Bank Consolidation and New Business Formation[*]

Bank Consolidation and New Business Formation

Abstract

As the trend of bank consolidation activities continues to grow in the U.S. and globally, the debate on the impact of such consolidation on small business credits and activities are still inconclusive. Building on the existing research (Berger, Saunders, Scalise and Udell, 1998; Black and Strahan, 2002), this paper investigates the effects of the actual intensity of bank consolidation on the formation of new businesses in the U.S. local markets. Evidence portrays that in the short-run, the overall intensity of bank consolidation is negatively related to the rate of new business formation, and this negative relationship is primarily driven by consolidations initiated by large acquirers. On the contrary, consolidations between small-to-medium sized banks show a positive impact on new business development and these results are consistent even when the M&As are distinguished with respect to in-market or out-of-market acquirers initiating the deals. However, two years after the consolidations, the evidence reveals a positive and significant impact on the rate of new business formation in the local markets for consolidations initiated by large in-market acquirers.

1. Introduction

Although consolidation of the U.S. banking industry started during the latter half of the 1970s, it was not until the deregulatory measures (e.g., The Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 that effectively eliminated interstate banking restrictions) were instituted in the mid-1990s that we experienced an unprecedented increase in the consolidation of the banking industry within and across state borders.[1,2]   This changing structure of the banking industry has led to a body of research investigating its impact and implications on loan availability, bank performance, and economic growth (see. e.g., Berger, Demsetz and Strahan, 1999; Clark, 1996; Garmaise and Moskowitz, 2006).

Consolidation of the banking sector is particularly important to entrepreneurs because it impacts their ability to raise funds.   Entrepreneurial firms are generally small, and as argued by Guiso, Sapienza, and Zingales (2004) and Cole, Wolken and Woodburn (1996), among others, depend heavily on the credit provided by local banking systems for their start, survival and continuous growth.[3]   It is, therefore, important to understand how the deregulation and consolidation of the banking industry has impacted small businesses, in general, and in particular entrepreneurial activities such as new business formation.

---

[1] Although bank consolidation can take different forms, Rhoades (2000) point out that most of the consolidation following deregulation is due to mergers and acquisitions (M&As) between banks. Consequently we use consolidation and M&A interchangeably.
[2] From 1980 to 1998, there were almost 8,000 M&As in the U.S. banking industry (Rhoades, 2000).
[3] Cole, Wolken and Woodburn (1996) report that banks provide more than 60 percent of small business credit, using the data from 1993 National Survey of Small Business Finance (NSSBF 1993).

The theoretical literature provides two competing views on the impact of competition in the banking industry and new business formation. Traditional banking theory treats borrowers as a homogenous group (Klein, 1971), and suggests that as competition increases, banks are more likely to charge lower interest rates on loans, thereby lead to an increase in the equilibrium supply of loans (Pagano, 1993). Petersen and Rajan (1995) contend that as competition among banks increases, banks have a reduced ability to inter-temporally share surplus with firms. Consequently, banks make lending decisions on a period-by-period basis, and are less likely to extend credit to small firms associated with large information asymmetries. More recently, Marquez (2002) shows that borrower-specific information becomes more dispersed as competition among banks increases, and a higher number of bad borrowers may obtain financing which in turn leads to higher interest rates.

The tremendous growth in consolidation of the banking industry has also led to a significant reduction in the importance of small banks in the credit market (Black and Strahan, 2002). Stein (2002) points out that the key distinguishing characteristic of small business lending is the "softness" of information generated in the decision making compared to large banks that rely more on "hard" information. This suggests that the supply of credit to small firms may be negatively affected because larger banks created from M&As tend to shun away from relationship-based lending to transaction-based lending, and are less likely to extend credit to small businesses, especially to those firms with almost no history (i.e., newly formed business). In sum, while there is no direct prediction on the impact of deregulation and

consolidation of banking industry on newly formed business, the theoretical literature suggests that it can either enhance or restrict new business formation. Thus it is an empirical issue.

The empirical literature is equally mixed. Black and Strahan (2002), using a broad aggregate state level measure are the first to examine the effect of deregulation on new business incorporations. Using new incorporations as the proxy for entrepreneurial activities, they document that the rate of incorporations increases following deregulation of branching restrictions.

However, Wall (2004) shows that the Black and Strahan (2002) findings are not necessarily uniform across different regions. He finds that after controlling for heterogeneous effects of deregulation across regions, deregulation has a negative impact on entrepreneurial activities in some regions, and a positive impact in others. Zarutskie (2006), using firm level information, finds that, following deregulation, newly formed firms use significantly less external debt, and more contributed equity capital as a result in a decline in the equilibrium supply of credit due to the increased competition in the banking sector.

Given this mixed evidence, it is unclear whether the deregulation and consolidation of the U.S. banking system help or hinder entrepreneurial activities. The formation of new ventures is important because of its significant impact on job creation and economic growth, and also because of its important social role (see, e.g., Garmaise and Moskowitz, 2006). Therefore, getting a clear picture of the effect of bank consolidation on new business formation will substantially advance our

understanding of the real effects of deregulation of the banking industry.

In this paper, we attempt to fill this void in the literature by using a unique dataset on new business formation in all 394 Labor Market Areas (LMAs) in the U.S. during the period of 1994-1999. Our empirical approach departs from the existing literature in the following ways. First, the existing research (Black and Strahan, 2002) based on state level data assumes that the effects of bank consolidation will be uniform within a state while a state is limited by its political boundary and covers areas that vary widely. Additionally, a bank within the same state may offer different products or interest rates depending on the local competitive environment (Garmaise and Moskowitz, 2006). Without taking into consideration of such heterogeneity, pooled estimations at state level may be driven by a small number of events (Huang, 2007; Wall 2004). We contend that using states as units of analysis falls short of capturing the real economic effects of actual consolidation in a given local market. It is also problematic to use Metropolitan Statistical Area (MSA) or non-MSA county as our unit of analysis because MSAs only cover a small portion of US geography, and small businesses do not necessarily borrow from banks within the counties they are located in. Instead, we employ Labor Market Area (LMA), a relatively recent development of the appropriate "regional" measure, as our units of analysis, which allows us to better define local markets at the micro-level. A LMA is the aggregation of counties, either within a state or cross the state boundary, which represents a real local economic unit. Using a LMA as a unit of analysis can minimize the heterogeneity problem, and allows us to investigate different types of

M&As and consequently, their effects on local entrepreneurial activities.

Secondly, we are able to directly measure new firm births as a proxy for entrepreneurial activities. In contrast, Black and Strahan (2002) use new incorporations as the measure of entrepreneurial activities at the state level to examine the impact of deregulation of financial service sectors. We take the position that interpretation of the empirical results based on this measure requires more scrutiny. New incorporations are not likely to be a precise measure of new business formation since new incorporations can come from existing businesses. That is, an increase in new incorporations may only reflect an increasing propensity to incorporate for existing businesses rather than the formation of new firms.

Thirdly, to the best of our knowledge, none of the existing studies examine the effects of the actual intensity of bank consolidation in local markets. Unlike other studies, this paper distinguishes itself by using two sets of indexes that directly measures the intensity of bank consolidation and investigating the effect of bank consolidation in local markets both in the short- and long-run.

This paper contributes to the literature by investigating micro-level mechanisms on how consolidation of the banking industry impacts the formation of new firms in local markets. Without knowledge about these mechanisms, it is difficult to understand the real consequences of policy changes. We find that the overall intensity of bank consolidation has a statistically significant and economic meaningful negative impact on the rate of new business formation after controlling for heterogeneity across LMAs and year effects. When we decompose the M&As

with respect to the size of acquiring banks, we observe that this negative relationship is primarily driven by consolidations initiated by large acquirers. In contrast, M&As between small-to-medium sized banks have a positive impact on new business formation. We conduct sensitivity analysis at the MSA level and find qualitatively the same results. These findings are consistent with the view that small banks have comparative advantage in using "soft" information and nurturing lending relationship with potential entrepreneurs (Berger, Miller, Petersen, Rajan and Stein, 2005).

We further distinguish M&As according to whether in-market or out-of-market acquirers initiated the transaction. Our main results are robust to this further distinction. We find M&As by large acquirers have a negative effect on new business formation regardless of whether the acquirer is in-market or out-of-market (Sapienza, 2002). Furthermore, we document that M&As by small acquirers are positively related to the local entrepreneurial activities, though only the coefficient for the out-of-market mergers is significant.

Given the negative relationship between bank M&As initiated by large acquirers, we take our analysis one step further by examine their long-run effects. Interestingly, we find that bank consolidations initiated by large in-market acquirers have a significantly positive effect on new business formation in the long-run, especially, two years after the M&As, while the adverse shock induced by large out-of-market acquirers will persist for one year. In summary, this paper provides the most comprehensive analysis on the impact of actual banking consolidation on new

business development in the local market.

The rest of the paper is organized as follows. Section 2 provides a brief literature review. Section 3 explains the data, and presents summary statistics of our sample. Section 4 reports our empirical findings along with results for robustness check. Section 5 summarizes and discusses our empirical findings.

2. Literature Review

Following the fall of the nation-wide barriers to interstate and intrastate banking, banks were no longer protected from competitive pressure. As a response, banks started to get involved in mergers and acquisitions (M&As) in order to strengthen their competitive positions. Theoretically, the literature is ambiguous as to the effect of banking consolidation on new business formation. On the one hand, consolidated banks may improve their efficiency, and consequently, lower their costs of providing credit because of economies of scale or scope gained from synergy effects or optimization of loan portfolios and risk diversification. Borrowers may benefit from bank mergers if certain gains can be passed on to them. On the other hand, acquiring banks may increase their monopoly power in the local markets through mergers and acquisitions and use their informational advantage to set unfavorable terms to borrowing firms. Compared to large firms, credit-constrained entrepreneurs have less access to other external capital markets and rely heavily on bank financing. Hence, they are more subject to the shocks induced by bank mergers (Bonaccorsi Di Patti and Gobbi, 2007).

Empirically, one line of research examines the lending behavior of consolidated banks. Berger, Saunders, Scalise and Udell, 1998) find that, in general, the availability of credit to most small firms is not adversely affected by bank M&As. However, they also report that M&A activities by lager banks/BHCs do have a negative impact on small business lending. Additionally, Berger, Demsetz and Strahan (1999), Peek and Rosengren (1998), and Strahan and Weston (1998) report that M&As between small banks are associated with increased small business lending.

More recently, researchers have focused on the impact of consolidation and deregulation of the financial sector on bank customers. For example, using bank consolidation experience of Norway, Karceski, Ongena and Smith (2005) find that market price of target customers, especially small publicly traded firms, reacts negatively to bank merger announcements. Along this same line of inquiry, Carow, Kane and Narayanan (2006) using U.S. data document that customers of acquired institutions experience a significant wealth loss at the announcement of banking mega-mergers especially when they are small and finance constrained. Bonaccorsi di Patti and Gobbi (2007), using a large sample of Italian corporate borrowers, document findings consistent with bank M&As having an adverse effect on credit, especially when lending relationships are terminated after M&As.

Another stream of research most related to our research examines the impact of bank competition on newly formed firms. While Black and Strahan (2002) report an unambiguous positive relationship between deregulation indicators and new incorporations, Wall (2004) provides evidence that this positive relationship is not

uniform across states. A recent study by Zarutskie (2007) finds that newly formed firms substitute more contributed equity finance for external debt and invest less following deregulation as a result of an equilibrium supply of credit. On the contrary, Erel (2007) provides evidence that small borrowers generally pay lower interest rates to banks expanding their operation through mergers. Thus these studies provide mixed results, thereby preventing us from drawing a clear inference on the impact of banking deregulation on new business formation.

Focusing on large bank mergers, Garmaise and Moskowitz (2006) further examine the social consequences of bank mergers and provide micro-level (within county) evidence that neighborhoods experience high interest rate, decline of local economy and higher property crime in subsequent years following bank mergers. While they suggest a potential causal relationship between bank mergers and crime, we take their results one step further and argue that new business formation may be an important channel for this relationship. This is the case because it is well recognized that small businesses are responsible for the majority of new job creation in the last twenty years. Harsh local economic conditions unfavorable to small business will therefore have significant social consequence through reduced job generation.

Without understanding the relationship between banking deregulation and new firm formation, we only have limited power to explain the root cause of this phenomenon. In what follows, we empirically examine this issue and try to shed some further light.

3. Data Collection and Sample Description

3.1. Unit of Analysis and Data Collection

As discussed earlier, we use Labor Market Areas (LMAs) as our unit of consolidation to investigate the effect of banking consolidation on entrepreneurship. There are 394 LMAs within the U.S., which are defined according to the 1990 specification of the Department of Agriculture. Under this specification, LMAs may cross the state boundaries since they are defined not only by the place of work but also by where the workers live (i.e., commuting routes linking work to workers). Thus, LMAs provide an appropriate basis for aggregating county level data to construct local economic units.

3.2. New Business Formation and Entrepreneurial Activities

In this study, we are interested in finding out whether small business lending will continue to prevail resulting in new business formation in the region as a consequence of bank consolidation in the same market. In order to address the proposed question, we construct a panel from 1994 to 1999 based on all 394 Labor Market Areas (LMAs) in the U.S. with appropriate and necessary variables, using different sources of information.[4] LMA Firm births 1990 through 1996 are obtained from a data file prepared by Armington and Acs (2002) using the Longitudinal Establishment and Enterprise Microdata (LEEM) file at the Center for Economic

---

[4] We select 1994-1999 as our sample period because the machine readable data for deposits at branch level starts in 1994 and the new firm birth information ends in 1999. In addition, Riegle-Neal Interstate Banking and Branching Efficiency Act era was passed in 1994, and became effective in 1997. Our sample period coincides with this era.

Studies of the Bureau of the Census.[5]   The data on firm births from 1997 through

1999 were prepared by the Company Statistics Division at the Census Bureau from a

more recent LEEM file using the same procedure for data collection.   We are able to

precisely measure the actual entrepreneurial activities in a local area, thereby allowing

us to more accurately capture the real effect of bank consolidation.

The LEEM data file is constructed by the Census Bureau from its annual

Statistics of U.S. Business (SUSB) files based on the economic micro-data underlying

Census' County Business Patterns.   The basic unit of the LEEM data is a business

establishment which we have data on its employment, location, start year and firm

affiliation.   Establishments are identified by the ultimate owner.   Firm births

include both new single-establishment firms with less than 500 employees and

primary locations of new multi-establishment firms with less than 500 employees

firm-wide.   For those new multi-establishment firms, the employment in their new

primary location should constitute at least one third of their total employment in the

first year.   The LEEM file identifies single-unit firm births in year *t* as non-affiliated

establishments with a start-year of *t* that had no employment in March of year *t-1*, and

had positive employment below 500 in March of year *t*.   We treat LMA labor force

as a potential pool for entrepreneurs.   Firm births were then multiplied by 1000 and

divided by the LMA labor force to avoid the implicit magnitude correlation with

population, generating a measure of local entrepreneurial activities expressed as an

---

[5] See Armington and Acs (2002), Armington, Kirchhoff, Hasan and Newbert (2006) for a full description of the data collection procedure.

annual birth rate -- the number of annual births of new firms per 1,000 workers in the

LMA.

3.3. Explanatory Variables

3.3.1. Indexes for Bank Consolidation Intensity

Black and Strahan (2002) point out that the relevant geographic scope of the banking market for entrepreneurs may well be below the state level given that they depend heavily on the credit provided by banks at the local level.   This suggests that although deregulation of the financial services sector led to a significant increase in banking consolidation, using only state level indicators to reflect the relaxation of banking regulation may not allow us to accurately capture the effects of bank M&As on entrepreneurs' access to credit.

To overcome this shortcoming of previous work, we construct two sets of indexes that are based on bank consolidation at the LMA level to directly measure the intensity of bank consolidation.   Banking assets involved in M&A activities would be ideal proxy for the intensity of bank consolidation.   However, there are no public sources with detailed information about banking assets at the LMA level. Alternatively, FDIC conducts survey on the size of deposits for each banking office of branch banking systems in order to provide a means for measuring deposits in local banking markets.   Therefore, we use the total deposits,[6] instead of assets or loans,

---

[6] Among the U.S. banks, except for a few largest organizations, the total assets and total deposits of banks are positively and significantly correlated as over 80% of the assets management depends on deposit financing.

associated with the M&A activities, to gauge the intensity of bank consolidation and construct our first set of indexes.[7]   Here, our focus is target banks.

We collect detailed information on banks that merged, and those that survived between 1994 and 1999 from the FDIC bank regulatory database.   Similar to Berger, Saunders, Scalis and Udell (1998), we call any consolidation of two or more non-failing banks under a single bank charter a "merger".   Accordingly, we denote the survivor as the "acquirer" and those non-survivors whose charters disappear as the "targets".   We define an "acquisition" as a union in which a bank retains its charter but obtained a different high holding company.   In this case, the high holding company is referred to as the "acquirer", and the bank is called the "target" with the assumption that the target has not failed.   There is one common type of merger which is the consolidation of several branches held by the same bank holding company because of bank branching restrictions.   Following Erel (2007), such instances of "within family" mergers are excluded from our bank M&A list.

These banks are matched with the FDIC summary of deposits database in order to determine their location (county or city).   Deposits are then aggregated to the LMA level, allowing us to measure the total deposits held by target banks in a given LMA at the beginning of a given year.[8]   We then scale this deposit number by the total deposits held by all the banks in that LMA.

---

[7] The past literature also revealed that it is reasonable to use deposit data as a proxy for market lending (Peterson and Rajan (1995)).

[8] Most of data sources report data for counties. We used a computer software application to convert counties into LMAs.   For those data sources without county information, we use ZIP code to perform the conversion.   For the other data, we match the city through U.S. Geographic Names Information System (GNIS) and then perform the conversion.

Previous research (e.g., Berger, Saunders, Scalise and Udell, 1998; Peek and Rosengren, 1998) documents that the lending behavior of organizations created from bank consolidation are quite different according to bank size. We therefore distinguish M&As by acquirers size, namely large and small-to-medium sized banks.[9] Based on these data we calculate two sets of indexes. The first set of indexes is based on the size of the deposits of both the acquirer and target. Three different measures are used to capture banking consolidation intensity: Index1TA which is based on the full bank M&A list as described above; Index1LG which is based on large acquirers; and Index1SM which is based on small-to-medium sized acquirers. Details on the measurements of these consolidation intensity proxies and other variables are given in Table 1.

The second set of indexes is based on the number of banks acquired in a given LMA. Index2TA is the total number of banks acquired in the LMA; Index2LG is the number of banks acquired by large banks; and Index2SM is the number of banks acquired by small-to-medium banks. Each measure is scaled by the total number of banks in the corresponding LMA-year. It is possible that different banks may be owned by the same bank holding company in the same local market. However, we are focusing on commercial banks rather than bank holding companies (BHCs) because prior studies ((Erel 2007; Strahan and Weston, 1998) suggest that lending decisions are mostly made at the bank level rather than the BHC level.

---

[9] Following Berger et al., (1998), we define a large bank (small-to-medium) as a bank with more than (less than) $1 billion total assets at the end of the year prior to the M&A, and calculate the amount of deposits held by target banks sorted by acquirers size.

3.3.2. LMA Financial Conditions

Financial conditions in the local area are important determinants of the rate of new business formation (Guiso, Sapienza, and Zingales, 2004).   Petersen and Rajan (1995) show that in concentrated credit markets, banks are more likely to finance credit-constrained firms because they can subsidize the firm at its early development stage and recoup the cost at later stage when the information asymmetry has been resolved.   In this sense, even though increased concentration may potentially impair competitiveness, new relationships with would-be entrepreneurs are more likely to be built up.   Thus, controlling for the local capital market conditions will allow us to evaluate the effect of banking consolidation more precisely.

We gauge competition directly by including a measure of local market concentration.   The calculation of market share is based on branch-level deposit information.   For instance, if Bank A own 5 branches in a LMA, we add up all deposits held by this bank and scale the number by total LMA deposits to obtain Bank A's market share.   We calculate the Herfindahl-Hirschman Index (HHI) for each LMA through summing up squared market shares for each bank.   When there is only a single bank in a LMA, the HHI index is equal to one.   For a perfectly atomistic market, HHI will be quite close to zero.

When small borrowers can easily find an alternative source of fund, long-term relationship is not easily maintained (Karceski, Ongena and Smith, 2005).   Because small businesses usually seek financial service in their local capital market (Petersen and Rajan, 1994), the number of branches in the local area reflects the potential

choices for small borrowers.   Hence, we use branch density, defined as the number of branch offices divided by the LMA acreage in 100 square miles, as another measure of local market conditions to proxy for the competitiveness of local banks. The lower the branch density, the more likely small borrowers will form an endurable relationship with lending banks.

3.3. LMA Demographic Information

New business formation rate may also be closely related to local demographics. We include several variables to control for the variation in demographic characteristics.   We control for LMA size by using natural logarithm of its population.   We also calculate the proportion of population with college degrees, and use this to proxy for the availability of trained human capital in the local area. Entrepreneurs are largely wealth constrained, and it is difficult for them to pledge bank loans if their lack collaterals.   High income will increase the creditworthiness of loan applicants, allowing these would-be entrepreneurs to obtain more bank credit. For this reason, we control for per capita income in the local markets.   Finally, we include unemployment rate to control for the overall condition of local economic environment.

*** Insert Table 1 Here***

3.4. Summary Statistics

Table 2 presents summary statistics of those variables used in our empirical analysis. For our sample, the new business formation rate has a mean of 3.55 per 1,000 labor force with a standard deviation of 0.89. Rhoades (2000) reported that after 1994 there is an increasing trend for large acquisitions. We observe a similar pattern in our sample. To be specific, on average, around 5 percent of the banks in a LMA are acquired in a given year, of which 60 percent are acquired by large banks and the rest by small-to-medium sized banks. Table 2 also shows that, on average, 7 percent of total deposits held by targets banks are involved in M&As in a LMA for each year. Almost 5 percent of total LMA deposits are held by targets involved with large acquirers and 2 percent are held by targets acquired by small-to-medium sized banks.

<center>***Insert Table 2 Here***</center>

We also calculate market concentration, as Herfindahl-Hirschman Index (HHI) based on deposit information, which has a mean of 0.1 and a standard deviation of 0.05. Branch density has a mean of 2 branches per 100 square miles and a standard deviation of 4. The number of branches ranges from 57 to 2,181 across LMAs. Our mean statistic for LMA per capita income is $21 thousand with a standard deviation of $3.87 thousand, which ranges from $11 thousand to $40 thousand. On average, 9.4 percentage of the population have college degrees, and the standard deviation is 3 percent. The LMA unemployment rate has a mean of 5.5 percent and a standard deviation of 2.4 percent. In summary, the descriptive statistics of the

sample variables portray significant variability across banks, years and LMAs and thus provide an ideal setup for our empirical analysis.

4. Empirical Results

4.1 Basic Results

In this section, we present our main empirical results of the impact of bank consolidation on the rate of new business formation in the local markets. If there are unobserved characteristics which are correlated to our variable of interest (e.g. the intensity of bank consolidation) but omitted from the model, it would be inappropriate to draw any inference from the OLS results due to the biased estimation. Therefore, for each regression, we include LMA fixed effects to control for the micro-level unobservable time-invariant heterogeneity. In addition, we add year dummies to control for timely trend.[10]

Insert Table 3 Here

Table 3 contains results based on our two sets of bank consolidation intensity indexes. Columns 1-4 are based on indexes using deposits information, and Column 5-8 are based on indexes using the number of banks involved in M&As. Column 1 shows that the overall intensity of bank consolidation has a significantly negative effect on new business formation, indicating that, at least in the short run, bank mergers on average impede local entrepreneurial activities. This result is inconsistent with that reported by Black and Strahan (2002) who find an increase in

---

[10] For all model specifications, we report robust standard errors. In addition, we specify our models to allow errors clustered at LMAs, and the results (not reported) are qualitatively the same.

entrepreneurship activities following state deregulation of banking industry. A possible explanation for the difference in results is that we use a measure of consolidation intensity whereas Black and Strahan (2002) use an indicator variable to indicate the deregulation of the banking industry. As mentioned earlier, the authors themselves identified this measure as a caveat to their results. Further, Huang (2007) argues that individual states deregulated branching in waves and banking deregulation may take place in anticipation of future growth, which may create a spurious correlation between banking deregulation and new incorporations. Garmaise and Moskowitz (2006) indicate that a micro-level unit of analysis (such as our measure) provides a stronger insight to the actual economic impact of bank consolidation that is not possible using indicator or dummy variables that capture statewide regulation.

To examine the effect of acquirer's size on new business formation we re-estimated our regressions where we use Index1LG and Index1SM as our measure of consolidation intensity. Results are reported in Columns 2 and 3, respectively. The results are dramatically different across the two measures of new business formation. To be specific, Index1LG has a negative and significant impact on new business formation. In contrast Index1SM has a positive and significant impact. Thus, the negative relationship between bank consolidation and new business formation reported in column 1 is due entirely to mergers initiated by large acquirers.

The negative and significant impact of Index1LG is consistent with the results of Peek and Rosengren (1998) who find that acquirers tend to recast the target in their own image, causing the small business loan portfolio share of the consolidated bank

to converge toward the pre-merger portfolio share of the acquirer. It is also consistent with Stein's (2002) theoretical argument and empirical evidences by Berger, Miller, Petersen, Rajan and Stein (2005) that large banks may have some disadvantages in providing relationship lending to small businesses. Consequently, large acquirers may reduce the lending portfolio of their targets to small businesses in the post-merger period, thereby negatively impacting the formation of new businesses. Finally, our results are also consistent with the findings of Carow, Kane and Narayanan (2006) who document that mega-bank mergers in the U.S. adversely affect small loan customers of the acquired institutions during the period of 1991 to 2001.

The positive impact of Index1SM on new business formation provides support for the argument that because small-to-medium size banks have the expertise in gathering "soft" information, and consequently, making lending decision to small business, they are more able to pass on the synergy gains to new small customers in the post-merger period.

It should also be noted that our results lend support to the findings reported by Garmaise and Moskowitz (2006), who document that local areas that experience more bank consolidation activities are also subject to higher property crime rate, and suggest a causal relationship between bank mergers and crime. Given the importance of small businesses in the new job creation, we believe that our results provide a plausible channel in explaining their findings.

Turning to the other results we see that higher branch density has a negative and significant impact on new business formation across all three measures of

consolidation intensity.   This finding provides support for Petersen and Rajan (1995), who argue that banks will have less incentive to subsidize small firms if they are not able to maintain long-term relationships and thus able to recoup the costs at a later stage when information asymmetry problem is reduced.   This is particular the case for areas characterized by high branch density since this generally means more alternative choices for potential entrepreneurs to obtain credit in local markets. Consequently, forging long-term relationships with newly formed firms is more difficult because entrepreneurs can easily switch to other banks.

Among the other control variables, we observe that local availability of trained human capital is significantly positively related to the rate of new business formation. We also find that LMA economic environment, as measured by unemployment rate, is significantly negatively related to new firm birth.

In Table 3 Columns 5-8, we re-estimate our regressions using indexes based on the number of target banks involved in M&As, and the results are qualitatively the same.   Again, we find that the overall intensity of bank consolidation negatively affects the new business formation rate.   While M&As associated with large acquiring banks have a significantly negative effect, and those associated with small-to-medium sized banks have a significantly positive effect.

4.2. Further Analysis for Sub-sample with "Non-zero" Bank M&A Activities

Berger, Goldberg and White (2001) suggest that bank mergers may have different effects under different environments.   Further, Wall (2004) argues that the effects of

deregulation appear to depend on where it actually occurred. Though we carefully control for the time invariant heterogeneity across LMAs by employing fixed effects in the regressions and control for timely trend, we are still concerned about the problem of omitted variables, especially when these variables are not time invariant. For example, banks consolidate within a certain market in anticipation of economic factors which may also impact the rate of new business formation. Such economic factors may not be time invariant and will lead to faulty inferences when omitted from our models.

In order to address this possibility we focus on a sub-sample with "non-zero" bank consolidation activities and re-run all our regressions with this sub-sample. Our measures of consolidation intensity reflects the fact that M&As events are not evenly distributed, and regional environments possess different attractiveness for such activities. Some LMAs have a substantially high level of bank merger activities, while others may not have any bank M&As activities (i.e., the bank consolidation intensity index is zero). If banks take action to merge in response to certain economic factors, it is reasonable to argue that these factors should be more prominent in LMAs with bank consolidation activities than LMAs without any such activities. By using this sub-sample, we are able to reduce the problem of differences in new business formation stemming from differences in attractiveness of bank consolidations.

Insert Table 4 Here

Results based on this sub-sample are reported in Table 4. Our main findings still

hold.   We find that the overall effect of bank consolidation on new business formation is negative and significant.   When we separate the M&As according to large and small-to-medium acquirers, we find consistent results that M&As by large acquirers have a negative and significant result while that by small-to-medium banks have a positive and significant effect.   In an unreported table, we also conduct the same analysis using a sub-sample with bank consolidation activities above median level.   The results (not reported) are qualitatively the same as our main findings. Taken together, these sets of results indicate that our main results are unlikely to be driven by unobserved factors that may affect both bank M&As activities and new business formation.

For the other control variables, we find consistent results.   Branch density is negatively related to the rate of new business formation.   Our proxy for regional availability of human capital, i.e., the percentage of population with college degrees, is positively related to the new business formation rate, though marginally significant. In addition, local economic environment measured by unemployment rate is negatively correlated with entrepreneurial activities.

4.3 Bank Consolidations in the Urban Areas and New Business Formation

We further investigate whether our reported results are sensitive to our definition and/or measure of LMAs as an additional robustness test.   Rhoades (2000) reports that the majority of metropolitan statistical areas (MSAs) experienced substantial increase in the local market concentration as an important consequence of bank

mergers. Garmaise and Moskowitz (2006) also document different effects of bank mergers on the risk of property crime across areas characterized by the level of market concentration. Hence, we are interested in finding out whether urban and rural areas present different patterns with respect to the effects of banking consolidation on new business formation. Empirically, we define a LMA as an urban area if it contains at least one Metropolitan Statistical Area (MSA, normally a big city). We then re-estimate our model specifications with a sub-sample including only observations in urban areas.

<p align="center">***Insert Table 5 Here***</p>

Table 5 presents our results based on our first and second sets of indexes with this sub-sample. Our main results are robust to different definitions of LMA. The overall effect of banking consolidation is still negative. While large acquirers initiated consolidation negatively affects the rate of new business formation, M&As between small-to-medium sized banks tend to facilitate the formation of new lending relationship. We also perform our tests with a sub-sample based on observations in all rural areas and obtain quite similar results, although the magnitude of coefficients for some of the independent variables are reduced (not reported).[11]

4.4 Bank Consolidation, Market Overlap and New Business Formation

Banks may enter into and expand their business in new markets through acquiring other banks. They may also acquire other banks in their own markets to gain market

---

[11] For the sake of brevity, we do not report all the results discussed in section of robustness check. However, these results are available from the authors upon request.

power. Recent evidence by Erel (2007) indicates that the effect of bank consolidation on loan pricing, especially for small loans, depends on the extent of market overlap between the acquirer and the target prior to the merger. When the acquirer and target have served some common areas before the merger, they may know more about each other and benefit more from potential synergy. It is also reasonable to believe that obtaining "soft" information through lending relationships may require a deeper level of understanding of local markets. Therefore, market overlap between the acquirer and target, and consequently the familiarity of the local market, may also impact the decision of consolidated banks to extend credit to potential entrepreneurs.

Similar to the approach used by Houston, James and Ryngaert (2001) and Erel (2007), we further distinguish our M&A sample by whether they are in-market mergers or out-of-market mergers. In-market mergers are defined as mergers of two banks that were serving at least one common LMA. In contrast, when acquirer and target do not have any market overlap prior to the merger, we define the deal as an out-of-market merger. We use FDIC's summary of deposits data to obtain information about the presence of banks in different LMAs, and use the following formula to calculate market overlap:

$$MarketOverlap = \frac{\sum_{n=1}^{394} \min(Deposits_{acq}, Deposits_{tgt})}{\sum_{n=1}^{394} (Deposits_{acq} + Deposits_{tgt})} \dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

$Deposits_{acq}$ and $Deposits_{tgt}$ denote total deposits held by the acquirer and the target, respectively, in all 394 LMAs. When $MarketOverlap$ equals to zero, it is an

out-of-market merger, otherwise it is an in-market merger. We also distinguish whether the acquirer is a large bank or a small-to-medium sized bank. Finally, we obtain six indexes: Index1TA-InMkt, Index1LG-InMkt, Index1SM-InMkt, Index1TA-OutMkt, Index1LG-OutMkt and Index1SM-OutMkt.[12]

Results based our new indexes are reported in Table 6. The model specifications are similar to those used in our previous analysis. Column 1 and 3 contains results for the overall in-market and out-of-market indexes based on our first and second sets of bank consolidation indexes. To get a deeper understanding of the effects of M&As initiated by different acquirers, in Column 2 and 4, we distinguish mergers according to the size of the acquirers. We find that M&As initiated by large acquirers have a significant negative effect on new business formation rate at the local markets regardless of in-market and out-of-market mergers. Moreover, we find that out-of-market mergers initiated by small-to-medium sized banks have a significantly positive effect on new business formation rate, while the coefficient for in-market mergers initiated by small-to-medium sized banks is also positive but insignificant.

In-market large acquirers may be characterized by a higher level of restructuring and reassessing of their lending portfolios due to the prior market overlap, and, consequently, adversely affect the credit availability of new businesses in the post-merger period. In contrast, mergers by in-market small-to-medium sized banks may not require significant changes because this is not new territory for them and in all likelihood have already established lending relationships. Consistent with this

---

[12] The definitions of these 6 indexes are quite similar to those we used before (also see Table 1 for definitions). Only here, we further distinguish a particular merger according to whether it is an in-market (InMkt) merger or an out-of-market (OutMkt) merger.

line of reasoning we observe insignificant effects of in-market mergers initiated by small banks on new business formation.

Marquez (2002) argues that entrant banks are at an informational disadvantage in screening creditworthy borrowers from non-creditworthy ones. In order for entrant banks to successfully compete in the new markets, they acquire information base about the markets and must also have the expertise to use this information appropriately. Out-of-market acquirers have no prior relationship(s) in the new markets, and rely on acquiring incumbent banks to get customer base and some familiarity of the new markets. However, large out-of-state acquirers may not have the expertise to process the acquired information, especially when the information is soft (Berger, Miller, Petersen, Rajan and Stein, 2005; Stein, 2002). Or, given their large size, they may even have no interest in extending credit to small new firms. Thus, it is not surprising that out-of-market large mergers do not significantly impact new business formation. In contrast, out-of-market small acquiring banks have the superior expertise and strong incentive to use the information they acquired to make lending decision to new firms, consequently have a positive effect on the rate of new business formation. This line of argument is supported by our findings in Table 6.

Insert Table 6 Here

4.4 The Long-run Effects of Bank Consolidation on New Business Formation

Prior research indicates that though merging banks typically experience reassessing and re-structuring of their loan portfolios, the negative shock to credit in

the post-merger period may be absorbed after a length of time (Bonaccorsi di Patti and Gobbi, 2007). Also, Erel (2007) shows that it is possible that synergy gains created in bank mergers will be passed on to bank customers, especially small customers, through reduced loan pricing in one and two years subsequent to the bank mergers.

Given the negative effect of bank M&As initiated by large acquirers on new business formation at the local market level, it is instructive to examine if this is a permanent effect. It is quite likely that small new customers will also benefit if merging banks can learn more about the local market and pass on some of the synergy gains to them in the post-merger period. To examine if this in fact occurs we investigate the long-run effect of bank M&As initiated by large banks on new business formation for up to three years.

Insert Table 7 Here

Table 7 reports our empirical results relating LMA new business formation rate over the long run to the intensity of banking consolidation initiated by large acquirer. In our model specifications, we distinguish in-market M&As and out-of-market M&As. In general, we find that after two years M&As initiated by large in-market acquirers have a positive impact on local new business formation rate, while the negative effects of out-of-market M&As initiated by large acquirers will persist for one more year.

A possible explanation for this phenomenon is the following. In the short-run, large in-market acquiring banks may experience restructuring of their lending

portfolio. However, in the long-run, they may use their informational advantage as incumbent banks to identify creditworthy potential entrepreneurs (Marquez, 2002). Also, by acquiring in-market targets, the acquirers can reduce their informational investment (Hauswald and Marquez, 2006) and pass on the synergy gains to small new customers. This result is also consistent with Erel's (2007) findings that, on average, the price for small loans decreases one year and two years following M&As, especially for in-market mergers. However, large acquirers from out-of-market are at an informational disadvantage and do not have the expertise in using soft information. Though they acquirer knowledge base about the local markets and customer relation, it is difficult for them to facilitate lending relationship with would-be entrepreneurs in the post-merger period.

4.6 Additional Robustness Tests

We perform some additional tests as robustness checks. For example, in areas where economies are doing poorly, there will be more M&A activities because bank consolidation serves as a means to reduce excess capacity. Therefore, the negative relationship between new business formation and bank consolidation could be driven by poor economic performance in local markets.

In order to address the possibility of reverse causality, we divide our sample into two sub-samples according to the local economy performance, proxied by LMA employment growth: LMAs with employment growth rate above median level and below median level. This allows us to examine whether the relationship between

new business formation and bank consolidation is similar across both "good" and "bad" economic times. Our results (not reported) indicate that although the coefficients of both sets of indexes are not always significant, the signs are similar to those reported above. This indicates that our findings are less likely to be driven by reverse causality.

In the previous analyses, we only separate the intensity of bank consolidation according to the size of acquirers. Here we further differentiate bank consolidation measures according to the size of targets, and consider different possible combinations between the acquirers and targets such as Large-Large, Large-Small and Small-Small. Results (not reported) are qualitatively similar to our main results. That is, whenever the acquirers are large banks, there is a negative relationship between new business formation and bank M&As, while consolidation between small-to-medium sized banks have a positive effect on new business formation.

Finally, we examine whether our results are sensitive to different measures of local entrepreneurial activities such as net new business formation. We collect data on firm deaths in the same LMAs, therefore, we are able to measure the net births of new firms. We re-estimate all the reported models using this new measure as dependent variables while keeping two sets of bank consolidation intensity indexes and other independent variables intact. In some cases, the results are strikingly similar however in some of the estimates while the magnitude of the key independent variables are same, but the strength of their statistical significance are found to be weaker than the reported results. Given these results did not change our conclusion

qualitatively we do not report these additional tests in the text for the sake of brevity.

5. Discussion and Conclusion

Small businesses are responsible for a significant proportion of innovation activities and wealth creation. Moreover, they also fulfill an important social function through their job creation. For these reasons, whether and to what extent banking consolidation will impact small businesses access to bank credit, and consequently entrepreneurial activities, have been a major public concern arising from the deregulation of banking system in the U.S. While the existing literature has provided some insights on the effects of bank M&A activities on small business lending, it is still ambiguous how this ongoing trend affects entrepreneurship.

Using a unique dataset, this paper further explores this issue in the local markets through investigating the impact of actual intensity of bank consolidation on the formation of new lending relationship and businesses in the post Riegle-Neal Interstate Banking and Branching Efficiency Act period. We find that overall, banking consolidation is negatively related to the rate of new business formation in the short-run. When we distinguish bank M&As according to whether large banks initiate the deals, further results emerge and indicate that the negative relationship is mainly driven by consolidations initiated by large acquirers. In contrast, consolidation among small-to-medium sized banks has a positive impact on the rate of new business formation. These findings are generally consistent with the existing literature (see, e.g., Berger, Saunders, Scalise and Udell, 1998; Peek and Rosengren, 1998; Strahan and Weston, 1998, Karceski, Ongena and Smith, 2005).

As a further step, we distinguish bank M&As according to whether out-of-market or in-market banks initiate the deals. Our main results still hold controlling for this distinction. We find that M&As associated with large in-market acquiring banks have a significant negative impact on the rate of new business formation. Also, bank mergers initiated by large out-of-market acquirers do not significantly affect local entrepreneurial activities. Moreover, we document that bank mergers initiated by small-to-medium sized out-of-market acquirers actually promote new business formation rate in local markets.

We also examine the long run effects of bank mergers on new business formation, especially for bank M&As initiated by large acquirers given that they have a negative effect on regional entrepreneurial activities in the short run. Interestingly, we find, after two years bank M&As initiated by large in-the-state acquirers have a significant positive impact on new business formation in local markets. This suggests that it takes some time for these consolidated banks to pass on some of the synergy gains to small new customers. In other words, these kinds of consolidations are characterized by a learning process. We find similar results when we turn to bank mergers initiated by smaller banks. However, the magnitude is smaller and not significant in the long-run.

In summary, our empirical research design based on a suitable unit of analysis and accurate measures of intensity of bank consolidation allows us to capture the impact of banking consolidation on new business formation more precisely. As the U.S. banking industry continues to consolidate resulting in the creation of even larger

banks, it is worthwhile to evaluate the real effects of bank mergers on new start-ups

and the availability of credit from banks.   We thus contribute to the existing literature

by shedding further light on this important issue.   Though the negative impact

associated with large bank mergers may partially be offset by smaller consolidations,

and in the long-run by M&As initiated by larger acquirers, nevertheless, these results

are still of concern since the banking industry is the major source of funding for small

businesses that are so crucial to the vitality of the economy.

REFERENCES

Armington, Catherine and Zoltan J. Acs (2002). "The Determinants of Regional Variation in New Firm Formation." Regional Studies 36: 34-35.

Armington, Catherine, Bruce Kirchhoff, Iftekhar Hasan, Scott Newbert (2006) "Linking University R&D, New Firm, and Economic Development: An Empirical Investigation." Journal of Entrepreneurship, Theory, and Practice, forthcoming.

Berger, Allen N., Rebecca S. Demsetz and Philip E. Strahan (1999). "The consolidation of the financial services industry: Causes, consequences, and implications for the future." Journal of Banking & Financing 23: 135-194.

Berger, Allen N., Lawrence G. Goldberg and Lawrence J. White (2001). "The Effects of Dynamic Changes in Bank Competition on the Supply of Small Business Credit." European Finance Review 5: 115-139.

Berger, Allen N., Nathan H. Miller, Mitchell A. Petersen, Raghuram G. Rajan and Jeremy C. Stein (2005). "Does function follow organization form? Evidence from the lending practices of large and small banks." Journal of Financial Economics 76: 237-269.

Berger, Allen N., Anthony Saunders, Joseph M. Scalise and Gregory F. Udell (1998). "The effects of bank mergers and acquisitions on small business lending." Journal of Financial Economics 50: 187-229.

Berger, Allen N. and Gregory F. Udell (1995). "Relationship Lending and Lines of Credit in Small Firm Finance." Journal of Business 68(3): 351-381.

Berger, Allen N. and Gregory F. Udell (1996). "Universal banking and the future of

small business lending." Universal Banking: Financial System Design Reconsidered(In: Saunders, A., Walter, I (Eds)): 558-627.

Black, Sandra E. and Philip E. Strahan (2002). "Entrepreneurship and Bank Credit Availability." The Journal of Finance, LVII(6): 2807-2833.

Board of Governors of the Federal Reserve System (2002). "Report to the Congress on the Availability of Credit to Small Business."
http://www.federalreserve.gov/boarddocs/RptCongress/sbfreport2002.pdf.

Bofondi, Marcello and Giorgio Gobbi (2004). "Bad Loans and Entry into Local Credit Markets." Working paper.

Bonaccorsi Di Patti, Emilia and Giorgio Gobbi (2007). "Winners or Losers? The Effects of Banking Consolidation on Corporate Borrowers." Journal of Finance, forthcoming.

Carow, Kenneth A., Edward J. Kane and Rajesh P. Narayanan (2006). "How Have Borrower Fared in Banking Megamergers?" Journal of Money, Credit and Banking 38(3): 821-836.

Clark, J. (1996). "Economic cost, scale efficiency and competitive viability in banking." Journal of Money, Credit, and Banking 28: 342-364.

Cole, R. A., J. D. Wolken, et al. (1996). "Bank and nonbank competition for small business credit: Evidence from the 1987 and 1993 National Surveys of Small Business Finance." Federal Reserve Bulletin 82: 983-995.

Erel, Isil (2007). "The Effect of Bank Mergers on Loan Prices: Evidence from the U.S." Dice Center Working Paper, The Ohio State University.

Evants, David S. and Linda S. Leighton (1989). "Some Empirical Aspects of Entrepreneurship." The American Economic Review 79(3): 519-535.

Garmaise, Mark J. and Tobias J. Moskowitz (2006). "Bank Mergers and Crime: The Real and Social Effects of Credit Market Competition." The Journal of Finance LXI(2): 495-538.

Guiso, Luigi, Paola Sapienza and Luigi Zingales (2004). "Does Local Financial Development Matter?" Quarterly Journal of Economics 119(3): 929-969.

Hauswald, Robert and Robert Marquez (2006). "Competition and Strategic Information Acquisition in Credit Markets." Review of Financial Studies 19(3):

967-1000

Houston, Joel F., Christopher M. James and Michale D. Ryngaert (2001). "Where do merger gains come from? Bank mergers from the perspective of insiders and outsiders." Journal of Financial Economics 69: 285-331.

Huang, Rocco R. (2007). "Evaluating the real effect of bank branching deregulation. Comparing contiguous counties across U.S. state borders." Journal of Financial Economics (In press).

Karceski, Jason, Steven Ongena and David C. Smith (2005). "The Impact of Bank Consolidation on Commercial Borrower Welfare." The Journal of Finance LX(4): 2043-2082.

Klein, Michael. (1971). "A theory of the banking firm." Journal of Money, Credit and Banking 3(2): 205-218.

Kirchhoff, Bruce A., Scott L. Newbert, Iftekhar Hasan and Catherine Armington (2007). "The Influence of University R&D Expenditures on New Business Formations and Employment Growth." Entrepreneurship: Theory & Practice July: 543-559.

Marquez, Robert. (2002). "Competition, adverse selection, and information dispersion in the banking industry." Review of Financial Studies, 15: 901-926.

Pagano, M., (1993), "Financial markets and growth. An overview" European Economic Review, 37: 613-622.

Peek, Joe and Eric S. Rosengren (1998). "Bank consolidation and small business lending: It's not just bank size that matters." Journal of Banking & Financing 22: 799-819.

Petersen, Michell A. and Raghuram G. Rajan (1994). "The Benefits of Lending Relationships: Evidence from Small Business Data." The Journal of Finance XLIX(1): 3-37.

Petersen, Mitchell A and Ragjuran G. Rajan (1995). "The Effect of Credit Market Competition on Lending Relationships." Quarterly Journal of Economies May: 407-443.

Rhoades, Stephen A. (2000). "Bank Mergers and Banking Structure in the United States, 1980-98." Board of Governors of the Federal Reserve System August.

Sapienza, Paola (2003). "The Effects of Banking Mergers on Loan Contracts." The

Journal of Finance LVII(1): 329-367.

Strahan, Philip E. and James P. Weston (1998). "Small business lending and the changing structure of the banking industry." Journal of Banking & Financing 22: 821-845.

Stein, Jeremy C. (2002). "Information Production and Capital Allocation: Decentralized versus Hierarchical Firms." The Journal of Finance LVII(8): 1891-1921.

Wall, Howard J. (2004). "Entrepreneurship and the Deregulation of Banking." Economic Letter 82: 333-339.

Williamson, O. (1988). "Corporate finance and corporate governance." Journal of Finance 43: 567-591.

Zarutskie, Rebecca (2006). "Evidence on the effects of bank competition on firm borrowing and investment." Journal of Financial Economics 81: 503-537.

Table 1
Variable Definitions[13]

Variable Name	LMA Measurement	Source of Data	Data Year
New Firm Formation	Number of firm births scaled by labor force in thousands	U.S. Census LEEM File	1994-1999
Index1TA	Total amount of deposits held by target banks scaled by total deposits in a LMA.	FDIC Regulatory Database: Merger Information	1994-1999
Index1LG	Total amount of deposits held by target banks scaled by total deposits in a LMA while acquirers are large banks.	FDIC Regulatory Database: Merger Information	1994-1999
Index1SM	Total amount of deposits held by target banks scaled by total deposits in a LMA while acquirers are small-to-medium sized banks.	FDIC Regulatory Database: Merger Information	1994-1999
Index2TA	The number of banks as targets involved in M&A scaled by total number of banks in a LMA.	FDIC Regulatory Database: Merger Information	1994-1999
Index2LG	The number of banks as targets scaled by total number of banks in a LMA when acquirers are large banks.	FDIC Regulatory Database: Merger Information	1994-1999
Index2SM	The number of banks as targets scaled by total number of banks in a LMA when acquirers are small-to-medium sized banks.	FDIC Regulatory Database: Merger Information	1994-1999
Market HHI	Herfindahl-Hirschman Index (HHI) calculated based on branch-level deposit information	FDIC summary of deposits database	1994-1999
Branch Density	The number of branches per 100 square miles	FDIC summary of deposits database	1994-1999
LMA Population	The number of residence in a LMA (in natural logarithm form)	U.S. Census LEEM File	1994-1999
Fraction of Population with College Degree	The number of population with college scaled by LMA population	U.S. Census LEEM File	1994-1999
Per Capita Income	Per Capital Income in thousand	BEA Database	1994-1999
Unemployment Rate	LMA unemployment rate	U.S. Census LEEM File	1994-1999

---

[13] Following Beger, Saunders, Scalise and Udell (1998) we define a large bank as a bank with total assets more than $1 billion.

39

Table 2 Summary Statistics

Variable Name	Observations	MEAN	ST.DEV	Minimum	Maximum
New Business Formation	2364	3.551	0.895	1.850	10.260
Index1TA	2364	0.066	0.105	0.000	0.785
Index1LG	2364	0.051	0.099	0.000	0.785
Index1SM	2364	0.015	0.035	0.000	0.412
Index2TA	2364	0.050	0.058	0.000	0.545
Index2LG	2364	0.029	0.049	0.000	0.294
Index2SM	2364	0.020	0.032	0.000	0.294
Market HHI (Deposit-based)	2364	0.096	0.049	0.021	0.523
Branch Density	2364	2.000	4.000	0.000	10.000
LMA Population in Logs	2364	12.800	0.940	11.510	16.590
Percentage of Population with College Degree	2364	0.094	0.029	0.040	0.242
Per capita Income ($ thousand)	2364	21.053	3.865	11.070	40.740
Unemployment Rate	2364	0.055	0.024	0.020	0.300

Table 3. Regression Relating New Business Formation to Bank Consolidation Intensity: Basic Results

Independent Variables	Dependent Variable: New Business Formation Rate							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	-13.815	-14.221	-13.227	-14.199	-11.631	-10.084	-13.352	-10.146
	(16.82)	(16.85)	(16.67)	(16.77)	(16.84)	(16.83)	(16.67)	(16.75)
Index1TA	-0.089*							
	(0.06)							
Index1LG		-0.151***		-0.147**				
		(0.05)		(0.06)				
Index1SM			0.387**	0.376*				
			(0.20)	(0.20)				
Index2TA					-0.259**			
					(0.11)			
Index2LG						-0.540***		-0.529***
						(0.13)		(0.12)
Index2SM							0.361*	0.358*
							(0.20)	(0.20)
Market HHI (Deposit)	0.457	0.463	0.453	0.465*	0.439	0.437	0.456*	0.439
	(0.29)	(0.28)	(0.29)	(0.30)	(0.29)	(0.30)	(0.28)	(0.30)
Branch Density	-1.034***	-1.019***	-1.003***	-0.988***	-1.043***	-1.035***	-1.026***	-1.005***
	(0.34)	(0.33)	(0.34)	(0.32)	(0.348)	(0.34)	(0.34)	(0.33)
LMA Population in Logs	1.196	1.223	1.151	1.217	1.038	0.925	1.164	0.925
	(1.22)	(1.22)	(1.21)	(1.22)	(1.22)	(1.22)	(1.21)	(1.22)
% of Population with College Degree	19.854*	20.440*	19.635*	20.807*	18.341	17.397	19.246*	17.808
	(11.88)	(11.91)	(11.75)	(11.83)	(11.88)	(11.82)	(11.75)	(11.745)
Per capita Income	0.0184	0.019	0.018	0.019	0.018	0.017	0.018	0.018
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployment Rate	-1.656*	-1.635*	-1.703**	-1.645*	-1.638*	-1.594*	-1.703**	-1.605*
	(0.87)	(0.86)	(0.87)	(0.87)	(0.88)	(0.86)	(0.87)	(0.86)
LMA fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	2,364	2,364	2,364	2,364	2,364	2,364	2,364	2,364
F-Statistics	54.26***	55.06***	58.28***	54.30***	54.12***	55.38***	58.68***	54.49***
Adjusted R-Square	93.58%	93.59%	93.60%	93.61%	94.69%	93.64%	93.59%	93.66%

The symbols ***, **, *, denote significance level at 1%, 5% and 10%, respectively.   Robust standard errors are reported in parentheses.

Table 4. Regression Relating New Business Formation to Bank Consolidation Intensity: Sub-sample with "Non-Zero" Bank M&As

Independent Variables	Dependent Variable: New Business Formation Rate							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	-28.215	-28.773	-26.394	-27.864	-25.736	-24.063	-27.170	-23.784
	(19.214)	(19.38)	-18.95	(19.27)	(19.17)	(19.18)	(18.84)	(19.09)
Index1TA	-0.086							
	(0.06)							
Index1LG		-0.150**		-0.130**				
		(0.06)		(0.06)				
Index1SM			0.485**	0.438*				
			(0.25)	(0.31)				
Index2TA					-0.310**			
					(0.15)			
Index2LG						-0.676***		-0.621***
						(0.16)		(0.16)
Index2SM							0.607**	0.335
							(0.25)	(0.26)
Market HHI (Deposit)	0.579*	0.601*	0.550*	0.593*	0.568*	0.607**	0.569*	0.603*
	(0.31)	(0.31)	(0.32)	(0.312)	(0.31)	(0.31)	(0.313)	(0.31)
Branch Density	-0.887***	-0.878***	-0.848***	-0.846***	-0.889***	-0.892***	-0.883***	-0.867***
	(0.32)	(0.31)	(0.31)	(0.30)	(0.33)	(0.32)	(0.32)	(0.31)
LMA Population in Logs	2.181*	2.218*	2.042	2.146*	2.005	1.886	2.105*	1.860
	(1.37)	(1.38)	(1.35)	(1.37)	(1.36)	(1.36)	(1.34)	(1.36)
% of Population with College Degree	32.756**	33.485**	32.168**	33.515**	31.048**	29.983**	31.848**	30.323**
	(14.08)	(14.11)	(13.76)	(13.97)	(13.94)	(13.85)	(13.72)	(13.75)
Per capita Income	0.029**	0.029**	0.029*	0.029**	0.027*	0.026*	0.029*	0.027*
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Unemployment Rate	-3.051***	-3.015***	-3.008***	-2.964***	-3.002***	-2.872***	-3.031***	-2.844***
	(1.09)	(1.09)	(1.10)	(1.10)	(1.09)	(1.08)	(1.09)	(1.08)
LMA fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	1,564	1,564	1,564	1,564	1,564	1,564	1,564	1,564
F-Statistics	33.48***	34.75***	35.72***	33.88***	33.24***	35.51***	37.28***	34.23***
Adjusted R-Square	94.44%	94.46%	94.47%	94.48%	94.46%	94.54%	94.48%	94.55%

The symbols ***, **, *, denote significance level at 1%, 5% and 10%, respectively. . Robust standard errors are reported in parentheses.

Table 5. Regression Relating New Business Formation to Bank Consolidation Intensity: Urban Areas

Independent Variables	Dependent Variable: New Business Formation Rate							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	-36.885**	-37.560**	-36.051**	-37.194**	-34.145**	-32.084**	-36.489**	-32.231**
	(15.12)	(15.16)	(14.78)	(14.96)	(15.00)	(14.99)	(14.92)	(14.92)
Index1TA	-0.054							
	(0.06)							
Index1LG		-0.126**		-0.117**				
		(0.06)		(0.06)				
Index1SM			0.690**	0.676**				
			(0.29)	(0.29)				
Index2TA					-0.280**			
					(0.12)			
Index2LG						-0.569***		-0.570***
						(0.14)		(0.13)
Index2SM							0.399*	0.398
							(0.26)	(0.2&)
Market HHI (Deposit)	0.547*	0.558*	0.544*	0.562*	0.528*	0.521*	0.542*	0.523*
	(0.31)	(0.30)	(0.31)	(0.31)	(0.30)	(0.30)	(0.31)	(0.30)
Branch Density	-0.994***	-0.987***	-0.925***	-0.924***	-1.006***	-1.005***	-0.977***	-0.992***
	(0.35)	(0.34)	(0.33)	(0.32)	(0.36)	(0.35)	(0.34)	(0.344)
LMA Population in Logs	2.739**	2.783***	2.669**	2.746***	2.547**	2.399*	2.710**	2.407**
	(1.07)	(1.07)	(1.04)	(1.06)	(1.06)	(1.05)	(1.05)	(1.05)
% of Population with College Degree	37.079***	37.845***	37.387***	38.521***	35.308***	34.122***	36.728***	34.237***
	(9.96)	(9.98)	(9.82)	(9.89)	(9.87)	(9.73)	(9.88)	(9.70)
Per capita Income	0.035***	0.036***	0.035***	0.037***	0.034***	0.035***	0.035***	0.035***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployment Rate	-1,888**	-1,872**	-1,887**	-1,864**	-1,873**	-1,770*	-1,843**	-1,716*
	(0.94)	(0.94)	(0.93)	(0.94)	(0.93)	(0.92)	(0.94)	(0.92)
LMA fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	1,602	1,602	1,602	1,602	1,602	1,602	1,602	1,602
F-Statistics	49.82***	50.81***	56.66***	52.62***	49.79***	50.79***	53.68***	49.69***
Adjusted R-Square	94.32%	94.34%	94.39%	94.40%	94.35%	94.42%	94.34%	94.43%

The symbols ***, **, *, denote significance level at 1%, 5% and 10%, respectively. Robust standard errors are reported in parentheses..

Table 6

The Effects of "In-market Mergers" Vs "Out-of-Market Mergers" on New Business Formation Rate at the Local Markets

Independent Variables	Dependent Variable: New Business Formation Rate			
	(1)	**(2)**	**(3)**	**(4)**
Constant	-13.786	-14.191	-11.603	-10.357
	(16.83)	(16.79)	(16.85)	(16.77)
Index1TA-InMkt	-0.075			
	(0.08)			
Index1LG-InMkt		-0.090		
		(0.08)		
Index1SM-InMkt		0.148		
		(0.33)		
Index1TA-OutMkt	-0.098			
	(0.08)			
Index1LG-OutMkt		-0.183**		
		(0.08)		
Index1SM-OutMkt		0.435**		
		(0.23)		
Index2TA-InMkt			-0.206	
			(0.16)	
Index2LG-InMkt				-0.343*
				(0.20)
Index2SM-InMkt				0.113
				(0.29)
Index2TA-OutMkt			-0.301**	
			(0.14)	
Index2LG-OutMkt				-0.679***
				(0.16)
Index2SM-OutMkt				0.514**
				(0.24)
Market HHI (Deposit)	0.457*	0.462	-0.441	0.446
	(0.29)	(0.23)	(0.29)	(0.29)
Branch Density	-1.032***	-0.962***	-1.036***	-0.983***
	(0.34)	(0.31)	(0.35)	(0.32)
LMA Population in Logs	1.194	1.215	1.035	0.943
	(1.22)	(1.22)	(1.22)	(1.21)
% of Population with College Degree	19.857*	21.049*	18.298	17.571
	(11.89)	(11.87)	(11.88)	(11.78)
Per capita Income	0.018	0.019	0.018	0.018*
	(0.01)	(0.01)	(0.01)	(0.01)
Unemployment Rate	-1.645*	-1.647*	-1.615*	-1.610*
	(0.87)	(0.86)	(0.87)	(0.86)
LMA fixed effect	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES
Number of observations	2,364	2,364	2,364	2,364
F-Statistics	50.15***	47.17***	50.33***	47.88***
Adjusted R-Square	93.58%	93.61%	93.59%	93.66%

The symbols ***, **, *, denote significance level at 1%, 5% and 10%, respectively. Robust standard errors are reported in parentheses.

Table 7
Long-run Effects of Bank Consolidation on New Business Formation: Evidence from Bank M&As Initiated by Large Acquirers

Independent Variables	Dependent Variable: New Business Formation Rate					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-26.991	-31.999	-27.599	-31.347	-29.995	-29.329
	(31.51)	(28.97)	(30.79)	(31.68)	(29.86)	(31.99)
Index1LG-InMkt(Lag-1)	-0.053		-0.043			
	(0.06)		(0.07)			
Index1LG-InMkt(Lag-2)	0.149**		0.147**			
	(0.06)		(0.07)			
Index1LG-InMKt(Lag-3)	0.279***		0.289***			
	(0.09)		(0.09)			
Index1LG-OutMkt(Lag-1)		-0.149**	-0.161***			
		(0.07)	(0.06)			
Index1LG-OutMkt(Lag-2)		0.132	0.122			
		(0.10)	(0.09)			
Index1LG-OutMkt(Lag-3)		-0.001	-0.007			
		(0.04)	(0.05)			
Index2LG-InMkt(Lag-1)				-0.224		-0.219
				(0.21)		(0.19)
Index2LG-InMkt(Lag-2)				0.589***		0.622***
				(0.09)		(0.10)
Index2LG-InMKt(Lag-3)				0.417**		0.429**
				(0.22)		(0.19)
Index2LG-OutMkt(Lag-1)					-0.356***	-0.385***
					(0.076)	(0.10)
Index2LG-OutMkt(Lag-2)					-0.070	-0.211
					(0.23)	(0.18)
Index2LG-OutMkt(Lag-3)					0.073	-0.029
					(0.12)	(0.15)
Market HHI (Deposits)	-0.169	-0.150	-0.144	-0.031	-0.143	-0.032
	(0.35)	(0.36)	(0.37)	(0.38)	(0.34)	(0.35)
Branch Density	1.373	1.712	1.358	1.548	1.644	1.426
	(1.28)	(1.45)	(1.31)	(1.47)	(1.47)	(1.53)
LMA Population in Logs	2.195	2.536	2.233	2.505	2.398	2.359
	(2.27)	(2.09)	(2.22)	(2.29)	(2.16)	(2.31)
% of Population with College Degree	21.745	27.067	22.728	25.306	25.306	24.109
	(21.32)	(19.00)	(20.85)	(20.88)	(19.62)	(21.18)
Per Capita Income	0.015	0.021	0.016	0.016	0.018	0.016
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Unemployment Rate	-1.325**	-1.245*	-1.215**	-1.492**	-1.383**	-1.571***
	(0.58)	(0.64)	(0.51)	(0.58)	(0.69)	(0.58)
LMA fixed effect	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES
Number of observations	1,182	1,182	1,182	1,182	1,182	1,182
F-Statistics	48.67***	48.58***	48.25***	48.87%	48.69***	48.41***
Adjusted R-Square	94.22%	94.20%	94.21%	94.24%	94.20%	94.32%

The symbols ***, **, *, denote significance level at 1%, 5% and 10%, respectively.   Robust standard errors are reported in parentheses.