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ABSTRACT

Does the pre-deal geographic overlap of the subsidiaries and branches of two banks affect the probability that they merge and post-merger value creation and synergies? We compile comprehensive information on U.S. bank acquisitions from 1986 through 2014, construct several measures of network overlap, and design and implement a new identification strategy. We find that greater pre-deal network overlap (1) increases the likelihood that two banks merge, (2) boosts the cumulative abnormal returns of the acquirer, target, and combined banks, and (3) is associated with larger labor cost reductions, managerial turnover, loan quality improvements, and revenue enhancements at target banks.

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1. Introduction

Mergers and acquisitions have reduced the number of U.S. banks by 60% since the mid-1980s, spurring research into the causes and consequences of bank mergers. Researchers examine whether bank mergers create value (e.g., James and Weir, 1987; Houston and Ryngaert, 1994, 1997; DeLong, 2001; Houston, James and Ryngaert, 2001), enhance operating performance (e.g., Cornett and Tehranian, 1992; Boyd and Runkle, 1993; Akhavein, Berger and Humphrey, 1997; Calomiris, 1999; Hughes and Mester, 2013), reduce competition (e.g., Focarelli and Panetta, 2003; Erel, 2011), and satisfy the empire-building incentives of executives at the expense of shareholders (e.g., Brook, Hendershott, and Lee, 1998; Bliss and Rosen, 2001; Hughes, Lang, Mester, Moon, and Pagano, 2003; Laeven and Levine, 2007; Goetz, Laeven and Levine, 2013).

What has received surprisingly little attention is how the geographic overlap of the subsidiaries and branches of two bank holding companies (BHCs) influences (a) the likelihood that they merge and (b) post-merger value creation and synergies. This is surprising both because bank executives overseeing a merger typically advertise the synergistic opportunities created by combining the geographic networks of the BHCs involved in the merger and because existing research offers differing perspectives on the impact of network overlap on the likelihood and effects of mergers. As suggested by the literature cited above, more overlap can provide greater opportunities for a merger to (a) lower costs through the elimination of redundant operations, (b) boost revenues through the exploitation of enhanced market power, and (c) avoid the formation of geographically expansive BHCs that impede effective governance. However, research also suggests that more overlap limits risk diversification opportunities, boosting the cost of capital. Houston and Ryngaert (1994, 1997) and DeLong (2001) are the only previous studies of how pre-acquisition network overlap affects stock price reactions to BHC mergers. They find that returns are positively associated with the degree of pre-deal network overlap.

In this paper, we push this examination forward in several ways. First, we evaluate whether and how the degree of geographic overlap between the subsidiaries and branches of two

BHCs influence the likelihood that they merge. We believe ours is the first study of this "extensive margin." Second, we contribute to research concerning the "intensive margin:" Given that banks merge, how does the geographic overlap between the subsidiaries and branches of the acquiring and target BHCs influence the cumulative abnormal returns (CARs) of the acquirer, target, and combined BHC? We not only quadruple the sample of bank acquisitions relative to past studies (e.g., Houston and Ryngaert 1994, 1997, and DeLong, 2001), we also develop and implement a new instrumental variable strategy to assess the impact of network overlap on CARs. Third, we explore potential mechanisms linking pre-acquisition network overlap and post-deal stock returns, such as post-deal labor costs, interest margins, the replacement of directors and executives, and loan quality. We believe that ours is the first study of the mechanisms through which pre-acquisition networks can shape post-acquisition synergies.

To conduct these examinations, we compile a comprehensive dataset on BHC mergers and acquisitions over the period from January 1986 through December 2014, the geographic location of bank subsidiaries and branches, stock prices, and other BHC and deal traits. After merging several datasets, we have data on 716 deals in which the acquiring BHC is publicly traded and 429 deals where the target is publicly traded. We construct several measures of the degree of overlap between the networks of the acquirer and target BHCs. These overlap measures focus on the degree to which the BHCs have subsidiaries (and branches) in the same or different states prior to the acquisition. To measure the CARs of the acquiring, target, and merged BHC, we use the five-day event window around the announcement of the acquisition, i.e., the window from two days before until two days after the announcement. To evaluate how the merged BHC responds to the deal in terms of other performance criteria, we examine changes in the target firm's (a) number of board members, executives, employees, (b) total salary expenditures, (c) insider loans, (d) net loan charge-offs, and (e) net interest margins. We believe this is the first paper to assess changes in these U.S. target bank traits following acquisitions.

We turn first to the question of whether more network overlap between two BHCs increases, decreases, or has no effect on the likelihood that they merge. To identify this

relationship, we construct pseudo-matching deals as in Gompers, Mukharlyamov and Xuan (2016). The goal is to form pseudo acquire-target pairs that are the same as those in the actual deal except that the pseudo-pairs have different degrees of pre-deal network overlap. We use two matching criteria. First, for each actual deal, we match the actual acquiring BHC with five pseudo-target BHCs that are closest in total assets to the actual target. We create an additional five pseudo-pairs by matching the actual target with five pseudo-acquirers that are closest in total assets to the actual acquiring BHC. Thus, for each completed deal, we create ten pseudo-deals. For these pseudo-deals, we also create network overlap measures. We then run a probit regression in which the dependent equals one for actual deals and zero of pseudo-deals. The main explanatory variable is a measure of network overlap between the acquirer and target BHCs in the actual or pseudo deal. For the second matching criterion, we use the market-to-book ratio rather than total assets to create pseudo-pairs and repeat the analyses.

We discover that the degree of network overlap is positively associated with the likelihood of a bank merger, using either matching criterion. After controlling for acquirer and target characteristics, we find that a BHC is much more likely to acquire a target with a network that heavily overlaps with that of the acquiring BHC. This finding holds across several different measures of network overlap and the estimated coefficients indicate that a one standard deviation increase in overlap is associated with an almost 9% increase in the probability of a merger.

We next evaluate whether the degree of network overlap between merging BHCs influences the CARs of the acquirer, target, and combined BHC. We first use ordinary least squares (OLS) regressions and control for an array of acquirer, target, and deal characteristics to limit the potential importance of omitted variables. Nevertheless, identification concerns remain. For example, BHCs with weak governance systems might allow empire-building executives to acquire BHCs with geographically dispersed networks, and markets might interpret such acquisitions as a signal that the acquiring BHC is poorly governed. In this case, both the choice of acquiring a target's network and the post-deal performance might reflect the acquiring BHC's

governance system rather than the independent effect of network overlap on post-deal performance.

To mitigate endogeneity concerns, we design an instrument variable (IV) of network overlap. Building on Goetz, Laeven, and Levine (2013, 2016), we exploit two plausibly exogenous sources of variation in the likelihood that a BHC acquires a target with subsidiaries in the same states as the acquirer. The first source of variation is interstate bank deregulation, which determined whether and when BHCs headquartered in one state could establish subsidiaries in each other state. For most of the 20th century, BHCs headquartered in one state were prohibited from establishing subsidiaries (or branches) in other states. Starting in 1982, individual U.S. states started removing these restrictions. Not only did states start the process of interstate bank deregulation in different years, they also followed very different dynamic paths, as states signed bilateral and multilateral reciprocal agreements in a fairly chaotic process over time. The Riegle-Neal Act eliminated regulatory restrictions on interstate banking in 1995.[1] The process of interstate bank deregulation yields information on whether BHCs headquartered in two different states can establish subsidiaries in the same states and hence on the potential degree of network overlap between BHCs headquartered in those states. But, interstate bank deregulation does not distinguish among BHCs within the same state. The second source of variation uses the geographic location of BHCs within a state to identify which BHCs in a given state are more likely to have subsidiaries in other states. In particular, the gravity model of investment predicts that the costs of acquiring and managing target BHCs increase with distance, implying that BHCs are more likely to acquire BHCs in geographically close states. By distinguishing among BHCs within a state, the gravity model provides additional information on the degree of network overlap between each BHC headquartered in a state and potential targets headquartered in other states. By integrating interstate bank deregulation with the gravity model, we create an IV of the

[1] An extensive body of research indicates that interstate bank deregulation does not reflect the level, growth rate, or distribution of state income (e.g., Jayaratne and Strahan, 1996, Kroszner and Strahan, 1999, Morgan, Rime and Strahan, 2004, and Beck, Levine and Levkov, 2010) or banking system profitability, valuations, and risk (Goetz, Levine, and Levine, 2013, 2016; Jiang, Levine, and Lin, 2016).

degree to which each BHC has a subsidiary network that overlaps with potential targets in other states.

From the OLS analyses, we find that the CARs of the acquirer, target, and merged BHC all rise more after a deal when there is greater overlap between the networks of the acquiring and target BHCs. These results hold across the different overlap indicators and when using either measures of subsidiary or branch overlap. The analyses control for acquirer, target, and deal characteristics as well as year and acquirer state fixed effects. The economic magnitudes are material: A one standard deviation in the overlap measures is associated with about a 0.47% increase in acquirer CAR, which is large as the mean acquirer CAR is -0.13%. As we will now explain, however, these OLS estimates are biased toward zero.

The instrumental variable (IV) analyses indicate that greater network overlap materially boosts the CARs of the acquirer, target, and merged BHC. In these analyses, the endogenous regressor is one of the pre-deal network overlap measures. The analyses continue to control for acquirer, target, deal characteristics, and fixed effects for year and the acquirer's state. We find that the deregulation-gravity instrument explains actual network overlap, entering with an F-statistic of over ten in all of the specifications for acquirer, target, and combined CAR and for all of the measures of pre-deal network overlap. The IV estimates are about ten times larger than in the OLS analyses, suggesting that BHCs facing less profitable futures have a greater tendency to purchase BHCs with overlapping networks. Pre-deal overlap exerts a strong, positive influence on post-announcement stock returns.

We next examine specific mechanisms through which network overlap might affect synergies and value creation. It is beyond the scope of this paper to explore all the potential mechanisms linking CARs and pre-deal network overlap. But, we do explore several. First, if network overlap boosts CARs by offering opportunities to review and replace inefficient or redundant executives and board members, then we should observe both an uptick in the rate of c-suite turnover in targets following an acquisition and an improvement in bank governance as, for example, measured by a reduction in insider lending and fewer bad loans. Second, if greater

network overlap offers expanded opportunities for the combined BHC to economize on labor costs, then we should observe cuts in staff and total salary expenditures. Third, if greater network overlaps creates a combined bank with more market power, then we should observe an increase in net interest margins following the merger. We examine each of these predictions by examining changes at target BHCs during the year following the acquisition. Typically, it is impossible to examine post-merger changes in target firms because the target firm's balance sheet is consolidated into the combined firms. However, The Chicago Fed's BHC data includes data on a subset of target BHCs following mergers, and we exploit those data.

We discover that more pre-acquisition network overlap is associated with (1) a higher rate of replacement of directors and executives at target banks and larger reductions in insider lending and net charge-offs at targets, (2) greater cuts in the number of employees and the total salary bill at target banks, and (3) bigger increases in net interest margins at target BHCs. These findings are consistent with the views that when merging banks overlap geographically, there are greater opportunities for the merged bank to (a) address managerial inefficiencies, (b) reduce workforce redundancies, and (c) increase net interest margins through the exploitation of the market power generated by the more intense overlap of subsidiary networks.

Our work relates to several strands of research. An extensive body of work examines whether empire-building motivates bank acquisitions (e.g., Gorton and Rosen 1995; Brook, Hendershott, and Lee, 1998; Ryan 1999; Bliss and Rosen, 2001; Hughes, Lang, Mester, Moon, and Pagano, 2003; Laeven and Levine, 2007; Goetz, Laeven and Levine, 2013). Although empire-building might be a powerful driver of some bank acquisitions, we show that the degree of pre-deal network overlap exerts a powerful influence on post-deal value creation, cost cutting, loan quality, and revenue generation. This suggests heterogeneity in the degree to which value-destroying empire-building shapes the likelihood and consequences of bank acquisitions.

Furthermore, our work relates to research on whether there is a diversification discount or premium. Berger and Ofek (1995) and Lang and Stulz (1994) stress that firms that diversify beyond their core competencies destroy value, while others stress that diversification lowers

risks and boosts shareholder value (e.g., Hubbard and Palia, 1999; and Stein, 1997). We show that the degree of pre-acquisitions overlap—the degree to which a merger will intensify geographic focus—boosts shareholder value.

The remainder of the paper is organized as follows. Section 2 described the data and variable construction. Section 3 examines whether the degree of pre-acquisition network overlap influences the likelihood that two banks merge, while Section 4 evaluates the CARs of the acquirer, target, and merged BHCs around the announcement date. Section 5 examines the potential sources of synergies by evaluating post-merger change to the target BHC's executives, board members, employees, salaries, insider lending, loan quality, and net interest margin. Section 6 concludes.

2. Data and Variable Construction

To assess how the pre-acquisition geographic overlap of BHC subsidiaries and branches shapes the likelihood and performance of BHC acquisitions, we use data on BHC acquisitions, the geographic overlap of BHC subsidiaries and branches, target BHC performance before and after the merger, and other characteristics of BHCs and M&A deals. To create the dataset used in our analyses, we merge several data sources. In this section, we describe the sample, data sources, and key variables. Table 1 gives variable definitions and Table 2 provides summary statistics.

2.1. BHC mergers & acquisitions

Thomson Reuters Securities Data Company (SDC) provides data on BHC mergers and acquisitions (M&As). Since the Federal Reserve only started providing information on the location of BHC subsidiaries in 1986 and we need this information to construct measures of the geographic overlap of BHC subsidiaries, we start our sample in January of 1986 and collect data through December 2014. When constructing measures of the geographic overlap of BHC branches, we start in 1994 because that is when the FDIC started providing such data. Thus, we

focus on the subsidiary analyses, and show in the appendix that the results hold for when using branch locations to calculate the geographic overlap of BHC networks.

We include deals in which the acquirer and target BHCs are US-based, the acquirer is publicly traded, the SDC categories the deals as "Merger," "Acquisition," "Acquisition of Assets," or "Acquisition of Majority Interest," the value of the deal is above $1 million (in 2000 US dollars) and above 1% of the acquirer's market value, and the deal results in the acquiring bank holding more than a 50% stake in the target. We exclude deals in which the acquirer's initial stake in the target already exceeded 50%. After the above screening, this leaves 2,854 deals.

2.2. CARs

We examine cumulative abnormal returns (*CARs*) for the acquirer, target, and combined entity over the five-day window from two days before until two days after the announcement day of the acquisition. Setting the announcement day as day 0, the CAR window is therefore indicated as (-2, +2). Following Brown and Warner (1985), we define abnormal returns by using the difference between actual and projected returns. To compute projected returns, we (1) regress the BHC's daily return on the value-weighted returns on the CRSP equally weighted market portfolio over the 200-day period from the 210^{th} trading day through the 11^{th} trading day before the announcement date of each deal and (2) use the estimated parameters to compute the projected returns during the 5-day event window (-2, +2). The CAR for the combined entity is calculated as the market value-weighted average of the CARs for the acquirer and target bank.[2]

To compute the acquirer, target and combined CARs, we use security prices from the Center for Research in Security Prices (CRSP) database. After excluding deals in which the acquirer is missing key data in CRSP, there are 2,341 deals. If we only exclude deals in which the target is missing key data in CRSP, there are 1,300 observations. The large number of

[2] The results reported below are robust to using (a) an11-day CAR window (-5, +5) or (b) using the three or four factor asset pricing model to compute abnormal returns.

missing data in CRSP on targets primarily arises because many target banks were not publicly traded at the time of the announcement. When we exclude deals in which either the acquirer or target is missing relevant CRSP data, this leaves 1,095 deals.

2.3. Network overlap measures

To identify BHC subsidiaries and their geographic location, we use Y-9C and Call Reports from the Federal Reserve Bank of Chicago. Following Goetz, Laeven and Levine (2013) and Jiang, Levine and Lin (2016), we define a bank as the subsidiary of a parent BHC if the "parent" owns at least 50% of the voting rights of the "subsidiary." The Call Reports provide each bank's address. There are challenges to matching banks in the SDC and Y-9C Reports due to spelling mistakes, abbreviations, and BHCs in different states sharing the same name, so we manually match banks.[3]

After matching BHCs with their subsidiaries, we create the overlap measures as follows. For each BHC in each year, we construct an unweighted and a weighted 51-element vector to measure the geographic distribution of its subsidiaries. In the unweighted vector, each element is one or zero depending on whether the BHC has a subsidiary in each state and the District of Columbia or not. In the weighted vector, each element is zero or the number of subsidiaries in each state and the District of Columbia.

We construct several proxies of the degree to which the networks of the acquirer and target BHCs overlap geographically. *Overlap* equals the number of non-zero elements in the intersection of the two BHCs' unweighted vectors of subsidiaries divided by the total number of non-zero elements in the union of the two BHCs' vectors. For example, if u=[1,0,1,0] and v=[1,1,0,0], then $u \cap v = [1,0,0,0]$ and $u \cup v = [1,1,1,0]$, therefore *Overlap* = 1/3. All of the results hold when using the weighted vectors of subsidiaries.

[3] Many banks that we cannot match in the Y-9C Reports can be matched in the FDIC bank branch data. As we report below, the results using FDIC data are very similar to the results using subsidiaries.

Correlation Coefficient equals the correlation coefficient of the two BHCs' unweighted vectors of subsidiaries. More formally, the *Correlation Coefficient* is defined as

$$\rho_{u,v} = \frac{\sum_{i=1}^{n}(u_i - \bar{u})(v_i - \bar{v})}{\sqrt{\sum_{i=1}^{n}(u_i - \bar{u})^2}\sqrt{\sum_{i=1}^{n}(v_i - \bar{v})^2}}.$$

For example, if u=[1,0,1,0] and v=[1,1,0,0], *Correlation Coefficient* is 0. It is worth noting that *Correlation Coefficient* takes on values between -1 and 1. *Correlation Coefficient (Weighted)* is defined similarly using the weighted vector of bank subsidiaries, i.e., using the number of subsidiaries that a BHC has in each state and the District of Columbia.

Cosine Distance and *Cosine Distance (Weighted)* measure overlap using cosine distance based on the unweighted and weighted vectors of bank subsidiary networks respectively. *Cosine Distance* of vector *u* and *v* is defined as

$$d(u, v) = 1 - \frac{u \cdot v}{||u||_2 ||v||_2}.$$

Cosine distance is a measure of "dissimilarity." It takes on values between 0 and 1, such that $d(u, v) = 0$ when *u* = *v*, which is when the two vectors are exactly the same and hence there is perfect overlap. In turn, $d(u, v) = 1$, when $u \cdot v = 0$, which is when the two vectors do not overlap at all. For example, if *u* = [1,0,1,0] and *v* = [1,1,0,0], then

$$u \cdot v = \sum_i u_i v_i = 1 \times 1 + 0 \times 1 + 1 \times 0 + 0 \times 0 = 1,$$

where u_i and v_i are components of vector *u* and *v*, so that

$$||u||_2 = \sqrt{\sum_i u_i^2} = \sqrt{1^2 + 0^2 + 1^2 + 0^2} = \sqrt{2},$$

$$||v||_2 = \sqrt{\sum_i v_i^2} = \sqrt{1^2 + 1^2 + 0^2 + 0^2} = \sqrt{2},$$

and,

$$d(u,v) = 1 - \frac{u \cdot v}{\left|\left|u\right|\right|_2 \left|\left|v\right|\right|_2} = 1 - \frac{1}{\sqrt{2} \times \sqrt{2}} = \frac{1}{2}.$$

We also use other measures of dissimilarity, including Bray-Curtis, Canberra, Correlation distance, Euclidean, Hamming, squared Euclidean, Dice, Jaccard-Needham, Kulsinski, Matching, Sokal-Michener, Sokal-Sneath, Rogers-Tanimoto, Russell-Rao, and Yule distance. While the results using cosine distance are presented in the main text, all of the results hold when using these alternatives as reported in Appendix Tables A.5 – A7.

2.4. Additional acquirer, target, and deal characteristics

We control for several acquirer, target, and deal characteristics in the analyses using data from the SDC, CRSP, Compustat and Bloomberg. From CRSP, we calculate *Acquirer Runup*, which is the percentage change in the acquirer's stock price over the period from 200 days before the announcement until 11 day before the announcement. From the SDC, we compute: *Deal size adjusted by assets*, which is value of the acquisition divided by the total assets of the acquiring BHC; *Cash deal dummy*, which equals one if the acquisition is 100% in cash and zero otherwise; *Stock deal dummy*, which equals one if the acquisition is 100% in stock and zero otherwise; *Attitude dummy*, which equals one if the deal is "friendly" (i.e., the target did not resist or receive an unsolicited offer, as defined by the SDC) and zero otherwise; *Target public dummy*, equal one if the target BHC is publicly traded and zero otherwise; and *Percentage of shares acquired*, which equals the percentage of share of the target purchased by the acquiring BHC. From Compustat, we obtain both *Acquirer total assets* and *Acquirer return on assets*, provided data on *Acquirer Tobin's Q*, which equals the ratio of the market to the book value of assets. When only including deals with nonmissing values on all of these acquirer, target, and deal characteristics, we are left with 716, 429, and 404 deals in which we can calculate acquirer, target, and combined CARs, respectively.

We are also able to assemble post-acquisition financial data on a subset of target BHCs from the Chicago Federal Reserve Bank. In particular, there are 1367 targets with separate financial statements. We are left with 472 targets after omitting those for which we cannot compute the network overlap proxies discussed above and after excluding observations with missing control variables. These data on target BHCs provide a unique opportunity to examine the post-merger performance of target BHCs. For each target BHC in a completed deal, we obtain its quarterly information from three years (12 quarters) before the announced merger to three years after the merger announcement. Our BHC-quarter observations have information such as each target BHC's quarterly total salary, average salary, number of employees, total loans, insider loans, net charge-offs, and net interest margin. Observations in the year of merger announcement are excluded.

3. Does Geographic Overlap Make BHCs More Likely to Merge?

In this section, we examine whether the likelihood that one BHC acquires another BHC is increasing in the degree to which the two BHCs have networks that overlap geographically. To identify the relationship between network overlap and BHC acquisitions, we use a strategy developed by Gompers, Mukharlyamov and Xuan (2016). Specifically, we examine both actual deals and pseudo-deals. For each actual deal, we take the actual acquirer and create five pseudo-deals by matching the acquirer with five pseudo-targets that are closest in total assets or market-to-book ratio to the actual target. We create an additional five pseudo-deals by matching the actual target with five pseudo-acquirers that are closest in total assets or market-to-book ratio to the actual acquiring BHC. Thus, for each actual deal, we create ten pseudo-deals. In creating these pseudo-deals, we choose only pairs that are legally permitted. That is, we do not create pseud-pairs among BHCs that could not merge due to interstate banking restrictions. The strategy is to create pseudo acquirer-target deals that are similar to the actual deal except in terms of the degree of network overlap and then assess whether network overlap helps account the

decision of two BHCs to merge. In creating the pseudo-deals, we do not select pseudo-acquirers or pseudo-targets that were involved in an M&A during the three years prior to the relevant deal.

After creating these pseudo-deals, we estimate the following probit regression:

$$Complete_d = \alpha + \beta_1 Network\ Overlap_d + \beta_2 Acquirer\ Char_d + \\ + \beta_3 Target\ Char_d + Deal\ FE_d + \varepsilon_{d,} \qquad (1)$$

where the dependent variable, $Complete_d$, is a dummy that equals one for actual acquisition deals (d) and equals zero for the pseudo matched pairs of the acquirer and target associated with deal d. $Network\ Overlap_d$ represents one of the measures of geographical overlap between the actual or pseudo acquirer and target of deal d. In Table 3, we provide the results for *Overlap*, *Correlation Coefficient*, and *Cosine Distance*, and give the results on the other network overlap indicators in the Appendix. We also control for acquirer and target characteristics in the year before the announcement of the deal ($Acquirer\ Char_d$ and $Target\ Char_d$), including the total assets, profitability (return on assets), and equity ratio, which are defined in Table 1. Deal fixed effects ($Deal\ FE_d$) are included in all regressions, where this fixed effect equals one for the actual deal and the pseudo-deals associated with the actual deal and zero otherwise. Thus, there is a deal fixed effect for each group of pseudo-pairs and its corresponding actual deal. Standard errors are clustered at the deal-level. The results also hold when clustering at the acquirer state level. Due to missing observations on some of the control variables, there is variation in the number of observations across the regressions. In Table 3, we report the marginal effects of the explanatory variables.

As shown in Table 3 when using the geographic location of BHC subsidiaries to measure network overlap, we discover that more network overlap is associated with a much higher probability that two BHCs merge. This result is statistically significant for each of the network overlap measures. As discussed above, larger values of *Cosine Distance* indicate less overlap, so the negative coefficient estimate on *Cosine Distance* is consistent with the positive coefficient estimates on *Overlap* and *Correlation Coefficient*. The estimated effects are also economically

large. Consider, for example, a one standard deviation increase in *Correlation Coefficient* (0.416) and the regression estimate in column (2) that includes all control variables (0.21). These estimates indicate a one standard deviation increase in network overlap as measured by *Correlation Coefficient* is associated with an 8.7% (0.087=0.416*0.21) increase in the probability that the two BHCs merge.[4] Furthermore, as shown in Appendix Table A.2, these results hold when using different combinations of the control variables.

The finding that network overlap is positively associated with the probability that two BHCs merge is robust to two additional sensitivity checks. First, we compute the geographic network overlap of subsidiaries at the MSA-level (Metropolitan Statistical Area level) rather than at the state-level. In particular, when constructing the network overlap measures at the state level, we used a one-zero vector of whether a BHC has subsidiaries in each US state and the District of Colombia or not. For the MSA-level overlap indicators, we instead we use a one-zero vector of whether each BHC has subsidiaries in each MSA or not. From this vector, we construct MSA-level network overlap measures for each merger. As shown in Appendix Table A.3, all of the results hold using these alternative geographic network overlap measures. Second, we compute the geographic network overlap of branches across states rather than subsidiaries. As shown in Appendix Table A.4, across all measures of network overlap and using different control variables, network overlap at the branch level is positively associated with the likelihood that two BHCs merge. Not only are the results statistically significant, the estimated economic magnitudes are similar to those reported in Table 3 when using bank subsidiaries to measure network overlap. For example, the estimated coefficients indicate that one standard deviation increase in *Correlation Coefficient* (computed from the bank branch data) is associated with a 9.6% increase in the probability of a merger. FDIC data allow us to generate *Correlation Coefficient* and *Cosine Distance* measures not only weighted by the number of branches in each state, but also by branch deposits in each state.

[4] When we only include acquirer or target total assets as control variable, we have more completed deals (728) than we do in later tables (716) because those later tables control for more deal characteristics from the SDC data and some deals have missing control variables.

These findings indicate that the likelihood of one BHC acquiring a target is increasing in the degree to which they have subsidiary or branch networks that overlap geographically. Holding other features of the BHCs constant, network overlap is apparently viewed as a positive feature by those making merger decisions within the BHCs. However, this does not necessarily imply that conditional on an acquisition that greater network overlap boosts the returns to and profitability of the merged BHC. We now turn to this question.

4. Network Overlap and CARs

In this section, we evaluate whether network overlap shapes the CARs of the acquirer, target, and merged BHC. In the first subsection, we use OLS and control for an array of acquirer, target, and deal characteristics. In the next subsections, we describe and use a gravity-deregulation instrumental variable to better address identification concerns.

4.1 OLS

To assess the relationship between pre-acquisition network overlap and the stock price reaction to the deal, we begin with the following linear regression:

$$CAR_d = \alpha + \beta_1 Network\ Overlap_d + \beta_2 Acquirer\ Char_d + \beta_3 Deal\ Char_d + Acquirer\ Bank\ State\ Dummy_i + Year\ FE_d + \varepsilon_d. \quad (2)$$

The dependent variable CAR_d is the acquirer, target, or combined 5-day CAR of (-2, +2) around the announcement date of deal *d*, which has one acquirer and one target BHC. As defined above, $Network\ Overlap_d$ is one of the measures of pre-acquisition network overlap that is announced in year *t*. As in Masulis, Wang and Xie (2007) study of CARs following M&As, we control for the following acquirer (*Acquirer Char$_d$*) and deal (*Deal Char$_d$*) characteristics: *Acquirer Runup, Acquirer profitability, Acquirer Tobin's Q, Deal size adjusted by assets, Acquirer total assets, Percentage of shared acquired,* and a series of four dummy variables that provide information about the deal: *Cash deal dummy, Stock deal dummy, Attitude dummy, and Target public dummy*.

In addition, we control for the year of the announcement and acquirer state fixed effects. Standard errors are clustered at the acquirer level since several BHCs engage in multiple acquisitions. Since some states have more BHCs engaging in acquisitions than others, we also confirm that all of the results hold when clustering at the acquirer state level. Table 4 reports the regression results. The dependent variable is *Acquirer CAR* in columns 1-3, *Target CAR* in columns 4-6, and *Combined CAR* in columns 7-9. For each of these dependent variables, we provide three regression results, which differ by the network overlap measure: *Overlap, Correlation Coefficient,* or *Cosine distance.*

As shown in Table 4, we find that (a) pre-announcement network overlap is positively associated with the post-announcement CARs of the acquirer, target, and combined BHCs and (b) the estimated relationship is economically large. Specifically, *Overlap, Correlation Coefficient,* and *Cosine Distance* enter significantly at the five-percent level in all regressions. For *Overlap* and *Correlation Coefficient*, larger values signify greater geographic overlap of BHC subsidiaries. These enter positively and significantly in the CAR regressions. For *Cosine Distance*, larger values indicate less overlap and it enters negatively and significantly in the CAR regressions. With respect to the estimated economic magnitudes, consider a one standard deviation increase in *Correlation Coefficient* (0.416). The estimated coefficients on *Correlation Coefficient* in Table 4 indicate that a one standard deviation increase in network overlap is associated with a 0.52, 1.90, and 2.55 percentage point increase in *Acquire CAR, Target CAR,* and *Combined CAR* respectively, as shown in columns 2, 5, and 8.

These results are robust to several sensitivity checks. First, these results hold across the other seventeen network overlap measures. We provide these results in Appendix Tables A.5 – A.7. Second, the results hold when using FDIC bank branch data to compute pre-announcement network overlap, as shown in Appendix Table A.8 – A.10. Third, the results hold when using the network overlap measures computed at the MSA-level, as shown in Appendix Table A.11. Fourth, the findings hold when excluding "big banks," i.e., BHCs with assets that are larger than 10% of the headquarter state's total bank assets, as reported in Appendix Table A.12.

4.2. Instrument variable construction and validity

Although the OLS regressions condition on many factors, identification concerns remain. Omitted variables might affect both the decision to merge and the market response to the merger. For example, poorly governed banks might both allow CEOs to engage in empire-building acquisitions that expand the geographic reach of the BHC, and the market might view the merger of distant banks as a signal of poor governance at the acquiring BHC. In this case, the stock price reaction to a non-overlapping acquisition would reflect new information about the governance of the acquiring BHC and not the causal impact of pre-acquisition network overlap on the expected performance of the merged BHC.

To mitigate endogeneity concerns, we develop an instrument for the network overlap of two merging BHCs that exploits two exogenous sources of variation in the ability of two BHCs to establish subsidiaries in the same state. The first source of variation is interstate bank deregulation. The dynamic process of interstate bank deregulation determined whether BHCs headquartered in different states could legally establish subsidiaries in the same states. The second source of variation is geographic location. The geographic location of BHCs within a state influences their likelihood of establishing subsidiaries in other state. Thus, geographic location provides additional information on which BHCs headquartered in different states are more likely to establish overlapping networks in other states.

More specifically, to construct an instrumental variable for the degree to which the pre-acquisition networks of the acquiring and target BHCs overlap geographically, we begin with the process of interstate bank deregulation. For most of the 20th century, states prohibited interstate banking, i.e., each state prohibited banks from other states from establishing subsidiaries (or branches) within its geographic borders. Starting in 1982, individual states began a process of removing these restrictions.[5] States both started interstate bank deregulation in different years

[5] More specifically, Maine passed in 1978 legislation permitting out-of-state acquisitions on a national reciprocal basis, i.e., Maine allowed a "foreign" state's banks to buy Maine banks if that foreign state allowed Maine's banks

and followed different paths of deregulation over time. Some states unilaterally opened their borders to out-of-state banks, while others signed a series of bilateral and multilateral reciprocal agreements with other states over time. For example, Figure 2 presents two maps. The upper map indicates the first year that each state's banks were allowed to enter Texas, and the lower map indicates the first year that each state's banks were allowed to enter Pennsylvania. These maps illustrate the general point: different states started the process of interstate bank deregulation in different years and followed different dynamic processes of deregulating with other states until prohibitions on interstate banking were effectively ended across the United States in 1995 by the Riegle-Neal Act.

The dynamic process of interstate bank deregulation provides variation in whether two BHCs headquartered in different states can establish subsidiaries in the same state and hence whether they have overlapping networks prior to any potential M&A activity between those BHCs. While interstate bank deregulation provides state-year information on the ability of BHCs headquartered in different states to acquire BHCs in the same state, it does not distinguishing among BHCs within the same state.

To differentiate among BHCs within a state, we exploit an additional source of exogenous variation: the pre-acquisition location of each BHC's headquarters and its corresponding distance to other states. In particular, the gravity model predicts that the costs of acquiring and managing target BHCs increase with distance, so that BHCs are more likely to acquire BHCs in geographically closer states. Since BHCs within a state differ in their distances to other states, the gravity model allows us to differentiate among BHCs within the same state. That is, by integrating the dynamic process of interstate bank deregulation with the gravity model of investment, we capture variation in the likelihood that different BHCs within a state acquire BHCs in another state.

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to buy its banks. Since no states reciprocated until 1982, this deregulation process was in fact stalled until 1982, when Alaska and New York passed laws similar to Maine's.

Operationally, we construct the instrumental variable for *Overlap* in the following manner, and use a similar procedure for constructing the instruments for *Correlation Coefficient* and *Cosine Distance*. First, for each completed deal, we identify all states that the acquiring BHC can legally enter in the year when the deal was announced. We call these "accessible states." Second, we find each accessible state's accessible states and calculate the degree of overlap between the acquirer's accessible states and each of the states that those accessible states can enter based on interstate bank regulations. For example, if the acquirer's state *i* can access five states when the acquisition is announced—states *j, k, l, m,* and *n*, we compute (a) the overlap between the states that BHCs headquartered in state *i* can access and the states that BHCs headquartered in state *j* can enter, (b) the overlap between the states that BHCs headquartered in state *i* can access and the states that BHCs headquartered in state *k* can enter, etc. This yields five overlap values, one for each of the acquirer's accessible states. Third, we divide each of these overlap values by the geographic distance between the acquirer's headquarters and the most populated city of the acquirer's corresponding accessible state. Continuing the example from above, for each acquiring BHC that is headquartered in state *i* and announces the acquisition of a target BHC during period *t*, we compute five overlap values weighted by distance to states *j, k, l, m*, and *n*. Then, we sum these distance weighted overlap values for each acquiring BHC and use this as the instrumental variable for network overlap. The instrument reflects both the dynamic, state-specific process of interstate bank deregulation and the differences in the geographic location of each BHC's headquarters.

For this deregulation-gravity instrumental variable to be a valid instrument, it must both satisfy the exclusion restriction, i.e., the deregulation-gravity instrument must explain CARs only through its effect on pre-announcement network overlap, and explain differences in actual network overlap. With respect to the exclusion restriction, the instrument is based on integrating two plausibly exogenous sources of variation in the network overlap of acquiring and target BHCs. Interstate bank deregulation occurred over two decades in which states started the process of interstate bank deregulation in different years and followed different dynamic paths as they

liberalized restrictions with different states in different years. Moreover, we differentiate among BHCs within a state and year by the differential distance between each BHC and the state's accessible states. Since our instrument is constructed from the interaction between the overlap of a state's accessible states with those states' accessible states and the differential distance of each BHC to those accessible states, we argue that our instrument satisfies the exclusion restriction.

With respect to the power of the instrument, the first stage regressions are revealing. We report these regressions in Panel B of Table 5. As shown, the instrument variable enters positively and significantly when the dependent variable is the actual pre-acquisition network overlap. Moreover, the F-values on the null hypotheses that the instrument does not explain actual overlap is 10, suggesting that we do not have a weak instrument problem (Stock and Watson 2007).

4.3. Instrument variable results

Using these gravity-deregulation instrumental variables, Table 5 presents the results of our assessment of the impact of network overlap on post-deal CARs. We examine three measures of network overlap, *Overlap*, *Correlation Coefficient*, and *Cosine Distance*, while using distinct instrumental variables for each of these measures. Standard errors are clustered at acquirer BHC level. As noted earlier, all of the results hold when clustering at the acquirer state level. The regressions include acquirer and deal characteristics, as well as year (the year of the announcement) and acquirer state fixed effects.

As shown, the instrumental variable results indicate that pre-acquisition overlap exerts a statistically significant, robust, and economically large impact on acquirer, target, and combined CARs. *Overlap*, *Correlation Coefficient*, and *Cosine Distance* enter the *Acquirer CAR*, *Target CAR*, and *Combined CAR* significantly at the five-percent level in all specifications. Thus, the results are robust to using alternative measures of the pre-announcement overlap of subsidiary networks. The estimated impact of geographic overlap on stock returns is large. For example, the coefficient estimates indicate that a one standard deviation increase in *Correlation Coefficient*

induces a 5.13% (=12.32*0.416) larger boost in acquirer CARs during the 5-day event window of the announcement. This estimated effect is almost ten times larger than the estimates from the OLS regressions in Table 4. The much larger estimates from the instrumental variables regressions are consistent with the view that BHCs that poorly governed banks are more likely to expand into geographical dispersed areas and the market views this as a signal of the quality of BHC governance. This effect can bias the OLS estimates toward zero. After addressing this bias through the use of the gravity-deregulation instrumental variable, we obtain larger estimates of the impact of network overlap on CARs, as reported in Table 5. These findings advertise the importance of using instrumental variables to address identification concerns and thereby obtain sharper estimates of the impact of network overlap on the stock price reaction to the announcement of BHC mergers.

5. Sources of Synergy

In this section, we examine several potential sources of the synergies between acquirer and target BHCs. We do this by examining post-merger changes at target BHCs. In particular, if network overlap offers opportunities to review management and replace inefficient executives, then we should observe a higher rate of replacement of executives in targets after the acquisition than before. If network overlap allows banks to economize on labor costs, then we should observe cuts in staff and total salary expenditures at target BHCs following an acquisition. If network overlap boosts overall efficiency and governance, then we should observe increases in net interest margins and reductions in insider lending and loan charge-offs at targets. We evaluate these changes at target BHCs during the year following the announcement. Typically, it is impossible to examine post-merger changes in target firms because the target firm's balance sheet is consolidated into the combined firms. However, The Chicago Fed's BHC data includes data on a subset of target BHCs following mergers, which we use to examine post-merger changes at target BHCs.

5.1 Replacement of directors and executives in target BHCs

We begin by assessing whether a higher percentage of target BHCs board members and executives are replaced during the year after an acquisition when the BHCs have a greater degree of pre-deal network overlap. We do this by merging data on the SDC on deals with data on directors and executives in BoardEx. For each deal, we find the target BHC's list of directors and executives one year before the merger announcement. We then check whether these directors and executives work for the target one year after the merger. If they are not working at the target BHC, we check if they are board members or executives at the acquiring BHC. If the directors and executives of the target before the merger work at the acquiring BHC after the merger, then we do not consider them "replaced." In this way, we measure whether each director and executive in the target BHC is replaced after the merger. We calculate the percentages of target board directors and executives that are replaced and use that percentage as the dependent variable in our regressions.

In particular, we estimate the following Tobit regression:

$$Perc_d = \alpha + \beta_1 Network\ Overlap_d + \beta_2 Deal\ Char_d + Target\ State\ FE_d + Year\ FE_d + \varepsilon_d \quad (3)$$

where the unit of analyses is a deal (*d*), $Perc_d$ is either the percentage of directors or executives at the target BHC who are replaced during the year following deal *d*'s announcement, $Network\ Overlap_d$ is one of three measures of pre-acquisition network overlap (*Overlap*, *Correlation Coefficient*, or *Cosine Distance)*, and $Deal\ Char_d$ are detailed features of each deal defined above. The regression also controls for target state and year fixed effects. We use a Tobit regression because the dependent variables are always nonnegative, though the results hold when using OLS. Standard errors are clustered at the target BHC level for the reasons discussed above.

As shown in Table 6, the degree of pre-deal network overlap is positively and significantly associated with the post-deal replacement of board members and executives at the target BHC. In particular, whether examining *Overlap, Correlation Coefficient*, or *Cosine Distance*, we find that

these proxies of pre-acquisition network overlap enter statistically significantly at the five percent level in the Tobit regressions, where the dependent variables are either the percentage of directors (columns 1-3) or executives (columns 4-6) who are replaced following acquisitions.[6] Moreover, the estimated relationship is economically significant. As reported in columns (2) and (5), a one standard deviation larger *Correlation Coefficient* is associated with an 8.21% and 6.72% greater reduction in target directors and executives, respectively. Though only suggestive, these results are consistent with the view that greater network overlap offers enhanced opportunities for acquiring BHCs to effective review and replace directors and executives at targets.

5.2 Employee layoff and cost of total salary payment

One mechanism through which network overlap could boost valuations is by providing the combined BHC greater opportunities to eliminate redundancies and reduce costs. Thus, we next evaluate the relationship between network overlap and changes in the total salary expenditures, average salary expenditures, and number of employees at target BHCs following an acquisition. To conduct this examination, we use deal level data on target BHCs, tracing the evolution of compensation and staff from 12 quarters before until 12 quarters after the announcement. We estimate the following equation:

$$\Delta ln(DepVar)_d = \alpha + \beta_1 Network\ Overlap_d + \beta_2 Deal\ Char_d + \\ + Target\ State\ FE_d + Year\ FE_d + \varepsilon_d, \quad (4)$$

where the dependent variable, $\Delta ln(DepVar)_d$, is the natural logarithm of the target BHC's total salary (Panel A, columns 1-6), average salary (Panel B, columns 7-12), or number of employees (Panel C, columns 13-18) for deal d averaged over the 12 quarters after the merger

[6] The results hold when examining the percentage of directors or executives at the target BHC who are replaced during the period from one year before the merger (instead of using the year of the merger) until one year after the merger.

announcement minus the corresponding average over the 12 quarters before the announcement The main independent variable of interest, $Network\ Overlap_d$ is one of three measures of pre-acquisition network overlap (*Overlap*, *Correlation Coefficient*, or *Cosine Distance)*, and $Deal\ Char_d$ are the detailed features of each deal defined above. The regression also controls for target state and year fixed effects. Standard errors are clustered at target BHC level.

Consistent with the view that pre-deal network overall facilitates post-deal cost cutting in the target, Table 7 shows that total salary expenditures and the number of employees at target BHCs fall more when there is greater pre-acquisition network overlap. There is no cut in the average salary of employees at targets. Rather, the cut in total salary is accounted for by the reduction in the number of employees.

5.3 Loan quality and net interest margin

To the extent that mergers involving BHCs with widely dispersed subsidiaries create a combined BHC that is more difficult to govern than mergers between BHCs with dense network overlap, the resultant differences in governance could generate differences in insider lending and the quality of loans. Furthermore, to the extent that more pre-deal network creates more post-deal market power, network overlap could boost valuations through this market power channel, too. Thus, we next examine the relation between pre-deal network overlap and measures of post deal insider lending, loan quality, and efficiency. Specifically, using the same econometric specification as in Table 7, we assess the relation between network overlap and (1) post-merger lending to corporate insiders at the target BHC (*Insider Loans/Total Loans*), (2) the proportion of loan charge-offs to total loans at the target BHC (*Net Charge-offs/Total Loans*), and (3) the net interest margin of the target (*Net Interest Margin*). For each of these three dependent variables, we examine three measures of network overlap: *Overlap*, *Correlation Coefficient*, and *Cosine Distance*. The results are robust to using the additional measures of the geographic overlap of networks discussed above.

As reported in Table 8, greater pre-deal network overlap is associated with a drop in *Insider Loans/Total Loans*, a reduction in *Net Charge-offs/Total Loans*, and an increase in *Net*

Interest Margin. The rise in net interest margins is consistent with the view that pre-deal network overlap creates more most-deal market power.

6. Conclusion

Does the geographic overlap of the subsidiaries and branches of two BHCs influence the likelihood that they merge and post-merger value creation and synergies? To address these questions, we compiled comprehensive data on U.S. bank acquisitions over the period from 1986 through 2014, constructed an array of measures of pre-deal network overlap, and designed and implemented a new identification strategy for assessing the impact of pre-deal network overlap on the acquirer, target, and combined CARs. Moreover, to shed empirical light on the potential synergies underlying stock price reactions, we examined how pre-deal networks influence the replacement of directors and executives at target BHCs, cost reductions through staff cuts at targets, and improvements in loan quality and interest margins at target BHCs.

Our two main findings are that (1) pre-deal network overlap is positively associated with the likelihood that two BHCs merge, (2) network overlap materially boosts the cumulative abnormal returns of the acquirer, target, and combined banks, i.e., pre-deal overlap boosts post-deal value creation, and greater pre-deal network overlap materially boosts the CARs of the acquirer, target, and merged BHC during the five-day event window around the announcement of the deal. The estimated economic magnitudes are large. The results indicate that a one standard deviation in network overlap increases acquirer CARs by almost 5%.

With respect to synergies, we discover that pre-acquisition network overlap is associated with (1) acquiring BHCs replacing a higher proportion of directors and executives at target BHCs, (2) greater cuts in the number of employees and the total salary bill at target BHCs, and (3) larger reductions in insider lending and net charge-offs at targets, and (4) bigger increases in net interest margins at target BHCs. The results are consistent with the view that bank mergers with greater network overlap offer expanded opportunities for both cost cutting and revenue generation.

References

Akhavein, J. D., Berger, A. N., & Humphrey, D. B. (1997). The Effects of Bank Megamergers on Efficiency and Prices. *Review of Industrial Organization, 12(1),* 95-139.

Beck, T., Levine, R., & Levkov, A. (2010). Big Bad Banks? The Winners and Losers from Bank Deregulation in the United States. *Journal of Finance, 65(5),* 1637-1667.

Berger, P.G., & Ofek, E. (1995). Diversification's Effect on Firm Value. *Journal of Financial Economics, 37(1),* 39-65.

Bliss, R. T., & Rosen, R. J. (2001). CEO Compensation and Bank Mergers. *Journal of Financial Economics, 61(1),* 107-138.

Boyd, J. H., & Runkle, D. E. (1993). Size and Performance of Banking Firms: Testing the Predictions of Theory. *Journal of Monetary Economics, 31(1),* 47-67.

Brook, Y., Hendershott, R., & Lee, D. (1998). The Gains from Takeover Deregulation: Evidence from the End of Interstate Banking Restrictions. *The Journal of Finance, 53(6),* 2185-2204.

Brown, S. J., & Warner, J. B. (1985). Using Daily Stock Returns: The Case of Event Studies. *Journal of Financial Economics, 14(1),* 3-31.

Calomiris, C. W. (1999). Gauging the Efficiency of Bank Consolidation during a Merger Wave. *Journal of Banking & Finance, 23(2),* 615-621.

Cornett, M.M., & Tehranian, H. (1992). Changes in Corporate Performance Associated with Bank Acquisitions. *Journal of Financial Economics, 31(2),* 211-234.

DeLong, G. L. (2001). Stockholder Gains from Focusing Versus Diversifying Bank Mergers. *Journal of Financial Economics, 59(2),* 221-252.

Erel, I. (2011). The Effect of Bank Mergers on Loan Prices: Evidence from the United States. *Review of Financial Studies, 24(4),* 1068-1101.

Focarelli, D., & Panetta, F. (2003). Are Mergers Beneficial to Consumers? Evidence from the Market for Bank Deposits. *American Economic Review*, 93(4), 1152-1172.

Goetz, M. R., Laeven, L., & Levine, R. (2013). Identifying the Valuation Effects and Agency Costs of Corporate Diversification: Evidence from the Geographic Diversification of U.S. Banks. *Review of Financial Studies, 26(7),* 1787-1823.

Goetz, M. R., Laeven, L., & Levine, R. (2016). Does the Geographic Expansion of Banks Reduce Risk?. *Journal of Financial Economics*, *120*(2), 346-362.

Gompers, P. A., Mukharlyamov, V., & Xuan, Y. (2016). The Cost of Friendship. *Journal of Financial Economics*, *119*(3), 626-644.

Gorton, G., & Rosen, R. (1995). Corporate Control, Portfolio Choice, and the Decline of Banking. *The Journal of Finance, 50(5), 1377-1420.*

Houston, J. F., & Ryngaert, M. D. (1994). The Overall Gains from Large Bank Mergers. *Journal of Banking & Finance, 18(6),* 1155-1176.

Houston, J. F., & Ryngaert, M. D. (1997). Equity Issuance and Adverse Selection: A Direct Test Using Conditional Stock Offers. *The Journal of Finance, 52(1),* 197-219.

Houston, J. F., James, C. M., & Ryngaert, M. D. (2001). Where do Merger Gains Come From? Bank Mergers from the Perspective of Insiders and Outsiders. *Journal of Financial Economics, 60(2),* 285-331.

Hubbard, R., & Palia, D. (1999). A Re-examination of the Conglomerate Merger Wave in the 1960s: An Internal Capital Markets View. *Journal of Finance 54(3),* 1131-1152.

Hughes, J. P., & Mester, L. J. (2013). Who Said Large Banks Don't Experience Scale Economies? Evidence from a Risk-return-driven Cost Function. *Journal of Financial Intermediation, 22(4),* 559-585.

Hughes, J. P., Lang, W. W., Mester, L. J., Moon, C. G., & Pagano, M. S. (2003). Do Bankers Sacrifice Value to Build Empires? Managerial Incentives, Industry Consolidation, and Financial Performance. *Journal of Banking & Finance, 27(3),* 417-447.

James, C. M., & Wier, P. (1987). Returns to Acquirers and Competition in the Acquisition Market: The Case of Banking. *Journal of Political Economy, 95(2),* 355-370.

Jayaratne, J., & Strahan, P. E. (1996). The Finance-Growth Nexus: Evidence from Bank Branch Deregulation. *The Quarterly Journal of Economics, 111(3),* 639-670.

Jiang, L., Levine, R., & Lin, C. (2016). Competition and Bank Opacity. *Review of Financial Studies, 29(7), 1911-1942.*

Kroszner, R. S., & Strahan, P. E. (2001). Bankers on Boards: Monitoring, Conflicts of Interest, and Lender Liability. *Journal of Financial Economics, 62(3), 415-452*

Laeven, L., & Levine, R. (2007). Is There a Diversification Discount in Financial Conglomerates?. *Journal of Financial Economics, 85(2),* 331-367.

Lang, L.H.P., & Stulz, R.M. (1994). Tobin's q, Corporate Diversification, and Firm Performance. *Journal of Political Economy 102(6),* 1248-1280.

Masulis, R. W., Wang, C., & Xie, F. (2007). Corporate governance and acquirer returns. *The Journal of Finance, 62*(4), 1851-1889.

Morgan, D., Rime, B., & Strahan, P. (2003). Bank Integration and State Business Cycles (No. w9704). *National Bureau of Economic Research.*

Ryan, S. J. (1999). Finding Value in Bank Mergers (No. 643). *In Federal Reserve Bank of Chicago Proceedings.*

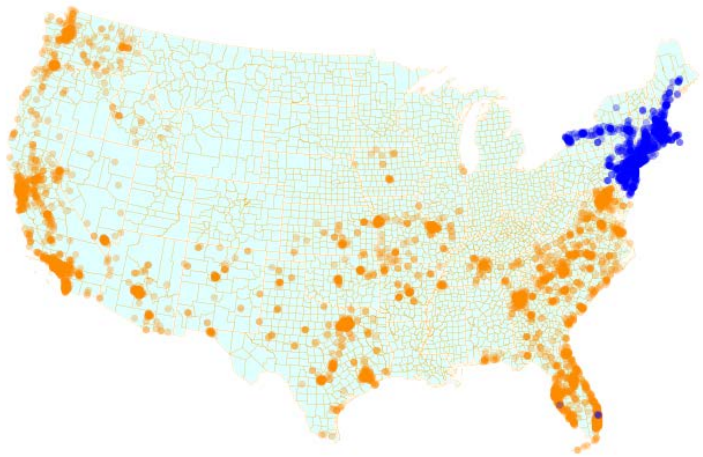
Stein, J. (1997). Internal Capital Markets and the Competition for Corporate Resources. *Journal of Finance, 52(1),* 111-134.

Stock, J. H., & Watson, M. W. (2007). Why has US Inflation Become Harder to Forecast?. *Journal of Money, Credit and banking, 39(1),* 3-33.

Figure 1: The Geographic Overlap of Subsidiaries before an Acquisition: Two Examples

Acquirer (Orange) and Target (Blue) Bank Branches' Geographic Distribution

Panel A: Bank of America (Headquartered in North Carolina) Acquires FleetBoston Financial (Massachusetts), Announced in 2003



Panel B: Financial (Alabama) Acquires AmSouth Bancorp (Alabama), Announced in 2006

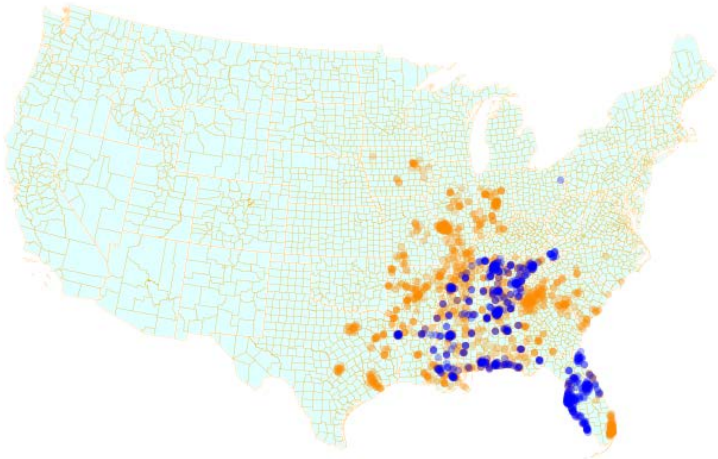
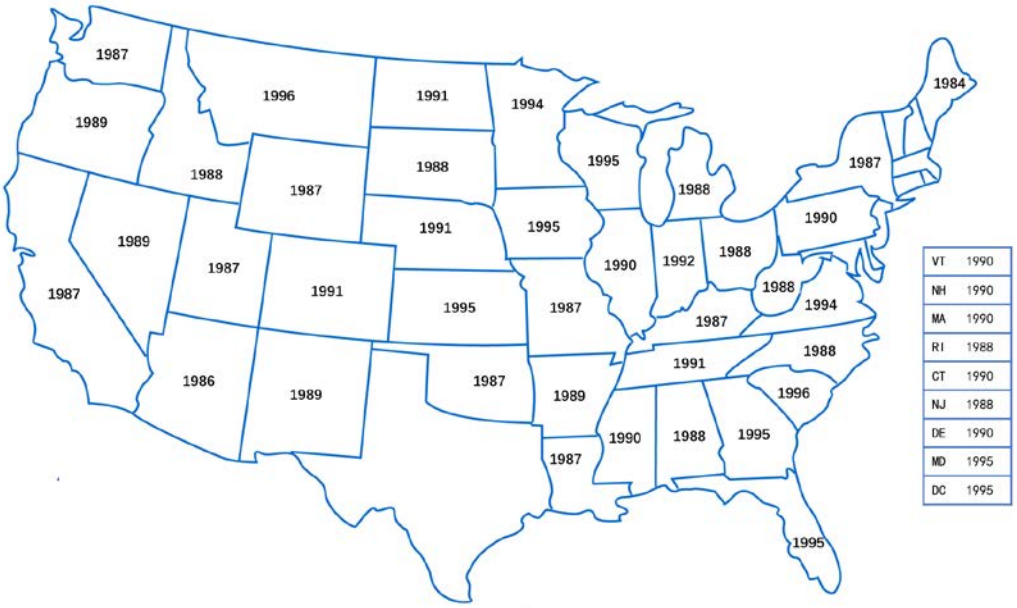


Figure 2: The Years When Texas and Pennsylvania Allowed Each State's Banks to Establish Subsidiaries within Their Borders

Panel A: Texas



Panel B: Pennsylvania

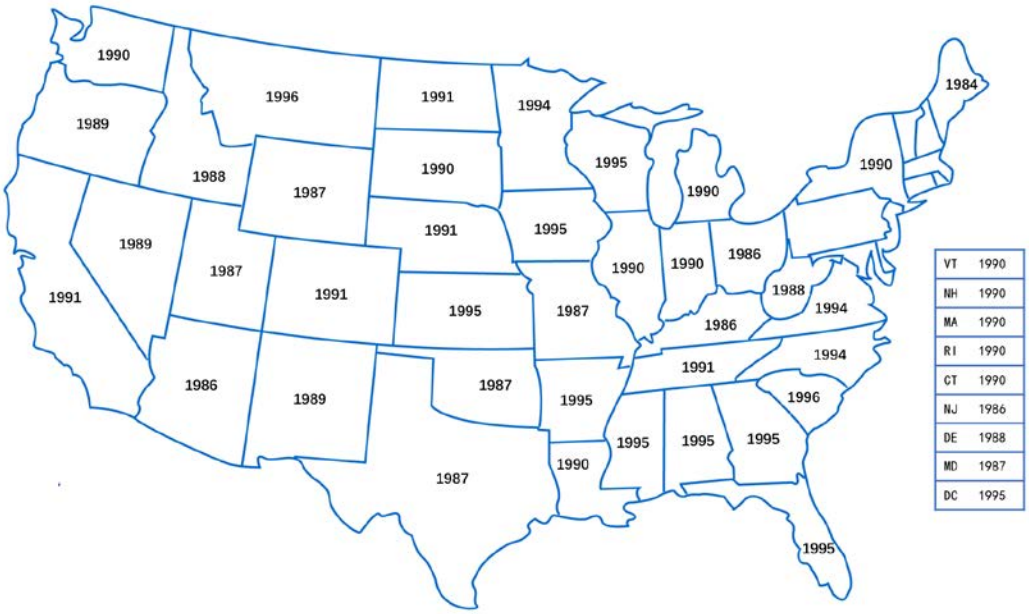


Table 1 Variable Definitions

	Dependent Variables
Cumulative Abnormal Return (CAR)	5-day CAR during the window (-2, +2), where day 0 is the announcement date of the acquisition. We define abnormal returns by using the difference between actual and projected returns, where we estimate projected returns as follows: (1) regress the BHC's daily return on the value-weighted returns on the CRSP equally weighted market portfolio over the 200-day period from the 210th trading day through the 11th trading day before the announcement date of each deal and collect the estimated coefficients and (2) use the estimated coefficients to compute the projected returns during the 5-day event window (-2, +2).
Percentage of Target Banks' Board Directors/Executives Replaced During the Year after the Acquisition	The number of board directors/executives who were in the target bank one year before the merger announcement but who were not in the target banks on the first year after the announcement, divided by the total number of board directors who were in the target banks on the year of merger announcement.
Total Salary	Total salary and employee benefits that a target bank pays all the employees in a quarter, in thousand dollars. Symbol and label are BHCK4135 (Salaries and Employee Benefits) in BHC subsidiary files. In thousand USD.
Employee Number	Number of employees that a target bank hires in a quarter. Symbol and label are BHCK4150 (Number of Full Time Equivalent Employees on Payroll at end of Current Period) in BHC subsidiary files.
Average Salary	Average salary that a target bank pays an employee in a quarter, in thousand dollars, i.e., Total salary/Employee number. In thousand USD.
Insider Loan Ratio	Value of insider loans (RCFD6164, from call report) divided by the value of total loans and leases (BHCK2122). In percentage.
Net Charge-off Ratio	The difference between the charge-offs on loans and leases (BHCK4635) and recoveries on loans and leases (BHCK4605) (Recoveries on Allowance for Loan and Lease Losses) divided by the total value of loans and leases (BHCK3516).
Net Interest Margin	Net interest income (BHCK4074) divided by total interest-bearing deposits (BHCK3517). In percentage.

Inputs into the Network Overlap Measures

Unweighted Vector	For each BHC in each year, we construct an unweighted 51-element vector to measure the geographic distribution of its subsidiaries (and a separate unweighted vector for branches). Each element is one or zero depending on whether the BHC has a subsidiary (branch) in each state and the District of Columbia or not.
Weighted Vector	For each BHC in each year, we construct a weighted 51-element vector to measure the geographic distribution of its subsidiaries (and a separate weighted vector for branches). Each element is zero or the number of subsidiaries (branches) in each state and the District of Columbia.

Network Overlap Measures

Overlap	The number of non-zero elements in the intersection of the two BHCs' unweighted vectors of subsidiaries divided by the total number of non-zero elements in the union of the two BHCs' vectors. For example, if *u*=[1,0,1,0] and *v*=[1,1,0,0], then $u \cap v = [1,0,0,0]$ and $u \cup v = [1,1,1,0]$, therefore Overlap = 1/3 = 33.33%. Denoted in percentage.
In the following definitions, u and v are two 1-dimentional vectors	
Correlation Coefficient	Pearson's correlation coefficient of two banks' unweighted vectors, defined as $$\rho_{u,v} = \frac{\sum_{i=1}^{n}(u_i - \bar{u})(v_i - \bar{v})}{\sqrt{\sum_{i=1}^{n}(u_i - \bar{u})^2}\sqrt{\sum_{i=1}^{n}(v_i - \bar{v})^2}}$$
Cosine Distance	Measures overlap using the cosine distance based on unweighted vectors of bank subsidiary networks: $$d(u,v) = 1 - \frac{u \cdot v}{\|\|u\|\|_2 \|\|v\|\|_2}$$ $d(u,v) = 0$ when $u = v$, meaning that the two vectors are the same. $d(u,v) = 1$ when $u \cdot v = 0$, meaning that the two vectors are very dissimilar.

	Control Variables
Acquirer Runup	The percentage change in the acquirer's stock price over the period from 200 days before the announcement until 11 day before the announcement. Data are from CRSP.
Acquirer Tobin's Q	The ratio of the market to the book value of assets. Obtained from Bloomberg.
Deal Size Adjusted by Asset	The value of the acquisition divided by the total assets of the acquiring BHC. Deal size is obtained from Thomson Reuters SDC.
Cash Deal Dummy	Equals one if the acquisition is 100% in cash and zero otherwise. Obtained from Thomson Reuters SDC.
Stock Deal Dummy	Equals one if the acquisition is 100% in stock and zero otherwise. Obtained from Thomson Reuters SDC.
Attitude Dummy	Equals one if the deal is friendly and zero otherwise, where "friendly" means the target bank did not resist or face an unsolicited offer as determined by the SDC. Obtained from Thomson Reuters SDC.
Target Public Dummy	Equals one if the target bank is public. Obtained from Thomson Reuters SDC.
Percentage of Shares Acquired	Percentage of shares acquired by the acquiring BHC. Obtained from Thomson Reuters SDC.
Acquirer/Target Total Assets	Acquirer/target banks' total assets. Obtained from Compustat. In million USD.
Acquirer/Target Profitability	Acquirer/target bank's return on assets. Obtained from Compustat.
Acquirer/Target Equity Ratio	Equals one minus acquirer/target banks' total liabilities/total assets ratio. Obtained from Compustat.

Table 2 Summary Statistics					
	Obs	Mean	Std. Dev.	Min	Max
Dependent Variables					
Deal Level Data					
Acquirer CAR (-2,+2)	716	-0.125	4.592	-30.706	26.508
Target CAR (-2,+2)	429	13.757	19.853	-50.555	117.137
Combined CAR (-2,+2)	404	12.974	18.929	-13.940	110.242
Percentage of Target Banks' Board Directors Replaced During the Year after the Acquisition	289	38.926	45.032	0	100
Percentage of Target Banks' Board Executives Replaced During the Year after the Acquisition	271	40.206	45.253	0	100
Bank-Quarter Level Data					
Total Salary	11345	45657.330	283109.4	180	6749000
Average Salary	11345	16.133	9.491	2.813	142.967
Employee Number	11345	2122.705	8871.263	20	121890
Insider Loan Ratio	11415	1.631	1.781	0.000	14.269
Net Charge-off Ratio	11388	0.184	0.353	-2.903	6.304
Net Interest Margin	11992	2.009	1.056	-2.165	9.743
Key Independent Variables (Deal Level)					
Overlap	716	1.191	0.768	0.000	6.250
Correlation Coefficient	716	0.593	0.416	-0.049	1
Correlation Coefficient (Weighted by Subsidiary Number)	716	0.600	0.440	-0.038	1
Cosine Distance	716	0.398	0.408	0	1
Cosine Distance (Weighted by Subsidiary Number)	716	0.392	0.431	0	1

Control Variables (Deal Level)					
Acquirer Runup	716	0.033	0.292	-0.670	3.656
Acquirer Profitability	716	1.182	0.763	-2.612	11.368
Acquirer Tobin's Q	716	1.090	0.132	0.939	2.922
Deal Size Adjusted by Acquirer Asset	716	0.023	0.033	0	0.299
Cash Deal Dummy	716	0.128	0.335	0	1
Stock Deal Dummy	716	0.546	0.498	0	1
Attitude Dummy	716	0.996	0.065	0	1
Target Public Dummy	716	0.546	0.498	0	1
Percentage of Shares Acquired	716	99.891	1.362	77.500	100.000
Acquirer Total Assets	716	26670	98183	62	1291803
Control Variables (Complete and Pseudo Deals)					
Complete and Pseudo Deals					
Acquirer Total Assets	4156	32648	119317	104	1910183
Acquirer Profitability	3689	1.028	0.612	-6.002	11.368
Acquirer Equity Ratio	3689	9.461	2.386	1.806	25.131
Target Total Assets	3180	7551	52388	31	782896
Target Profitability	1812	0.737	0.961	-7.705	6.857
Target Equity Ratio	1812	9.342	3.282	1.920	38.348
Only Complete Deals					
Acquirer Total Assets	728	22018	102788	104	1351520
Acquirer Profitability	624	1.086	0.434	-1.994	2.913
Acquirer Equity Ratio	624	9.277	2.033	5.168	19.978
Target Total Assets	480	9262	57336	60	782896
Target Profitability	238	0.714	1.013	-7.175	2.165
Target Equity Ratio	238	9.140	3.178	2.785	38.348
Only Pseudo Deals					
Acquirer Total Assets	3428	34688	122142	203	1910183
Acquirer Profitability	3065	1.017	0.640	-6.002	11.368
Acquirer Equity Ratio	3065	9.496	2.446	1.806	25.131
Target Total Assets	2700	7421	52002	31	782896
Target Profitability	1574	0.739	0.957	-7.705	6.857
Target Equity Ratio	1574	9.357	3.290	1.920	38.348

Table 3: The Geographic Overlap of BHC Subsidiaries and the Probability of Merging

This table reports Probit regression results of the relation between the probability that two BHCs merge and the degree to which the two BHCs have subsidiary networks that overlap geographically. The regression sample includes data on actual deals and pseudo matched deals, where the pseudo deals include both (a) pseudo matched deals of the actual acquirer with targets of similar total assets (model 1-3) or similar market-to-book ratio (model 4-6) to that of the actual target and (b) pseudo matched deals of the actual target with acquirers of similar total assets (model 1-3) or similar market-to-book ratio (model 4-6) to that of the actual acquirer. The dependent variable is a dummy variable that equals one for actual deals and zero for the pseudo deals. The table reports the estimated marginal effects of three measures of the geographic overlap of BHC subsidiaries: *Overlap*, *Correlation Coefficient*, and *Cosine Distance*, which are defined in Table 1. The regressions control for *Acquirer total assets*, *Target total assets*, *Acquirer profitability*, *Target profitability*, *Acquirer equity ratio*, and *Target equity ratio*, as defined in Table 1. The regressions also include a Deal dummy, which equals one for the actual deal and zero for pseudo-matched deals. Standard errors are clustered at the deal level. Robust z-statistics are in parentheses. *, **, *** indicate significance at 1%, 5% and 10%.

	(1)	(2)	(3)	(4)	(5)	(6)
	Matched by Total Assets			Matched by Market-to-Book Ratio		
	Acquirer-Target Bank Pairing: Complete Deals with Control Sample, Probit Model					
	Dependent Variable: Deal Completed					
Overlap	0.05**			0.05***		
	(2.43)			(5.88)		
Correlation Coefficient		0.21***			0.23***	
		(14.00)			(8.62)	
Cosine Distance			-0.22***			-0.23***
			(-14.42)			(-8.52)
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer profitability	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer equity ratio	Yes	Yes	Yes	Yes	Yes	Yes
Target total assets	Yes	Yes	Yes	Yes	Yes	Yes
Target profitability	Yes	Yes	Yes	Yes	Yes	Yes
Target equity ratio	Yes	Yes	Yes	Yes	Yes	Yes
Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Completed deals	206	206	206	197	197	197
Counterfactual pairs	1402	1402	1402	637	637	637
Observations	1,608	1,608	1,608	834	834	834

Table 4: The Geographic Overlap of BHC Subsidiaries and CARs: OLS Results

This table presents OLS regressions of the relation between the CARs of acquirer, target, and combined BHCs and the degree to which the two BHCs have subsidiary networks that overlap geographically. The dependent variable is either the 5-day CAR (-2, +2) of the acquirer, target, or combined BHC around the announcement date of the deal (i.e., *Acquirer CAR (-2, +2)*, *Target CAR (-2, +2)*, and *Combined CAR (-2, +2)*. The table reports the estimated coefficients on three measures of the geographic overlap of BHC subsidiaries: *Overlap*, *Correlation Coefficient*, and *Cosine Distance*, which are defined in Table 1. The table also controls for an array of acquirer, target, and deal characteristics, where Table 1 provides definitions of each of these regressors. In addition, we control for the year of the announcement and acquirer state fixed effects. Standard errors are clustered at acquirer bank level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Acquirer CAR (-2,+2) in %			Target CAR (-2,+2) in %			Combined CAR (-2,+2) in %		
Overlap	0.61**			2.61***			3.43***		
	(2.40)			(2.67)			(2.88)		
Correlation Coefficient		1.25***			4.84**			6.23***	
		(2.72)			(2.51)			(3.05)	
Cosine Distance			-1.27***			-4.89**			-6.31***
			(-2.72)			(-2.48)			(-3.02)
Acquirer Runup	0.36	0.36	0.36	0.91	0.79	0.79	1.72	1.53	1.54
	(0.37)	(0.36)	(0.36)	(0.45)	(0.39)	(0.39)	(0.72)	(0.63)	(0.63)
Acquirer Profitability	-1.19**	-1.19**	-1.19**	0.21	0.47	0.46	-1.74	-1.50	-1.50
	(-2.43)	(-2.41)	(-2.41)	(0.12)	(0.27)	(0.27)	(-0.80)	(-0.70)	(-0.70)
Acquirer Tobin's Q	6.90***	7.03***	7.03***	-1.97	-1.21	-1.25	11.93	13.58	13.51
	(2.78)	(2.88)	(2.88)	(-0.48)	(-0.30)	(-0.31)	(1.11)	(1.26)	(1.25)
Deal Size Adjusted by Asset	-9.80	-9.75	-9.75	-62.10***	-60.86***	-60.75***	-74.23***	-71.22***	-71.18***
	(-1.40)	(-1.37)	(-1.37)	(-2.70)	(-2.64)	(-2.63)	(-3.23)	(-3.08)	(-3.08)
Cash Deal Dummy	0.71	0.71	0.71	-0.74	-0.78	-0.78	-0.07	-0.10	-0.11
	(1.23)	(1.26)	(1.26)	(-0.34)	(-0.35)	(-0.35)	(-0.03)	(-0.05)	(-0.05)
Stock Deal Dummy	0.27	0.32	0.32	0.64	0.94	0.94	1.02	1.30	1.30
	(0.53)	(0.62)	(0.62)	(0.30)	(0.43)	(0.43)	(0.45)	(0.57)	(0.57)
Attitude Dummy	-1.31	-1.43	-1.44	5.17	5.33	5.34	1.32	1.66	1.65
	(-0.54)	(-0.59)	(-0.59)	(0.53)	(0.55)	(0.55)	(0.11)	(0.14)	(0.14)
Target Public Dummy	-0.40	-0.40	-0.40	24.66***	24.78***	24.77***	23.89***	23.98***	23.98***
	(-1.02)	(-1.00)	(-1.01)	(13.61)	(13.58)	(13.58)	(12.10)	(12.10)	(12.10)
Percentage of Shares Acquired	-0.08	-0.06	-0.07	-0.23	-0.08	-0.08	-0.42	-0.24	-0.24
	(-0.51)	(-0.41)	(-0.41)	(-0.59)	(-0.19)	(-0.20)	(-1.19)	(-0.67)	(-0.68)
Acquirer Total Assets	0.01	0.01	0.01	-0.00	-0.00	-0.00	-0.00	0.00	0.00
	(0.83)	(1.43)	(1.42)	(-0.52)	(-0.03)	(-0.04)	(-0.18)	(0.37)	(0.36)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	3.28	1.72	3.00	5.43	-11.16	-6.02	14.69	-6.12	0.41
	(0.19)	(0.11)	(0.18)	(0.13)	(-0.27)	(-0.15)	(0.35)	(-0.14)	(0.01)
Observations	716	716	716	459	459	459	434	434	434
R-squared	0.217	0.220	0.220	0.361	0.359	0.359	0.350	0.346	0.346

Table 5 The Geographic Overlap of BHC Subsidiaries and CARs: IV Results

This table presents instrument variable regressions of the relation between the CARs of acquirer, target, and combined BHCs and the degree to which the two BHCs have subsidiary networks that overlap geographically. Panel A provides the second-stage results, where the dependent variable is either the 5-day CAR (-2, +2) of the acquirer, target, or combined BHC around the announcement date of the deal (i.e., *Acquirer CAR (-2, +2)*, *Target CAR (-2, +2)*, and *Combined CAR (-2, +2)*. The table reports the estimated coefficients on three measures of the geographic overlap of BHC subsidiaries: *Overlap*, *Correlation Coefficient*, and *Cosine Distance*, which are defined in Table 1. The regressions control for an array of acquirer, target, and deal characteristics, where Table 1 provides definitions of each of these regressors. In addition, we control for the year of the announcement and acquirer state fixed effects. Panel B provides the first-stage results. The instrumental variable for the geographic overlap measures are the gravity-deregulation instrument defined in the text. Standard errors are clustered at the acquirer bank level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

Panel A: Second Stage	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent Variables:	Acquirer CAR (-2,+2) in %			Target CAR (-2,+2) in %			Combined CAR (-2,+2) in %		
Overlap	6.19***			6.64***			9.64***		
	(2.71)			(2.32)			(2.70)		
Correlation Coefficient		12.32***			15.58**			20.97**	
		(2.69)			(2.36)			(2.46)	
Cosine Distance			-12.53***			-15.87**			-21.38**
			(-2.70)			(-2.34)			(-2.46)
Acquirer Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	716	716	716	429	429	429	404	404	404
F-test of Instruments' Joint Significance	21.66	11.94	12.17	12.89	14.76	14.59	21.66	12.05	11.49
Excluded Instruments:									
Weighted Overlap of States that Allowed Entry	Yes			Yes			Yes		
Weighted Correlation Coeff of States that Allowed Entry		Yes			Yes			Yes	
Weighted Cosine Distance of States that Allowed Entry			Yes			Yes			Yes
Panel B: First Stage									
Weighted Overlap of States that Allowed Entry (%)	0.30***			1.03***			0.93***		
	(4.61)			(3.59)			(3.24)		
Weighted Correlation Coeff of States that Allowed Entry		0.15***			0.44***			0.43***	
		(3.53)			(3.84)			(3.47)	
Weighted Cosine Distance of States that Allowed Entry			0.14***			0.43***			0.42***
			(3.56)			(3.82)			(3.46)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	716	716	716	429	429	429	404	404	404

Table 6: The Geographic Overlap of BHC Subsidiaries and the Replacement of Target Directors and Executives

This table presents Tobit regressions of the relations between rate of replace of directors and executives at target banks and the degree to which the two BHCs have subsidiary networks that overlap geographically. The table provides results on two dependent variables: The percentages of the target BHCs (1) board directors and (2) executives replaced during the year following the acquisition. The table reports the estimated coefficients on three measures of the geographic overlap of BHC subsidiaries: *Overlap*, *Correlation Coefficient*, and *Cosine Distance*, which are defined in Table 1. The table also controls for deal characteristics (Deal controls), i.e., *Acquirer Runup, Deal size adjusted by assets, Cash deal dummy, Stock deal dummy, Attitude dummy, Target public dummy*, and *Percentage of shared acquired*, which are defined in Table 1. The regressions also control for target state and year fixed effects. Standard errors are clustered at the target BHC level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

	(1)	(2)	(3)	(4)	(5)	(6)
	Percentage of Target Banks' Board Directors Being Replaced in One Year After Acquisition			Percentage of Target Banks' Executives Being Replaced in One Year After Acquisition		
	Tobit	Tobit	Tobit	Tobit	Tobit	Tobit
Overlap	15.12***			14.02***		
	(4.45)			(6.23)		
Correlation Coefficient		19.73**			16.17**	
		(2.13)			(2.45)	
Cosine Distance			-20.50**			-16.31**
			(-2.17)			(-2.42)
Deal Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Target Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-5.22	-5.94	-5.92	12.52***	9.43***	9.36***
	(-1.14)	(-1.38)	(-1.37)	(5.42)	(3.97)	(3.94)
Observations	333	333	333	472	472	472
Pseudo R-squared	0.059	0.055	0.055	0.066	0.061	0.061

Table 7: The Geographic Overlap of BHC Subsidiaries and Target BHC Salaries and Employees

This table presents OLS regressions of the relations between salary and number of employees at target banks and the degree to which the two BHCs have subsidiary networks that overlap geographically. Across three panels, the table provides results on three dependent variables: The change in the natural logarithm of the target BHC's (1) total salary (Panel A), (2) average salary (Panel B), and (3) number of employees (Panel C) over the period from 12 quarter before the announcement of the merger until 12 quarters after the announcement. The table reports the estimated coefficients on three measures of the geographic overlap of BHC subsidiaries: *Overlap*, *Correlation Coefficient*, and *Cosine Distance*, which are defined in Table 1. The table also controls for deal characteristics (Deal controls), i.e., *Acquirer Runup*, *Deal size adjusted by assets*, *Cash deal dummy*, *Stock deal dummy*, *Attitude dummy*, *Target public dummy*, and *Percentage of shared acquired*, which are defined in Table 1. The regressions also control for target state and year fixed effects. Standard errors are clustered at the target BHC level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

Panel A	(1)	(2)	(3)	(4)	(5)	(6)
			Change of log(Total Salary)			
Overlap	-0.22**			-0.34**		
	(-2.26)			(-2.27)		
Correlation Coefficient		-0.46**			-0.84***	
		(-2.11)			(-2.86)	
Cosine Distance			0.47**			0.86***
			(2.08)			(2.86)
Deal Characteristics	No	No	No	Yes	Yes	Yes
Target Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-2.56***	-2.60***	-3.06***	3.17	3.21	2.36
	(-3.14)	(-3.12)	(-3.56)	(0.51)	(0.50)	(0.37)
Observations	232	232	232	186	186	186
R-squared	0.502	0.502	0.501	0.624	0.632	0.632

Panel B	(7)	(8)	(9)	(10)	(11)	(12)
			Change of log(Average Salary)			
Overlap	-0.02			-0.04		
	(-0.72)			(-1.14)		
Correlation Coefficient		-0.03			-0.08	
		(-0.73)			(-1.14)	
Cosine Distance			0.03			0.09
			(0.68)			(1.14)
Deal Characteristics	No	No	No	Yes	Yes	Yes
Target Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.85***	-0.85***	-0.88***	-2.96**	-3.01**	-3.10**
	(-4.72)	(-4.74)	(-4.76)	(-2.28)	(-2.28)	(-2.38)
Observations	232	232	232	186	186	186
R-squared	0.496	0.496	0.496	0.541	0.541	0.541

Panel C	(13)	(14)	(15)	(16)	(17)	(18)
			Change of log(Employee Number)			
Overlap	-0.21**			-0.31**		
	(-2.45)			(-2.42)		
Correlation Coefficient		-0.45**			-0.77***	
		(-2.37)			(-3.13)	
Cosine Distance			0.45**			0.79***
			(2.33)			(3.13)
Deal Characteristics	No	No	No	Yes	Yes	Yes
Target Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-1.54**	-1.56**	-2.01***	5.94	6.08	5.30
	(-2.23)	(-2.22)	(-2.79)	(1.09)	(1.07)	(0.94)
Observations	232	232	232	186	186	186
R-squared	0.480	0.480	0.480	0.618	0.630	0.630

Table 8: The Geographic Overlap of BHC Subsidiaries and Target BHC's Insider Lending, Charge-offs, and Net Interest Margins

This table presents OLS regressions of the relations between salary and number of employees at target banks and the degree to which the two BHCs have subsidiary networks that overlap geographically. Across three panels, the table provides results on three dependent variables: Panel A: Post-merger lending to corporate insiders at the target BHC (*Insider Loans/Total Loans*); Panel B: Proportion of loan charge-offs to total loans at the target BHC (*Net Charge-offs/Total Loans*); and Panel C: Net interest margin of the target (*Net Interest Margin*). The table reports the estimated coefficients on three measures of the geographic overlap of BHC subsidiaries: *Overlap, Correlation Coefficient*, and *Cosine Distance*. The table also controls for deal characteristics (Deal controls), i.e., *Acquirer Runup, Deal size adjusted by assets, Cash deal dummy, Stock deal dummy, Attitude dummy, Target public dummy,* and *Percentage of shared acquired*. Table 1 provides variable definitions. The regressions also control for target state and year fixed effects. Standard errors are clustered at the target BHC level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

Panel A	(1)	(2)	(3)	(4)	(5)	(6)
	Change of Insider Loan/Total Loan Ratio (%)					
Overlap	-0.16**			-0.25**		
	(-2.01)			(-2.25)		
Correlation Coefficient		-0.50**			-0.61**	
		(-2.32)			(-2.52)	
Cosine Distance			0.52**			0.63**
			(2.36)			(2.56)
Deal Characteristics	No	No	No	Yes	Yes	Yes
Target Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.93	-0.88	-1.39*	-16.24***	-15.21**	-15.81**
	(-1.26)	(-1.14)	(-1.69)	(-2.72)	(-2.52)	(-2.63)
Observations	217	217	217	169	169	169
R-squared	0.621	0.628	0.628	0.752	0.757	0.758

Panel B	(7)	(8)	(9)	(10)	(11)	(12)
	Change of Net Charge-off/Total Loan Ratio (%)					
Overlap	-0.05***			-0.05***		
	(-3.46)			(-2.93)		
Correlation Coefficient		-0.11***			-0.11***	
		(-2.85)			(-2.81)	
Cosine Distance			0.11***			0.12***
			(2.87)			(2.81)
Deal Characteristics	No	No	No	Yes	Yes	Yes
Target Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.04	0.03	-0.08	-0.18	-0.21	-0.32
	(0.43)	(0.28)	(-0.79)	(-0.53)	(-0.62)	(-1.01)
Observations	240	240	240	199	199	199
R-squared	0.459	0.456	0.456	0.524	0.527	0.527
Panel C	(13)	(14)	(15)	(16)	(17)	(18)
	Change of Net Interest Margin (%)					
Overlap	0.06**			0.08*		
	(2.12)			(1.91)		
Correlation Coefficient		0.14**			0.19**	
		(2.12)			(2.00)	
Cosine Distance			-0.14**			-0.20*
			(-2.06)			(-1.97)
Deal Characteristics	No	No	No	Yes	Yes	Yes
Target Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	1.03***	1.02***	1.16***	2.82	2.94	3.14
	(4.29)	(4.14)	(4.70)	(1.34)	(1.43)	(1.54)
Observations	222	222	222	176	176	176
R-squared	0.557	0.560	0.559	0.622	0.625	0.625

Table A.1 Summary Statistics (FDIC Bank Branch)					
	Obs	Mean	Std. Dev.	Min	Max
Dependent Variables					
Deal Level Data					
Acquirer CAR (-2,+2)	975	-0.200	5.748	-53.220	70.333
Target CAR (-2,+2)	583	10.900	18.900	-50.555	117.137
Combined CAR (-2,+2)	560	10.300	19.100	-54.248	125.222
Key Independent Variables (Deal Level)					
Overlap	975	1.600	0.997	0	6.250
Correlation Coefficient	975	0.604	0.372	-0.311	1
Correlation Coefficient (Weighted by Subsidiary Number)	975	0.603	0.443	-0.218	1
Cosine Distance	975	0.383	0.359	0	1
Cosine Distance (Weighted by Subsidiary Number)	975	0.387	0.431	0	1
Control Variables (Deal Level)					
Acquirer Runup	975	0.043	0.296	-0.982	3.656
Acquirer Profitability	975	1.145	0.561	-6.370	9.364
Acquirer Tobin's Q	975	1.088	0.092	0.937	2.588
Deal Size Adjusted by Asset	975	0.029	0.036	0	0.327
Cash Deal Dummy	975	0.186	0.390	0	1
Stock Deal Dummy	975	0.486	0.500	0	1
Attitude Dummy	975	0.996	0.066	0	1
Target Public Dummy	975	0.481	0.500	0	1
Percentage of Shares Acquired	975	99.808	2.861	34.600	100
Acquirer Total Assets	975	29893	118790	96	1502157

Table A.2: The Geographic Overlap of BHC Subsidiaries and the Probability of Merging: Robustness Test

This table reports Probit regression results of the relation between the probability that two BHCs merge and the degree to which the two BHCs have subsidiary networks that overlap geographically. The regression sample includes data on actual deals and pseudo matched deals, where the pseudo deals include both (a) pseudo matched deals of the actual acquirer with targets of similar total assets (Panel A, B, C) or similar market-to-book ratio (Panel D, E, F) to that of the actual target and (b) pseudo matched deals of the actual target with acquirers of similar total assets (Panel A, B, C) or similar market-to-book ratio (Panel D, E, F) to that of the actual acquirer. The dependent variable is a dummy variable that equals one for actual deals and zero for the pseudo deals. The table reports the estimated marginal effects of measures of the geographic overlap of BHC subsidiaries, which are defined in Table 1. As indicated, the regressions include different combinations of control variables: *Acquirer total assets*, *Target total assets*, *Acquirer profitability*, *Target profitability*, *Acquirer equity ratio*, and *Target equity ratio*, as defined in Table 1. The regressions also include a Deal dummy, which equals one for the actual deal and zero for pseudo-matched deals. Standard errors are clustered at the deal level. Robust z-statistics are in parentheses. *, **, *** indicate significance at 1%, 5% and 10%.

Panel A	(1)	(2)	(3)	(4)	(5)
	Acquirer-Target Bank Pairing: Complete Deals with Control Sample, Probit Model				
	Dependent Variable: Deal Completed				
Overlap	0.05**				
	(2.43)				
Correlation Coefficient		0.21***			
		(14.00)			
Correlation Coefficient (Weighted)			0.22***		
			(16.18)		
Cosine Distance				-0.22***	
				(-14.42)	
Cosine Distance (Weighted)					-0.22***
					(-16.10)
Acquirer total assets	Yes	Yes	Yes	Yes	Yes
Acquirer profitability	Yes	Yes	Yes	Yes	Yes
Acquirer equity ratio	Yes	Yes	Yes	Yes	Yes
Target total assets	Yes	Yes	Yes	Yes	Yes
Target profitability	Yes	Yes	Yes	Yes	Yes
Target equity ratio	Yes	Yes	Yes	Yes	Yes
Deal Dummy	Yes	Yes	Yes	Yes	Yes
Completed deals	206	206	206	206	206
Counterfactual pairs	1432	1432	1432	1432	1432
Observations	1,638	1,638	1,638	1,638	1,638

Panel B	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Acquirer-Target Bank Pairing: Complete Deals with Control Sample, Probit Model									
	Dependent Variable: Deal Completed									
Overlap	0.10**					0.05***				
	(2.35)					(2.62)				
Correlation Coefficient		0.30***					0.22***			
		(22.49)					(14.82)			
Correlation Coefficient (Weighted)			0.30***					0.23***		
			(24.16)					(16.90)		
Cosine Distance				-0.30***					-0.23***	
				(-23.29)					(-15.46)	
Cosine Distance (Weighted)					-0.31***					-0.24***
					(-24.14)					(-16.80)
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Acquirer profitability	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Acquirer equity ratio	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Target total assets	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Target profitability	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Target equity ratio	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Completed deals	624	624	624	624	624	238	238	238	238	238
Counterfactual pairs	3030	3030	3030	3030	3030	1574	1574	1574	1574	1574
Observations	3,654	3,654	3,654	3,654	3,654	1,812	1,812	1,812	1,812	1,812

Panel C	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
	Acquirer-Target Bank Pairing: Complete Deals with Control Sample, Probit Model									
	Dependent Variable: Deal Completed									
Overlap	0.10**					0.07***				
	(2.55)					(2.65)				
Correlation Coefficient		0.31***					0.25***			
		(24.37)					(20.67)			
Correlation Coefficient (Weighted)			0.32***					0.26***		
			(25.87)					(22.23)		
Cosine Distance				-0.32***					-0.26***	
				(-24.98)					(-20.97)	
Cosine Distance (Weighted)					-0.33***					-0.27***
					(-25.82)					(-22.18)
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Acquirer profitability	No	No	No	No	No	No	No	No	No	No
Acquirer equity ratio	No	No	No	No	No	No	No	No	No	No
Target total assets	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Target profitability	No	No	No	No	No	No	No	No	No	No
Target equity ratio	No	No	No	No	No	No	No	No	No	No
Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Completed deals	728	728	728	728	728	480	480	480	480	480
Counterfactual pairs	3386	3386	3386	3386	3386	2700	2700	2700	2700	2700
Observations	4,114	4,114	4,114	4,114	4,114	3,180	3,180	3,180	3,180	3,180

Panel D	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Acquirer-Target Bank Pairing: Complete Deals with Control Sample, Probit Model									
	Dependent Variable: Deal Completed									
Overlap	0.05***					0.11***				
	(5.88)					(6.67)				
Correlation Coefficient		0.23***					0.50***			
		(8.62)					(15.41)			
Correlation Coefficient (Weighted)			0.22***					0.42***		
			(8.69)					(16.87)		
Cosine Distance				-0.23***					-0.52***	
				(-8.52)					(-15.36)	
Cosine Distance (Weighted)					-0.22***					-0.44***
					(-8.65)					(-16.91)
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer equity ratio	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target total assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target equity ratio	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	834	834	834	834	834	952	952	952	952	952

Panel E	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	Acquirer-Target Bank Pairing: Complete Deals with Control Sample, Probit Model									
	Dependent Variable: Deal Completed									
Overlap	0.18***					0.12***				
	(6.42)					(6.76)				
Correlation Coefficient		0.78***					0.53***			
		(20.95)					(16.12)			
Correlation Coefficient (Weighted)			0.64***					0.44***		
			(23.40)					(17.06)		
Cosine Distance				-0.81***					-0.55***	
				(-21.06)					(-16.26)	
Cosine Distance (Weighted)					-0.66***					-0.46***
					(-23.47)					(-17.14)
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Acquirer profitability	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Acquirer equity ratio	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Target total assets	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Target profitability	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Target equity ratio	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,875	1,876	1,876	1,876	1,876	1,022	1,023	1,023	1,023	1,023

Panel F	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
	Acquirer-Target Bank Pairing: Complete Deals with Control Sample, Probit Model									
	Dependent Variable: Deal Completed									
Overlap	0.20***					0.18***				
	(6.34)					(7.59)				
Correlation Coefficient		0.84***					0.76***			
		(22.12)					(18.76)			
Correlation Coefficient (Weighted)			0.69***					0.61***		
			(24.10)					(20.04)		
Cosine Distance				-0.88***					-0.79***	
				(-22.24)					(-18.87)	
Cosine Distance (Weighted)					-0.71***					-0.63***
					(-24.16)					(-20.10)
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
Acquirer profitability	No	No	No	No	No	No	No	No	No	No
Acquirer equity ratio	No	No	No	No	No	No	No	No	No	No
Target total assets	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Target profitability	No	No	No	No	No	No	No	No	No	No
Target equity ratio	No	No	No	No	No	No	No	No	No	No
Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,000	2,001	2,001	2,001	2,001	1,336	1,336	1,336	1,336	1,336

Table A.3: The Geographic Overlap of BHC Subsidiaries and the Probability of Merging: MSA Overlap

This table reports Probit regression results of the relation between the probability that two BHCs merge and the degree to which the two BHCs have subsidiary networks that overlap geographically. The regression sample includes data on actual deals and pseudo matched deals, where the pseudo deals include both (a) pseudo matched deals of the actual acquirer with targets of similar sizes to that of the actual target and (b) pseudo matched deals of the actual target with acquirers of similar sizes to that of the actual acquirer. The dependent variable is a dummy variable that equals one for actual deals and zero for the pseudo deals. The table reports the estimated marginal effects of measures of the geographic overlap of BHC subsidiaries computed at the MSA-level. As indicated, the regressions include different combinations of control variables: *Acquirer total assets, Target total assets, Acquirer profitability, Target profitability, Acquirer equity ratio,* and *Target equity ratio*, as defined in Table 1. The regressions also include a Deal dummy, which equals one for the actual deal and zero for pseudo-matched deals. Standard errors are clustered at the deal level. Robust z-statistics are in parentheses. *, **, *** indicate significance at 1%, 5% and 10%.

Panel A	(1)	(2)	(3)	(4)	(5)
	Acquirer-Target Bank Pairing: Complete Deals with Control Sample, Probit Model				
	Dependent Variable: Deal Completed				
MSA Overlap (%)	0.03***				
	(4.20)				
MSA Correlation Coefficient		0.37***			
		(10.22)			
MSA Correlation Coefficient (Weighted)			0.33***		
			(10.50)		
MSA Cosine Distance				-0.38***	
				(-10.51)	
MSA Cosine Distance (Weighted)					-0.33***
					(-10.52)
Acquirer total assets	Yes	Yes	Yes	Yes	Yes
Acquirer profitability	Yes	Yes	Yes	Yes	Yes
Acquirer equity ratio	Yes	Yes	Yes	Yes	Yes
Target total assets	Yes	Yes	Yes	Yes	Yes
Target profitability	Yes	Yes	Yes	Yes	Yes
Target equity ratio	Yes	Yes	Yes	Yes	Yes
Deal Dummy	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes
Completed deals	183	183	183	183	183
Counterfactual pairs	1,369	1,369	1,369	1,369	1,369
Observations	1,552	1,552	1,552	1,552	1,552

Panel B	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Acquirer-Target Bank Pairing: Complete Deals with Control Sample, Probit Model									
	Dependent Variable: Deal Completed									
MSA Overlap (%)	0.02***					0.02***				
	(3.63)					(2.9)				
MSA Correlation Coefficient		0.59***					0.37***			
		(16.56)					(14.86)			
MSA Correlation Coefficient (Weighted)			0.44***					0.28***		
			(16.44)					(15.49)		
MSA Cosine Distance				-0.60***					-0.38***	
				(-17.28)					(-16.18)	
MSA Cosine Distance (Weighted)					-0.44***					-0.28***
					(-16.48)					(-15.63)
Acquirer total assets	Yes	Yes	Yes	Yes	Yes					
Acquirer profitability	Yes	Yes	Yes	Yes	Yes					
Acquirer equity ratio	Yes	Yes	Yes	Yes	Yes					
Target total assets						Yes	Yes	Yes	Yes	Yes
Target profitability						Yes	Yes	Yes	Yes	Yes
Target equity ratio						Yes	Yes	Yes	Yes	Yes
Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Completed deals	409	409	409	409	409	205	205	205	205	205
Counterfactual pairs	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436
Observations	1,845	1,845	1,845	1,845	1,845	1,641	1,641	1,641	1,641	1,641

Table A.4: The Geographic Overlap of BHC Branches and the Probability of Merging

This table reports Probit regression results of the relation between the probability that two BHCs merge and the degree to which the two BHCs have branch networks that overlap geographically. The regression sample includes data on actual deals and pseudo matched deals, where the pseudo deals include both (a) pseudo matched deals of the actual acquirer with targets of similar sizes to that of the actual target and (b) pseudo matched deals of the actual target with acquirers of similar sizes to that of the actual acquirer. The dependent variable is a dummy variable that equals one for actual deals and zero for the pseudo deals. The table reports the estimated marginal effects of seven measures of the geographic overlap of BHC subsidiaries that are defined in Table 1. The regressions control for *Acquirer total assets*, *Target total assets*, *Acquirer profitability*, *Target profitability*, *Acquirer equity ratio*, and *Target equity ratio*, as defined in Table 1. The regressions also include a Deal dummy, which equals one for the actual deal and zero for pseudo-matched deals. Standard errors are clustered at the deal level. Robust z-statistics are in parentheses. *, **, *** indicate significance at 1%, 5% and 10%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Acquirer-Target Bank Pairing: Complete Deals with Control Sample, Probit Model						
	Dependent Variable: Deal Completed						
Overlap	0.08***						
	(11.45)						
Correlation Coefficient		0.26***					
		(12.29)					
Correlation Coefficient (Weighted by Branch Number)			0.29***				
			(12.53)				
Correlation Coefficient (Weighted by Branch Deposit)				0.29***			
				(12.50)			
Cosine Distance					-0.26***		
					(-12.04)		
Cosine Distance (Weighted by Branch Number)						-0.29***	
						(-12.48)	
Cosine Distance (Weighted by Branch Deposit)							-0.29***
							(-12.46)
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer equity ratio	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target total assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target equity ratio	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,046	1,046	1,046	1,046	1,046	1,046	1,046

Table A.5: The Geographic Overlap of BHC Subsidiaries and Acquirer CARs: Robustness Tests

This table presents OLS regressions of the relation between the CARs of acquirer BHCs and the degree to which the two BHCs have subsidiary networks that overlap geographically. The dependent variable is the 5-day CAR (-2, +2) of the acquiring BHC. The table reports the estimated coefficients on several measures of the geographic overlap of BHC subsidiaries, which are defined in Table 1. The table also controls for an array of acquirer, target, and deal characteristics, where Table 1 provides definitions of each of these regressors. In addition, we control for the year of the announcement and acquirer state fixed effects. Standard errors are clustered at acquirer bank level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Dependent Variable: Acquirer CAR (-2,+2) in %								
	Correlation Coefficient (Weighted)	Cosine Distance (Weighted)	Bray-Curtis Distance	Canberra Distance	Correlation Distance	Dice Distance	Euclidean Distance	Hamming Distance	Jaccard-Needham Distance
Correlation Coefficient (Weighted)	1.02**								
	(2.51)								
Cosine Distance (Weighted)		-1.05**							
		(-2.52)							
Network Distance			-1.73***	-0.23*	-1.70***	-1.73***	-0.73***	-14.87*	-1.68***
			(-3.53)	(-1.89)	(-3.48)	(-3.53)	(-2.88)	(-1.89)	(-3.54)
Acquirer Runup	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Tobin's Q	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal size adjusted by asset	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cash deal dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock deal dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attitude dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target public dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Percentage of shares acquired	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	2.19	3.24	-11.60	-13.19	-11.56	-11.60	-13.24	-13.19	-11.72
	(0.14)	(0.21)	(-0.57)	(-0.63)	(-0.57)	(-0.57)	(-0.64)	(-0.63)	(-0.58)
Observations	716	716	716	716	716	716	716	716	716
R-squared	0.218	0.218	0.167	0.158	0.167	0.167	0.163	0.158	0.167

Panel B	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	Dependent Variable: Acquirer CAR (-2,+2) in %							
	Kulsinski Distance	Matching Distance	Rogers-Tanimoto Distance	Russell-Rao Distance	Sokal-Michener Distance	Sokal-Sneath Distance	Squared Euclidean Distance	Yule Distance
Network Distance	-86.55***	-14.87*	-8.74**	-83.54***	-8.74**	-1.58***	-0.23*	-0.72***
	(-2.98)	(-1.89)	(-2.05)	(-2.93)	(-2.05)	(-3.49)	(-1.89)	(-3.02)
Acquirer Runup	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Tobin's Q	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal size adjusted by asset	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cash deal dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock deal dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attitude dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target public dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Percentage of shares acquired	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	76.78**	-13.19	-13.28	73.91**	-13.28	-11.76	-13.19	-10.81
	(2.19)	(-0.63)	(-0.64)	(2.13)	(-0.64)	(-0.58)	(-0.63)	(-0.53)
Observations	716	716	716	716	716	716	716	716
R-squared	0.165	0.158	0.158	0.165	0.158	0.166	0.158	0.164

Table A.6 The Geographic Overlap of BHC Subsidiaries and Target CARs: Robustness Tests

This table presents OLS regressions of the relation between the CARs of target BHCs and the degree to which the two BHCs have subsidiary networks that overlap geographically. The dependent variable is the 5-day CAR (-2, +2) of the target BHC. The table reports the estimated coefficients on several measures of the geographic overlap of BHC subsidiaries, which are defined in Table 1. The table also controls for an array of acquirer, target, and deal characteristics, where Table 1 provides definitions of each of these regressors. In addition, we control for the year of the announcement and acquirer state fixed effects. Standard errors are clustered at acquirer bank level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Dependent Variable: Target CAR (-2,+2) in %								
	Correlation Coefficient (Weighted)	Cosine Distance (Weighted)	Bray-Curtis Distance	Canberra Distance	Correlation Distance	Dice Distance	Euclidean Distance	Hamming Distance	Jaccard-Needham Distance
Correlation Coefficient (Weighted)	3.77**								
	(2.13)								
Cosine Distance (Weighted)		-3.82**							
		(-2.11)							
Network Distance			-4.84**	-1.39***	-4.84**	-4.84**	-2.62***	-88.84***	-4.26**
			(-2.47)	(-3.50)	(-2.51)	(-2.47)	(-2.73)	(-3.50)	(-2.23)
Acquirer Runup	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Tobin's Q	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal size adjusted by asset	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cash deal dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock deal dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attitude dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target public dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Percentage of shares acquired	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-8.07	-4.15	-5.99	-15.55	-6.32	-5.99	-10.96	-15.55	-4.84
	(-0.19)	(-0.10)	(-0.15)	(-0.37)	(-0.16)	(-0.15)	(-0.26)	(-0.37)	(-0.12)
Observations	429	429	429	429	429	429	429	429	429
R-squared	0.356	0.356	0.359	0.366	0.359	0.359	0.360	0.366	0.357

Panel B	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	Dependent Variable: Target CAR (-2,+2) in %							
	Kulsinski Distance	Matching Distance	Rogers-Tanimoto Distance	Russell-Rao Distance	Sokal-Michener Distance	Sokal-Sneath Distance	Squared Euclidean Distance	Yule Distance
Network Distance	-280.98***	-88.84***	-48.98***	-261.34***	-48.98***	-3.61*	-1.39***	-1.99**
	(-2.80)	(-3.50)	(-3.45)	(-2.67)	(-3.45)	(-1.96)	(-3.50)	(-2.30)
Acquirer Runup	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Tobin's Q	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal Size Adjusted by Asset	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cash Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attitude Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target Public Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Percentage of Shares Acquired	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Total Assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	285.87***	-15.55	-15.52	266.77***	-15.52	-3.64	-15.55	-3.94
	(2.82)	(-0.37)	(-0.37)	(2.69)	(-0.37)	(-0.09)	(-0.37)	(-0.10)
Observations	429	429	429	429	429	429	429	429
R-squared	0.362	0.366	0.365	0.361	0.365	0.355	0.366	0.357

Table A.7 The Geographic Overlap of BHC Subsidiaries and Combined CARs: Robustness Tests

This table presents OLS regressions of the relation between the CARs of combined BHCs and the degree to which the two BHCs have subsidiary networks that overlap geographically. The dependent variable is the 5-day CAR (-2, +2) of the combined BHC. The table reports the estimated coefficients on several measures of the geographic overlap of BHC subsidiaries, which are defined in Table 1. The table also controls for an array of acquirer, target, and deal characteristics, where Table 1 provides definitions of each of these regressors. In addition, we control for the year of the announcement and acquirer state fixed effects. Standard errors are clustered at acquirer bank level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Dependent Variable: Combined CAR (-2,+2) in %								
	Correlation Coefficient (Weighted)	Cosine Distance (Weighted)	Bray-Curtis Distance	Canberra Distance	Correlation Distance	Dice Distance	Euclidean Distance	Hamming Distance	Jaccard-Needham Distance
Correlation Coefficient (Weighted)	4.94***								
	(2.62)								
Cosine Distance (Weighted)		-5.01***							
		(-2.61)							
Network Distance			-6.19***	-1.49***	-6.23***	-6.19***	-2.96***	-95.62***	-5.44***
			(-3.01)	(-3.52)	(-3.05)	(-3.01)	(-3.01)	(-3.52)	(-2.76)
Acquirer Runup	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Tobin's Q	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal size adjusted by asset	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cash deal dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock deal dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attitude dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target public dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Percentage of shares acquired	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-2.42	2.69	0.52	-5.97	0.11	0.52	-2.55	-5.97	2.29
	(-0.06)	(0.06)	(0.01)	(-0.14)	(0.00)	(0.01)	(-0.06)	(-0.14)	(0.05)
Observations	404	404	404	404	404	404	404	404	404
R-squared	0.342	0.342	0.346	0.349	0.346	0.346	0.344	0.349	0.343

Panel B	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	Dependent Variable: Combined CAR (-2,+2) in %							
	Kulsinski Distance	Matching Distance	Rogers-Tanimoto Distance	Russell-Rao Distance	Sokal-Michener Distance	Sokal-Sneath Distance	Squared Euclidean Distance	Yule Distance
Network Distance	-367.32***	-95.62***	-52.98***	-343.52***	-52.98***	-4.63**	-1.49***	-2.76***
	(-3.03)	(-3.52)	(-3.49)	(-2.88)	(-3.49)	(-2.48)	(-3.52)	(-2.84)
Acquirer Runup	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Tobin's Q	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal size adjusted by asset	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cash deal dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock deal dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attitude dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target public dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Percentage of shares acquired	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	381.11***	-5.97	-6.07	358.21***	-6.07	4.10	-5.97	2.89
	(3.33)	(-0.14)	(-0.14)	(3.16)	(-0.14)	(0.10)	(-0.14)	(0.07)
Observations	404	404	404	404	404	404	404	404
R-squared	0.351	0.349	0.349	0.350	0.349	0.340	0.349	0.345

Table A.8 The Geographic Overlap of BHC Branches and Acquirer CARs: Robustness Tests

This table presents OLS regressions of the relation between the CARs of acquirer BHCs and the degree to which the two BHCs have branch networks that overlap geographically. The dependent variable is the 5-day CAR (-2, +2) of the acquiring BHC. The table reports the estimated coefficients on several measures of the geographic overlap of BHC branches, which are defined in Table 1. The table also controls for an array of acquirer, target, and deal characteristics, where Table 1 provides definitions of each of these regressors. In addition, we control for the year of the announcement and acquirer state fixed effects. Standard errors are clustered at acquirer bank level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Acquirer CAR (-2,+2) in %						
Overlap	0.52***						
	(2.74)						
Correlation Coefficient		1.20***					
		(3.02)					
Correlation Coefficient (Weighted by			0.87**				
Number of Branches)			(2.55)				
Correlation Coefficient (Weighted by				0.85**			
Deposit Amount)				(2.55)			
Cosine Distance					-1.28***		
					(-3.16)		
Cosine Distance (Weighted by Number of						-0.91**	
Branches)						(-2.58)	
Cosine Distance (Weighted by Deposit							-0.88**
Amount)							(-2.57)
Acquirer Runup	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Tobin's Q	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal Size Adjusted by Assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cash Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attitude Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target Public Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Percentage of Shares Acquired	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Total Assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-6.83	-6.89	-6.11	-6.08	-5.66	-5.22	-5.20
	(-1.30)	(-1.27)	(-1.13)	(-1.11)	(-1.04)	(-0.96)	(-0.95)
Observations	953	953	953	953	953	953	953
R-squared	0.101	0.100	0.098	0.098	0.100	0.098	0.098

Table A.9 The Geographic Overlap of BHC Branches and Target CARs: Robustness Tests

This table presents OLS regressions of the relation between the CARs of target BHCs and the degree to which the two BHCs have branches networks that overlap geographically. The dependent variable is the 5-day CAR (-2, +2) of the target BHC. The table reports the estimated coefficients on several measures of the geographic overlap of BHC branches, which are defined in Table 1. The table also controls for an array of acquirer, target, and deal characteristics, where Table 1 provides definitions of each of these regressors. In addition, we control for the year of the announcement and acquirer state fixed effects. Standard errors are clustered at acquirer bank level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Target CAR (-2,+2) in %						
Overlap	2.48**						
	(2.45)						
Correlation Coefficient		5.69***					
		(2.84)					
Correlation Coefficient (Weighted by Number of Branches)			4.90***				
			(3.11)				
Correlation Coefficient (Weighted by Deposit Amount)				4.80***			
				(3.19)			
Cosine Distance					-6.50***		
					(-3.25)		
Cosine Distance (Weighted by Number of Branches)						-5.13***	
						(-3.18)	
Cosine Distance (Weighted by Deposit Amount)							-4.99***
							(-3.24)
Acquirer Runup	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Tobin's Q	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal Size Adjusted by Assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cash Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attitude Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target Public Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Percentage of Shares Acquired	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Total Assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	567	567	567	567	567	567	567
R-squared	0.409	0.401	0.402	0.402	0.403	0.402	0.403

Table A.10 The Geographic Overlap of BHC Branches and Combined CARs: Robustness Tests

This table presents OLS regressions of the relation between the CARs of combined BHCs and the degree to which the two BHCs have branch networks that overlap geographically. The dependent variable is the 5-day CAR (-2, +2) of the combined BHC. The table reports the estimated coefficients on several measures of the geographic overlap of BHC branches, which are defined in Table 1. The table also controls for an array of acquirer, target, and deal characteristics, where Table 1 provides definitions of each of these regressors. In addition, we control for the year of the announcement and acquirer state fixed effects. Standard errors are clustered at acquirer bank level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Combined CAR (-2,+2) in %						
Overlap	3.24***						
	(2.81)						
Correlation Coefficient		6.57***					
		(3.17)					
Correlation Coefficient (Weighted by Number of Branches)			5.55***				
			(3.40)				
Correlation Coefficient (Weighted by Deposit Amount)				5.47***			
				(3.51)			
Cosine Distance					-7.48***		
					(-3.74)		
Cosine Distance (Weighted by Number of Branches)						-5.82***	
						(-3.51)	
Cosine Distance (Weighted by Deposit Amount)							-5.69***
							(-3.58)
Acquirer Runup	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Tobin's Q	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal Size Adjusted by Assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cash Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attitude Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target Public Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Percentage of Shares Acquired	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Total Assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	547	547	547	547	547	547	547
R-squared	0.401	0.383	0.384	0.385	0.386	0.385	0.385

Table A.11 The Geographic Overlap of Subsidiaries at the MSA-level and CARs

This table presents OLS regressions of the relation between the CARs of acquirer, target, and combined BHCs and the degree to which the two BHCs have subsidiary networks that overlap geographically, where overlap is computed at the MSA level. The dependent variable is either the 5-day CAR (-2, +2) of the acquirer, target, or combined BHC around the announcement date of the deal (i.e., *Acquirer CAR (-2, +2)*, *Target CAR (-2, +2)*, and *Combined CAR (-2, +2)*. The table reports the estimated coefficients on three measures of the geographic overlap of BHC subsidiaries: *Overlap*, *Correlation Coefficient*, and *Cosine Distance*, which are defined in Table 1. The table also controls for an array of acquirer, target, and deal characteristics, where Table 1 provides definitions of each of these regressors. In addition, we control for the year of the announcement and acquirer state fixed effects. Standard errors are clustered at acquirer bank level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Acquirer CAR (-2,+2) in %			Target CAR (-2,+2) in %			Combined CAR (-2,+2) in %		
MSA Overlap	1.22*			8.49***			11.83***		
	(0.098)			(0.001)			(0.000)		
MSA Correlation Coefficient		2.52***			10.32***			12.14***	
		(0.006)			(0.007)			(0.001)	
MSA Cosine Distance			-2.68***			-11.98***			-14.20***
			(0.004)			(0.002)			(0.000)
Acquirer Runup	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Tobin's Q	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal Size Adjusted by Asset	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cash Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock Deal Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attitude Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target Public Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Percentage of Shares Acquired	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Total Assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	474	474	474	319	319	319	297	297	297
R-squared	0.310	0.315	0.317	0.541	0.508	0.512	0.570	0.514	0.519

Table A.12 The Geographic Overlap of Subsidiaries and CARs: Excluding Big Banks

This table presents OLS regressions of the relation between the CARs of acquirer, target, and combined BHCs and the degree to which the two BHCs have subsidiary networks that overlap geographically. The sample excludes BHCs with assets that are larger than 10% of the headquarter state's total bank assets. The dependent variable is either the 5-day CAR (-2, +2) of the acquirer, target, or combined BHC around the announcement date of the deal (i.e., *Acquirer CAR (-2, +2)*, *Target CAR (-2, +2)*, and *Combined CAR (-2, +2)*. The table reports the estimated coefficients on five measures of the geographic overlap of BHC subsidiaries, which are defined in Table 1. The table also controls for an array of acquirer, target, and deal characteristics, where Table 1 provides definitions of each of these regressors. In addition, we control for the year of the announcement and acquirer state fixed effects. Standard errors are clustered at acquirer bank level. Heteroskedasticity robust t-statistics are reported in parentheses, and *, **, *** indicate significance at 1%, 5% and 10%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Dependent Variable: Acquirer CAR (-2,+2) in %			Dependent Variable: Target CAR (-2,+2) in %			Dependent Variable: Target CAR (-2,+2) in %		
Overlap	0.94***			3.57***			4.79***		
	(2.72)			(2.76)			(2.94)		
Correlation Coefficient		1.29**			5.50**			6.57**	
		(2.43)			(2.07)			(2.38)	
Cosine Distance			-1.32**			-5.57**			-6.67**
			(-2.43)			(-2.07)			(-2.38)
Acquirer Runup	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Tobin's Q	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal size adjusted by asset	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cash deal dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock deal dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attitude dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Target public dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Percentage of shares acquired	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer total assets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Bank State Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	19.93	18.34	19.65	-34.46	-45.84	-40.19	-3.67	-12.36	-5.74
	(1.20)	(1.08)	(1.17)	(-0.91)	(-1.18)	(-1.03)	(-0.09)	(-0.28)	(-0.13)
Observations	434	434	434	282	282	282	260	260	260
R-squared	0.268	0.263	0.263	0.531	0.525	0.525	0.536	0.529	0.529