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How Important Are Local Community Banks to Small Business Lending? Evidence from Mergers and Acquisitions

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Abstract

We investigate the shrinking community banking sector and the impact on local small business lending (SBL) in the context of mergers and acquisitions. From all mergers that involved community banks, we examine the varying impact on SBL depending on the local presence of the acquirers' and the targets' operations prior to acquisitions. Our results indicate that, relative to counties where the acquirer had operations before the merger, local SBL declined significantly more in counties where only the target had operations before the merger. This result holds even after controlling for the general local SBL market or local economic trends. These findings are consistent with an argument that SBL funding has been directed (after the mergers) toward the acquirers' counties. We find even stronger evidence during and after the financial crisis. Overall, we find evidence that local community banks have continued to play an important role in providing funding to local small businesses. The absence of local community banks that became a target of a merger or acquisition by nonlocal acquirers has, on average, led to local SBL credit gaps that were not filled by the rest of the banking sector.

Keywords: community banks, small business lending, bank mergers

JEL Classifications: G21, G28, G34

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I. Introduction

Small businesses are one of the key factors that drive economic growth, and small business lending (SBL) is critical to their success in performing important functions to spur economic prosperity. Small businesses account for roughly half of private employment and more than half of total economic output (Laderman (2008)). Further, small businesses and start-ups are disproportionately responsible for job creation (Neumark, Wall, and Zhang (2011), Haltiwanger, Jarmin, and Miranda (2013)). Small businesses are very dependent on access to funding, and declines in this funding depress long-term economic employment growth (Drechsler, Savov, and Schnabl (2017)). Maintaining the functionality of the SBL markets is critical to continued economic growth.

Community banks traditionally served as the primary source for small businesses' funding needs. SBL poses some unique challenges since small firms and local start-ups tend to be opaque and have short credit histories. As a result, SBL was more dependent on relationship-based lending and collection of "soft" information (Petersen and Rajan (1994), Berger and Udell (1995), and Cole (1998)). Traditionally, community banks had a comparative advantage in collecting soft information and in relationship lending, which in turn led to a comparative advantage in SBL funding to local small businesses. Community banks' outsized role in SBL is a major contributor to the economic importance of the overall community banking sector.

In contrast to the traditional paradigm, recent SBL trends suggest a new banking landscape where large banks are more active in providing funding to small businesses. For example, Jagtiani, Kotliar, and Maingi (2016) show that large banks have doubled their market shares in SBL made by banks over the last decade. This could indicate complete shifts of the entire SBL market — a shift to formula-based underwriting for SBL — see Berger, Frame, and Miller (2005) and Berger, Cowan, and Frame (2011). Similarly, Jagtiani and Lemieux (2016) find that large banks, with no physical presence in the local community, were able to reach out to small businesses in recent years, resulting in a smaller local SBL share originated by local community banks.

Despite strong indications of aggregate changes in the SBL landscapes, the distributional implications of these changes have not been well studied. Certain local credit markets may be affected in a disproportionately negative light by the decline in SBL funding by local community banks than other areas. There has also been evidence that firms lend "out-of-market," particularly in recent years; see Laderman (2008) and Jagtiani and Lemieux (2016). On the other hand, local markets and geographic proximity do seem to matter for other financial institutions and markets; see Berger and DeYoung (2001) and Nguyen (2017).

In this paper, we attempt to further our in-depth understanding of the interplay among community banks' comparative advantages in SBL, their local presence, and their involvement in mergers and acquisitions (M&As). We systematically study this question by using bank mergers as shocks to the community banking sector to clearly identify firm-level and county-level responses in the local SBL markets. An important innovation of this paper is merging and consolidating data from various reliable sources to allow us to identify the specific locations of SBL borrowers and lenders. Our imputation method also allows us to identify operations for a large number of local community banks that are too small to be included in the analysis of previous studies because of the lack of data for these small banking firms.

Overall, we are able to compare SBL activities across counties where the target and the acquiring banks have (or do not have) operations prior to the mergers. We classify all the counties into three categories for each of the merger transactions in our sample: 1) only the acquirer was operating prior to the merger, 2) only the target was operating prior to the merger, or 3) both the acquirer and the target were operating prior to the merger. This allows us to group all the county-level responses for each county type, particularly those counties where at least one of the counterparties was operating in prior to the merger. We explore the different behaviors for each of the county types.

We find significant negative responses to declines in local community banks. Specifically, our results show that the merged (combined) banking firms are about 11 percentage points more likely to decrease their SBL activity in counties where only the target was operating in prior to the merger, compared with counties where only the acquirer was operating before the merger. Furthermore, we find that reactions by other banking firms do not compensate for this SBL decrease. Overall, we find that local community banks still play an important role in providing SBL funding to local small businesses and that shocks to their management structures (through M&As) result in a decline in local SBL funding not covered by other SBL lenders.

The rest of the paper is organized as follows: Section II reviews the existing literature on community bank mergers and our unique contributions to the literature. Section III describes our data sources. Section IV describes our identification strategy. The empirical results and our conclusions and policy discussion are presented in Section V and Section VI, respectively.

II. The Literature Review

Existing research on community banks and SBL covers the various advantages and disadvantages of more traditional, relationship-based lending compared with transaction-based

lending technologies that are more common at larger banks. There is also a rich literature on community bank M&A activity and its impact on SBL markets. This section focuses on the literature that pertains to the relative advantages and disadvantages of community banks in SBL and the impact of bank mergers.

The first general strand of this research argues that small community banks have some comparative advantages in certain types of lending that enable them to compete with large banks. For example, Kowalik (2014) finds that community banks have a comparative advantage in monitoring their consumers through relationship lending. Similarly, Berger, Cerqueiro, and Penas (2014) find that for certain types of informationally intensive loans, small banks had a greater volume of loans with lower failure rates during the period prior to the financial crisis (but they observe the reverse after the financial crisis). Jagtiani (2008) finds that the majority of community bank mergers during 1990–2006 involved community banks acquirers (rather than large banks), suggesting that community bank acquisitions were not motivated by a desire to gain efficiency by becoming a part of a large bank.

The second strand of the literature suggests that large banks are better than community banks at certain important facets of SBL. Berger, Cowan, and Frame (2011) and Berger, Frame, and Miller (2005) find that the small business credit scores (SBCS) that are commonly used by large banks in SBL credit decisions are superior to the consumer credit scores of small business owners that community banks use in determining the quality of small business loans. The SBCS has also played an important role in allowing large banks to expand their lending to small business customers. In addition, Jagtiani, Kotliar, and Maingi (2016) show that large banks have doubled their market shares in SBL made by banks over the last decade.

M&As are often used as a source of exogenous variation in the literature. Hastings and Gilbert (2005) use them to study gasoline markets, and Dafny, Duggan, and Ram (2012) use them to study health-insurance markets. Of particular relevance to our paper are Garmaise and Moskowitz (2006), and Nguyen (2017), who both use mergers to study local banking markets. Similar to these papers, we believe that mergers provide a useful context to study declines in community banking and SBL markets.

Similar to the noncommunity banking literature, mergers have also been studied in the community banking and SBL literature. Berger, Scalise, Saunders, and Udell (1998) find that while the short-term *static* effects of a community bank merger can result in a somewhat negative impact (reduction in SBL), the longer term, *dynamic* effects tend to outweigh this negative impact when taking into account the reactions of local firms. This is further explained by Berger, Bonime,

Goldberg, and White (2004) who find that de novo banks (state banks that have been in business for fewer than five years) emerge in the local community and issue small business loans to fill the credit gap. Similarly, using data from 1994 to 1997, Avery and Samolyk (2004) find that, unlike large bank mergers, community bank mergers are associated with a higher overall loan growth and a greater market share of local community banks; other local community banks tend to increase their own SBL following a local community bank merger.

Jagtiani, Kotliar, and Maingi (2016) examine community bank mergers, focusing on the impact of acquirer characteristics on SBL activities at the combined banking firms (after the merger). Overall, they find that lending to small businesses actually increases after community bank mergers (when compared with the combined SBL made by the acquirer and the target before the merger), especially when the acquirer is a large bank (with assets greater than $10 billion). Jagtiani and Lemieux (2016) find that technological advances have enabled large banks to provide funding to small businesses in locations far away, resulting in decreasing market shares for small, local community banks.[1]

While past studies have generally found that community bank mergers are on net beneficial to small businesses because of increased overall SBL volume, these studies are subject to significant geographic and time period limitations. Berger et al. (1998) used the Survey of the Terms of Bank Lending to Businesses, which is limited to about 300 disproportionally large banking institutions. Avery and Salmolyk (2004) impute geographic concentration of SBL using summary of deposit data, which may not be a good proxy for SBL activities. Perhaps the closest study in the literature is by Nguyen (2017), who uses mergers to construct an instrument for branch closings to study local markets' dependencies on branches. However, Nguyen does not examine mergers generally, and she does not account for small community banks because most community bank merger targets are below the relevant reporting thresholds. But these small community banks are important in understanding markets' responses to bank mergers; see Berger et al. (2004). Further, direct studies of mergers are concentrated in the period before the crisis, and their findings may no longer hold because of significant changes to the competition and cost structures for community banking in the wake of the financial crisis; see Hughes, Jagtiani, and Mester (2016), and Powell (2016). We study this question in-depth in light of our improved data that are available for the postcrisis period.

[1] The authors outline partnership opportunities between community banks and fintech lenders as a way to retain SBL market shares.

We find that there are significant negative responses to declines in community banking. As mentioned earlier, the merged firms are more likely to decrease their SBL activity in counties where only the target was operating before the merger (compared with counties where only the acquirer was operating before the merger). We also find that acquirer size is important in determining the decline in local SBL. Our results overall suggest that local community banks still play an important role in lending to small businesses and that shocks to their management structures (e.g., through M&A) could result in long-term declines in lending to local small businesses that are not selected by other SBL lenders.

III. The Data

We use data from multiple sources and appropriately merge them for the various analytical purposes. First, our bank merger sample consists of all bank mergers during 2002–2014 that involved U.S. community bank targets. Second, our data on SBL originations (by each bank, in each county, and in each year) cover the period from 2001 to 2015. This allows us to analyze SBL activities for the period 12 months before and after the merger. It is important to note that we are able to identify the geographic location of each bank's SBL activities. That is, we can identify the amount of SBL that each banking institution originated and purchased in each county in each year. This enables us to compare the merger counterparties' (target and acquirer) SBL activities across counties before and after the mergers. Third, we collect information on the firms' structures premerger and postmerger. We use the Federal Reserve's bank structure database, along with the SBL allocation data, to evaluate changes in SBL allocation (at the county level and firm level) across different merger and county types. The merger types are classified based on whether the target and/or the acquirer have existing operations in the county: Target-Only, Acquirer-Only, or Both. Lastly, we use other data sources for local economic factors and general banking activities in each county. We describe each of the data sources in more detail below.

III.1 M&A Data

We collect transaction-level data on bank M&As from SNL Financial's M&A Database. The database contains information about the targets, the acquirers, the M&A announcement dates and completion dates, and financial information about the targets and the acquirers around the merger dates. We restrict the sample to M&A transactions that involved a community bank target completed between 2002 and 2014, with separate analysis for transactions before and after the

financial crisis when appropriate. We exclude minority interest acquisitions, government-assisted acquisitions, asset purchases, acquisitions with a foreign acquirer, and merger deals that had been announced but not completed by the end of 2014.

We use the following two definitions for community bank in this paper: 1) banks with assets less than $1 billion in the main results, and 2) banks with assets less than $10 billion.[2] Our sample of community bank mergers changes according to the definition of community banks and the sample period. Our final samples for the entire period 2002–2014 include 1,280 and 1,366 community bank mergers when the target community banks are defined as having less than $1 billion and less than $10 billion, respectively. Of the 1,280 community bank mergers (for the $1 billion definition), 477 mergers were completed during what we define as the postcrisis period of 2010–2014. Similarly, of the 1,366 community bank mergers (for the $10 billion definition), 511 mergers took place during the 2010–2014 postcrisis period.

III.2 Small Business Lending Data

Our initial measure of small business lending (SBL) is the total SBL outstanding in each bank's portfolio. We collect these overall SBL outstanding data from the quarterly Call Reports, which are submitted to the Federal Reserve and the Federal Deposit Insurance Corporation (FDIC) by all banks. The relevant data items are available quarterly from 2010 forward but only available yearly in the June Call Reports until 2009. We collect the total outstanding SBL as of June each year for each bank for our entire sample period of 2001–2015.

We then geographically allocate this firm-level (total outstanding) SBL volume into firm-county-level SBL following the allocation process used in Jagtiani and Lemieux (2016), which takes two different approaches based on two data sources (for two different groups of banks). We then use these data to classify counties based on acquirer and target operations prior to the mergers. Depending on data availability, we use either the Community Reinvestment Act (CRA) Disclosure Reports or the FDIC's Summary of Deposits report to geographically allocate firm-level SBL volume into firm-county-level SBL volume. The first data source is the annual CRA Disclosure Report, which contains highly disaggregated information on SBL activities (newly originated and purchased SBL)

[2] Both of these definitions have been widely used in the literature. The $1 billion definition used to be more common, but the $10 billion definition has become more popular after the passage of the Dodd–Frank Wall Street Reform and Consumer Protection Act of 2010. See e.g., Critchfield, Davis, Davison, Gratton, Hanc, and Samolyk (2004), DeYoung, Hunter, and Udell (2004), Jagtiani (2008), and Jagtiani and Lemieux (2016) for the $1 billion definition or Hughes, Jagtiani, and Mester (2016), Jagtiani and Lemieux (2016), and Rice and Rose (2016) for the $10 billion definition.

at each banking institution in each county in each year. These data are available for all banks that exceed a size threshold that varies over time. [3] Using the CRA data, we calculate (for each county in each year) a proportion of a bank's overall SBL activities that occur in a given year in each specific county. This calculated firm-county-year-level of SBL ratio is applied to the outstanding SBL volume that a bank reports in the following June Call Report. In other words, the overall SBL *outstanding* in each year is allocated to firm-county-level SBL activities, based on the banking firm's SBL origination and purchase activities reported by the bank in the previous year.

For the majority of small community banks that are not required to submit the CRA reports, we rely on their deposit taking activities, as reported in the annual FDIC's Summary of Deposits report, to allocate their overall SBL outstanding into firm-county-year-level SBL. The FDIC Summary of Deposits contains the locations and amount of deposits held at each branch of all FDIC-insured institutions, which could be added to the county level. For these community banks that do not submit CRA reports, we collect the total SBL outstanding from the Call Reports as of June each year, then observe the geographic distribution of bank deposits in each county as reported in the Summary of Deposits reports and apply the same distribution across counties for the total SBL. We impute the annual firm-county-level SBL based on the distribution of deposit taking across counties in each year for this group of banks that do not submit CRA reports.[4]

III.3 Branching and Bank Structure Data

We gather information on the banks' organizational structure from the Federal Reserve Structure Data, which allows us to identify the top and intermediate holders of a banking firm with details about the nature of the relationships. We use these data to classify target and acquirer size based on the top holder of each of the counterparties prior to the merger.

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[3] Firms below a size threshold are not required to submit CRA disclosure data. The threshold for CRA reporting has changed over time; for our sample, the threshold to submit the CRA report was for banks with assets of at least $250 million during 2001–2005, at least $1 billion of assets in 2006, and the threshold was indexed to CPI inflation after 2006. The full information on size thresholds to report the CRA data post-2006 can be found on the Federal Financial Institutions Examination Council (FFIEC)'s website at www.ffiec.gov/cra/reporter.htm.

[4] Avery and Samolyk (2004) use deposit taking to allocate SBL from Call Reports regardless of whether the firms report their actual CRA activities at the county level (from CRA reports). Rather than applying the deposit distribution to all sampled banks, we follow the process used in Jagtiani and Lemieux (2016) in which the actual CRA distribution from the CRA reports are used to allocate SBL to specific counties when the CRA data are available. Jagtiani and Lemieux argue for this approach on the grounds that it is unlikely for small community banks to engage in material lending outside of their immediate geographic footprint.

III.4 Economic Factors

We gather information on general county-level macroeconomic indicators from the Haver Analytics database to use as control variables. The imputed SBL market concentration variables are derived from the several data sources — the CRA reports, the Call Reports, and the FDIC Summary of Deposits database. Our specific set of economic factors includes 1) *Population*, which we expect to be positively correlated with SBL, as larger (highly populated) counties with higher population density can support more small businesses, 2) *Unemployment*, which allows us to observe the general macroeconomic health of the county and to capture variation across the business cycle, 3) *Per-Capita Personal Income* as another proxy for how relatively well off the county is, and 4) *Per-Capita Business and Personal Bankruptcy* to capture the credit risk exposure in each county on the aggregate level.

IV. Identification Strategy

Our objective is to explore the impact of mergers that involved a community bank target on local small businesses' ability to access credit. We measure the overall impact in two different components: the firm-county-level impact and the county-level impact. First, in examining the firm-county-level responses, we ask whether the shock to the firm's management (through mergers) resulted in changes in SBL activity compared with the rest of the acquirers' operations. For example, we examine whether the acquirers would direct SBL funding from the target's counties (counties where the target was operating before the merger) to its own counties (counties where only the acquirer was operating before the merger).

Second, in examining the county-level responses, we ask whether reactions of local nonmerged banks to the mergers outweigh the change in SBL activities because of the mergers. Specifically, we investigate whether the overall change (net impact) in SBL activities in each county is affected by the number and type of community bank mergers that involved targets and/or acquirers in the county. Wherever possible, we allow for the impact to differ by whether the acquirer is also a community bank or a large bank. For example, we might expect a county to lose SBL funding if many local small community banks have been targets of a merger that involved large out-of-state acquirers.

IV.1 Firm-County-Level Impact

For the firm-county-level impact analysis, our identification strategy uses a difference-in-differences approach. We compare the differences across different acquirer sizes and different types of counties (Target, Acquirer, Both) as classified by premerger SBL activity. Our identification assumption is that firm-county-specific SBL effects differ systematically based on whether acquiring firms had premerger operations in the county.[5] Under this assumption, we can use Acquirer-Only counties as a quasi-experimental control group to identify the impacts of premerger operations in Target-Only counties. Since we are comparing firms with themselves, we avoid some typical identification challenges that arise in merger studies.[6]

To identify firm-county responses, we examine the set of counties that the Target and/or Acquirer (for each merger) was operating in as of June the year prior to the merger year.[7, 8] The three county categories are:

- (1,0) county — counties where only the Acquirer, and not the Target, is operating
- (1,1) county — counties where both the Acquirer and the Target are operating
- (0,1) county — counties where only the Target, and not the Acquirer, is operating

We measure SBL at the firm-county-level for several different regressions. Specifically, we compare the sum of premerger Target and Acquirer SBL activity with postmerger combined firm SBL activity in each county. We construct several dependent variables based on this theme:

$$ChangeSBL_{i,j} = SBL_{i,j,t+1} - SBL_{i,j,t-1} \quad (1)$$

$$ChangeSBLCommitment_{i,j} = \frac{SBL_{i,j,t+1}}{SBL_{i,t+1}} - \frac{SBL_{i,j,t-1}}{SBL_{i,t-1}} \quad (2)$$

$$D\_IncreasedSBL_{i,j} = \begin{cases} 1 \; if \; ChangeSBL_{i,j} > 0 \\ 0 \; otherwise \end{cases} \quad (3)$$

$$D\_IncreasedSBLCommitment_{i,j,t} = \begin{cases} 1 \; if \; ChangeSBLCommitment_{i,j} > 0 \\ 0 \; otherwise \end{cases} \quad (4)$$

where:

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[5] This assumption would not hold, for example, if there were dynamic, unobserved differences between the average acquirer's operating counties and the average target's operating counties. We include macroeconomic and year controls to help control for differences that may exist between the sets of counties.

[6] A common problem is that firms that merge are observably and unobservable different from firms that don't merge, which complicates selection of a control group.

[7] We classify the status as of June the year prior to the merger because the data as of June of the merger year could reflect status after the merger (i.e., after the targets' SBL operations may have been eliminated).

[8] Postmerger, firms may start operations in counties outside of the set of counties where they were operating prior to the merger. However, data show that this effect represents on average of less than 1 percent of the combined firm's postmerger total lending. We focus on premerger operations only.

- $SBL_{i,j,t}$ represents our SBL measure for the merger counterparties (Target, Acquirer) in merger *i* in county *j* at time *t*;
- $SBL_{i,t}$ represents total SBL lending for the counterparties in merger *i* at time *t*;
- $IncreasedSBL_{i,j}$ represents changes in SBL in inflation-adjusted dollar amounts;
- $IncreasedSBLCommitment_{i,j,t}$ represents shifts the relative importance of county *j* to the counterparties in merger *i* at time *t.*

The *ChangeSBL* variable measures capture actual changes in lending, whereas the *ChangeSBLCommitment* variable measures capture strategic shifts by the combined firm relative to premerger operations by the merger counterparties. If combined firms are systematically decreasing funding in (0,1) Target counties, we should observe that trend in all four dependent variables. We use the continuous measures in linear regressions and use the dummy variables in probabilistic regressions described next.

Equations (5) and (6) are the model specifications for $D\_IncreasedSBL_{i,j}$ and $D\_IncreasedSBLCommitment_{i,j}$, respectively. We estimate the coefficients using a logistic regression analysis, with a standard log-odds link function and estimated via maximum likelihood. We then calculate and report the marginal effects on the probability of increased SBL ratio, using the marginal effects at representative values method.

$$\ln\left(\frac{\Pr\left(D\_IncreasedSBL_{i,j}=1\right)}{1+\Pr\left(D\_IncreasedSBL_{i,j}=1\right)}\right)=\hat{\beta}_0+\widehat{\boldsymbol{\beta}}_1\boldsymbol{C}_{i,j}+\widehat{\boldsymbol{\beta}}_2\Delta\boldsymbol{M}_j+\widehat{\boldsymbol{\beta}}_3\boldsymbol{Y}_i+\epsilon_{i,j} \quad (5)$$

$$\ln\left(\frac{\Pr\left(D\_IncreasedSBLCommitment_{i,j}=1\right)}{1+\Pr\left(D\_IncreasedSBLCommitment_{i,j}=1\right)}\right)=\hat{\beta}_0+\widehat{\boldsymbol{\beta}}_1\boldsymbol{C}_{i,j}+\widehat{\boldsymbol{\beta}}_2\Delta\boldsymbol{M}_j+\widehat{\boldsymbol{\beta}}_3\boldsymbol{Y}_i+\epsilon_{i,j} \quad (6)$$

where the independent variables:

- $\mathbf{C}_{i,j}$ represents a vector of indicator variables for the county classifications interacted with indicator variables for whether the acquirer is a community bank or not. The base case is for a (1,1) county and the Acquirer being a community bank;
- $\Delta\mathbf{M}_j$ represents a vector of changes in macroeconomic conditions in county *j* between one year prior to the merger and one year after the merger;
- $\mathbf{Y}_i$ represents a vector of merger completion year dummies. The base case is for mergers that were completed in 2002.

Similarly, the linear regressions are estimated using OLS and the model specifications are presented in equations (7) and (8). All covariates have the same definitions as in equations (5) and (6) noted previously.

$$ChangeSBL_{i,j} = \hat{\beta}_0 + \widehat{\boldsymbol{\beta}}_1 \boldsymbol{C}_{i,j} + \widehat{\boldsymbol{\beta}}_2 \Delta \boldsymbol{M}_j + \widehat{\boldsymbol{\beta}}_3 \boldsymbol{Y}_i + \epsilon_{i,j} \quad (7)$$

$$ChangeSBLCommitment_{i,j} = \hat{\beta}_0 + \widehat{\boldsymbol{\beta}}_1 \boldsymbol{C}_{i,j} + \widehat{\boldsymbol{\beta}}_2 \Delta \boldsymbol{M}_j + \widehat{\boldsymbol{\beta}}_3 \boldsymbol{Y}_i + \epsilon_{i,j} \quad (8)$$

We apply two minor econometric modifications to the previous specifications. First, we cluster all standard errors at the Merger level to account for the possibility of correlations in residuals within mergers. Second, to ensure that we give all mergers equal weight regardless of the number of counties that the Targets and/or the Acquirers were operating in before the merger, we weight our regressions such that for each merger transaction, the total weight of the Acquirer's counties adds to 1, the total weight of a Target's counties adds to 1, and, for a given county classification and merger, each county is weighted equally.[9,10]

The estimated coefficient vector $\widehat{\boldsymbol{\beta}}_1$ contains our primary coefficients of interest as it captures the merger impact for each county type. Our hypothesis is that SBL activities are more likely to increase after the mergers in counties where the Acquirer has an operation in before the merger.

Postcrisis Mergers: We perform a separate analysis using sample of community bank mergers that took place in our 2010–2014 postcrisis period. During this period, there were very few mergers with a noncommunity bank Acquirer. Thus, we make a couple small modifications to equations (5)-(8) for the postcrisis regressions to try to capture size effects:

$$\ln\left(\frac{\Pr\left(D\_IncreasedSBL_{i,j} = 1\right)}{1 + \Pr\left(D\_IncreasedSBL_{i,j} = 1\right)}\right) = \hat{\beta}_0 + \widehat{\boldsymbol{\beta}}_1 \boldsymbol{C}_{i,j} + \widehat{\boldsymbol{\beta}}_2 \Delta \boldsymbol{M}_j + \widehat{\boldsymbol{\beta}}_3 \boldsymbol{Y}_i + \hat{\beta}_4 A_i + \epsilon_{i,j} \quad (9)$$

$$\ln\left(\frac{\Pr\left(D\_IncreasedSBLCommitment_{i,j} = 1\right)}{1 + \Pr\left(D\_IncreasedSBLCommitment_{i,j} = 1\right)}\right) = \hat{\beta}_0 + \widehat{\boldsymbol{\beta}}_1 \boldsymbol{C}_{i,j} + \widehat{\boldsymbol{\beta}}_2 \Delta \boldsymbol{M}_j + \widehat{\boldsymbol{\beta}}_3 \boldsymbol{Y}_i + \hat{\beta}_4 A_i + \epsilon_{i,j} \quad (10)$$

$$ChangeSBL_{i,j} = \hat{\beta}_0 + \widehat{\boldsymbol{\beta}}_1 \boldsymbol{C}_{i,j} + \widehat{\boldsymbol{\beta}}_2 \Delta \boldsymbol{M}_j + \widehat{\boldsymbol{\beta}}_3 \boldsymbol{Y}_i + \hat{\beta}_4 A_i + \epsilon_{i,j} \quad (11)$$

$$ChangeSBLCommitment_{i,j} = \hat{\beta}_0 + \widehat{\boldsymbol{\beta}}_1 \boldsymbol{C}_{i,j} + \widehat{\boldsymbol{\beta}}_2 \Delta \boldsymbol{M}_j + \widehat{\boldsymbol{\beta}}_3 \boldsymbol{Y}_i + \hat{\beta}_4 A_i + \epsilon_{i,j} \quad (12)$$

where:

[9] If we did not weight the regressions, the largest 10 percent of mergers would account for 72 percent of observations, and the top 50 percent would account for 97 percent of observations. This is primarily because of a highly skewed distribution of acquirer size. These mergers are almost certainly not representative of the typical merger.

[10] For example, in a merger with 30 (1,0) counties, 8 (1,1,) counties, and 5 (0,1) counties, the weights would be 1/38 for the (1,0) counties, 1/38+1/13 for the (1,1) counties, and 1/13 for the (0,1) counties.

$\mathbf{C}_{i,j}$ represents county classifications *only* (that is, it is not interacted with the community bank acquirer dummy), with a (1,1) county as the base case;

A_i represents the ratio of the premerger acquirer total assets to premerger target total assets.

All other variables keep the same definition as previously. Similar to the reference above, standard errors are clustered at the merger level, and we use the earlier described weighting scheme.

IV.2 County-Level Impact

The analysis focuses on aggregate measure of SBL in each of the counties. Our goal is to estimate the overall impact of community bank mergers on the aggregate SBL market at the county level, controlling for the level and type of community bank mergers that took place in the county. To accomplish this goal, we construct a balanced panel of counties from 2002 to 2014 and calculate total SBL activities by all banks in each county in each year.[11] We then construct a measure of county-level merger activity in each year.

For each merger that involves a target and/or acquirer that have operations in the county, we classify the merger based on county type that the county represents for the merger. Specifically, a merger is classified as Acquirer-Only (1,0) county if only the acquirer has presence in the county, classified as Target-Only (0,1) county if only the target has presence in the county, and classified as a (1,1) county if both the acquirer and the target have presence in the county.[12] For each type of merger in each county, we calculate total amount of SBL in the county before and after the merger. We then calculate the share of SBL in the county that is associated with each type of merger in the county in each year:

$$MktShare_{\{x,y\},AcqSize,j,t} = \frac{\sum_{i \in C_{\{x,y\},AcqSize}} SBL_{i,j,t-1}}{SBL_{j,t-1}} \qquad (13)$$

where:

{x,y} represents one of {1,0},{0,1},{1,1};

AcqSize represents an indicator of being a community bank or a large bank;

[11] Our identification assumption is that variation in a county's exposure to community bank mergers is unrelated to unobserved determinants of changes in the SBL markets or activities.

[12] In the event that a firm is involved in multiple mergers with the same county classification for a given county in a single year, we only include it once in the county-level regressions to avoid the possibility of a market share measure greater than one.

$C_{\{x,y\},AcqSize}$ represents the set of all firm-county observations that have county classification *{x,y}* with an acquirer of *AcqSize*.

As an example, in year *t*, the total SBL funded by all banks in county *j* is $50 million. That year, three mergers involved banks that operated in county *j* in year *t-1*. Two of the mergers classify county *j* as an Acquirer-Only (1,0) county (because only the acquirers had operations in county *j* before the merger); one of the mergers classifies county *j* as a Target-Only (0,1) county (because only the target had operations in county *j* before the merger). All three acquirers are community banks. If the sum of all the premerger SBL made by the targets and the acquirers in county *j* was $10 million for the two (1,0) type mergers and $6.5 million for the only (0,1) type merger in county *j*, the calculated market share measures for county *j* in year *t* for community bank acquirers would be 0.20 for (1,0) type, 0.00 for (1,1) type, and 0.13 for (0,1) type; for noncommunity bank acquirers, they would all be zero.

We then estimate the model as specified in equation (14) with the market share measures described previously included on the right-hand side to determine how the change in county-level SBL activities may be influenced by the various types of community bank mergers that took place in the county. [13] We cluster standard errors at the county level.

$$SBL_{j,t+1} - SBL_{j,t-1} = \beta_0 + \widehat{\boldsymbol{\beta}}_1 \boldsymbol{MktShare}_{AcqSize,j,t} + \widehat{\boldsymbol{\beta}}_2 \boldsymbol{M}_{j,t} + \widehat{\boldsymbol{\beta}}_3 \Delta \boldsymbol{M}_{j,t} + \widehat{\boldsymbol{\beta}}_4 \boldsymbol{Y}_{j,t} + \epsilon_{j,t} \qquad (14)$$

where:

MktShare$_{AcqSize,j,t}$ represents a vector of (1,1), (1,0), and (0,1) merger market share measures as described previously for acquirers of size classification *AcqSize* in county *j* at time *t*;

$\mathbf{M}_{j,t}$ represents a vector of macroeconomic conditions in county *j* at time *t*;

All other variables are as defined earlier.

V. The Empirical Results

We presented basic summary statistics in Table 1. Panel A presents summary statistics for the firm-county-level regression sample; Panel B presents summary statistics for the county-level regression sample. The empirical results are presented in three subsections. First, we show the

[13] We winsorize the dependent variable at the 1st and 99th percentiles to take care of the extreme values and outliers.

results of equations (5)-(6) and equations (9)-(10) in Table 2 for each definition of community banks. We then show the results of equations (7)-(8) and equations (11)-(12) in Table 3. For both tables, the results for the entire sample periods are reported in columns 1, 3, 5, and 7; the results for the postcrisis sample are reported in columns 2, 4, 6, and 8. Columns 1 to 4 report the results on the *ChangeSBL* variables; columns 5 to 8 report the results on the *ChangeSBLCommitment variables.* Third, we present the results from equation (14) in Table 4.

We also present some summary statistics graphically. Figures 1a-1b show the number of mergers and merger-county observations for each year for the firm-county level analysis. The number of mergers and merger-counties decline significantly during the financial crisis, and, while the number of mergers recovers, the number of merger counties stays lower than the precrisis merger boom. This suggests that merger counterparties operate in fewer counties prior to the average merger. Figures 2a-2b show the proportion of Acquirer-Only (1,0), Target-Only (0,1), and Both (1,1) counties that see a positive *ChangeSBLCommitment*. Target-only counties fair slightly worse on average for the precrisis period; however they fair substantially worse during and after the financial crisis. Counties with Both (1,1) target and acquirer operations seem to fair on average worse than the Acquirer-Only counties, but this impact is noisy and inconsistent.

V.1 Firm-County Level — Logistic Regressions

As described previously, the dependent variable here is the probability that the combined (merged) firm would increase SBL origination in a specific county after the merger, compared with the SBL activities of the acquirer and the target in that county before the merger. Table 2 presents the results of our logistic regressions, based on equations (1) and (3), using both definitions of community bank ($1 billion and $10 billion asset size threshold), to investigate changes in SBL activities both in terms of SBL dollar volume and SBL ratio and taking into consideration the financial crisis period (covering the entire sample period 2002–2014 and only the postcrisis period 2010–2014).

The results in Table 2 show that the coefficients of the Acquirer-Only (1,0) county are consistently significantly positive relative to the Target-Only (0,1) counties across all model specifications for mergers that took place during the full sample and postcrisis period. That is, we find evidence that the combined merged banking firms tend to increase their SBL funding in their own (1,0) counties relative to (0,1) counties, even after controlling for other economic and risk factors. The differences are statistically and economically significant with differences ranging from 11 percentage points to 21 percentage points. The effect tends to be the largest for large

(noncommunity bank) acquirers and during the postcrisis period. Target-Only counties experience a decline in SBL origination after the merger.

While the Acquirer-Only (1,0) counties tend to do better than Target-Only (0,1) counties, the relative change between Both (1,1) counties and Acquirer-Only (1,0) counties is less clear. For community bank acquirers, the (1,0) counties are statistically and economically more likely to increase lending, regardless of our definition of community bank or how we measure the change in SBL. However, for large acquirers, the results are not robust to different specifications or definitions.

Our analysis of the simple SBL measure, the dollar volume of SBL, also shows that the combined (merged) firms are significantly more likely to increase their SBL activities in the Acquirer-Only (1,1) counties than in the Target-Only (0,1) counties.[14] However, the economic significance is weaker, and it is rather inconsistent in the increased SBL commitment (ratio) regressions. The difference between the probability of increasing SBL commitment in Target-Only counties (0,1) and the probability in the (1,1) counties in this case is either insignificant or weakly significant at the 10 percent level.[15] This may be because of a mixed nature of the relationship in the (1,1) counties since it is possible that either targets or acquirers could dominate premerger relationships. This weakens the (1,1) classification and would weaken the possible divergences between (1,1) counties and (0,1) or (1,0) counties.

V.2 Firm-County Level — Linear Regressions

The results in Table 3 show that the coefficients of the Acquirer-Only (1,0) county type are consistently significantly positive across all model specifications for mergers that took place during the full sample and postcrisis periods. These differences are significant relative to Target-Only (0,1) and Both (1,1) counties.

The magnitude of the effect varies based on acquirer size and then the acquisitions took place. For the full sample, community bank acquirers tend to increase their SBL lending by about $5 million more in Acquirer-Only (1,0) counties than in Target-Only (0,1) counties. Large bank acquirers would increase SBL lending by $8 million to $13 million more in the (1,0) counties than in

[14] The χ^2 tests for equivalence of coefficients for (1,1) county and (0,1) county with a large acquirer are rejected with p-values of .045 and .011 for the $1 billion and $10 billion definitions of community bank, respectively.

[15] The χ^2 tests for equivalence of coefficients for (1,1) county and (0,1) county with a large acquirer have p-values of .309 and .060 for the $1 billion and $10 billion definitions of community bank, respectively.

the (0,1) counties. This translates to a relative commitment change of about 4 percent for community bank acquirers and about 0.7 percent to 2.5 percent for large acquirers, depending on the definition of community bank that we use in the analysis. These effects continue in the postcrisis period, with an average magnitude of about $6 million or a 4 percent change in the commitment for Acquirer-Only (1,0) counties relative to the Target-Only (0,1) counties.[16]

Overall, across all the 16 specifications reported in Tables 2 and 3, we find an economically and statistically significant difference between Acquirer-Only counties and Target-Only counties. This holds regardless of acquirer size, the definition we use to define community banks, and the sample period. Despite the robust difference between Acquirer-Only (1,0) counties and Target-Only (0,1) counties, we find that the results for counties where both the Acquirer and the Target have presences, the (1,1) counties, are inconsistent, with negative results relative to Acquirer-Only counties but often insignificantly different from the Target-Only counties. Additionally, the macroeconomic variables tend to be unimportant across all specifications.

One interesting trend that emerges in the results is that the definition of a *community bank* tends not to matter all that much in most cases, but it is quite consequential for the noncommunity bank Acquirer-Only counties. This suggests that target community bank populations are relatively similar regardless of the cutoff for community bank ($1 billion or $10 billion in assets).

In addition, acquirer size (community bank acquirers versus large bank acquirers) does seem to be quite consequential, as evidenced by the shifts in the results for the noncommunity bank acquirer and county classification interactive terms. This is broadly consistent with Jagtiani, Kotliar, and Maingi (2016), which find that acquirer size was important in determining the SBL activities after the merger, although they only focus their analysis on the overall SBL volume, rather than SBL in the local community (at county level). Our paper delves deeper into the geographic location of the SBL, and we find that the increased SBL (after the merger) by large bank acquirers generally occur in the counties where the acquirers had existing operations before the merger.

V.3 County-Level Analysis

Table 4 presents the results of our county-level regressions based on equation (14). We find that the overall county-level impact of SBL funding transfer for those Acquirer-Only (1,0) counties

[16] The F-test for equivalence of the coefficients on (0,1) and (1,0) counties for noncommunity bank acquirers for the ratio change regression is rejected with a p-value of 0.060 for the $10 billion definition. We fail to reject the difference between the coefficients on (0,1) and (1,0) counties for noncommunity bank acquirers for the dollar amount change regression with a p-value of 0.108 for the $10 billion definition. All other differences between the (1,0) county and (0,1) county coefficients are rejected with p-values of <0.0001.

varies in its significance, depending on acquirer size. For community bank acquirers, there is no significant change in the overall SBL volume in the county. The coefficients of the variable *Market Share of (1,0) mergers * CB Acquirer* are consistently insignificant, which suggests that those counties follow the overall market trend.

In contrast, when the acquirers are large banks, the impact in the Acquirer-Only (1,0) is significant; that is, large acquirers would move SBL funding toward counties that it had operations before the merger. The coefficients of the variable *Market Share of (1,0) mergers * Non-CB Acquirer* are consistently positive and significant for the full sample period. In terms of economic significance, the coefficients of the variable *Market Share of (1,0) mergers * Non-CB Acquirer* indicate that counties with large acquirers have statistically significant positive effects of a $530,000 (and $950,000) increase in SBL for each 10 percent increase in its market share of SBL in the county for the $1 billion (and $10 billion) thresholds of community bank size, respectively.

For counties with significant exposure to (0,1) merger classifications, we find strong and significant negative impacts on the SBL volume in the county after the merger, regardless of the size of the acquirers or the sample period. During the full sample period 2002–2014, we find the marginal negative effects of about a $1 million decline in SBL for each 10 percent increase in market share of community bank target in the overall SBL lending in the county before the merger. The coefficients of the variables *Market Share of (0,1) mergers * CB Acquirer* and the variable *Market Share of (0,1) mergers * Non-CB Acquirer* are both strongly negative across all specifications. This effect is even larger when the acquirers are large banks — with a marginal negative effect of a $1,800,000 (and $3,350,000) decline in SBL volume for each 10 percent increase in market share of SBL by large acquirers in the county — for the $1 billion (and $10 billion) size thresholds, respectively.

Our results overall are consistent with the conventional belief that there would be an adverse impact on credit availability to the local small businesses in the counties where small community banks are acquired by large banks (especially those that operate mostly outside the target's local community).

VI. Conclusions

The decline in the number of community banks in the past two decades along with the significant decline in their market share of SBL have spurred concerns about potential unintended consequences of community bank mergers. As more community banks have disappeared through mergers and failures, there might be a shortage of funding supply available to local small

businesses. Previous studies have produced mixed results. In this paper, we fill the literature gap by focusing on the local community impacts and accounting for the merger types and characteristics of the acquirers.

Jagtiani, Kotliar, and Maingi (2016) find that the *overall* funding for SBL tends to increase after the merger (for the combined firm), relative to SBL funded by the target and the acquirer before the merger. In addition, they find that the increased SBL amount is even larger when the acquirers are large banks (noncommunity banks). In this paper, we look deeper into the geographic location of the increased SBL. Specifically, we look at where (i.e.; in the local community where the target was operating vs. elsewhere) the increased SBL takes place, and we explore the key determinants of these increased SBL. Our empirical findings, which serve to fill the literature gap, indicate that the increased SBL funding actually did not occur in the local community where the community bank targets were located.

The overall impact of community bank mergers depends significantly on where the acquirers and the targets had operations in before the mergers. We find a statistically significant increase in the SBL activities in counties where acquirers operated in, which is met with a corresponding decline in counties where the target operated in (before the merger). These changes in SBL activities are significant even after controlling for the general market trends or changes in the local macroeconomic variables. Funding available to small businesses seems to be directed away from the target's community especially if the acquirers did not also have operations in the same county before the merger. We observe an even stronger result (with larger decline in SBL in the target's local community) when the acquiring bank is a large bank.

Although the magnitude of this decline in SBL in the target's community vary from specification to specification in our analysis, it is always statistically and economically significant regardless of whether the acquirers are community bank or large banks. Our results are also robust to different estimation techniques, different measures of changes in SBL activities, different definitions of community bank, and different sample periods.

Overall, our results are consistent with the hypothesis that community banks have continued to play an important role in SBL funding to local small businesses. The SBL credit gaps that emerge in Target-Only counties (after the mergers) are not filled by other banking firms (including local de novo banks). This SBL credit gap could portend significant negative economic

consequences in the absence of new interventions to ensure the continuing functionality of SBL markets and community banks' niche within these markets.[17]

[17] Note, however, that these gaps could have been filled by nonbank lenders that are not included in our analysis.

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Table 1: Summary Statistics of the Sample

Panel A: Panel Data (Firm-County Sample)

Observation represents a bank merger in each county type (Acquirer-Only, Target-Only, Both, None)

This panel presents basic summary statistics of our sample of mergers for the merger-county level regressions with community bank targets. The samples use two different definitions of community bank target ($1 billion and $10 billion in asset thresholds) for two sample periods (2002−2014 mergers, which is referred to as the "full sample" and 2010−2014 mergers, which is referred to as the postcrisis sample)). Means are weighted as explained in the text of the paper.

	Full Sample $1B Definition		Full Sample $10B Definition		Postcrisis Sample $1B Definition		Postcrisis Sample $10B Definition	
Variable	Mean	St Dev	Mean	St Dev	Mean	St Dev	Mean	St Dev
$1000s Change in Lending	-1981.10	17524.47	-1902.26	18782.58	-3101.73	14367.58	-2980.13	14478.35
D_Lending_Increased	0.41	0.50	0.40	0.50	0.38	0.49	0.38	0.49
Change in Commitment	-0.02	0.03	-0.02	0.02	-0.02	0.03	-0.02	0.03
D_Commitment_Increased	0.34	0.49	0.34	0.49	0.35	0.49	0.35	0.49
CB Acquirer, (1,0) county	0.25	0.26	0.39	0.47	0.26	0.30	0.40	0.47
CB Acquirer, (0,1) county	0.19	0.12	0.24	0.19	0.20	0.17	0.25	0.24
Non-CB Acq., (1,1) county	0.13	0.13	0.03	0.11	0.12	0.17	0.01	0.12
Non-CB Acq., (1,0) county	0.18	0.33	0.03	0.49	0.16	0.40	0.02	0.38
Non-CB Acq., (0,1) county	0.07	0.11	0.01	0.10	0.06	0.13	0.01	0.13
County Population Change	9486.09	17861.70	9580.50	17277.75	11699.88	19637.28	11742.86	19787.17
Unemployment Rate Chg.	-0.09	1.98	-0.10	2.19	-1.44	1.14	-1.46	1.11
Per-Capita Income Chg.	2523.70	2886.05	2532.74	2899.33	2727.76	3137.86	2730.36	3020.19
Per-Capita Business Bankruptcy Chg.	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Per-Capita Personal Bankruptcy Chg.	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Ratio of Acq. to Tgt. Assets	--	--	--	--	9.87	30.56	9.49	28.11
Number of Observations	66,882	--	89,504	--	12,336	--	15,734	
Number of Mergers	1280	--	1366	--	477	--	511	--

Panel B: Panel Data (County and Merger Category Sample)

Observation represents a county of each type (Acquirer-Only, Target-Only, Both) involved in the mergers during each year

This panel presents basic summary statistics of our sample of mergers for the short-term county regressions with community bank targets. The samples use two different definitions of community bank target ($1 billion in assets and $10 billion in assets) for two different analysis periods (2002−2014 mergers, which is referred to as the "full sample" and 2010−2014 mergers, which is referred to as the postcrisis sample)). Note that the county classifications listed here represent the total market share of firms that merged with that county classification for that county.

	Full Sample $1B Definition		Full Sample $10B Definition		Postcrisis Sample $1B Definition		Postcrisis Sample $10B Definition	
Variable	Mean	St Dev	Mean	St Dev	Mean	St Dev	Mean	St Dev
$1000s Change in Lending	3191.269	51847.48	3191.269	51847.48	-7590.136	43345.95	-7590.136	43345.95
CB Acquirer, (1,0) county	0.011	0.06	0.033	0.10	0.009	0.06	0.033	0.10
CB Acquirer, (1,1) county	0.002	0.03	0.006	0.04	0.002	0.03	0.006	0.04
CB Acquirer, (0,1) county	0.003	0.03	0.005	0.04	0.003	0.03	0.005	0.04
Non-CB Acq, (1,0) county	0.050	0.11	0.042	0.10	0.024	0.08	0.006	0.04
Non-CB Acq, (1,1) county	0.003	0.03	0.002	0.02	0.003	0.03	0.001	0.02
Non-CB Acq, (0,1) county	0.002	0.02	0.001	0.01	0.001	0.02	0.001	0.01
County Population	97,268	310410.40	97,268	310410.40	100,665	320100.40	100,665	320,100
Unemployment Rate	6.713	2.83	6.713	2.83	7.918	3.00	7.918	3.00
Per-Capita Income	32481.06	9959.95	32,481.06	9959.95	37245.19	10640.35	37245.190	10640.35
Per-Capita Business BK	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Per Capita Personal BK	0.004	0.00	0.004	0.00	0.003	0.00	0.003	0.00
County Population Chge.	1669.461	7985.64	1669.461	7985.64	1557.290	7602.17	1557.290	7602.17
Unemployment Rate Chg.	0.076	2.21	0.076	2.21	-1.327	1.33	-1.327	1.33
Per-Capita Income Chg.	2298.494	3240.79	2298.494	3240.79	2719.931	3712.54	2719.931	3712.54
Business BK rate Chg.	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Personal BK rate Chg.	0.000	0.00	0.000	0.00	-0.001	0.00	-0.001	0.00
Number of Observations	40,019	--	40,019	--	15,387	--	15,387	--

Data Sources: SNL Financial, Haver Analytics, CRA database, Call reports, Y-9C reports, and Summary of Deposits database.

Table 2: Firm-County Analysis — Logistic Regression Results

This table presents the results from logistic regressions, based on equations (1) and (3). The dependent variable is the probability that the merged firm would increase SBL in each of the counties that either target or acquirer had operations in before the merger. The results are presented for the $1 billion in assets and $10 billion in assets definitions of community bank, with separate analyses for the full sample of 2002–2014 and the postcrisis sample of 2010–2014 as well as for our two measures of increased SBL. Standard errors are clustered at the merger level and presented in parenthesis below parameter estimates. Regressions are weighted as described in the text of the paper. The *, **, and *** indicate significance at the 1%, 5%, and 10% levels, respectively.

	$$ Amount of SBL				Ratio of County SBL to total SBL			
	$ 1 Billion Definition		$10 Billion Definition		$ 1 Billion Definition		$10 Billion Definition	
Variable	Full Sample (1)	Postcrisis (2)	Full Sample (3)	Postcrisis (4)	Full Sample (5)	Postcrisis (6)	Full Sample (7)	Postcrisis (8)
(0,1) County	--	-0.377**	--	-0.409**	--	0.161	--	0.0630
		(0.182)		(0.171)		(0.186)		(0.172)
(1,0) County	--	0.514***	--	0.474***	--	1.098***	--	0.997***
		(0.144)		(0.134)		(0.157)		(0.144)
Ratio of Acq. to Tgt. Assets	--	-0.00875**	--	-0.00837**	--	-0.00960***	--	0.00950***
		(0.00381)		(0.00365)		(0.00365)		(0.00352)
CB Acquirer, (1,0) county	0.422***	--	0.386***	--	0.882***	--	0.802***	--
	(0.121)		(0.0831)		(0.133)		(0.0908)	
CB Acquirer, (0,1) county	-0.0481	--	-0.0746	--	0.249*	--	0.179	--
	(0.137)		(0.104)		(0.144)		(0.110)	
Non-CB Acq., (1,1) county	-0.434***	--	-0.00177	--	-0.353**	--	0.256	--
	(0.146)		(0.176)		(0.150)		(0.167)	
Non-CB Acq., (1,0) county	-0.0479	--	0.200**	--	0.402***	--	0.650***	--
	(0.113)		(0.0993)		(0.115)		(0.0912)	
Non-CB Acq., (0,1) county	-0.778***	--	-0.645***	--	-0.535***	--	-0.205	--
	(0.181)		(0.233)		(0.189)		(0.232)	
County Population Change	0.00000411***	0.00000523**	0.00000330**	0.00000505**	0.0000	0.0000	0.0000	0.0000
	(0.00000138)	(0.0000)	(0.00000129)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Unemployment Rate Chg.	0.0110	0.0669	0.0192	0.0777	-0.0106	0.126**	-0.00229	0.122**
	(0.0339)	(0.0620)	(0.0321)	(0.0580)	(0.0283)	(0.0521)	(0.0271)	(0.0485)
Per-Capita Income Chg.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Business BK rate Chg.	-76.76	-724.8	-64.24	-641.8	92.07	-1026.9*	94.88	-951.1*
	(210.5)	(556.6)	(209.7)	(532.3)	(228.0)	(526.2)	(226.7)	(505.2)
Personal BK rate Chg.	28.50	53.11	22.28	46.35	11.55	89.60	8.381	87.04
	(29.41)	(74.60)	(27.84)	(70.84)	(25.37)	(71.56)	(23.99)	(67.32)
Intercept	-0.158	-0.887***	-0.269	-0.848***	-0.835***	-0.920***	-0.926***	-0.852***
	(0.187)	(0.261)	(0.170)	(0.248)	(0.154)	(0.192)	(0.132)	(0.180)
Year Dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Probability of Increase for elements of $\mathbf{C}_{i,j}$ vs. base case								
(1,1) County	--	0.353***	--	0.355***	--	0.240***	--	
		(0.0294)		(0.0275)		(0.024)		0.253***
(1,0) County	--	0.475***	--	0.468***	--	0.483***	--	(0.0230)
		(0.0151)		(0.0144)		(0.015)		0.476***
(0,1) County	--	0.274***	--	0.269***	--	0.270***	--	(0.0142)
		(0.0251)		(0.0237)		(0.025)		0.265***
CB Acquirer, (1,1) county	0.410***	--	0.372***	--	0.281***	--	0.258***	(0.0236)
	(0.0258)		(0.0176)		(0.023)		(0.0150)	--
CB Acquirer, (1,0) county	0.513***	--	0.464***	--	0.486***	--	0.437***	
	(0.014)		(0.009)		(0.136)		(0.009)	--
CB Acquirer, (0,1) county	0.398***	--	0.355***	--	0.334***	--	0.294***	
	(0.021)		(0.0166)		(0.020)		(0.0156)	--
Non-CB Acq., (1,1) county	0.311***	--	0.371***	--	0.216***	--	0.310***	
	(0.021)		(0.0367)		(0.017)		(0.0314)	--
Non-CB Acq., (1,0) county	0.398***	--	0.419***	--	0.370***	--	0.400***	
	(0.007)		(0.0155)		(0.006)		(0.0110)	--
Non-CB Acq., (0,1) county	0.243***	--	0.238***	--	0.187***	--	0.221***	
	(0.0264)		(0.0397)		(0.023)		(0.0374)	--
Number of Obs.	66,882	12,336	89,504	15,734	66,882	12,336	89,504	15,734
Cluster Level	Merger	Merger	Merger	Merger	Merger	Merger	Merger	Merger
No. of Clusters	1280	477	1366	511	1280	477	1366	511

Data Sources: SNL Financial, Haver Analytics, CRA database, Call Reports, Y-9C reports, and Summary of Deposits database.

Table 3: Linear Regression Results

This table presents the results of the OLS regressions based on equations (2) and (4). Dependent variable is change in SBL in the county in each year for each merger category (Acquirer-Only, Target-Only, Both) that took place in the county during the year. The results are presented for the $1 billion in assets and $10 billion in assets definitions of community bank, with separate analyses for the full sample of 2002−2014 and the postcrisis sample of 2010−2014 as well as for our two measures of increased SBL. Standard errors are clustered at the merger level and presented in parenthesis below parameter estimates. Regressions are weighted as described in the text of the paper. The *, **, and *** indicate significance at the 1%, 5%, and 10% levels, respectively.

	$$ Amount of SBL				Ratio of County SBL to total SBL			
	$ 1 Billion Definition		$10 Billion Definition		$ 1 Billion Definition		$10 Billion Definition	
Variable	Full Sample	Postcrisis	Full Sample	Postcrisis	Full Sample	Postcrisis	Full Sample	Postcrisis
(0,1) County	--	726.0	--	604.4	--	-0.00192	--	-0.00262
		(1500.9)		(1408.5)		(0.00867)		(0.00808)
(1,0) County	--	6557.8***	--	6295.7***	--	0.0432***	--	0.0401***
		(1390.4)		(1313.8)		(0.00752)		(0.00706)
Ratio of Acq. to Tgt. Assets	--	-13.34	--	-19.57	--	0.0000712	--	0.0000453
		(30.10)		(31.04)		(0.0000719)		(0.0000679)
CB Acquirer, (1,0) county	4621.3***	--	5253.7***	--	0.0485***	--	0.0426***	--
	(1112.5)		(1251.6)		(0.00798)		(0.00519)	
CB Acquirer, (0,1) county	98.22	--	401.7	--	0.00618	--	0.00514	--
	(1150.8)		(1301.5)		(0.00822)		(0.00563)	
Non-CB Acq., (1,1) county	-2853.9	--	348.8	--	0.0121	--	0.0332***	--
	(2737.3)		(4141.7)		(0.00820)		(0.00544)	
Non-CB Acq., (1,0) county	3545.8***	--	4804.5***	--	0.0461***	--	0.0410***	--
	(1095.9)		(1456.0)		(0.00734)		(0.00473)	
Non-CB Acq., (0,1) county	-4451.4**	--	-7599.4	--	0.0185**	--	0.0341***	--
	(2049.7)		(7659.3)		(0.00819)		(0.00591)	
County Population Change	-0.00699	0.0794**	-0.00720	0.0716**	-2.04e-08	6.27e-08	-1.45e-08	6.28e-08
	(0.0456)	(0.0330)	(0.0425)	(0.0321)	(0.0000)	(0.0000)	(9.71e-08)	(0.0000)
Unemployment Rate Chg.	102.3	843.0*	217.6	894.7*	-0.000453	0.00405	-0.000532	0.00371
	(346.6)	(498.5)	(333.2)	(477.0)	(0.00141)	(0.00255)	(0.00132)	(0.00237)
Per-Capita Income Chg.	0.182	0.123	0.146	0.0825	0.0000	0.0000	0.0000	0.0000
	(0.127)	(0.148)	(0.121)	(0.145)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Business BK rate Chg.	517058.6	249062.0	540449.0	281690.4	4.750	6.871	3.892	6.590
	(1348200.4)	(2912766.7)	(1280569.5)	(2794759.7)	(8.366)	(19.03)	(8.070)	(18.30)
Personal BK rate Chg.	306798.0	957763.0	217816.2	767370.0	0.604	9.828*	0.561	9.481*
	(310806.5)	(738378.2)	(302807.5)	(707347.1)	(1.523)	(5.339)	(1.439)	(5.082)
Intercept	-1702.1	-9751.6***	-2464.1	-9086.0***	-0.0378***	-0.0286***	-0.0338***	-0.0269***
	(1759.1)	(2209.5)	(1950.6)	(2174.9)	(0.0126)	(0.00790)	(0.0117)	(0.00751)
Year Dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation Level	Merger-County	Merger-County	Merger-County	Merger-County	Merger-County	Merger-County	Merger-County	Merger-County
Number of Obs.	66,882	12,336	89,504	15,734	66,882	12,336	89,504	15,734
Cluster Level	Merger	Merger	Merger	Merger	Merger	Merger	Merger	Merger
No. of Clusters	1280	477	1366	511	1280	477	1366	511
R^2	3.0%	5.6%	2.4%	4.7%	4.9%	7.0%	4.8%	6.5%

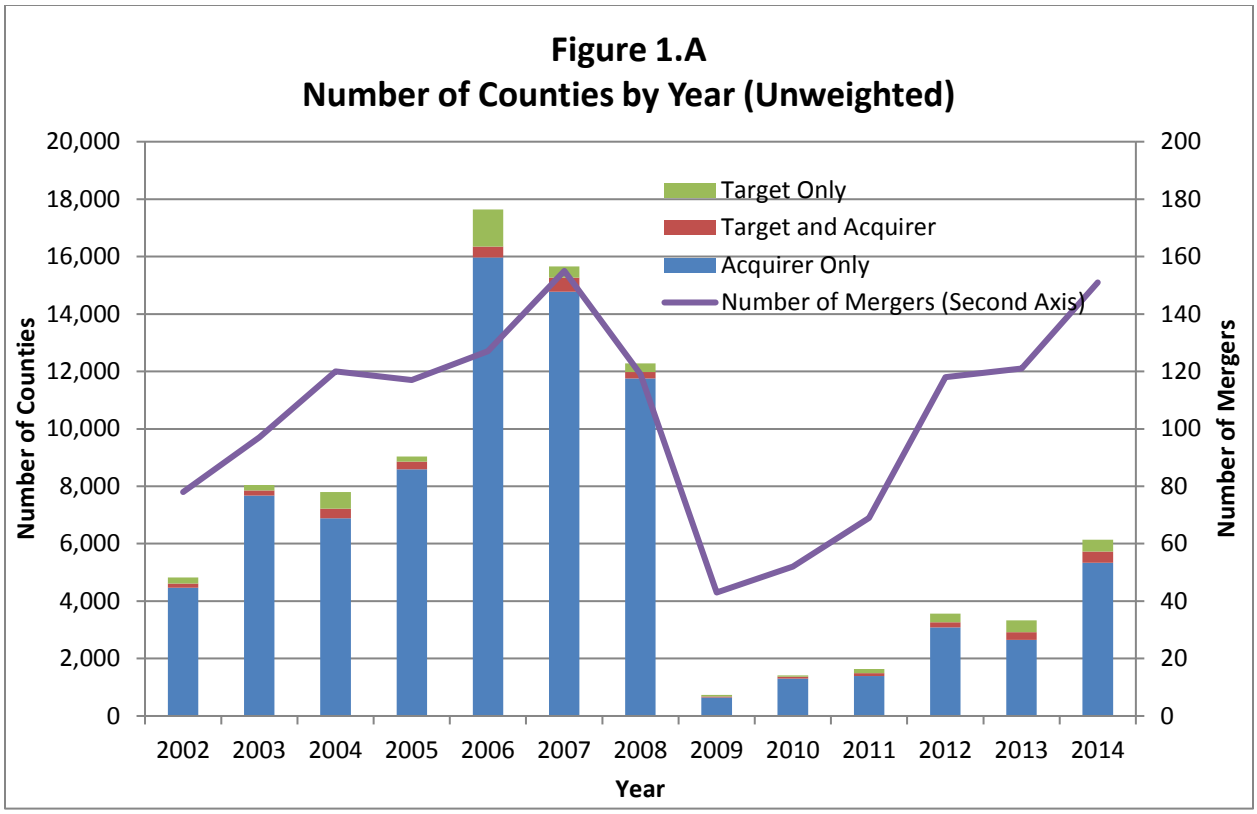
Data Sources: SNL Financial, Haver Analytics, CRA database, Call Reports, Y-9C reports, and Summary of Deposits database.

Table 4: County-Level Regression Results

This table presents the results of the OLS regressions based on equation (5). Dependent variable is change in overall SBL volume in the county in each year. The results are presented for the $1 billion in assets and $10 billion in assets definitions of community bank, with separate analyses for the full sample of 2002−2014 and the postcrisis sample of 2010−2014. Standard errors are clustered at the merger level and presented in parenthesis below parameter estimates. The *, **, and *** indicate significance at the 1%, 5%, and 10% levels, respectively.

Variable	Full Sample $1 Billion Definition	Full Sample $10 Billion Definition	Postcrisis Sample $1 Billion Definition	Postcrisis Sample $10 Billion Definition
Market Share of (1,0) mergers CB Acquirer	-2863.8 (2615.5)	2565.1 (1872.5)	4145.3 (2603.9)	-1244.4 (2796.3)
Market Share of (1,1) mergers CB Acquirer	-19929.1*** (6376.9)	-8954.9* (5110.6)	-20049.3** (8866.4)	-20868.9*** (6406.0)
Market Share of (0,1) mergers CB Acquirer	-9846.9*** (3482.8)	-10280.8*** (3468.3)	-12037.1** (5102.5)	-20967.3*** (5392.4)
Market Share of (1,0) mergers Non-CB Acquirer	5309.5** (2144.0)	9502.2*** (2550.7)	-4881.5 (3978.1)	-6842.0 (7152.0)
Market Share of (1,1) mergers Non-CB Acquirer	24946.0* (13130.0)	87294.8*** (22041.7)	-32534.7*** (11851.1)	-41381.5* (22512.5)
Market Share of (0,1) mergers Non-CB Acquirer	-18060.8** (8094.8)	-33558.4*** (8986.7)	-47385.9*** (9175.8)	-53095.3** (22228.7)
County Population	0.0103*** (0.00399)	0.00999** (0.00396)	-0.0144*** (0.00538)	-0.0143*** (0.00537)
Unemployment Rate	-380.4*** (105.7)	-393.4*** (105.7)	126.6 (137.7)	139.8 (137.3)
Per-Capita Income	0.241*** (0.0636)	0.232*** (0.0627)	-0.0609 (0.0628)	-0.0614 (0.0630)
Business Bankruptcy Rate	-17011135.8*** (1420053.1)	-17023316.8*** (1421329.9)	-16578400.6*** (2387683.0)	-16603532.7*** (2387449.4)
Personal Bankruptcy Rate	-744304.3*** (116317.3)	-737766.7*** (116517.8)	-2585440.3*** (257862.7)	-2596084.3*** (258820.1)
County Population Change	0.738*** (0.103)	0.725*** (0.103)	0.812*** (0.187)	0.812*** (0.187)
Unemployment Rate Chg.	-5.618 (172.0)	2.290 (172.1)	-336.2 (274.7)	-337.7 (274.8)
Per-Capita Income Chg.	0.721*** (0.0870)	0.729*** (0.0871)	0.430*** (0.0857)	0.437*** (0.0862)
Business BK rate Chg.	1990139.8** (828183.3)	1897188.9** (824805.7)	1576841.1 (1320356.1)	1513277.8 (1319985.3)
Personal BK rate Chg.	-1961648.6*** (249914.8)	-1964419.5*** (250623.1)	-2405421.4*** (403686.2)	-2390974.6*** (403988.8)
Intercept	2658.5 (2106.7)	2599.0 (2073.7)	-14973.4*** (3268.2)	-15093.2*** (3264.2)
Year Dummies?	Yes	Yes	Yes	Yes
Observation Level	County-Year	County-Year	County-Year	County-Year
Number of Obs.	40,019	40,019	15,387	15,387
Cluster Level	County	County	County	County
Number of Clusters	3079	3079	3078	3078
R^2	15.1%	15.2%	9.7%	9.7%

Data Sources: SNL Financial, Haver Analytics, CRA database, Call Reports, Y-9C reports, and Summary of Deposits database.



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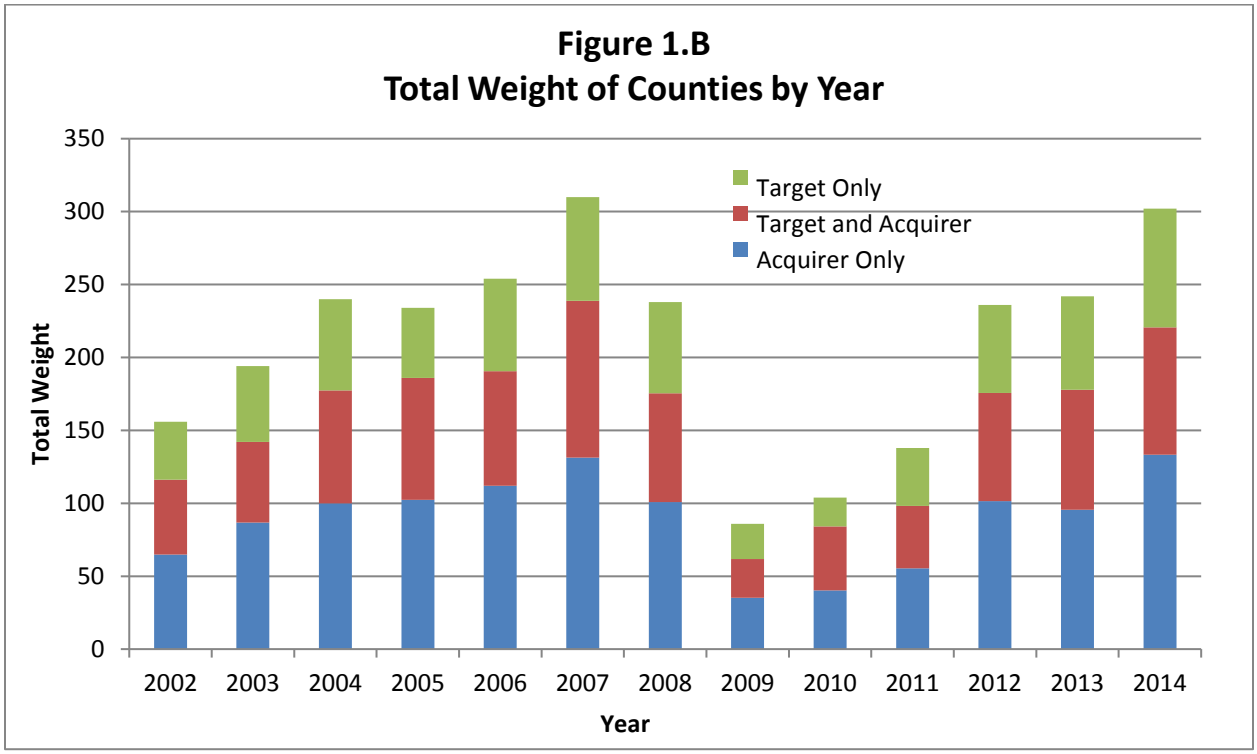

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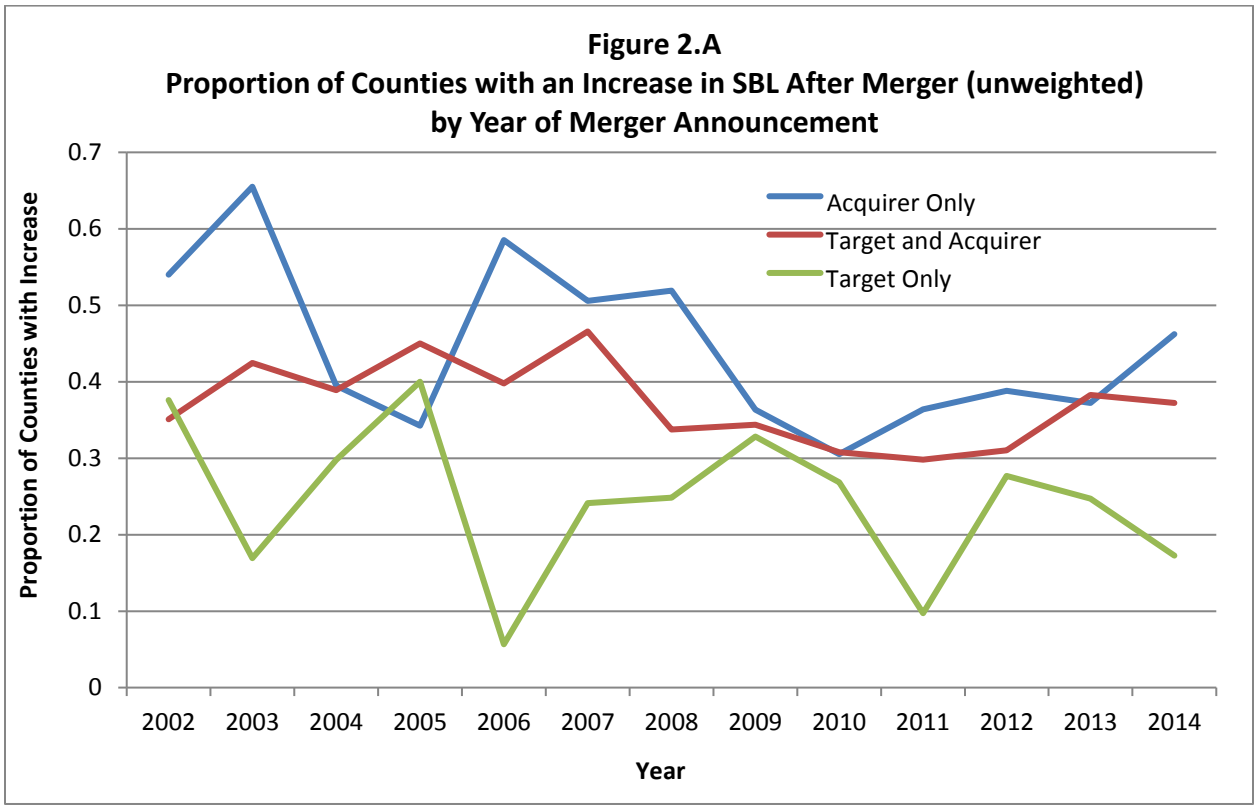

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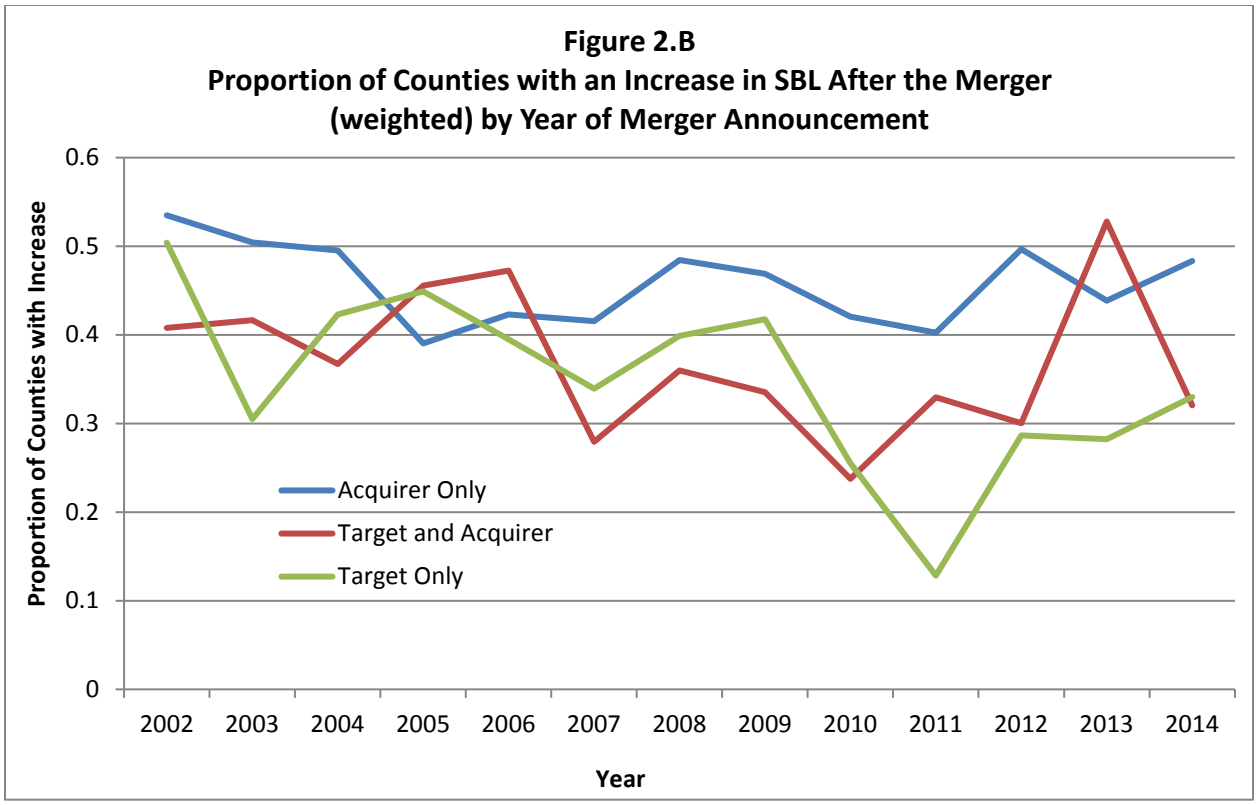

Data Sources: SNL Financial, CRA database, Call Reports, Y-9C reports, and Summary of Deposits database.