

# Bank Mergers and Loan Officer Reallocation\*

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## Abstract

I find that mortgage loan officer turnover increases after bank mergers. The effect is more pronounced for officers working in areas where both target and acquiring banks have mortgage businesses. Officers staying in the merged banks originate more loans than those leaving for other banks. The findings suggest that merged banks trying to improve efficiency by reducing redundant employees. Focusing on officers in overlapping areas, I find that officers in merged banks originate fewer loans closer to their offices. I also find that officers in merged banks originate fewer small loans after mergers. These results suggest that bank mergers lead to the loss of soft information and limit the availability of small mortgages.

**Keywords:** Banking, Merger and Acquisition, Loan Officers, Labor Reallocation, Mortgage

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# 1 Introduction

Mergers and acquisitions (M&As) have long been a focal point in finance research. Despite the potential efficiency gains M&As can bring to the combined firms, this could occur at the expense of non-financial stakeholders, such as rank-and-file employees. These individuals form the backbone of firms’ day-to-day operations and are essential for fulfilling firms’ strategic objectives. In this paper, I seek to provide empirical evidence on how M&As could impact rank-and-file employees.

Specifically, I examine how bank mergers affect mortgage loan officers. Mergers and acquisitions are often accompanied by extensive restructuring to obtain efficiency gains. Besides the asset side of restructuring, labor restructuring has been attracting more attention in recent research ([Lagaras 2024](#); [Carriquiry 2018](#); [Gehrke et al. 2021](#); [Arnold et al. 2023](#)). As the merged banks seek to leverage the synergies from the merger, the extensive integration of the organization is necessary (e.g., [Zollo and Singh 2004](#)), including the integration at the rank-and-file employee level. Thus, some officers can be regarded as “redundant” in the operations of the merged banks after the deal, and their risk of being laid off can rise.

In particular, loan officers play a critical role in mortgage lending decisions. Even with the availability of hard information and the application of algorithmic underwriting, loan officers can still exert discretion in loan origination decisions based on additional information they have. Specifically, loan officers in the banking sector collect and process soft information through frequent and personal contact with borrowers. This soft information serves to supplement the deficiencies of hard information. For example, previous research has provided evidence on the critical role of loan officers and their use of soft information in shaping the racial gap in mortgage access ([Chu 2023](#); [Jiang et al. 2022](#); [Frame et al. 2022](#)). If bank mergers lead to a reallocation of loan officers, it is plausible that this could also affect officers’ mortgage lending decisions.

Using a novel dataset combining the Nationwide Multistate Licensing System (NMLS) loan officer data, CoreLogic mortgage data, and bank merger activity data in the U.S., I conduct loan officer-level analyses. Both NMLS data and CoreLogic mortgage data provide a unique NMLS ID number of the loan officers, which I can use to merge loan officer data. I find that loan officers in merging banks, relative to those in non-merging banks, are more likely to leave after mergers. Specifically, the probability of departure for officers in merging banks increases by 9 percentage

points, amounting to approximately 15% of the unconditional loan officer turnover rate in the sample. These results suggest that bank mergers is a big shock for rank-and-file employees and can significantly impact their career path. Furthermore, when I check the impact on target and acquirer officers separately, I find that the effects on turnover are concentrated on target officers, indicating that target loan officers are less likely to be retained in the post-merger labor restructuring. When focusing on loan officers in merging banks only, I also find a higher probability of departure for target loan officers than for acquirer loan officers. The results are robust after controlling for loan officers' past performance, measured by the natural logarithm of one plus the total number of loans originated by the loan officer in the year before the merger.

Next, I study the role of geographic overlap in the impact of bank mergers on loan officer turnover. If loan officers in target and acquiring banks operate within the same geographic area, their operational scopes and client base likely overlap with each other. Therefore, to minimize redundancies, merging banks may opt to lay off loan officers working in these overlapping areas post-merger. At the establishment level, [Harford et al. \(2023\)](#) find that having acquirer and target establishments in the same city increases the likelihood of establishment closure. Similarly, I find that loan officers working in areas (measured at the CBSA level) where both target and acquiring banks have mortgage businesses are more likely to leave post-merger, consistent with merged banks trying to improve efficiency by reducing redundant employees. Specifically, within three years following mergers, loan officers working in overlapping areas exhibit a roughly 18 percentage points increase in the probability of turnover, amounting to roughly 29% of the unconditional loan officer turnover rate in the sample.

Using a triple difference specification, I examine the sensitivity of loan officer turnover to individual performance in a six-year window around mergers. I do not find any significant change in the sensitivity of turnover to performance in merged banks.

Next, using a difference-in-difference (DID) specification, I track the performance of stayers, i.e. loan officers who stay in the merged banks, relative to leavers, i.e. loan officers who leave for other banks post-merger. I find that stayers perform relatively better, with the total number of loans originated by stayers being about 16% higher than that of leavers per year. The results suggest that merged banks trying to improve efficiency by reducing underperforming officers. The results are robust to the inclusion of loan officer fixed effect, suggesting that the results are unlikely to be

driven by unobservable individual characteristics.

Finally, to examine how bank mergers affect officers' mortgage lending decisions, I construct a new CoreLogic-NMLS matched sample. For each bank merger, the sample includes officers in overlapping areas from merging banks, as well as officers within the same areas from all non-merging banks. To track officers' mortgage lending around bank mergers, I include only officers staying in merged banks for at least three years. I first focus on the distance between the loan officer's working addresses and the property address, as a shorter distance can enhance the collection of soft information (Petersen and Rajan 2002; Agarwal and Hauswald 2010; Liberti and Petersen 2019). For officers in merged banks, I find that the percentage of nearby loan originations for properties located within 8 miles of officers' offices decreases by 10 percentage points, amounting to about 22% of the unconditional average percentage of nearby mortgages in the sample. The results suggest that the departure of officers leads to a loss of soft information in the merged bank. Furthermore, I find an even larger effect on target officers, consistent with smaller banks being better at collecting and using soft information (Berger et al. 2005). I find similar results when using alternative physical distance cutoffs.

I further explore the impact on small mortgage lending. Many first-time homebuyers and low-income families depend on relatively low-cost properties to transition from renting to homeownership. However, fewer lenders make small mortgages these days. The lack of access to small mortgage financing can pose a significant barrier to homeownership for individuals with relatively low incomes. With the departure of some loan officers, officers staying in the merged bank face an increased number of mortgage applicants to handle. In this case, the loan officers can select larger loans due to competency constraints and the incentives of commission-based compensation. I find that the percentage of small loans under \$100,000 originated by officers in merged banks decreases by 6 percentage points, amounting to about 14% of the unconditional average percentage of small mortgages in the sample. Examining the separate effects on target and acquirer officers, I find that the impacts are concentrated on acquirer officers. This could arise from acquirer officers receiving more resources and better treatment in the merged bank. I find similar results when applying other small loan thresholds.

This paper contributes to the literature on the link between M&As and labor. The existing literature finds that human capital considerations and labor restructuring are important drivers of

merger activities (e.g., [Lee et al. 2018](#); [Ouimet and Zarutskie 2020](#); [Tate and Yang 2024](#); [Chen et al. 2021](#)). In addition, a set of papers provides evidence of the effect of mergers on labor, including a majority of papers documenting the negative effects of M&As on employment at the company level (e.g., [Conyon et al. 2001](#); [Conyon et al. 2002](#); [Geurts and Van Biesebroeck 2019](#); [Li 2013](#)) and establishment level ([Arnold 2021](#); [Ma et al. 2022](#)). More relatedly, recent studies provide direct evidence of the influence of M&As on individual employee turnover and wage. In particular, [Carriquiry \(2018\)](#) finds that M&As generally increase the probability of employee turnover, especially for employees with relatively low human capital. [Arnold \(2021\)](#) also finds that M&A workers are more likely to switch jobs after mergers. [Gehrke et al. \(2021\)](#) find a large target employee turnover after M&As, and acquirers subsequently hire younger and less expensive employees. [Arnold et al. \(2023\)](#) find that workers moving from targets to other firms after the merger suffer losses in earnings. Similarly, [Lagaras \(2024\)](#) argue that mergers are related to large and persistent wage declines for target employees. Focusing on inventors, [Bena et al. \(2023\)](#) find that inventors with human capital more complementary with acquisition partners’ patent portfolios are more likely to stay in merging firms, and their investments are also more specific to acquisition partners’ assets after M&As. This paper contributes to this literature by examining how mergers affect rank-and-file employees in the banking sector.

This paper also contributes to an extensive literature on the impact of mergers of financial institutions. Prior studies document the post-merger effects on the welfare of various stakeholders, such as shareholders (e.g., [Knapp et al. 2006](#); [Cornett et al. 2006](#)), borrowers with an emphasis on the price and availability of business credit (e.g., [Ji et al. 2023](#); [Berger et al. 1998](#); [Scott and Dunkelberg 2003](#); [Degryse et al. 2011](#); [Erel 2011](#)) and mortgage credit in recent study ([Ratnadiwakara and Yerramilli 2022](#)), depositors ([Corvoisier and Gropp 2002](#); [Craig and Dinger 2009](#); [Focarelli and Panetta 2003](#); [Park and Pennacchi 2008](#)), and analysts ([Wu and Zang 2007](#)). This paper is the first to examine how bank mergers impact mortgage loan officers.

Finally, this paper contributes to the literature on loan officers. The literature documents the role of loan officers on the racial gap in mortgage lending. Specifically, [Jiang et al. \(2022\)](#) and [Frame et al. \(2022\)](#) find that under-representation of minority loan officers contributes to the racial gap in mortgage lending; [Ambrose et al. \(2021\)](#) find that broker (i.e., individual loan officer) race affects the cost of mortgage credit to minorities; [Chu \(2023\)](#) finds that the political ideology of loan

officers is another source of the racial gap in mortgage lending. Besides, [Huang et al. \(2022\)](#) focus on gender disparities and find evidence on gender bias in promotions at financial institutions. Several other studies focus on syndicated loan officers. [Herpfer \(2021\)](#) and [Bushman et al. \(2021\)](#) find that individual loan officers can influence the loan contracting process of corporate lending. [Drexler and Schoar \(2014\)](#) find that loan officers play a crucial role in maintaining client relationships. This paper is the first to examine officers' reallocation and mortgage lending after bank mergers.

The remainder of the paper is organized as follows. In Section 2, I describe the details of data sources and the sample construction process. Section 3 provides the results on the effect of bank mergers on loan officer turnover. Section 4 examines stayer and leaver performance around mergers. Section 5 provides the results on distance and soft information. Section 6 provides the results on small mortgage lending, and Section 7 concludes.

## 2 Data and Sample Construction

### 2.1 NMLS loan officer data

Congress passed the Secure and Fair Enforcement for Mortgage Licensing Act in 2008 (SAFE Act) to enhance consumer protection and reduce fraud in the mortgage market. The SAFE Act sets minimum standards for licensing and registering mortgage loan originators and requires all residential mortgage loan originators (i.e. loan officers) to be either federally registered or state licensed. Loan officers who work for an insured depository institution or its subsidiary regulated by a federal banking agency, or for an institution regulated by the Farm Credit Administration, are federally registered. All other loan officers are state licensed. The SAFE Act requires all loan officer registrations and licenses to be included in the Nationwide Multistate Licensing System (NMLS). By 2012, all state and federal regulators had integrated into the NMLS and a nationwide mortgage licensing system and registry for the residential mortgage industry was established.

I obtain historical snapshots of NMLS files at the end of each calendar year from 2011 to 2022. The files contain information on registrations, licenses, employers, and office locations for loan officers. NMLS assigns a unique and permanent ID number to each loan officer, which allows me to track each loan officer's employment records over time in the mortgage industry. I construct a nationwide panel of loan officers with information on their NMLS ID, employers, and work

addresses. The NMLS loan officer data consists of 7,277,937 loan officer records for 1,365,420 individuals across 45,361 financial institutions.

## **2.2 Bank merger data**

I obtain the bank merger data from the transformation table provided by the Federal Financial Institutions Examination Council (FFIEC). I only focus on events where predecessors cease to exist as head office after transformation and require dates of transformation to be after 2012. I begin the merger sample from 2012 because the NMLS database starts to have a comprehensive coverage of loan officers' records in 2012. After matching with the NMLS data, I have 83 mergers between bank holding companies during 2012 - 2020 with both target and acquiring bank identifiers in the NMLS dataset.

## **2.3 Mortgage origination data**

I obtain mortgage origination data from CoreLogic. The CoreLogic collects information from mortgage deed documents, including the exact location of the underlying property, loan amount, mortgage origination date, mortgage type (FHA, VA, Conventional, fixed-rate, adjustable-rate), property type (single-family, multi-family, manufactured home), lien status (first lien, second lien, etc.), borrower name, lender name, loan officer NMLSID. I retain only single-family, fixed-rate, first-lien mortgages. I use the unique loan officer NMLSID to merge the CoreLogic mortgage data with the NMLS loan officer data.

## **2.4 Sample construction**

I merge the bank merger data with bank call report data (aggregate at the holding company level) in the quarter right before the mergers. For each acquisition, I require that both the target and acquiring banks be successfully matched, otherwise I remove them from the sample. I obtain 78 mergers with bank call report data.

For my main analysis, I match each target and acquiring bank with a control bank in the quarter right before the merger using the propensity score matching. To ensure no bias from using early-treated banks as controls, I exclude all banks ever treated by mergers from 2009 (3 years before the first merger in treated banks). I estimate the probit model with the following bank characteristics:

*Bank Size* (the natural logarithm of total assets), *Capital* (total capital to risk-weighted assets), *RWA* (risk-weighted assets scaled by total assets), *ROA* (net income to total assets), *ALLL* (loan loss allowance scaled by total assets), *Subdebt* (subordinated debt scaled by total assets), *Charge-offs* (loan charge-offs scaled by total assets), *Deposits* (deposits to total assets), *Non-deposit Fee Income* (non-deposit fee income to total assets), and *Non-interest Income* (non-interest income to total income). Control banks are selected as the ones with the closest propensity score as treated banks in the same quarter. I report the statistics of comparing the bank characteristics of target and acquiring banks with matched control banks in Table 1. Differences in these variables are all statistically insignificant, indicating that treated and control banks are similar along all the dimensions.

After matching bank call report data with NMLS loan officer data in year  $t-1$ , i.e. the year before mergers, I have 75 mergers from 2012 to 2020 (3 mergers with missing loan officer information for target and/or acquiring banks). I present the distribution of the mergers in Table 2. For each loan officer in year  $t-1$ , I track their employment records post-merger. I define a dummy variable, *Turnover*, that equals one if the loan officer no longer works in the merging banks in year  $t+3$  and zero otherwise. I rely on the number of loans originated by the loan officer as a proxy for loan officer performance. This cross-sectional data sample consists of 69,646 loan officers.

I then use the link file developed by the U.S. Department of Housing and Urban Development to match the zip code of loan officers' working locations to corresponding core-based statistical areas (CBSAs). For incumbent loan officers working in merging banks pre-merger, I define a dummy variable, *Overlap*, that equals one if a loan officer works in a CBSA where both target and acquiring banks have mortgage businesses one year before the merger and zero otherwise.

I also match bank call report data with NMLS loan officer data from three years before to three years after the merger. Requiring loan officer data from both target and acquiring banks, I keep only mergers from 2017 to 2020 because the comprehensive data on CoreLogic is from 2014. The panel data sample consists of 193,576 loan officer records. I redefine *Turnover* to equal one if a loan officer from the previous year leaves the bank this year and zero otherwise. In later analysis, I restrict the panel sample of loan officers to stayers, i.e. loan officers continuously working in the merging banks in  $(t-3, t+3)$ , and leavers, i.e. loan officers continuously working in the merging banks in  $(t-3, t-1)$  but are subsequently employed by other banks starting from a certain point in



( $t+1, t+3$ ).

The summary statistics of the main variables are provided in Table 3. Panel A of Table 3 presents the summary statistics of the cross-sectional data sample. Loan officers in target and acquiring banks account for 40.1% of the matched sample. 61.6% of incumbent loan officers leave the bank within three years post-merger. Among all officers, 10% of the loan officers work in overlapping areas, and 29.6% of the loan officers work in non-overlapping areas. Panel B of Table 3 presents the summary statistics of the loan officer panel, showing that 53.1% of the loan officers work in merging banks in the panel sample. On average, 26.7% of loan officers leave the banks per year.

Next, focusing on officers remaining in overlapping areas only, I match detailed CoreLogic data with NMLS loan officer data within the six-year window around the mergers. For each bank merger, the sample includes officers in overlapping areas from merging banks and officers within the same areas from all non-merging banks. Requiring at least one mortgage record in a given officer-year, I have 16,619 officer-year records.

I provide the summary statistics of the overlapping-area sample in Table 4. Loan officers in merging banks account for 14.6% of the matched sample, with 3.8% from target banks and 10.8% from acquiring banks. The average percentage of small loans under \$90,000, \$100,000, and \$110,000 are respectively 39.6%, 45.3%, and 48.7%. The average percentage of nearby loans for properties located within 7, 8, and 9 miles of the officer's working address are respectively 42.1%, 46.0%, and 49.7%.

### 3 Bank Merger and Loan Officer Turnover

#### 3.1 The impact of bank mergers on loan officer turnover

In this section, I examine the effect of bank mergers on loan officer turnover at the employee level using the following specification,

$$\begin{aligned} Turnover_{i,m,b,i,(t-1,t+3)} = & \beta_1 Treat_b + \beta_2 Performance_{i,t-1} \\ & + \beta_3 Treat_b \times Performance_{i,t-1} + \beta_4 X_{b,t-1} + \alpha_t + \varepsilon_{i,m,b,t+3}, \end{aligned} \quad (1)$$

where  $i$  indexes loan officer,  $m$  indexes bank merger,  $b$  indexes bank, and  $t$  indexes merger year,  $Turnover_{i,m,b,i,(t-1,t+3)}$  is a dummy variable that equals one if the incumbent loan officer from year  $t - 1$  leaves the bank by year  $t + 3$  and zero otherwise,  $Treat$  is a dummy variable that equals one if bank  $b$  is involved in a merger,  $Performance_{i,t-1}$  is the natural logarithm of one plus the average number of loans officer  $i$  originated in the year before the merger, and  $X_{b,t-1}$  is a set of bank control variables measured at the bank-year level in year  $t - 1$ , including *Bank Size*, *Capital*, *RWA*, *ROA*, *ALLL*, *Subdebt*, *Charge-offs*, *Deposits*, *Non-deposit Fee Income*, and *Non-interest Income*. All continuous variables are winsorized at the 1st and 99th percentiles. Year ( $\alpha_t$ ) fixed effect is also included. I clustered the standard error by bank.

The results are presented in Table 5. In column (1), I don't include loan officer performance. I then include loan officers' past performance in column (2). In column (3), I include the interaction term between loan officer performance and the treat dummy. In columns (1)-(3), the coefficient estimates on  $Treat$  are all positive and statistically significant, suggesting that loan officers working in merging banks are more likely to leave following mergers. The magnitude of the effect is large. The likelihood of departure for incumbent loan officers in merging banks increases by about 9 percentage points, amounting to about 15% of the average turnover rate for the matched sample. In column (3), the coefficient estimate on  $Treat \times Performance$  is statistically insignificant, indicating that merging banks, relative to non-merging banks, do not demonstrate a differential sensitivity in loan officer turnover to performance metrics. These results are consistent with merging banks attempting to reduce employee redundancies post-merger. Furthermore, in columns (4)-(6), I examine the impact on loan officers at target and acquiring banks separately. After controlling for officer performance, I find that the impact is concentrated on target loan officers. Specifically, the probability of departure for target loan officers rises by about 18 percentage points, corresponding to around 30% of the average turnover rate observed within the matched sample.

Next, I examine the effect of bank merger activity on loan officer turnover within merging banks using the following specification:

$$Turnover_{i,m,b,i,(t-1,t+3)} = \beta_1 Target_{m,b} + \beta_2 Performance_{i,t-1} + \beta_3 Target_{m,b} \times Performance_{i,t-1} + \beta_4 X_{m,b,t-1} + \alpha_t + \varepsilon_{i,m,b,t+3}, \quad (2)$$

where  $Target_{m,b}$  is a dummy variable that equals one if loan officer  $i$  is employed at target bank  $b$  within merger  $m$  pre-merger and zero otherwise.

I present the results of estimating Equation (2) in Table 6. The coefficient estimates on  $Target$  are positive and statistically significant, suggesting that target loan officers experience higher turnover rates relative to acquirer loan officers. The results are consistent with target loan officers being less likely to be retained when merging banks decide to reduce employee redundancies post-merger.

### 3.2 Geographic overlap between target and acquiring banks

Next, I study how geographic overlap changes the impact of bank mergers on loan officer turnover. If loan officers at target and acquiring banks operate within the same geographic area before the merger, their operational scopes and client base likely overlap with each other. Therefore, to minimize redundancies, merging banks may opt to lay off loan officers working in these overlapping areas post-merger. For this analysis, I estimate the following specification,

$$\begin{aligned} Turnover_{i,m,b,i,(t-1,t+3)} = & \beta_1 Overlap_m + \beta_2 Non-overlap_m + \\ & + \beta_7 Performance_{i,t-1} + \beta_8 X_{b,t-1} + \alpha_t + \varepsilon_{i,m,b,t+3}, \end{aligned} \quad (3)$$

where  $Overlap_m$  equals one if the officer from merging banks works in areas where both target and acquiring banks maintain mortgage businesses and zero otherwise,  $Non-overlap_m$  equals one if the loan officer from merging banks operates in non-overlapping areas and zero otherwise,  $Performance_{i,t-1}$  is the natural logarithm of one plus the number of loans the officer originated in the year before the merger.

I present the results of estimating Equation (3) in Table 7. In column (1), the coefficient estimates on  $Overlap$  are positive and statistically significant, suggesting that officers operating in overlapping areas where both target and acquiring banks have mortgage businesses before the merger are more likely to leave post-merger, consistent with the interpretation that merging banks seek to improve efficiency by reducing employee redundancies. Specifically, three years following mergers, loan officers working in overlapping areas exhibit a roughly 18 percentage points increase in the probability of turnover, amounting to roughly 29% of the unconditional loan officer turnover

rate in the sample. However, I find no differences in the departure probabilities between officers in non-overlapping areas from merging banks and officers from non-merging banks. In column (2), I further examine target officers in overlapping (non-overlapping) areas and acquirer officers in overlapping (non-overlapping) areas separately. Compared with officers in non-merging banks, acquirer officers working in overlapping areas and target officers are more likely to leave after mergers.

### 3.3 Sensitivity of officer turnover to individual performance

Next, I examine whether the sensitivity of loan officer turnover to performance exhibits any changes around mergers. Analyzing the sensitivity of loan officer turnover to performance can help to understand the higher loan officer turnover in merging banks. If merging banks inherently demand superior performance from loan officers post-merger, loan officer turnover would be more sensitive to individual performance. This can partly explain the higher loan officer turnover rates observed in merging banks. In contrast, if merging banks do not require superior performance from loan offices, no change in the sensitivity of loan officer turnover to performance will be observed. For this analysis, I employ the following triple difference specification:

$$\begin{aligned} Turnover_{i,m,b,i,(t-1,t)} = & \beta_1 Performance_{i,t-1} \times Treat_b \times Post_t + \beta_2 Performance_{i,t-1} \times Treat_b \\ & + \beta_3 Treat_b \times Post_t + \beta_4 Performance_{i,t-1} \times Post_t + \beta_5 Performance_{i,t-1} + \beta_6 Post_t \\ & + \beta_7 X_{b,t-1} + \alpha_{m,b} + \alpha_{m,t} + \varepsilon_{i,m,b,t}, \end{aligned} \quad (4)$$

where  $Turnover_{i,m,b,i,(t-1,t)}$  is a dummy variable that equals one if the incumbent loan officer from year  $t - 1$  leaves the bank in year  $t$  and zero otherwise,  $Performance_{i,t-1}$  is the natural logarithm of one plus the total number of loans officer  $i$  originated in year  $t - 1$ ,  $Treat$  is a dummy variable that equals one if bank  $b$  is involved in a merger,  $Post_t$  is a dummy variable that equals one if the year is within  $[t + 1, t + 3]$  years of a merger at  $t$  for merging banks or a pseudo-event year at  $t$  for matched banks and zero otherwise. I include merger-year ( $\alpha_{m,t}$ ) and merger-bank ( $\alpha_{m,b}$ ) fixed effects to avoid the common bias associated with staggered treatment effects (Callaway and Sant’Anna 2021; De Chaisemartin and d’Haultfoeuille 2020; Goodman-Bacon 2021; Baker et al. 2022). I clustered the standard error by merger and bank.

The results of estimating Equation (4) are presented in Table 8. In column (1), I include merger-year and bank fixed effects. I then include merger-year and merger-bank fixed effects in column (2). I then include merger and bank-year fixed effects in column (3). In both columns, the coefficient estimates on the triple interaction term are statistically insignificant, suggesting that merging banks exhibit no difference in the sensitivity of loan officer turnover to individual performance post-merger.

## 4 Performance of Stayers and Leavers

Nest, I examine how the performance of stayers and leavers changes around mergers. For stayers and leavers, I calculate the total number of loans the officer originated each year, and then run the following Poisson fixed effects regression separately:

$$E[Number\ of\ Loans_{i,m,b,t}] = \exp(\beta_1 Stayer_{m,b,i} \times Post_{m,t} + \beta_2 X_{b,t} + \alpha_{m,t} + \alpha_{m,i} + \alpha_{m,b}), \quad (5)$$

where  $E[\cdot]$  is the expectation sign,  $Number\ of\ Loans_{i,m,b,t}$  is the total number of loans the loan officer  $i$  originated in year  $t$ ,  $Stayer_{m,b,i}$  equals one if officer  $i$  work in bank  $b$  in the three years following merger  $m$  and zero otherwise, and  $\alpha_{m,i}$  is the merger-officer fixed effect.

The Poisson fixed effect model is used here because the dependent variable (the total number of loans) is skewed and could take the value of zero. Additionally, the literature already shows that taking the natural logarithm of the dependent variable or one plus the dependent variable could lead to severe bias and suggests using the Poisson fixed effect model instead (Cohn et al. 2022; Chen and Roth 2024).

The estimation results of Equation (5) are provided in Table 9. In all the columns, the coefficient estimates on  $Stayer \times Post$  are positive and statistically significant, suggesting that stayers perform better than those leaving for other banks. Specifically, the number of loans originated by stayers is about 16% higher than that of officers leaving for other banks. The results suggest that officer reallocation after mergers improves labor market efficiency.

## 5 Distance and Soft Information

Loan officers collect soft information over time through frequent and personal contact with borrowers. A shorter distance can enhance the collection of soft information (Petersen and Rajan 2002; Agarwal and Hauswald 2010; Liberti and Petersen 2019). Soft information is hard to put down on paper. If the departure of loan officers leads to a loss of soft information following bank mergers, the distance between the loan officer and the borrower (property) should increase. I geocode the working addresses of loan officers and the property addresses and calculate the distance between them. For each loan officer, I calculate the percentage of mortgages originated by the officer in the year where the distance between the property address and the officer’s working address is within 8 miles, and then run the following regression:

$$Dist8_{i,m,b,l,t} = \beta_1 Treat_b \times Post_{m,t} + \beta_2 X_{b,t} + \alpha_{m,t} + \alpha_{m,b} + \alpha_{l,t} + \alpha_{m,i} + \varepsilon_{i,m,b,l,t}, \quad (6)$$

where  $Dist8_{i,m,b,l,t}$  is the percentage of mortgages originated by officer  $i$  in area  $l$  in year  $t$ , with the distance between the property address and the officer’s working address being within 8 miles,  $\alpha_{l,t}$  is the location-year fixed effect.

I put the results of estimating equation (6) in columns (1)-(3) of Table 10. The coefficient estimates on  $Treat \times Post$  are all close to -10% and statistically significant at the 1% level. These results suggest that the percentage of nearby loans originated by officers in merged banks decreases by 10 percentage points following mergers, amounting to about 22% of the unconditional average percentage of nearby loans in the sample.

Target banks usually are smaller than acquiring banks. As discussed in Berger et al. (2005), smaller banks are better able to collect and make use of soft information. In contrast, larger banks are more willing to use hard information and thus can lend at a greater distance. If target officers rely more on soft information than acquirer officers to originate mortgages before mergers, the effects on distance should be larger for target officers. I then check the effects on target and acquirer officers separately by running the following regression:

$$Dist8_{i,m,b,l,t} = \beta_1 Target_{m,b} \times Post_{m,t} + \beta_2 Acquirer_{m,b} \times Post_{m,t} + \beta_3 X_{b,t} + \alpha_{m,t} + \alpha_{m,b} + \alpha_{l,t} + \alpha_{m,i} + \varepsilon_{i,m,b,l,t}, \quad (7)$$

where  $Dist8_{i,m,b,l,t}$  is the percentage of loans within 8 miles officer  $i$  located in area  $l$  originated in year  $t$ ,  $Target_{m,b}$  equals one if bank  $b$  is the target bank in merger  $m$  and zero otherwise, and  $Acquirer_{m,b}$  equals one if bank  $b$  is the acquiring bank in merger  $m$  and zero otherwise.

The results of estimating equations (7) are shown in columns (4)-(6) of Table 10. The coefficient estimates on  $Target \times Post$  are close to -18% and statistically significant, while the coefficient estimates on  $Acquirer \times Post$  are only -10% and also statistically significant. The results are consistent with target officers being more affected by the loss of soft information following the departure of other loan officers.

To check the robustness of the results, I also try other distance cutoffs, including 7 miles and 9 miles. I put the results in Table 11. The results are similar with these alternative thresholds.

## 6 Small Mortgage Lending

In addition to distance and soft information, I also examine how bank mergers affect small mortgage lending. With the departure of loan officers in overlapping areas, remaining officers in the merged bank may face an increased number of mortgage applicants to handle. In this case, the loan officers can select borrowers due to competency constraints. As discussed in Agarwal and Ben-David (2011), under a commission-based compensation system, loan officers are incentivized to approve larger loans. The unavailability of small mortgage financing for low-cost properties will limit homeownership access for low-income families.

For this analysis, I replace the dependent variable in equation (6) with  $Small100$ , the percentage of mortgages below \$100,000 originated by the officer in a given year. The results are provided in Table 12. In columns (1)-(3), the coefficient estimates on  $Treat \times Post$  are about -6% and statistically significant, suggesting that the percentage of small loans originated by officers in merged banks decreases by about 6 percentage points after mergers, amounting to about 14% of the unconditional average percentage of nearby loans in the sample. The results are consistent with officers in merged banks tending to give up small mortgage loans following mergers.

After mergers, target officers may be subject to more intense restructuring and reorganization in the merged banks. For example, the change in team composition. It is plausible that acquirer officers, relative to target officers, can receive more resources and better treatment in the merged

bank. In this case, the effects on small mortgage originations are expected to be concentrated among acquirer officers. Replacing the dependent variable in equation (7) with *Small100*, I check the effects on target and acquirer officers separately. The results are provided in columns (4)-(6) in Table 12. The coefficient estimates on *Acquirer*  $\times$  *Post* are still negative and statistically significant, while the coefficient estimates on *Target*  $\times$  *Post* are very small and statistically insignificant. The results are consistent with only acquirer loan officers having the ability to select large loans post-merger.

To check the robustness of the results, I try other size cutoffs, including \$90,000 and \$110,000. I put the results in Table 13. The results are similar with these alternative thresholds.

## 7 Conclusion

I find that mortgage loan officer turnover increases after bank mergers. The effects are more pronounced for officers working in areas where both target and acquiring banks have mortgage businesses. Officers staying in the merged banks originate more loans than those leaving for other banks. The findings suggest that merged banks trying to improve efficiency by reducing redundant employees. Focusing on officers in overlapping areas, I find that officers in merged banks originate fewer loans closer to their offices. I also find that officers in merged banks originate fewer small loans after mergers. These results suggest that bank mergers lead to the loss of soft information and limit the availability of small mortgages.



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Table 1: Comparing treated and control banks

This table presents the comparison of treated and control banks in the quarter right before mergers. The bank-level variables are: *Bank Size* (the natural logarithm of total assets), *Capital* (total capital to risk-weighted assets), *RWA* (risk-weighted assets scaled by total assets), *ROA* (net income to total assets), *ALLL* (loan loss allowance scaled by total assets), *Subdebt* (subordinated debt scaled by total assets), *Charge-offs* (loan charge-offs scaled by total assets), *Deposits* (deposits to total assets), *Non-deposit Fee Income* (non-deposit fee income to total assets), and *Non-interest Income* (non-interest income to total income).

|                        | Treated |       | Control |       | Difference | t-Stat |
|------------------------|---------|-------|---------|-------|------------|--------|
|                        | Mean    | S.D.  | Mean    | S.D.  |            |        |
| Bank Size              | 14.140  | 1.543 | 14.241  | 1.784 | 0.079      | 0.533  |
| Capital                | 0.162   | 0.039 | 0.157   | 0.052 | -0.001     | -0.299 |
| RWA                    | 0.735   | 0.110 | 0.717   | 0.135 | -0.007     | -0.613 |
| ROA                    | 0.006   | 0.004 | 0.005   | 0.004 | 0.000      | 0.436  |
| ALLL                   | 0.008   | 0.004 | 0.008   | 0.004 | 0.000      | 1.068  |
| Subdebt                | 0.001   | 0.002 | 0.001   | 0.002 | 0.000      | -0.275 |
| Charge-off             | 0.001   | 0.002 | 0.002   | 0.003 | 0.000      | 1.205  |
| Deposits               | 0.808   | 0.063 | 0.810   | 0.068 | 0.003      | 0.452  |
| Non-deposit Fee Income | 0.004   | 0.005 | 0.005   | 0.007 | 0.001      | 1.030  |
| Non-interest Income    | 0.186   | 0.107 | 0.185   | 0.149 | 0.002      | 0.190  |

Table 2: Bank merger by year

This table provides the distribution of bank mergers by year from 2012 to 2020.

| Year  | No. | Percent |
|-------|-----|---------|
| 2012  | 5   | 6.67    |
| 2013  | 4   | 5.33    |
| 2014  | 14  | 18.67   |
| 2015  | 11  | 14.67   |
| 2016  | 8   | 10.67   |
| 2017  | 8   | 10.67   |
| 2018  | 9   | 12      |
| 2019  | 12  | 16      |
| 2020  | 4   | 5.33    |
| Total | 75  | 100     |

Table 3: Summary statistics of the NMLS sample

This table presents the summary statistics of the samples, with Panel A for the loan officer cross-sectional sample and Panel B for the loan officer panel sample. *Turnover* equals one if the incumbent loan officer leaves the bank and zero otherwise; *Treat* equals one if the bank is involved in a bank merger, *Overlap* equals one if the officer works for either the target or acquirer in an overlapping area where both the target and acquirer have mortgage businesses, *Non – overlap* equals one if the officer works for either the target or acquirer in an area where only one of them has a mortgage business, *Number of Loans* is the total number of loans originated by a loan officer in a given year, and *Performance* is the natural logarithm of one plus the total number of loans originated in a given year. The definitions of the bank variables are in the note to Table 1.

Panel A: Cross-sectional data

|                        | N      | Mean   | SD     | MIN    | 25th perc. | 50th perc. | 75th perc. | MAX    |
|------------------------|--------|--------|--------|--------|------------|------------|------------|--------|
| Treat                  | 69,646 | 0.401  | 0.490  | 0      | 0          | 0          | 1          | 1      |
| Turnover               | 69,646 | 0.616  | 0.486  | 0      | 0          | 1          | 1          | 1      |
| Overlap                | 67,890 | 0.102  | 0.303  | 0      | 0          | 0          | 0          | 1      |
| Non-overlap            | 67,890 | 0.296  | 0.456  | 0      | 0          | 0          | 1          | 1      |
| Number of Loans        | 56,290 | 5.436  | 14.849 | 0      | 0          | 0.000      | 3.000      | 91.000 |
| Performance            | 56,290 | 0.810  | 1.177  | 0      | 0          | 0.000      | 1.386      | 4.522  |
| Bank Size              | 69,646 | 16.381 | 0.868  | 12.881 | 16.308     | 16.840     | 16.840     | 16.840 |
| Capital                | 69,646 | 0.165  | 0.026  | 0.109  | 0.156      | 0.160      | 0.175      | 0.239  |
| RWA                    | 69,646 | 0.766  | 0.099  | 0.499  | 0.697      | 0.825      | 0.835      | 0.959  |
| ROA                    | 69,646 | 0.006  | 0.002  | 0.000  | 0.005      | 0.006      | 0.008      | 0.014  |
| ALLL                   | 69,646 | 0.009  | 0.004  | 0.002  | 0.007      | 0.008      | 0.009      | 0.018  |
| Subdebt                | 69,646 | 0.003  | 0.003  | 0.000  | 0.000      | 0.004      | 0.007      | 0.007  |
| Charge-off             | 69,646 | 0.002  | 0.003  | 0.000  | 0.001      | 0.002      | 0.002      | 0.016  |
| Deposits               | 69,646 | 0.778  | 0.051  | 0.638  | 0.752      | 0.791      | 0.811      | 0.905  |
| Non-deposit Fee Income | 69,646 | 0.007  | 0.004  | 0.000  | 0.004      | 0.006      | 0.009      | 0.019  |
| Non-interest Income    | 69,646 | 0.289  | 0.097  | 0.049  | 0.221      | 0.337      | 0.359      | 0.482  |



Panel B: Panel data

|                        | N       | Mean   | SD     | MIN    | 25th perc. | 50th perc. | 75th perc. | MAX    |
|------------------------|---------|--------|--------|--------|------------|------------|------------|--------|
| Treat                  | 193,576 | 0.531  | 0.499  | 0      | 0          | 1          | 1          | 1      |
| Turnover               | 193,576 | 0.267  | 0.443  | 0      | 0          | 0          | 1          | 1      |
| Number of Loans        | 186,990 | 6.797  | 19.030 | 0      | 0          | 0          | 3          | 115    |
| Performance            | 186,990 | 0.821  | 1.268  | 0      | 0          | 0          | 1.386      | 4.754  |
| Bank Size              | 190,231 | 17.618 | 1.610  | 10.660 | 16.509     | 18.181     | 18.802     | 19.841 |
| Capital                | 189,363 | 0.162  | 0.024  | 0.112  | 0.145      | 0.158      | 0.178      | 0.329  |
| RWA                    | 189,363 | 0.748  | 0.089  | 0.443  | 0.697      | 0.738      | 0.829      | 0.926  |
| ROA                    | 190,231 | 0.011  | 0.003  | 0.003  | 0.008      | 0.011      | 0.013      | 0.016  |
| ALLL                   | 190,231 | 0.008  | 0.004  | 0.002  | 0.006      | 0.008      | 0.009      | 0.026  |
| Subdebt                | 190,231 | 0.003  | 0.003  | 0      | 0.000      | 0.003      | 0.005      | 0.017  |
| Charge-off             | 190,231 | 0.004  | 0.005  | 0      | 0.001      | 0.002      | 0.003      | 0.021  |
| Deposits               | 190,231 | 0.785  | 0.060  | 0.335  | 0.754      | 0.795      | 0.828      | 0.905  |
| Non-deposit Fee Income | 190,231 | 0.012  | 0.006  | 0.000  | 0.008      | 0.012      | 0.018      | 0.060  |
| Non-interest Income    | 190,231 | 0.295  | 0.099  | 0.030  | 0.227      | 0.291      | 0.373      | 0.796  |

Table 4: Summary Statistics of the overlapping-area sample

This table presents the summary statistics of the overlapping-area sample. *Treat* equals one if the officer works in the merging bank and zero otherwise, *Target* equals one if the officer works in the target bank and zero otherwise, *Acquirer* equals one if the officer works in the acquirer bank and zero otherwise, *Small90* is the percentage of mortgages less than \$90,000 originated by the officer within the year, *Small100* is the percentage of mortgages less than \$100,000 originated by the officer within the year, *Small110* is the percentage of mortgages less than \$110,000 originated by the officer within the year, *Dist7* is the percentage of mortgages for properties located within 7 miles of officers' offices in a given year, *Dist8* is the percentage of mortgages for properties located within 8 miles of officers' offices in a given year, and *Dist9* is the percentage of mortgages for properties located within 9 miles of officers' offices in a given year. The definitions of the bank variables are in the note to Table 1.

|                        | N      | Mean   | SD    | MIN    | 25th perc. | 50th perc. | 75th perc. | MAX    |
|------------------------|--------|--------|-------|--------|------------|------------|------------|--------|
| Treat                  | 16,619 | 0.146  | 0.353 | 0      | 0          | 0          | 0          | 1      |
| Target                 | 16,619 | 0.038  | 0.192 | 0      | 0          | 0          | 0          | 1      |
| Acquirer               | 16,619 | 0.108  | 0.310 | 0      | 0          | 0          | 0          | 1      |
| Small90                | 16,617 | 0.396  | 0.403 | 0      | 0          | 0.250      | 0.800      | 1      |
| Small100               | 16,617 | 0.453  | 0.412 | 0      | 0.009      | 0.357      | 1          | 1      |
| Small110               | 16,617 | 0.487  | 0.413 | 0      | 0.042      | 0.486      | 1          | 1      |
| Dist7                  | 16,615 | 0.421  | 0.393 | 0      | 0          | 0.333      | 0.818      | 1      |
| Dist8                  | 16,615 | 0.460  | 0.397 | 0      | 0          | 0.400      | 1          | 1      |
| Dist9                  | 16,615 | 0.497  | 0.395 | 0      | 0.060      | 0.500      | 1          | 1      |
| Bank Size              | 16,606 | 18.073 | 1.349 | 13.011 | 17.534     | 18.644     | 18.854     | 19.161 |
| Capital                | 16,447 | 0.153  | 0.021 | 0.107  | 0.142      | 0.156      | 0.160      | 0.204  |
| RWA                    | 16,447 | 0.754  | 0.105 | 0.449  | 0.697      | 0.813      | 0.833      | 0.891  |
| ROA                    | 16,606 | 0.012  | 0.004 | 0.003  | 0.009      | 0.013      | 0.015      | 0.016  |
| ALLL                   | 16,606 | 0.008  | 0.003 | 0.001  | 0.007      | 0.008      | 0.009      | 0.015  |
| Subdebt                | 16,606 | 0.004  | 0.003 | 0      | 0.003      | 0.003      | 0.005      | 0.013  |
| Charge-off             | 16,606 | 0.002  | 0.001 | 0.000  | 0.002      | 0.002      | 0.003      | 0.004  |
| Deposits               | 16,606 | 0.790  | 0.101 | 0.325  | 0.773      | 0.803      | 0.860      | 0.898  |
| Non-deposit Fee Income | 16,606 | 0.012  | 0.008 | 0.001  | 0.012      | 0.012      | 0.013      | 0.058  |
| Non-interest Income    | 16,606 | 0.318  | 0.124 | 0.049  | 0.316      | 0.352      | 0.372      | 0.767  |

Table 5: Bank mergers and loan officer turnover

This table reports the results of estimating Equation (1). The dependent variable, *Turnover*, equals one if the incumbent loan officer leaves the bank within three years after the merger and zero otherwise; *Treat* equals one if the bank is involved in a bank merger; *Performance* is the natural logarithm of one plus the number of loans the officer originated in the year before the merger; *Target* equals one if the loan officer works in the target bank pre-merger and zero otherwise; *Acquirer* equals one if the loan officer works in the acquiring bank pre-merger and zero otherwise. The definitions of the bank variables are in the note to Table 1. Standard errors clustered by merger and bank are reported in parentheses below the coefficient estimates. The significance at the levels of 1%, 5%, and 10% is indicated by \*\*\*, \*\*, and \*, respectively.

|                               | (1)                  | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
|-------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Treat                         | 0.097**<br>(0.040)   | 0.090*<br>(0.050)    | 0.080*<br>(0.047)    |                      |                      |                      |
| Target                        |                      |                      |                      | 0.194***<br>(0.041)  | 0.183***<br>(0.048)  | 0.167***<br>(0.050)  |
| Acquirer                      |                      |                      |                      | 0.082*<br>(0.043)    | 0.078<br>(0.055)     | 0.068<br>(0.053)     |
| Performance                   |                      | -0.046***<br>(0.005) | -0.051***<br>(0.006) |                      | -0.045***<br>(0.005) | -0.051***<br>(0.006) |
| Treat $\times$ Performance    |                      |                      | 0.011<br>(0.010)     |                      |                      |                      |
| Target $\times$ Performance   |                      |                      |                      |                      |                      | 0.029*<br>(0.017)    |
| Acquirer $\times$ Performance |                      |                      |                      |                      |                      | 0.011<br>(0.010)     |
| Bank Size                     | 0.024*<br>(0.013)    | 0.038**<br>(0.019)   | 0.039**<br>(0.019)   | 0.031**<br>(0.012)   | 0.044**<br>(0.017)   | 0.045***<br>(0.017)  |
| Capital                       | -0.410<br>(0.527)    | -0.246<br>(0.886)    | -0.241<br>(0.883)    | -0.456<br>(0.466)    | -0.267<br>(0.908)    | -0.260<br>(0.906)    |
| RWA                           | -0.035<br>(0.176)    | -0.091<br>(0.228)    | -0.092<br>(0.228)    | -0.059<br>(0.180)    | -0.126<br>(0.226)    | -0.128<br>(0.226)    |
| ROA                           | -7.527<br>(6.399)    | -8.742<br>(8.470)    | -9.003<br>(8.449)    | -4.953<br>(6.044)    | -5.374<br>(8.670)    | -5.595<br>(8.663)    |
| ALLL                          | -0.308<br>(4.675)    | 0.817<br>(9.007)     | 0.923<br>(9.032)     | -1.546<br>(4.422)    | -1.368<br>(9.169)    | -1.270<br>(9.197)    |
| Subdebt                       | 6.486<br>(12.419)    | 9.135<br>(16.296)    | 9.155<br>(16.230)    | 5.387<br>(13.301)    | 7.609<br>(17.285)    | 7.649<br>(17.196)    |
| Charge-off                    | 20.521***<br>(6.344) | 12.649<br>(8.080)    | 12.295<br>(8.190)    | 21.742***<br>(7.188) | 15.923**<br>(8.007)  | 15.470*<br>(8.093)   |
| Deposits                      | 0.385<br>(0.412)     | 0.444<br>(0.649)     | 0.444<br>(0.645)     | 0.240<br>(0.441)     | 0.341<br>(0.678)     | 0.338<br>(0.674)     |
| Non-deposit Fee Income        | 18.321***<br>(6.756) | 22.345*<br>(11.721)  | 22.665*<br>(11.592)  | 14.278*<br>(8.402)   | 17.284<br>(13.672)   | 17.631<br>(13.519)   |
| Non-interest Income           | -0.524<br>(0.421)    | -0.724<br>(0.631)    | -0.749<br>(0.627)    | -0.372<br>(0.470)    | -0.540<br>(0.697)    | -0.566<br>(0.693)    |
| Constant                      | -0.021<br>(0.440)    | -0.177<br>(0.668)    | -0.179<br>(0.663)    | -0.006<br>(0.449)    | -0.185<br>(0.688)    | -0.192<br>(0.682)    |
| Observations                  | 69,646               | 56,290               | 56,290               | 69,646               | 56,290               | 56,290               |
| Adjusted R-squared            | 0.053                | 0.062                | 0.062                | 0.055                | 0.064                | 0.064                |
| Year FE                       | Yes                  | Yes                  | Yes                  | Yes                  | Yes                  | Yes                  |

Table 6: Bank mergers and loan officers turnover in merging banks

This table reports the results of estimating Equation (2). The dependent variable, *Turnover*, equals one if the incumbent loan officer leaves the bank within three years after the merger and zero otherwise; *Target* equals one if the loan officer works in the target bank pre-merger and zero otherwise; *Performance* is the natural logarithm of one plus the number of loans the officer originated in the year before the merger. The definitions of the bank variables are in the note to Table 1. Standard errors clustered by merger and bank are reported in parentheses below the coefficient estimates. The significance at the levels of 1%, 5%, and 10% is indicated by \*\*\*, \*\*, and \*, respectively.

|                             | (1)                     | (2)                     |
|-----------------------------|-------------------------|-------------------------|
| Target                      | 0.262***<br>(0.062)     | 0.259***<br>(0.063)     |
| Performance                 | -0.036***<br>(0.007)    | -0.037***<br>(0.008)    |
| Target $\times$ Performance |                         | 0.005<br>(0.013)        |
| Bank Size                   | 0.075***<br>(0.025)     | 0.075***<br>(0.025)     |
| Capital                     | 0.079<br>(1.447)        | 0.078<br>(1.448)        |
| RWA                         | 0.226<br>(0.490)        | 0.226<br>(0.490)        |
| ROA                         | -36.021***<br>(13.031)  | -35.994***<br>(13.034)  |
| ALLL                        | -0.914<br>(9.022)       | -0.882<br>(9.041)       |
| Subdebt                     | 18.550<br>(12.900)      | 18.569<br>(12.891)      |
| Charge-off                  | -222.224***<br>(75.958) | -221.939***<br>(75.850) |
| Deposits                    | 0.622<br>(0.802)        | 0.621<br>(0.803)        |
| Non-deposit Fee Income      | 38.928***<br>(13.564)   | 38.922***<br>(13.574)   |
| Non-interest Income         | -0.807*<br>(0.476)      | -0.807*<br>(0.476)      |
| Constant                    | -0.885<br>(0.947)       | -0.886<br>(0.947)       |
| Observations                | 21,982                  | 21,982                  |
| Adjusted R-squared          | 0.074                   | 0.074                   |
| Year FE                     | Yes                     | Yes                     |

Table 7: Geographic overlap

This table reports the results of estimating Equation (3). The dependent variable, *Turnover*, equals one if the incumbent loan officer leaves the bank and zero otherwise; *Overlap* equals one if the officer works for either the target or acquirer in an overlapping area where both the target and acquirer have mortgage businesses; *Non – overlap* equals one if the officer works for either the target or acquirer in an area where only one of them has a mortgage business; *Target* equals one if the loan officer works in the target bank pre-merger and zero otherwise; *Acquirer* equals one if the loan officer works in the acquiring bank pre-merger and zero otherwise; *Performance* is the natural logarithm of one plus the number of loans the officer originated in a given year. The definitions of the bank variables are in the note to Table 1. Standard errors clustered by merger and bank are reported in parentheses below the coefficient estimates. The significance at the levels of 1%, 5%, and 10% is indicated by \*\*\*, \*\*, and \*, respectively.

|  | (1)                  | (2)                  |
|--|----------------------|----------------------|
| Overlap                                | 0.184***<br>(0.059)  |                      |
| Non $\times$ <i>Overlap</i>            | 0.059<br>(0.044)     |                      |
| Target $\times$ <i>Overlap</i>         |                      | 0.212***<br>(0.054)  |
| Acquirer $\times$ <i>Overlap</i>       |                      | 0.180**<br>(0.082)   |
| Target $\times$ <i>Non – overlap</i>   |                      | 0.161***<br>(0.052)  |
| Acquirer $\times$ <i>Non – overlap</i> |                      | 0.048<br>(0.043)     |
| Performance                            | -0.046***<br>(0.006) | -0.045***<br>(0.006) |
| Bank Size                              | 0.042**<br>(0.018)   | 0.045***<br>(0.017)  |
| Capital                                | -0.256<br>(0.848)    | -0.284<br>(0.857)    |
| RWA                                    | -0.141<br>(0.220)    | -0.160<br>(0.216)    |
| ROA                                    | -5.850<br>(8.285)    | -3.430<br>(8.420)    |
| ALLL                                   | 0.425<br>(8.256)     | -0.934<br>(8.352)    |
| Subdebt                                | 7.001<br>(14.954)    | 6.101<br>(15.172)    |
| Charge-off                             | 15.374*<br>(7.969)   | 16.940**<br>(7.715)  |
| Deposits                               | 0.369<br>(0.620)     | 0.307<br>(0.619)     |
| Non-deposit Fee Income                 | 16.014<br>(12.881)   | 13.900<br>(12.843)   |
| Non-interest Income                    | -0.529<br>(0.621)    | -0.437<br>(0.627)    |
| Constant                               | -0.166<br>(0.651)    | -0.171<br>(0.651)    |
| Observations                           | 54,997               | 54,997               |
| Adjusted R-squared                     | 0.068                | 0.069                |
| Year FE                                | Yes                  | Yes                  |

Table 8: The sensitivity of loan officer turnover to performance

This table reports the results of estimating Equation (4). The dependent variable, *Turnover*, equals one if the incumbent loan officer leaves the bank and zero otherwise; *Treat* equals one if the bank is engaged in a bank merger; *Performance* is the natural logarithm of one plus the number of loans the officer originated in the previous year; *Post* equals one if the year is post-merger and zero otherwise. The definitions of the bank variables are in the note to Table 1. Standard errors clustered by merger and bank are reported in parentheses below the coefficient estimates. The significance at the levels of 1%, 5%, and 10% is indicated by \*\*\*, \*\*, and \*, respectively.

|  | (1)                  | (2)                 |
|--|----------------------|---------------------|
| Performance $\times$ <i>Treat</i> $\times$ <i>Post</i> | -0.007<br>(0.016)    | -0.009<br>(0.012)   |
| Performance $\times$ <i>Treat</i>                      | 0.012<br>(0.011)     | 0.013<br>(0.010)    |
| <i>Treat</i> $\times$ <i>Post</i>                      | -0.009<br>(0.041)    | -0.001<br>(0.040)   |
| Performance $\times$ <i>Post</i>                       | -0.013<br>(0.009)    | -0.010<br>(0.007)   |
| Performance  | -0.019**<br>(0.008)  | -0.020**<br>(0.008) |
| Post   | 0.015<br>(0.056)     |                     |
| Bank Size  | -0.018<br>(0.030)    | -0.002<br>(0.021)   |
| Capital  | 1.967**<br>(0.817)   | 1.097<br>(0.895)    |
| RWA  | 0.118<br>(0.120)     | 0.105<br>(0.279)    |
| ROA  | -14.680<br>(8.693)   | -13.541<br>(10.579) |
| ALLL   | 1.768<br>(6.635)     | -6.859<br>(9.076)   |
| Subdebt  | 3.117<br>(3.694)     | 2.848<br>(8.792)    |
| Charge-off   | 46.531**<br>(21.855) | 28.399*<br>(14.991) |
| Deposits   | 0.168<br>(0.451)     | 0.499<br>(0.410)    |
| Non-deposit Fee Income                                 | 8.852<br>(12.867)    | 17.217<br>(17.712)  |
| Non-interest Income                                    | 0.005<br>(0.741)     | -0.488<br>(0.738)   |
| Observations   | 182,786              | 182,785             |
| Adjusted R-squared                                     | 0.105                | 0.135               |
| Merger-Year FE   | Yes                  | Yes                 |
| Bank FE  | Yes                  |                     |
| Merger-Bank FE   |                      | Yes                 |

Table 9: Performance of stayers and leavers

This table reports the results of estimating Equation (5). The dependent variable is *Number of Loans*, the total number of loans originated by the loan officer in a given year; *Stayer* equals one if the officer stays in the merged bank for three years post-merger; *Post* equals one if the year is post-merger and zero otherwise. The definitions of the bank variables are in the note to Table 1. Standard errors clustered by merger and bank are reported in parentheses below the coefficient estimates. The significance at the levels of 1%, 5%, and 10% is indicated by \*\*\*, \*\*, and \*, respectively.

|                        | (1)                    | (2)                    | (3)                    |
|------------------------|------------------------|------------------------|------------------------|
| Stayer $\times$ Post   | 0.162**<br>(0.070)     | 0.162**<br>(0.070)     | 0.121*<br>(0.068)      |
| Post                   | -0.232*<br>(0.120)     | -0.231*<br>(0.120)     |                        |
| Stayer                 | -0.078*<br>(0.044)     |                        |                        |
| Bank Size              | -0.046<br>(0.071)      | -0.046<br>(0.071)      | -0.038<br>(0.078)      |
| Capital                | -1.003<br>(1.933)      | -0.997<br>(1.936)      | -1.381<br>(2.812)      |
| RWA                    | -0.289<br>(0.303)      | -0.290<br>(0.304)      | -0.630<br>(0.778)      |
| ROA                    | 29.837***<br>(7.219)   | 29.842***<br>(7.252)   | 14.577<br>(15.144)     |
| ALLL                   | -8.700<br>(13.616)     | -8.731<br>(13.600)     | 24.637<br>(21.131)     |
| Subdebt                | -28.200**<br>(13.600)  | -28.120**<br>(13.604)  | -6.100<br>(13.800)     |
| Charge-off             | 41.368***<br>(13.623)  | 41.328***<br>(13.655)  | 26.007<br>(28.729)     |
| Deposits               | -0.504<br>(0.830)      | -0.505<br>(0.827)      | -0.355<br>(1.586)      |
| Non-deposit Fee Income | -54.302***<br>(19.406) | -54.197***<br>(19.415) | -64.980***<br>(21.001) |
| Non-interest Income    | 3.433***<br>(0.998)    | 3.421***<br>(0.997)    | 4.314***<br>(1.299)    |
| Observations           | 22,178                 | 22,053                 | 22,032                 |
| Officer FE             | Yes                    |                        |                        |
| Merger-Bank FE         | Yes                    |                        | Yes                    |
| Year FE                | Yes                    | Yes                    |                        |
| Merger-officer FE      |                        | Yes                    | Yes                    |
| Bank FE                |                        | Yes                    |                        |
| Merger-Year FE         |                        |                        | Yes                    |

Table 10: Bank mergers and nearby loans for properties located within 8 miles of officer offices  
This table reports the results of estimating equations (6) and (7). The dependent variable *Dist8* is the percentage of mortgages for properties located within 8 miles of officers' offices in a given year. *Treat* equals one if the officer works in merging bank and zero otherwise, *Target* equals one if the officer works in target bank pre-merger and zero otherwise, *Acquirer* equals one if the officer works in acquiring bank pre-merger and zero otherwise. Standard errors clustered by merger and bank are reported in parentheses below the coefficient estimates. The significance at the levels of 1%, 5%, and 10% is indicated by \*\*\*, \*\*, and \*, respectively.

|                               | (1)                  | (2)                  | (3)                  | (4)                  | (5)                  | (6)                  |
|-------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <i>Treat</i> × <i>Post</i>    | -0.099***<br>(0.019) | -0.099***<br>(0.018) | -0.102***<br>(0.018) |                      |                      |                      |
| <i>Target</i> × <i>Post</i>   |                      |                      |                      | -0.181**<br>(0.071)  | -0.179**<br>(0.073)  | -0.183**<br>(0.076)  |
| <i>Acquirer</i> × <i>Post</i> |                      |                      |                      | -0.096***<br>(0.018) | -0.097***<br>(0.017) | -0.099***<br>(0.017) |
| <i>Target</i>                 |                      |                      |                      | 0.070***<br>(0.021)  |                      |                      |
| Bank Size                     | 0.094***<br>(0.028)  | 0.093***<br>(0.029)  | 0.094***<br>(0.029)  | 0.135**<br>(0.049)   | 0.134**<br>(0.050)   | 0.136**<br>(0.051)   |
| Capital                       | -0.637<br>(0.595)    | -0.610<br>(0.583)    | -0.614<br>(0.567)    | -0.767<br>(0.657)    | -0.734<br>(0.652)    | -0.739<br>(0.635)    |
| RWA                           | 0.064<br>(0.117)     | 0.056<br>(0.108)     | 0.057<br>(0.110)     | 0.089<br>(0.130)     | 0.083<br>(0.122)     | 0.085<br>(0.123)     |
| ROA                           | -2.087<br>(4.368)    | -2.294<br>(4.409)    | -2.405<br>(4.382)    | -1.704<br>(4.284)    | -1.926<br>(4.332)    | -2.024<br>(4.313)    |
| ALLL                          | 14.322**<br>(4.967)  | 14.687***<br>(4.515) | 15.591***<br>(4.577) | 16.340***<br>(4.982) | 16.669***<br>(4.573) | 17.622***<br>(4.571) |
| Subdebt                       | 5.801**<br>(2.442)   | 5.828**<br>(2.436)   | 6.080**<br>(2.495)   | 6.090**<br>(2.187)   | 6.107**<br>(2.201)   | 6.382***<br>(2.190)  |
| Charge-off                    | -14.024<br>(13.960)  | -15.142<br>(13.385)  | -15.536<br>(13.447)  | -13.537<br>(14.082)  | -14.758<br>(13.534)  | -15.139<br>(13.613)  |
| Deposits                      | -0.366<br>(0.363)    | -0.375<br>(0.366)    | -0.374<br>(0.372)    | -0.401<br>(0.346)    | -0.408<br>(0.349)    | -0.407<br>(0.354)    |
| Non-deposit Fee Income        | -3.370<br>(6.620)    | -3.115<br>(6.566)    | -3.229<br>(6.624)    | -2.816<br>(6.148)    | -2.572<br>(6.079)    | -2.684<br>(6.116)    |
| Non-interest Income           | 0.242<br>(0.421)     | 0.237<br>(0.424)     | 0.252<br>(0.427)     | 0.325<br>(0.442)     | 0.316<br>(0.447)     | 0.334<br>(0.452)     |
| Observations                  | 16,213               | 16,210               | 16,194               | 16,213               | 16,210               | 16,194               |
| R-squared                     | 0.653                | 0.653                | 0.659                | 0.653                | 0.653                | 0.659                |
| Merger-Year FE                | Yes                  | Yes                  | Yes                  | Yes                  | Yes                  | Yes                  |
| Officer FE                    | Yes                  | Yes                  |                      | Yes                  | Yes                  |                      |
| Local-Year FE                 | Yes                  | Yes                  | Yes                  | Yes                  | Yes                  | Yes                  |
| Merger-Bank FE                |                      | Yes                  | Yes                  |                      | Yes                  | Yes                  |
| Merger-Officer FE             |                      |                      | Yes                  |                      |                      | Yes                  |



Table 11: Bank mergers and nearby loans with other distance cutoffs

This table reports the results of estimating equations (6) and (7). The dependent variables are *Dist7*, the percentage of mortgages for properties located within 7 miles of officers' offices in a given year, and *Dist9*, the percentage of mortgages for properties located within 9 miles of officers' offices in a given year. *Treat* equals one if the officer works in the merging bank and zero otherwise, *Target* equals one if the officer works in the target bank pre-merger and zero otherwise, *Acquirer* equals one if the officer works in the acquiring bank pre-merger and zero otherwise. Standard errors clustered by merger and bank are reported in parentheses below the coefficient estimates. The significance at the levels of 1%, 5%, and 10% is indicated by \*\*\*, \*\*, and \*, respectively.

|                                      | (1)<br>Dist7         | (2)<br>Dist9         | (3)<br>Dist7         | (4)<br>Dist9         |
|--------------------------------------|----------------------|----------------------|----------------------|----------------------|
| <i>Treat</i> $\times$ <i>Post</i>    | -0.104***<br>(0.022) | -0.079***<br>(0.019) |                      |                      |
| <i>Target</i> $\times$ <i>Post</i>   |                      |                      | -0.193***<br>(0.051) | -0.136**<br>(0.060)  |
| <i>Acquirer</i> $\times$ <i>Post</i> |                      |                      | -0.101***<br>(0.020) | -0.077***<br>(0.019) |
| Bank Size                            | 0.085**<br>(0.030)   | 0.080**<br>(0.029)   | 0.130**<br>(0.046)   | 0.109**<br>(0.043)   |
| Capital                              | -0.721<br>(0.704)    | -0.601<br>(0.529)    | -0.858<br>(0.766)    | -0.689<br>(0.571)    |
| RWA                                  | -0.003<br>(0.112)    | 0.119<br>(0.114)     | 0.028<br>(0.125)     | 0.138<br>(0.121)     |
| ROA                                  | -2.325<br>(4.337)    | -2.339<br>(4.260)    | -1.909<br>(4.151)    | -2.073<br>(4.207)    |
| ALLL                                 | 14.448***<br>(4.719) | 8.100<br>(5.533)     | 16.670***<br>(4.500) | 9.525<br>(5.812)     |
| Subdebt                              | 8.684**<br>(3.094)   | 1.892<br>(2.825)     | 9.014***<br>(2.920)  | 2.104<br>(2.531)     |
| Charge-off                           | -11.877<br>(14.950)  | -6.396<br>(13.497)   | -11.443<br>(15.122)  | -6.117<br>(13.695)   |
| Deposits                             | -0.255<br>(0.328)    | -0.294<br>(0.308)    | -0.291<br>(0.316)    | -0.318<br>(0.298)    |
| Non-deposit Fee Income               | -4.960<br>(6.028)    | -3.189<br>(6.515)    | -4.364<br>(5.703)    | -2.807<br>(6.108)    |
| Non-interest Income                  | 0.295<br>(0.376)     | 0.258<br>(0.432)     | 0.385<br>(0.385)     | 0.315<br>(0.454)     |
| Observations                         | 16,194               | 16,194               | 16,194               | 16,194               |
| R-squared                            | 0.646                | 0.666                | 0.646                | 0.666                |
| Merger-Year FE                       | Yes                  | Yes                  | Yes                  | Yes                  |
| Merger-Officer FE                    | Yes                  | Yes                  | Yes                  | Yes                  |
| Local-Year FE                        | Yes                  | Yes                  | Yes                  | Yes                  |
| Merger-Bank FE                       | Yes                  | Yes                  | Yes                  | Yes                  |

Table 12: Bank mergers and small loan below \$100,000

This table reports the results on small loan origination in overlapping areas. The dependent variable *Small100* is the percentage of mortgages less than \$100,000 originated by the officer within the year, *Treat* equals one if the officer works in merging bank and zero otherwise, *Target* equals one if the officer works in target bank pre-merger and zero otherwise, *Acquirer* equals one if the officer works in acquiring bank pre-merger and zero otherwise. Standard errors clustered by merger and bank are reported in parentheses below the coefficient estimates. The significance at the levels of 1%, 5%, and 10% is indicated by \*\*\*, \*\*, and \*, respectively.

|                                      | (1)                 | (2)                 | (3)                 | (4)                 | (5)                 | (6)                 |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| <i>Treat</i> $\times$ <i>Post</i>    | -0.065**<br>(0.024) | -0.064**<br>(0.024) | -0.064**<br>(0.024) |                     |                     |                     |
| <i>Target</i> $\times$ <i>Post</i>   |                     |                     |                     | -0.000<br>(0.082)   | 0.001<br>(0.083)    | 0.004<br>(0.086)    |
| <i>Acquirer</i> $\times$ <i>Post</i> |                     |                     |                     | -0.067**<br>(0.024) | -0.066**<br>(0.024) | -0.066**<br>(0.024) |
| <i>Target</i>                        |                     |                     |                     | -0.035<br>(0.024)   |                     |                     |
| <i>Bank Size</i>                     | 0.051*<br>(0.025)   | 0.051*<br>(0.025)   | 0.049*<br>(0.025)   | 0.018<br>(0.049)    | 0.018<br>(0.049)    | 0.014<br>(0.051)    |
| <i>Capital</i>                       | -0.946**<br>(0.366) | -0.939**<br>(0.364) | -1.032**<br>(0.360) | -0.844*<br>(0.435)  | -0.838*<br>(0.432)  | -0.928**<br>(0.416) |
| <i>RWA</i>                           | -0.269*<br>(0.136)  | -0.269*<br>(0.137)  | -0.276*<br>(0.136)  | -0.289**<br>(0.133) | -0.291**<br>(0.135) | -0.299**<br>(0.135) |
| <i>ROA</i>                           | 2.222<br>(2.533)    | 2.143<br>(2.526)    | 2.176<br>(2.581)    | 1.923<br>(2.648)    | 1.842<br>(2.651)    | 1.861<br>(2.703)    |
| <i>ALLL</i>                          | -10.247<br>(6.646)  | -10.225<br>(6.681)  | -10.868<br>(7.039)  | -11.835<br>(7.590)  | -11.845<br>(7.670)  | -12.554<br>(8.087)  |
| <i>Subdebt</i>                       | 6.281<br>(5.383)    | 6.247<br>(5.376)    | 5.864<br>(5.584)    | 6.054<br>(5.353)    | 6.019<br>(5.343)    | 5.613<br>(5.567)    |
| <i>Charge-off</i>                    | -26.416<br>(17.268) | -26.442<br>(17.226) | -25.829<br>(17.426) | -26.788<br>(17.553) | -26.756<br>(17.490) | -26.159<br>(17.691) |
| <i>Deposits</i>                      | 0.204<br>(0.281)    | 0.207<br>(0.282)    | 0.187<br>(0.281)    | 0.231<br>(0.289)    | 0.234<br>(0.290)    | 0.215<br>(0.288)    |
| <i>Non-deposit Fee Income</i>        | -2.226<br>(4.921)   | -2.245<br>(4.945)   | -1.777<br>(5.074)   | -2.669<br>(4.762)   | -2.689<br>(4.785)   | -2.230<br>(4.880)   |
| <i>Non-interest Income</i>           | 0.097<br>(0.237)    | 0.095<br>(0.238)    | 0.055<br>(0.246)    | 0.032<br>(0.246)    | 0.030<br>(0.246)    | -0.013<br>(0.259)   |
| <i>Observations</i>                  | 16,215              | 16,212              | 16,198              | 16,215              | 16,212              | 16,198              |
| <i>R-squared</i>                     | 0.677               | 0.677               | 0.682               | 0.677               | 0.677               | 0.682               |
| <i>Merger-Year FE</i>                | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 |
| <i>Officer FE</i>                    | Yes                 | Yes                 |                     | Yes                 | Yes                 |                     |
| <i>Local-Year FE</i>                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 |
| <i>Merger-Bank FE</i>                |                     | Yes                 | Yes                 |                     | Yes                 | Yes                 |
| <i>Merger-Officer FE</i>             |                     |                     | Yes                 |                     |                     | Yes                 |

Table 13: Bank mergers and small loan with other size thresholds

This table reports the results on small loan origination in overlapping areas. The dependent variables are *Small90*, the percentage of mortgages less than \$90,000 originated by the officer within the year; *Small110*, the percentage of mortgages less than \$110,000 originated by the officer within the year. *Treat* equals one if the officer works in the merging bank and zero otherwise, *Target* equals one if the officer works in the target bank pre-merger and zero otherwise, *Acquirer* equals one if the officer works in the acquiring bank pre-merger and zero otherwise. Standard errors clustered by merger and bank are reported in parentheses below the coefficient estimates. The significance at the levels of 1%, 5%, and 10% is indicated by \*\*\*, \*\*, and \*, respectively.

|                                      | (1)<br>Small90       | (2)<br>Small110     | (3)<br>Small90       | (4)<br>Small110     |
|--------------------------------------|----------------------|---------------------|----------------------|---------------------|
| <i>Treat</i> $\times$ <i>Post</i>    | -0.063**<br>(0.029)  | -0.060**<br>(0.024) |                      |                     |
| <i>Target</i> $\times$ <i>Post</i>   |                      |                     | -0.003<br>(0.080)    | -0.016<br>(0.078)   |
| <i>Acquirer</i> $\times$ <i>Post</i> |                      |                     | -0.065**<br>(0.030)  | -0.061**<br>(0.024) |
| Bank Size                            | 0.039**<br>(0.018)   | 0.046**<br>(0.021)  | 0.008<br>(0.051)     | 0.024<br>(0.046)    |
| Capital                              | -0.789**<br>(0.275)  | -0.819**<br>(0.374) | -0.697**<br>(0.245)  | -0.751*<br>(0.424)  |
| RWA                                  | -0.351***<br>(0.115) | -0.309*<br>(0.174)  | -0.372***<br>(0.119) | -0.323*<br>(0.171)  |
| ROA                                  | 0.183<br>(2.529)     | 3.562<br>(2.587)    | -0.099<br>(2.442)    | 3.358<br>(2.607)    |
| ALLL                                 | -10.698<br>(7.763)   | -10.387<br>(6.896)  | -12.204<br>(8.751)   | -11.479<br>(8.071)  |
| Subdebt                              | 5.207<br>(5.747)     | 7.811<br>(5.358)    | 4.983<br>(5.726)     | 7.648<br>(5.383)    |
| Charge-off                           | -16.940<br>(12.948)  | -26.203<br>(17.308) | -17.234<br>(13.225)  | -26.417<br>(17.535) |
| Deposits                             | 0.284<br>(0.270)     | 0.248<br>(0.227)    | 0.309<br>(0.277)     | 0.266<br>(0.239)    |
| Non-deposit Fee Income               | -4.108<br>(5.903)    | -3.864<br>(4.411)   | -4.513<br>(5.790)    | -4.157<br>(4.433)   |
| Non-interest Income                  | 0.348<br>(0.243)     | 0.111<br>(0.167)    | 0.288<br>(0.256)     | 0.067<br>(0.186)    |
| Observations                         | 16,198               | 16,198              | 16,198               | 16,198              |
| R-squared                            | 0.658                | 0.709               | 0.658                | 0.709               |
| Merger-Year FE                       | Yes                  | Yes                 | Yes                  | Yes                 |
| Merger-Officer FE                    | Yes                  | Yes                 | Yes                  | Yes                 |
| Local-Year FE                        | Yes                  | Yes                 | Yes                  | Yes                 |
| Merger-Bank FE                       | Yes                  | Yes                 | Yes                  | Yes                 |