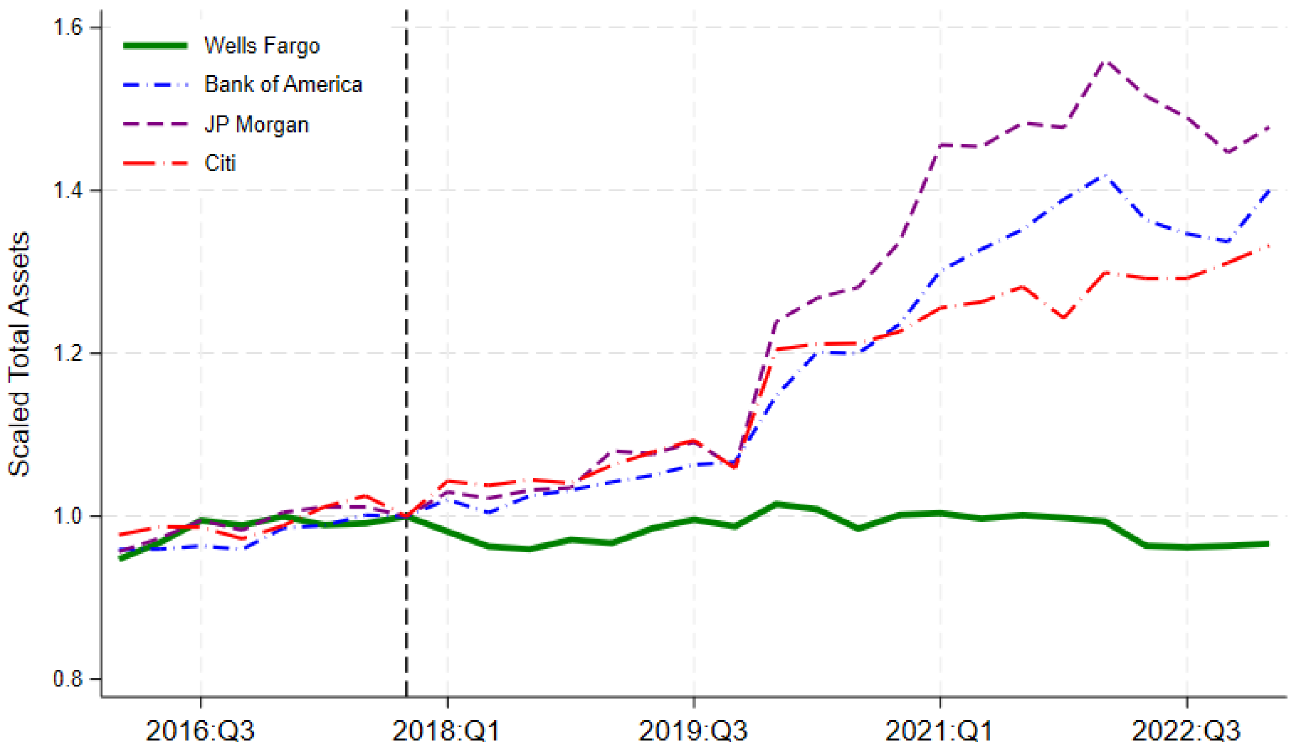


Figure 3: **Weekly Evolution of Federal Funds Rate and Aggregate Deposits in 2013–2023:Q1**

This figure shows the weekly evolution of the federal funds effective rate (left axis) and aggregate deposits of the commercial bank sector (in billions of USD, right axis). The weekly data for the federal funds effective rate is from Fed Board Release H.15 "Selected Interest Rates" and downloaded from FRED (series name: FF). The weekly data for aggregate deposits of the commercial bank sector is from Fed Board Release H.8 "Assets and Liabilities of Commercial Banks in the United States" and downloaded from FRED (series name: DPSACBW027SBOG). The three vertical lines indicate the time when the Fed lowered the interest rate at the onset of the COVID-19 pandemic in mid March 2020, when the Fed started raising interest rate in March 2022, and when the regional bank crisis unfolded in March 2023.

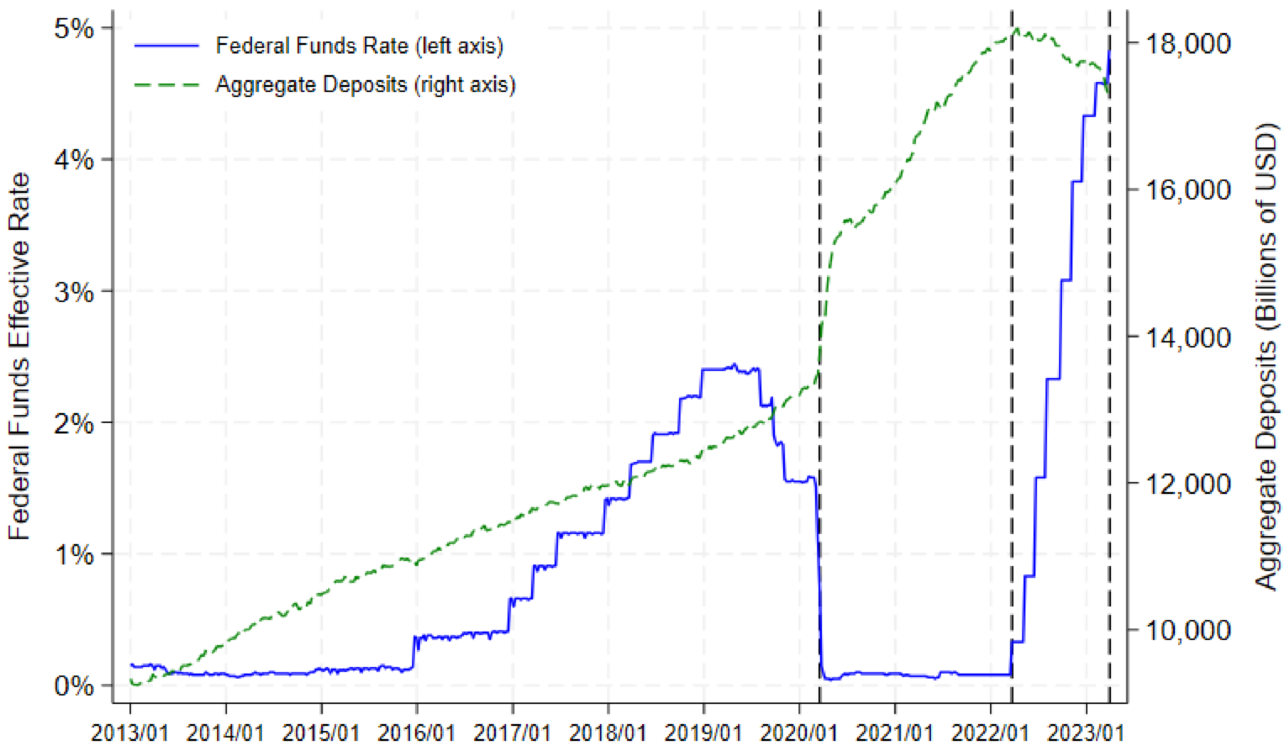


Figure 4: **Quarterly Evolution of Federal Funds Rate and Aggregate Insured versus Uninsured Deposits in 2013–2023:Q1**

This figure shows the quarterly evolution of the federal funds effective rate (left axis) and aggregate insured and uninsured deposits of the commercial bank sector (normalized to their respective levels in 2017:Q4, right axis). For the federal funds effective rate, we download the daily federal funds effective rate from Fed Board Release H.15 "Selected Interest Rates" (FRED series name: DFF) and take its average within a quarter to be the quarterly federal funds effective rate. We calculate insured and uninsured deposits based on the deposit insurance limits using the call report data (details in Section 3.B) and sum across all filing banks to obtain the aggregate insured and uninsured deposits for the overall banking sector. We normalized the aggregate insured and uninsured deposits to their respective levels in 2017:Q4. The three vertical lines indicate 2020:Q1 (when the Fed lowered the interest rate at the onset of the COVID-19 pandemic), 2022:Q1 (when the Fed started raising interest rate), and 2023:Q1 (when the regional bank crisis unfolded).

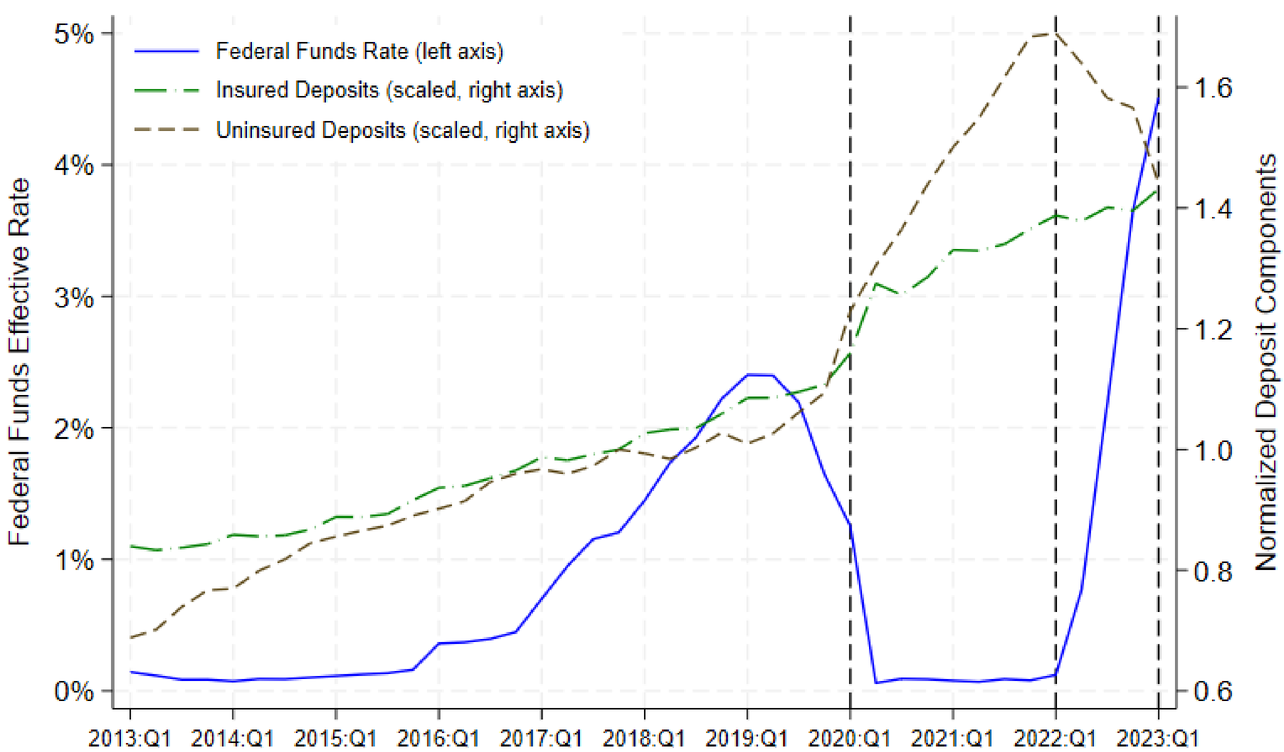


Figure 5: **Deposit Growth of Top 4 Bank Holding Companies**

This figure compares the deposit growth of the top 4 U.S. bank holding companies– JP Morgan, Bank of America, Citigroup, and Wells Fargo. We normalized the total deposits of the 4 bank holding companies to their respective levels in 2017:Q4. The vertical line indicates 2017:Q4.

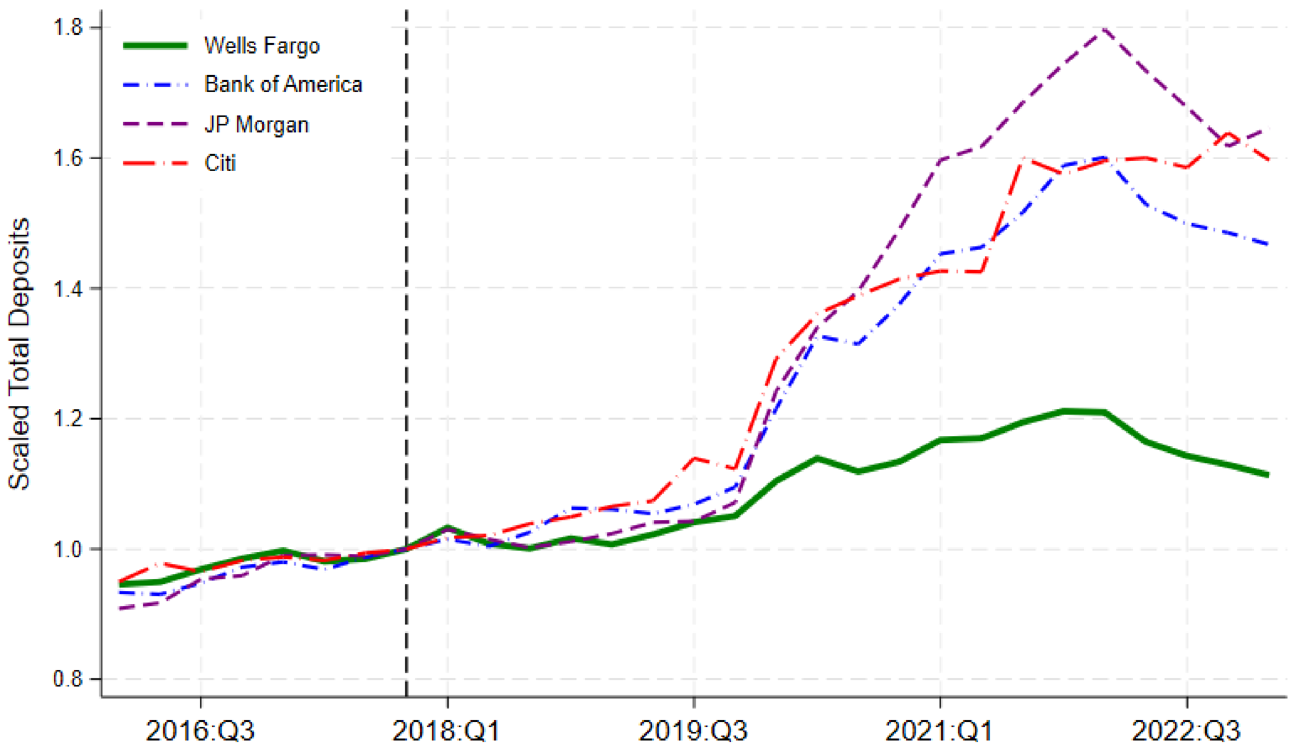
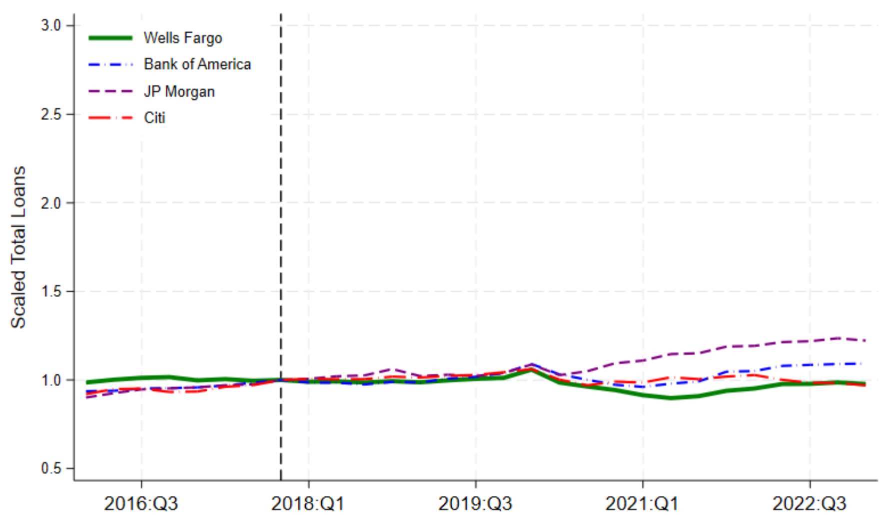


Figure 6: **Growth of Loans versus Securities of Top 4 Bank Holding Companies**

This figure compares the loan growth of the top 4 U.S. bank holding companies– JP Morgan, Bank of America, Citigroup, and Wells Fargo in Panel (A) and the growth of securities holding in Panel (B). We normalized the total loans and total securities holding of the 4 bank holding companies to their respective levels in 2017:Q4. The vertical line indicates 2017:Q4.

(A) Total loans



(B) Total securities

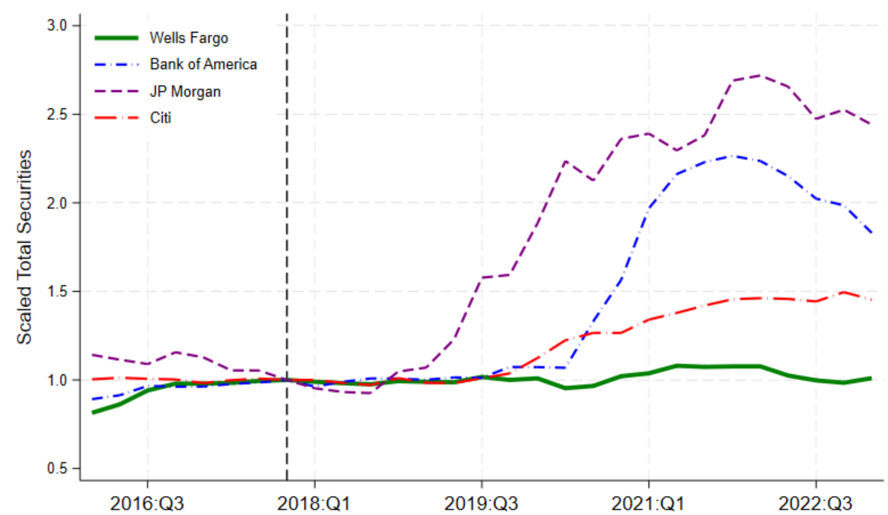


Figure 7: **Wells Fargo's Geographic Presence in Key Functions**

This figure shows the evolution of Wells Fargo's geographic presence in three key functions: deposit taking, small business lending, and mortgage lending. Data sources are the Community Reinvestment Act (CRA) data for small business lending, the Home Mortgage Disclosure Act (HMDA) data for mortgage lending, and the FDIC Summary of Deposits (SOD) data for deposit taking. For each function, we count the number of counties that Wells Fargo was present in each year and scale the number of counties to the level in 2017. The vertical line indicates 2017.

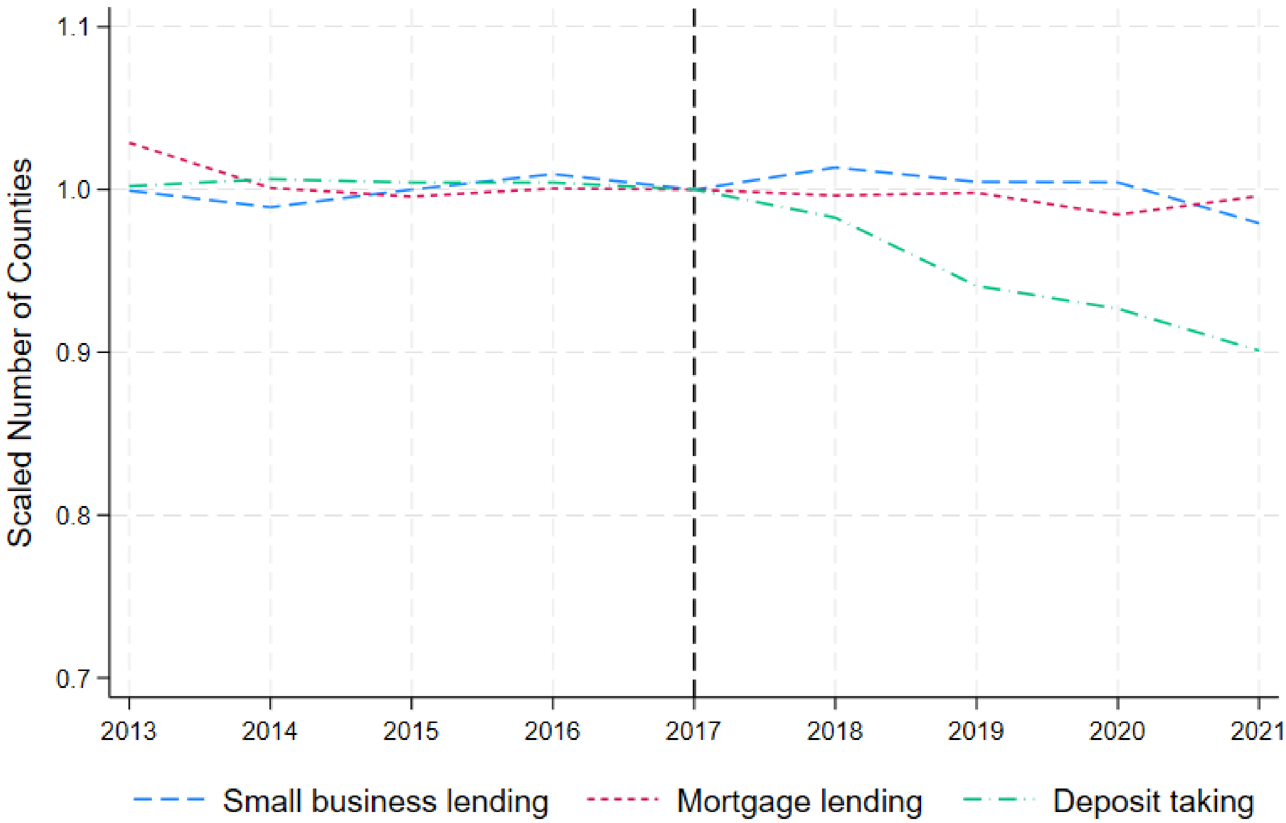


Figure 8: **Distribution of Zip Codes with Wells Fargo Presence prior to the Asset Cap**

This map shows the distribution of Wells Fargo and Company (WFC) bank branches across U.S. zip codes at the end of June 2017. We categorize zip codes as those with (i) at least one WFC branch ('treated'); (ii) zero WFC branches but with branches of other banks ('control'); and (iii) zero bank branches.

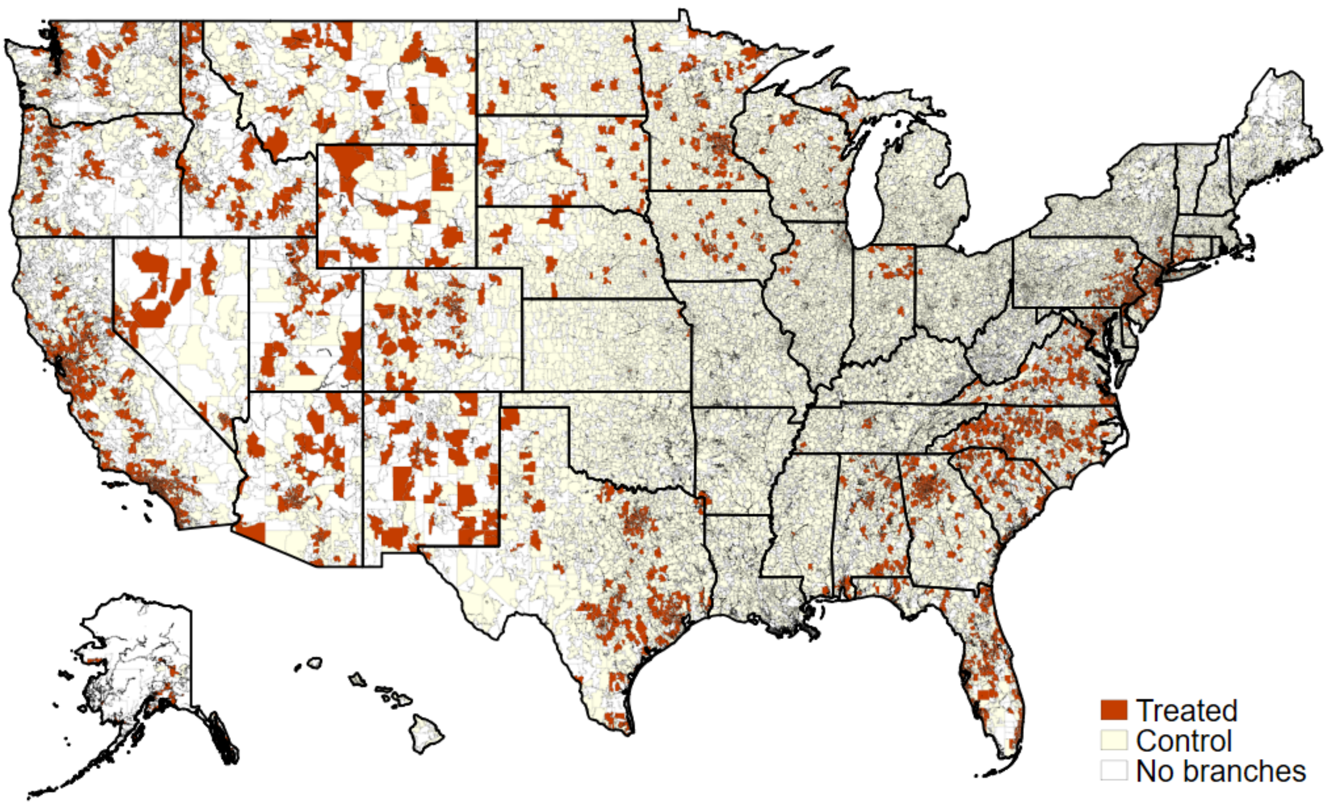


Figure 9: **Deposit Growth of Wells Fargo by Business and Retail Branches**

This figure shows the average deposit growth of Wells Fargo branches by location. We consider branches located in central business districts (CBDs) and the main office collectively as business branches, and branches located in other places collectively as retail branches. Following Holian and Kahn (2012), we define CBD centers as the pairs of latitude and longitude coordinates corresponding to MSA primary cities from Google's Geocoding API. We define CBD branches as those branches located within 1km distance from the nearest CBD centers (Conwell et al., 2023).

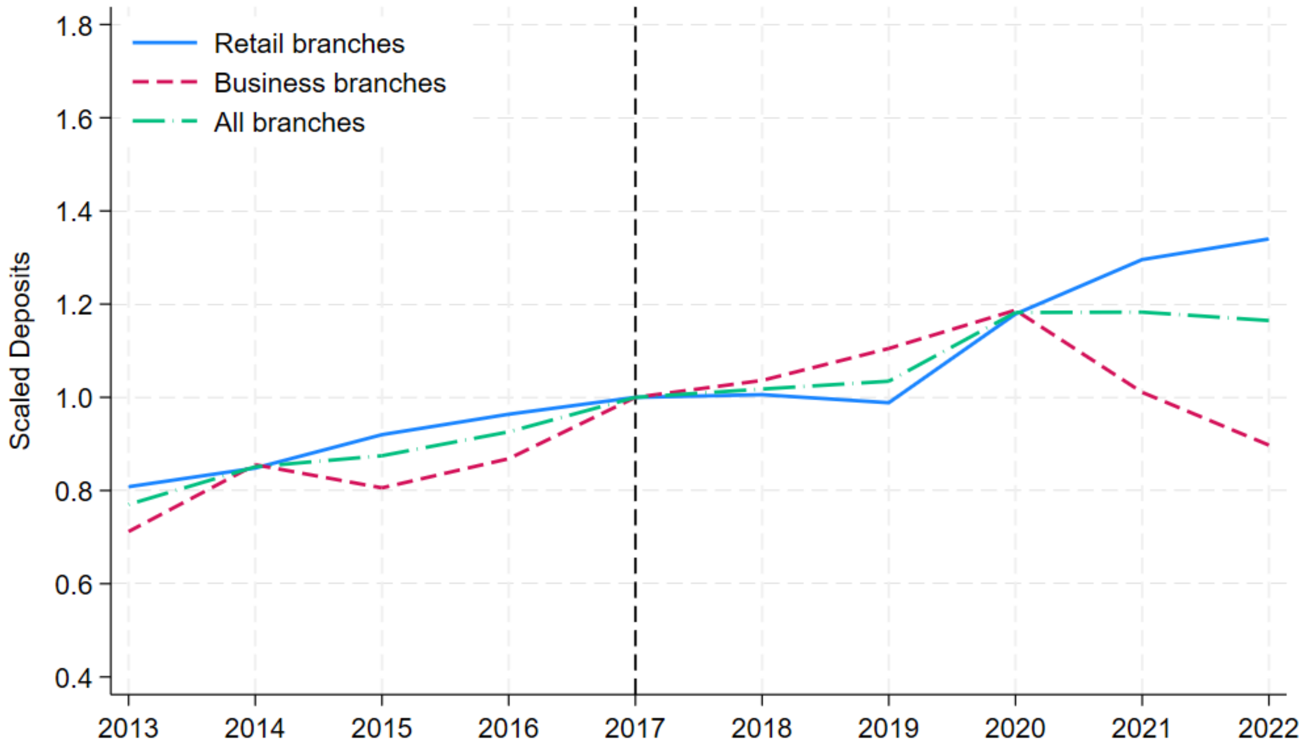
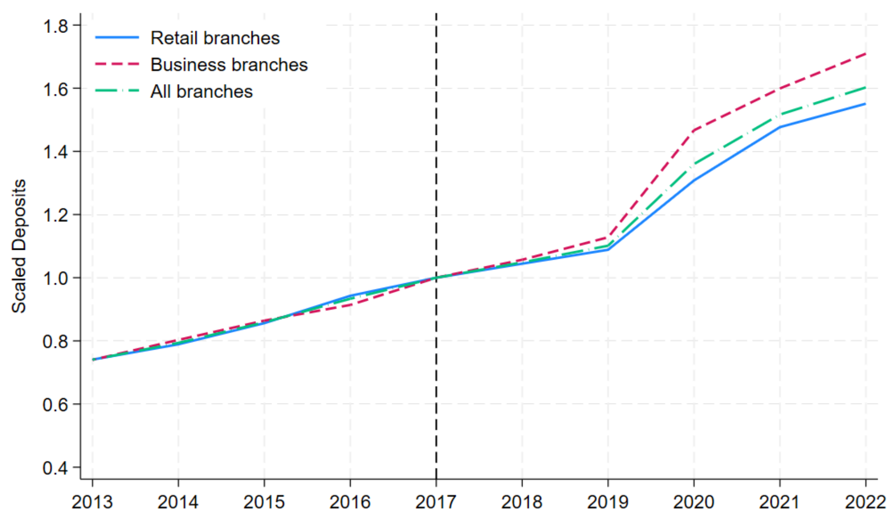


Figure 10: **Deposit Growth of other Banks by Business and Retail Branches**

This figure shows the average deposit growth of non-Wells Fargo bank branches by location. The bank-level *Proximity to Wells Fargo* is the fraction of the bank's deposits in 2017 that are in zip codes that also have a Wells Fargo branch in 2017, computed using using Equation 1 from the FDIC SOD data. We separately analyze the deposit growth for higher-proximity banks in Panel (A) and lower-proximity banks in Panel (B). We consider branches located in central business districts (CBDs) and the main office collectively as business branches, and branches located in other places collectively as retail branches. Following Holian and Kahn (2012), we define CBD centers as the pairs of latitude and longitude coordinates corresponding to MSA primary cities from Google's Geocoding API. We define CBD branches as those branches located within 1km distance from the nearest CBD centers (Conwell et al., 2023).

(A) Higher-proximity banks



(B) Lower-proximity banks

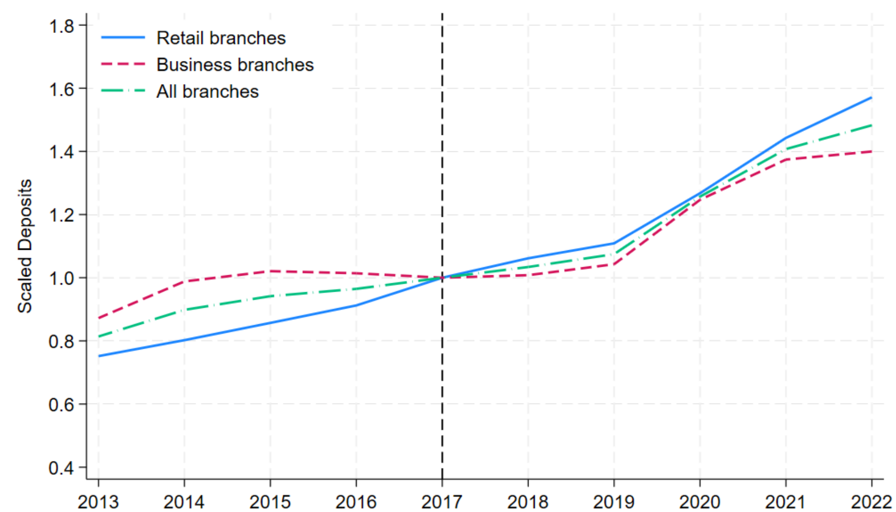


Figure 11: **Cumulative Uninsured Deposit Growth by Proximity to Wells Fargo**

This figure compares the quarterly evolution of the fraction of uninsured deposits in total deposits among higher- versus lower-proximity banks. The bank-level *Proximity to Wells Fargo* is the fraction of the bank's deposits in 2017 that are in zip codes that also have a Wells Fargo branch in 2017, computed using using Equation 1 from the FDIC SOD data. We calculate insured and uninsured deposits based on the deposit insurance limits using the call report data (details in Section 3). For each bank, we normalize the fraction of uninsured deposits in total deposits to the level in 2017:Q4 to show cumulative growth. We average the normalized fraction across banks in the groups of higher- and lower-proximity banks separately.

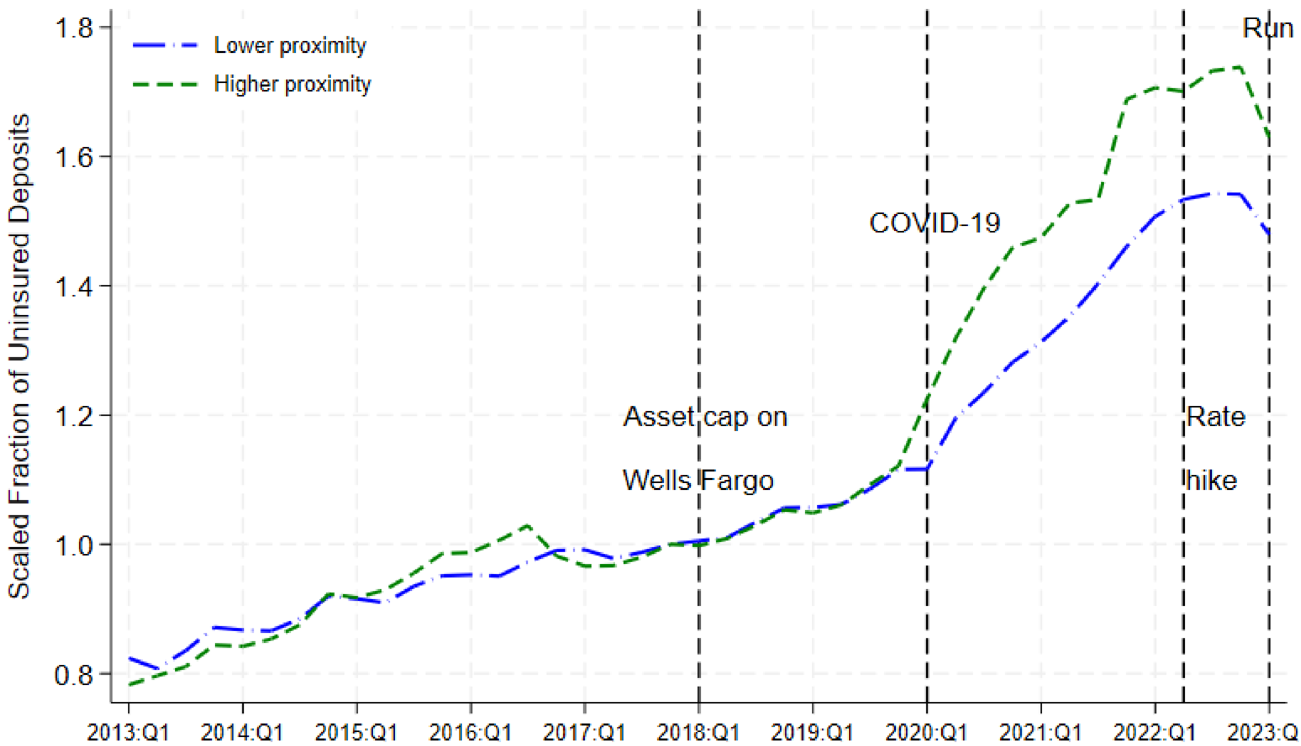


Figure 12: **Falsification Test for Proximity to Large Banks**

This figure shows the results from the falsification test for proximity to large banks in general. We repeat the baseline zip-code level deposits analysis with each of the 25 largest bank holding companies being separately treated as the bank subject to the "asset cap". The coefficient on the DID variable is plotted on the x-axis, and the corresponding t-statistic is plotted on the y-axis. The size of the bubble indicates the relative size of the treated bank. The graph shows that only when Wells Fargo is the treated bank is the t-statistic above 1.96 (5% significance).

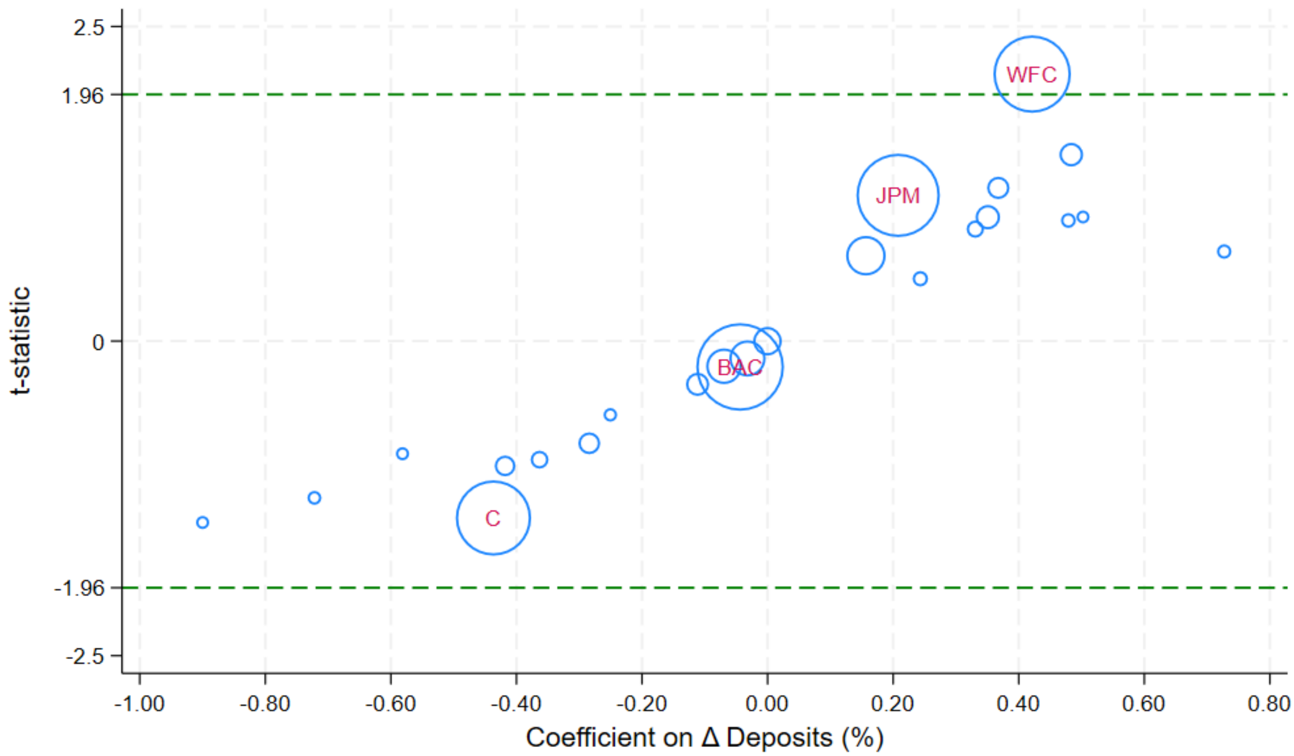


Figure 13: **Falsification Test for Random Assignment of Treatment**

This figure shows the results from the falsification test for random assignment of treatment. In the second test, treatment is randomly assigned to zip codes with the total number of treated zip codes being 4,373 (the number of treated zip codes in the baseline result). 500 such random permutations of treated zip codes are created and the baseline analysis is conducted on each of these permutations. A histogram of the resulting DID coefficient is plotted here. The dashed red line indicates the coefficient with the Wells Fargo-treated zip codes.

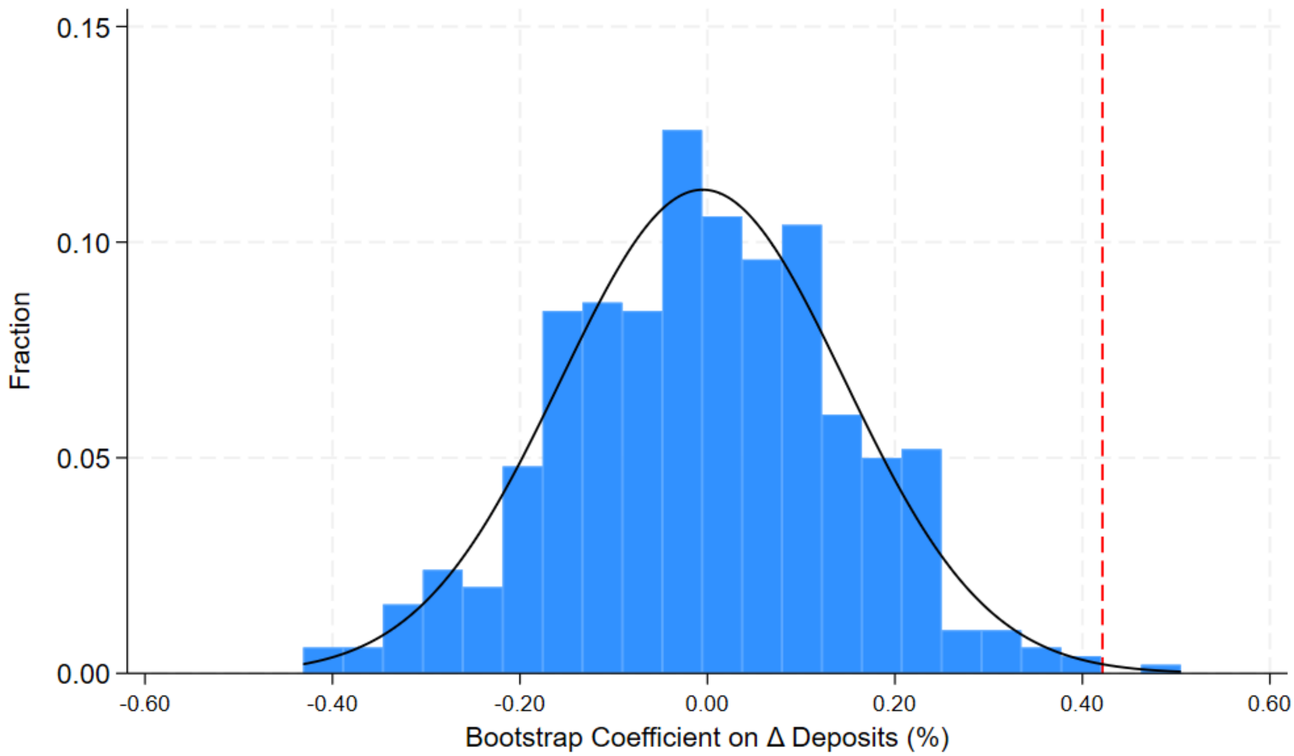


Figure 14: **Contribution of Wells Fargo Deposits to Deposit Inflows**

This figure shows how the Wells Fargo "missing" deposits were distributed among banks assuming that the deposits were distributed in a weighted manner where the weights are the product of the bank's pre-existing proximity to Wells Fargo and the size of the bank. The period covered is 2020-2022Q1. The variable on the x-axis is the fraction of the increase in a bank's total deposits during that period that are attributed to the Wells Fargo gap. The sample is restricted to banks with positive proximity to Wells Fargo, and the median value is used to divide high and low proximity banks. We also indicate where the two failed regional banks, Silicon Valley Bank (SVB) and First Republic Bank (FRC), are located in the distribution.

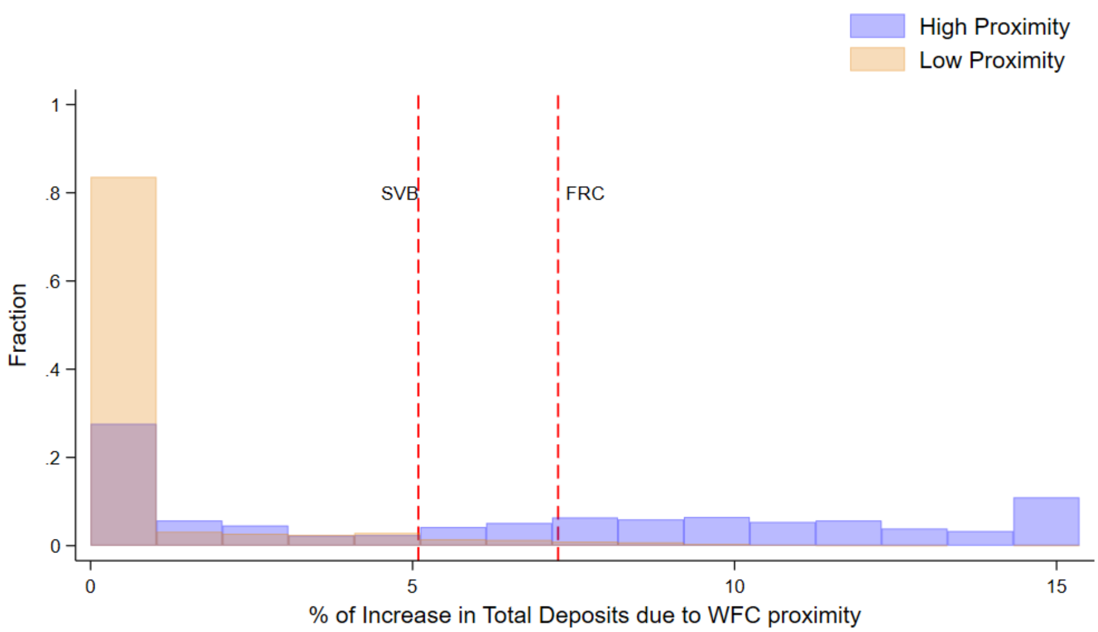


Figure 15: **Contribution of Wells Fargo Deposits to Deposit Inflows**

This figure shows how the Wells Fargo "missing" uninsured deposits were distributed among banks assuming that the deposits were distributed in a weighted manner where the weights are the product of the bank's pre-existing proximity to Wells Fargo and the size of the bank. The period covered is 2020-2022Q1. The variable on the x-axis is the fraction of the increase in a bank's uninsured deposits during that period that are attributed to the Wells Fargo gap. The sample is restricted to banks with positive proximity to Wells Fargo, and the median value is used to divide high and low proximity banks. We also indicate where the two failed regional banks, Silicon Valley Bank (SVB) and First Republic Bank (FRC), are located in the distribution.

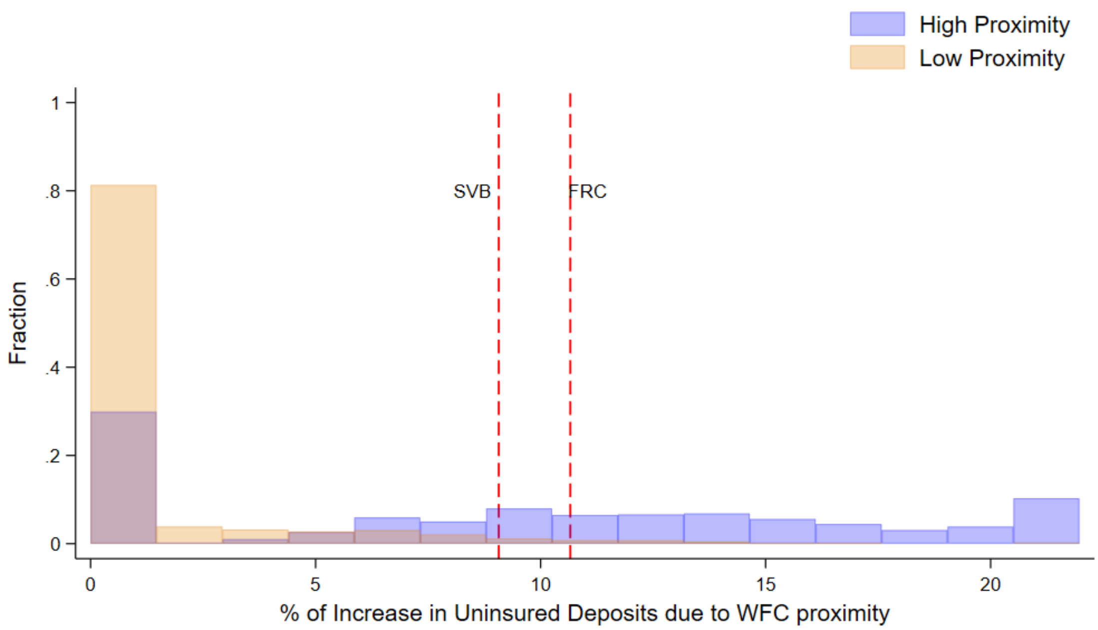


Table 1: **Summary Statistics**

This table reports the summary statistics for bank size, treatment intensity, and deposit composition and pricing. The sample includes all non-Wells Fargo banks in the call report data for the period from 2013 to 2023:Q1. Size groups of banks are defined using nominal size thresholds following the regulatory practices of the Dodd-Frank Act: Community banks are banks with quarter-end assets not exceeding \$10 billion; regional banks are defined as the banks with quarter-end assets above \$10 billion but not exceeding \$250 billion; and national banks are defined as banks with quarter-end assets above \$250 billion.

	Mean	Std. Dev.	25%	50%	75%
Size distribution:					
Total Assets (millions of USD)	3,604.202	56,669.599	145.100	289.812	661.446
Size group:					
$\mathbb{1}$(community bank)	0.964	0.186	1.000	1.000	1.000
$\mathbb{1}$(regional bank)	0.033	0.180	0.000	0.000	0.000
$\mathbb{1}$(national bank)	0.003	0.051	0.000	0.000	0.000
Treatment intensity:					
Proximity to Wells Fargo	0.247	0.362	0.000	0.000	0.493
Deposit composition and pricing:					
Δ Uninsured deposit fraction (%)	0.239	2.857	-0.981	0.171	1.412
Δ Uninsured leverage (%)	0.209	2.720	-0.991	0.155	1.382
Δ Number of depositors (%)	0.644	7.621	-0.669	0.032	0.890
Δ Average balance per depositor (%)	1.463	7.367	-1.260	0.958	3.554
Δ Deposit Interest Expense (%)	0.011	0.140	-0.033	-0.003	0.032
Obs. (bank $\times$ quarter)	169,002				

Table 2: **Proximity to Wells Fargo and Uninsured Deposit Growth**

This table shows the relationship between the growth of uninsured deposits and the proximity to Wells Fargo in the sample of all non-Wells Fargo banks. The data are at the bank-quarterly level from 2013Q1 to 2023Q1. The bank-level *Proximity to Wells Fargo* is the fraction of the bank's deposits in 2017 that are in zip codes that also have a Wells Fargo branch in 2017, computed using using Equation 1 from the FDIC SOD data. In the dynamic specification, we include a set of interactions of proximity and indicators that correspond to periods before and after the enactment of the asset cap on Wells Fargo. Bank fixed effects, size-group specific year-quarter fixed effects, and time-varying bank size control are included and denoted at the bottom. The sample of banks used in each regression is also denoted at the bottom. Standard errors are clustered at the bank level and reported in parentheses. We use ***, ** and * to denote significance at 1%, 5% and 10% level (two-sided), respectively.

	Δ Uninsured deposit fraction (%)			
	(1)	(2)	(3)	(4)
Proximity to Wells Fargo				
× 1 year before asset cap	0.0549	0.0675	-0.1172	0.6460
	(0.0492)	(0.0498)	(0.2866)	(1.4142)
× First 2 years of asset cap	0.1419***	0.1550***	-0.0551	0.1193
	(0.0384)	(0.0393)	(0.2544)	(0.3330)
× COVID-19 pandemic	0.2300***	0.2199***	0.6124*	1.2437
	(0.0489)	(0.0495)	(0.3205)	(0.7913)
× Monetary tightening in 2022	-0.1384*	-0.0704	-1.1433**	0.5344
	(0.0833)	(0.0828)	(0.5062)	(2.1319)
× Crisis in 2023Q1	-1.3672***	-1.2668***	-3.2158**	-4.3434**
	(0.2237)	(0.2251)	(1.4249)	(1.8789)
Bank chars.	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Size Group × Year-Quarter FE	Yes	Yes	Yes	Yes
Sample banks	All	Community	Regional	National
R^2	0.0389	0.0360	0.174	0.189
Observations	169,002	162,914	5,648	440

Table 3: **Proximity to Wells Fargo and Deposit Pricing**

This table shows the relationship between the change in deposit interest expense and the proximity to Wells Fargo in the sample of all non-Wells Fargo banks. The data are at the bank-quarterly level from 2013Q1 to 2023Q1. The bank-level *Proximity to Wells Fargo* is the fraction of the bank's deposits in 2017 that are in zip codes that also have a Wells Fargo branch in 2017, computed using using Equation 1 from the FDIC SOD data. In the dynamic specification, we include a set of interactions of proximity and indicators that correspond to periods before and after the enactment of the asset cap on Wells Fargo. Bank fixed effects, size-group specific year-quarter fixed effects, and time-varying bank size control are included and denoted at the bottom. The sample of banks used in each regression is also denoted at the bottom. Standard errors are clustered at the bank level and reported in parentheses. We use ***, ** and * to denote significance at 1%, 5% and 10% level (two-sided), respectively.

	Δ Deposit Interest Expense (%)			
	(1)	(2)	(3)	(4)
Proximity to Wells Fargo				
× 1 year before asset cap	-0.0021	-0.0018	-0.0030	0.0030
	(0.0015)	(0.0015)	(0.0116)	(0.0567)
× First 2 years of asset cap	-0.0005	-0.0002	-0.0045	-0.0020
	(0.0017)	(0.0017)	(0.0111)	(0.0326)
× COVID-19 pandemic	-0.0168***	-0.0159***	-0.0391**	0.0641
	(0.0027)	(0.0027)	(0.0181)	(0.1162)
× Monetary tightening in 2022	0.0433***	0.0422***	0.0809	-0.3432
	(0.0082)	(0.0081)	(0.0562)	(0.2428)
× Crisis in 2023Q1	0.0540***	0.0552***	0.0481	-0.0234
	(0.0131)	(0.0136)	(0.0465)	(0.3339)
Bank chars.	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Size Group × Year-Quarter FE	Yes	Yes	Yes	Yes
Sample banks	All	Community	Regional	National
R^2	0.516	0.503	0.706	0.703
Observations	168,973	162,885	5,648	440

Table 4: **Proximity to Wells Fargo and Other Measures of Uninsured Deposit Growth**

This table shows the relationship between other measures of uninsured deposit growth and the proximity to Wells Fargo in the sample of all non-Wells Fargo banks. The data are at the bank-quarterly level from 2013Q1 to 2023Q1. The bank-level *Proximity to Wells Fargo* is the fraction of the bank's deposits in 2017 that are in zip codes that also have a Wells Fargo branch in 2017, computed using using Equation 1 from the FDIC SOD data. In the dynamic specification, we include a set of interactions of proximity and indicators that correspond to periods before and after the enactment of the asset cap on Wells Fargo. Bank fixed effects, size-group specific year-quarter fixed effects, and time-varying bank size control are included and denoted at the bottom. Standard errors are clustered at the bank level and reported in parentheses. We use ***, ** and * to denote significance at 1%, 5% and 10% level (two-sided), respectively.

	(1) Δ Uninsured leverage (%)	(2) Δ Number of depositors (%)	(3) Δ Average balance per depositor (%)
Proximity to Wells Fargo			
× 1 year before asset cap	0.0667	0.1922	0.1178
	(0.0504)	(0.1778)	(0.1679)
× First 2 years of asset cap	0.1523***	0.3408**	0.0261
	(0.0379)	(0.1563)	(0.1208)
× COVID-19 pandemic	0.2971***	0.4912***	0.3979**
	(0.0483)	(0.1783)	(0.1670)
× Monetary tightening in 2022	-0.2180***	0.7086***	-0.2771
	(0.0830)	(0.2508)	(0.2374)
× Crisis in 2023Q1	-0.7177***	2.1837***	-2.2484***
	(0.2001)	(0.6126)	(0.5823)
Bank chars.	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
Size Group × Year-Quarter FE	Yes	Yes	Yes
Sample banks	All	All	All
R^2	0.0393	0.0487	0.0729
Observations	169,002	169,002	169,002

Table 5: **Proximity to Wells Fargo and Branch-Level Deposit Growth**

This table shows the relationship between the proximity to Wells Fargo and branch-level deposit growth in the sample of all non-Wells Fargo bank branches. The data are at the annual frequency from 2013 to 2022. *Post* is an indicator variable equal to 1 for 2018 and all subsequent years. *Treat* is the zip-code level treatment indicator that equals to 1 if Wells Fargo operated at least one branch at the zip code in 2017 and 0 otherwise. The included fixed effects and control variables are denoted at the bottom. Standard errors are clustered at the zip-code level and reported in parentheses. We use ***, ** and * to denote significance at 1%, 5% and 10% level (two-sided), respectively.

	Δ Deposits (%)					
	All banks		Excluding national banks		National banks	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat × Post	0.4214**	0.4176**	0.4355*	0.4411*	0.2217	0.2036
	(0.1986)	(0.1984)	(0.2516)	(0.2517)	(0.3146)	(0.3138)
Bank × Zip FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank × County × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Zip controls	No	Yes	No	Yes	No	Yes
R^2	0.425	0.426	0.454	0.454	0.345	0.344
Observations	652,083	651,882	490,107	489,925	161,976	161,957

Table 6: **Proximity to Wells Fargo and Branch-Level Deposit Growth in CBD and Non-CBD Counties**

This table shows the relationship between the proximity to Wells Fargo and branch-level deposit growth in the sample of all non-Wells Fargo bank branches, separately in CBD and non-CBD counties. CBD counties are those which include part or whole of a central business district. The data are at the annual frequency from 2013 to 2022. *Post* is an indicator variable equal to 1 for 2018 and all subsequent years. *Treat* is the zip-code level treatment indicator that equals to 1 if Wells Fargo operated at least one branch at the zip code in 2017 and 0 otherwise. The included fixed effects and control variables are denoted at the bottom. Standard errors are clustered at the zip-code level and reported in parentheses. We use ***, ** and * to denote significance at 1%, 5% and 10% level (two-sided), respectively.

	Δ Deposits (%)			
	CBD Counties		Non-CBD Counties	
	(1)	(2)	(3)	(4)
Treat × Post	0.5114**	0.5102**	0.1966	0.1915
	(0.2376)	(0.2373)	(0.3501)	(0.3502)
Bank × Zip FE	Yes	Yes	Yes	Yes
Bank × County × Year FE	Yes	Yes	Yes	Yes
Zip controls	No	Yes	No	Yes
R^2	0.405	0.405	0.467	0.467
Observations	378,752	378,667	273,331	273,215

Table 7: **Proximity to Wells Fargo and Branch-Level Deposit Growth (Robustness)**

This table shows the robustness tests for the relationship between the proximity to Wells Fargo and branch-level deposit growth in the sample of all non-Wells Fargo bank branches. The data are at the annual frequency from 2013 to 2022. *Post* is an indicator variable equal to 1 for 2018 and all subsequent years. *Treat* is the zip-code level treatment indicator that equals to 1 if Wells Fargo operated at least one branch at the zip code in 2017 and 0 otherwise. The included fixed effects and control variables are denoted at the bottom. Standard errors are clustered at the zip-code level and reported in parentheses. We use ***, ** and * to denote significance at 1%, 5% and 10% level (two-sided), respectively.

	Δ Deposits (%)			
	Excluding Silicon Valley		Excluding New York City	
	(1)	(2)	(3)	(4)
Treat × Post	0.4059**	0.4016**	0.6477***	0.6447***
	(0.2004)	(0.2002)	(0.2112)	(0.2110)
Bank × Zip FE	Yes	Yes	Yes	Yes
Bank × County × Year FE	Yes	Yes	Yes	Yes
Zip controls	No	Yes	No	Yes
R^2	0.426	0.426	0.430	0.430
Observations	642,215	642,014	609,421	609,228

Table 8: **Magnitude of Wells Fargo's Deposit Gap**

The table shows a back-of-the-envelope calculation to quantify the deposits Wells Fargo could not acquire due to the asset cap imposed in February 2018. The first column shows the quantum of deposits at the end of 2017. In columns 2–5, the change in deposits in billion dollars and % terms are shown for four distinct periods: first 2 years of the asset cap (2018–2019), COVID-19 pandemic (2020–2022Q1), monetary tightening in 2022 (2022Q2–2022Q4), and the crisis period (2023Q1). In the first panel, the numbers are for the entire commercial banking sector. In the second panel, we report what Wells Fargo actually saw, followed by a counterfactual where Wells Fargo grows at the same rate as the aggregate sector. For Wells Fargo, gap is the counterfactual amount minus the actual amount in each period. We also calculate the cumulative gap over the periods. In the third panel, we focus on the set of all banks with positive-proximity to Wells Fargo. We compare their actual growth with a counterfactual where they grow at the same rate as the aggregate sector. For these banks, excess is the actual amount minus the counterfactual amount in each period. We also calculate the cumulative excess over the periods.

	Deposits (bn)	Δ Deposits (bn)			
	2017	2018-19	2020-22Q1	22Q2-22Q4	22Q4-23Q1
All commercial banks	12,081.46	1,139.14	5,160.61	-655.85	-421.4
		9.43%	39.03%	-3.57%	-2.38%
Wells Fargo					
Actual	1,271.97	66.14	182.92	-103.06	-13.93
		5.20%	13.67%	-6.78%	-0.98%
Counterfactual	1,271.97	119.93	543.32	-69.05	-44.37
		9.43%	39.03%	-3.57%	-2.38%
Gap		53.79	360.40	34.01	-30.44
Cumulative gap		53.79	**414.19**	448.21	417.77
Banks with positive proximity to Wells Fargo					
Actual	8,710.72	889.48	4,129.93	-484.68	-401.55
		10.21%	43.02%	-3.53%	-3.03%
Counterfactual	8,710.72	821.32	3,720.79	-472.87	-303.83
		9.43%	39.03%	-3.57%	-2.38%
Excess		68.16	409.14	-11.81	-97.72
Cumulative excess		68.16	**477.30**	465.49	367.76

Table 9: **Magnitude of Wells Fargo's Uninsured Deposit Gap**

The table shows a back-of-the-envelope calculation to quantify the uninsured deposits Wells Fargo could not acquire due to the asset cap imposed in February 2018. The first column shows the quantum of deposits at the end of 2017. In columns 2–5, the change in uninsured deposits in billion dollars and % terms are shown for four distinct periods: first 2 years of the asset cap (2018-2019), COVID-19 pandemic (2020-2022Q1), monetary tightening in 2022 (2022Q2-2022Q4), and the crisis period (2023Q1). In the first panel, the numbers are for the entire commercial banking sector. In the second panel, we report what Wells Fargo actually saw, followed by a counterfactual where Wells Fargo grows at the same rate as the aggregate sector. For Wells Fargo, gap is the counterfactual amount minus the actual amount in each period. We also calculate the cumulative gap over the periods. In the third panel, we focus on the set of all banks with positive-proximity to Wells Fargo. We compare their actual growth with a counterfactual where they grow at the same rate as the aggregate sector. For these banks, excess is the actual amount minus the counterfactual amount in each period. We also calculate the cumulative excess over the periods.

	Uninsured (bn)	Δ Uninsured (bn)			
	2017	2018-19	2020-22Q1	22Q2-22Q4	22Q4-23Q1
All commercial banks	5,307.01	497.63	3,163.18	-655.762	-665.229
		9.38%	54.49%	-7.31%	-8.00%
Wells Fargo					
Actual	607.56	108.63	79.21	-47.07	-7.77
		17.88%	11.06%	-5.92%	-1.04%
Counterfactual	607.56	56.97	362.13	-75.07	-76.16
		9.38%	54.49%	-7.31%	-8.00%
Gap		-51.66	282.92	-28.01	-68.39
Cumulative gap		-51.66	**231.25**	203.25	134.85
Banks with positive proximity to Wells Fargo					
Actual	3,973.54	349.13	2,627.83	-476.67	-603.19
		8.79%	60.79%	-6.86%	-9.32%
Counterfactual	3,973.54	372.59	2,368.38	-490.99	-498.08
		9.38%	54.49%	-7.31%	-8.00%
Excess		-23.46	259.45	14.32	-105.11
Cumulative excess		-23.46	**235.99**	250.31	145.21