SMALL BUSINESS LENDING AND BANK CONSOLIDATION

Luke Mueller-Oden

George Washington University

Abstract

This paper examines the relationship between market concentration in banking and the quantity of loans available to small businesses. Using data on origination of small business loans and deposit market share from the Community Reinvestment Act (CRA) and the Federal Deposit Insurance Corporation (FDIC) respectively, I evaluate the relationship between concentration and small business lending. This analysis uses panel data across all 50 states and D.C with entity and time fixed effects to control for variation across jurisdictions and business cycles. The results show a statistically significant negative relationship between the small business lending measure and bank market concentration. However, further research and data collection is needed to better understand this relationship. (JEL Classification Codes: G21, G28, G34, G38)

1 Introduction

Small business lending is an important engine for economic growth, and any threat to the availability of credit for small businesses could have negative consequences for the American economy. The negative consequences of limited capital access for small businesses include, but are not limited to, reduced business birth and survival rates, weaker competition among businesses, and higher local and national rates of unemployment. Many small businesses have historically relied upon their relationships with loan officers at local and community banks to secure access to credit. Therefore, when rules preventing banks from operating across state lines were relaxed and a wave of bank consolidation kicked off in the mid-1990s, researchers worried that it would lead to credit rationing affecting small businesses. As a result, this became a major empirical question for economists, many of whom feared that market power in finance and a decline in institutional relationships in lending would deprive American small businesses of capital.

In this paper, I employ a panel data analysis, examining data across all 50 states and the District of Columbia for every third year between 1997 and 2018. For this analysis, my dependent variable is the quantity of funds lent out in small business loans in thousands of real 2012 dollars (chained). They key independent variable is market concentration measured by the Herfindahl-Hirschman Index looking at deposit market share in banking. This novel approach allows me to examine the macroeconomic implications of trends towards market concentration at the state level with implications for small business capital access at national level. This approach differs from most of the existing literature because it is not limited to the microeconomic implications of mergers and acquisitions for a given bank's clients. For the purposes of this paper, I use the Community Reinvestment Act definition of small business loans, which is loans in amounts of 1 million dollars or less. This paper benefits from additional data and a longer period of study than much of the existing literature.

My findings lend support to the concerns raised above since they show a statistically significant negative relationship between higher levels of market concentration and small business lending. This may be because small banks are unable to sufficiently expand their small business lending operations to cover the gaps left by larger banks, or because there are barriers to new banks entering the market.

2 Literature Review

The bulk of the existing literature was written in the late 1990s when reforms to banking regulations kicked off a surge in mergers and acquisitions, both of which generated a great deal of interest in the

effects of market concentration on lending practices. Researchers were concerned that bank consolidation would lead to credit rationing, a situation wherein the demand for credit outstrips the supply, driving higher interest rates and tighter lending standards, because larger banks that replaced small banks might not lend as much to small businesses as their predecessors. This could lead to negative impacts on economic growth because small businesses are crucial sources of employment and provide much needed competition for larger firms. Because small businesses are known to be dependent on bank capital to survive and grow, small business credit rationing could have severe consequences to the creation and growth of American small businesses. On the other hand, if large banks are able to achieve economies of scale and if a level of competition is maintained, bank consolidation could potentially have positive consequences by lowering rates and expanding lending.

2.1 Organizational Economies of Scale

The potential for bank consolidation to sustain small business lending is examined by Strahan and Weston (1996), who found that a decline in the presence of small banks will not adversely impact the availability of credit for small businesses. They based this conclusion on the fact that while small, independent banks maintained a larger portion of their loan portfolio in small business loans, many larger banks also engaged in significant small business lending. They also found that small banks involved in mergers expanded their small business lending portfolios, rather than reducing them. Additionally, some of the data examined during the period where banks were consolidating, found that small non-merging banks were expanding their portfolio of small business loans. These findings imply that bank consolidation does not result in a significant withdrawal from the small business credit markets by consolidating banks, and while some consolidating banks do reduce their participation in the market for small business credit, other small banks make up for the difference. It should be noted that the researchers in this article only examine the amount of small business lending, not differential loan interest rates or the specific loan recipients. This conclusion was also reached based on a relatively new data set and the researchers cautioned against taking too strong a message from their findings.

Research from Strahan and Weston (1998) examines the possible effects of economies of scale on small business lending using data covering the whole of the U.S. These researchers theorize that although the complexity of the organization might introduce diseconomies of scale, the superior ability to diversify loan portfolios will exert a countervailing force. They hypothesize that banks with more branches will have greater turnover among their loan officers as people are promoted or move between branches, disrupting the relationships upon which much of small business lending depends. Their findings indicate that as banks consolidate, they expand their small business lending portfolios until they reach a certain asset value threshold. After reaching this threshold, small business lending declines as a portion of total lending. However, this does not necessarily indicate that larger banks withdraw from small business lending, but rather that they expand lending to larger enterprises once they grow beyond a certain size and have greater lending capacity. Small banks are generally prevented from lending to larger firms because the size of the loans big companies need would strain regulatory requirements on bank portfolio diversification. Thus, while these researchers conclude that bank consolidation is not a threat to small businesses, they caution that their results consider only the actions of merging institutions. They do not analyze the response from the market as a whole.

Other researchers try to find evidence for diseconomies of scale by looking at the organizational structure of banks and how this influenced their lending practices. Similar to reasoning on the study of relationship lending, this research was based on the hypothesis that organizationally complex banks suffer a competitive disadvantage in small business lending and would therefore reduce their participation in this lending segment. A study by Keeton (1995) asked if large, multi-office banks would be less willing to lend to small businesses than the pre-existing small banks prior to the mergers. They found that branch banks and banks headquartered out of state tended to reduce the portion of their portfolios allocated to small businesses lending compared to the smaller banks. This finding is in line with the conclusions of Hendrickson and Rauch (2004) and Udell (1995), who found that larger banks do not engage in small business financing to the same degree as smaller banks. Their conclusion also has similar limitations in that it does not prove that bank consolidation will lead to reduced credit availability for small businesses. Because only consolidating and small banks were analyzed, many banks and financial institutions were not studied in this work. The researchers leave open the possibility that as banks continue to consolidate and reduce their role in the small business lending market, new entrants will rise to fill the void. However, if this does not occur, then it is likely smaller businesses

would suffer from a lack of access to credit.

2.2 Relationship lending

Another issue examined in the literature is the types of loans being offered. It was suspected that small banks were better able to maintain a lending relationship with the businesses which borrowed from them, with firms being evaluated both on the objective information available and on the subjective judgement of the loan officer. This process is dependent on loan officers and other relevant bank officials serving for long periods of time so a relationship can develop. These more embedded relationships generate higher-quality information on lending risks and lending terms for a larger range of business types. Policymakers were concerned that larger banks would be unable to or uninterested in establishing strong lending relationships due to their moving and promoting employees more frequently. Larger banks would instead make "ratio" loans based on a set of predefined objective criteria, which tends to exclude newer and smaller businesses lacking a consistent track record or standard form of collateral.

The first type of lending popular among smaller banks, relationship lending, is beneficial to small business lending because it helps overcome the information asymmetries associated with small business lending. Udell and Berger (1995) found that borrowers with longer relationships with their lenders had better terms on their lines of credit because of these reduced information asymmetries. These researchers were careful, however, to caution that their findings did not prove that bank consolidation would limit credit availability to small businesses, even though small banks had a competitive advantage in small business lending relative to larger banks. This would suggest that as larger banks merged with or acquired smaller banks, they would reduce their participation in the small business lending market, but their place might be filled by other small banks.

This concern was validated by research from Hendrickson and Rauch (2004), who found evidence that consolidation led larger banks to reduce relationship loans with small businesses. This finding was drawn from data taken from the Federal Reserve's Quarterly Survey of the Terms and Bank Lending and was based upon changes in the interest rate markups charged by large and small banks. The researchers found that, as banks consolidated, they abandoned relationship loans in favor of ratio loans, and this was reflected in diverging interest rates by type of loan. As large banks abandoned relationship lending, demand for this service was driven to smaller banks and interest rates at those institutions rose as new loan demand exceeded supply of capital available at small banks. Meanwhile interest rates on ratio loans trended downward. This study did not rule out the possibility that given enough time, new small banks would enter the market or existing small banks would grow to fill the gaps and revivify relationship lending.

My study aims to look beyond the implications for individual firms and instead look at how trends in bank consolidation in each state have been associated with small business lending. While most of the literature on the subject was written before the 2008 financial crisis, this study examines a much longer time series and see how trends in small business lending have advanced since banking deregulations. Additionally, there were no studies found which aggregated data at the state level, focusing either on the national or local levels.

3 Data Description

3.1 Independent and Dependent Variables

This analysis makes use of data aggregated at the state level available through the Community Reinvestment Act and the FDIC. For small business lending, I chose to use total funds lent in a given year in each of the 50 states and the District of Columbia in real (chained) 2012 dollars. This data is available through the Community Reinvestment Act, which mandates that certain data on small business lending be reported and available through the Federal Financial Institutions Examination Council (FFEIC). This data is only available in thousands of current dollars and had to be converted to thousands of chained 2012 dollars for the purposes of this analysis. In order to study market concentration, I used data from the FDIC on deposit market share by institution.

The data in the FFEIC is not aggregated in a way which is easy to study. These data are reported on an annual basis and are available by MSA or county. The data was aggregated manually to derive

state level totals. Previous studies on this topic have avoided using data from the CRA, preferring instead to use firm level survey data on mergers and acquisitions during a given period or national data on interest rates to infer the effects of market consolidation. These data allowed researchers to study the microeconomic consequences of mergers and to study the effect of market concentration on interest rates for small business loans. However, firm level data make it difficult to study the impact of consolidation on the quantity supplied in the market for small business credit. However, by using the data available through the CRA one can directly study the quantity of funds supplied on an annual basis.

I used the data described above for every third year starting in 1997 and ending in 2018. I chose to begin in 1997 because it is the first year data is available on the FFEIC website, and it also marks the start to a period of financial deregulation, which allowed many banks to consolidate across state lines. I aggregate the data to reflect the total quantity of funds lent in each state in each of the years over the time period, measured in thousands of real 2012 dollars.

My dependent variable, market concentration, is generally measured using the Herfindahl-Hirschman index (HHI), which is computed by adding the squares of the market share percentage of each firm in the market. To compute this value for each state, I use data available through the FDIC describing the market share of each FDIC insured financial institution in a given state and year. I chose to use deposit market share rather than share of loans extended for several reasons. The primary reason is feasibility, data on total assets and total lending by financial institution are not available at the state level. As such I am unable to compute measures of market share based on either of these alternatives. Data on lending is available at the state level only for certain kinds of lending such as small business lending. While it would be possible to compute market concentration in small business lending specifically, measuring market concentration this way would fail to provide insight on some of the issues discussed above in the review of the literature. It is suggested by Hendrickson and Rauch (2004) and by Strahan and Weston (1998) that as banks merge and grow, they will devote a smaller proportion of their funds to small business finance. If this is the case, then measures of market concentration based in small business lending will fail to capture the shift in overall market concentration. For these reasons, I choose deposit market share over the only other measure of bank market concentration available at the state level.

3.2 Control Variables

To control for other factors, I include a number of control variables in my analysis to better isolate the effect of market concentration on lending. In selecting my control variables, I chose factors which account for variation in small business lending between the states during the period of study. In service of this goal, I examine variables which impact economic conditions between the states and those which would account for some of the other differences between states and over years examined.

It is likely that demographic factors such as urbanization would influence lending amounts with rural areas potentially having different market conditions than urban ones. For this reason, state population density is included in order to capture the effect this might have on lending markets. This is done on the suspicion that population concentration might impact small business credit demand or supply in ways not captured by state economic figures alone. As shown in table 1 below population density varies considerably between states and this is likely to affect market dynamics. For instance, it is likely that dense cities have faster small business turnover or higher failure rates, which would lead to higher lending amounts as startups replace older firms. This data comes from RAND state statistics and by way of the Census Bureau and records the number of persons per square mile in each state.

I also include several variables linked to the health and size of the economy. To this end, I acquire State unemployment figures from RAND state statistics, and State GDP figures from the Bureau of Economic Analysts. These are included in order to isolate the impact that the overall size and health of the economy would have on lending, with larger economies having larger credit markets. In order to avoid endogeneity problems, I use State GDP from the previous year, and as such, I collect State GDP data every third year from 1996-2017. The percentage change in state GDP from the previous year is also included because I am interested in isolating the effect that economic growth would have on small business lending.

Unemployment is an important factor to include when examining small business lending markets because the price of labor is one of the largest costs faced by a small business. Thus, we would expect

changes in the labor market to impact the expansion possibilities of small businesses, and therefore their demand for credit. There are several possible impacts that labor market conditions might have on small business, a high unemployment rate might mean reduced wage costs, improving the prospects for a given firm. On the other hand, high unemployment might result in reduced demand for the services of a given small business. I use the rate of unemployment as a percentage to avoid having my analysis confounded by the natural variation in the size of the workforce between states.

I also include other measures of local economic health related more specifically to small business. One such variable is the survival rate for businesses in a given state founded in the previous year. This data comes from the Department of Labor Statistics. The other variable of this type I include is the total non-performing loans for commercial banks in each state in the previous year, measured in thousands of 2012 dollars. I am including these variables to help isolate variations in economic conditions which specifically affected the small business lending market.

Table 1: Summary Statistics

Variable	Mean	Std. Dev.
Quantity of Funds Lent in thousands of 2012 $	5009431	5494771
HHI	1062.51	862.33
Population Density	381.5719	1383.704
State GDP in the Previous year in millions of 2012 $	290119.8	359560.5
% Change in State GDP from previous year	2.50925	3.7594
Survival rate of businesses founded the previous year	78.7069	3.0081
State unemployment rate	5.42598	2.018711
Total value of non-performing loans at commercial banks in the state in thousands of 2012 $	2171740	6615299

4 Methodology

Previous analyses on the impacts of market consolidation in banking either rely on survey data covering firms engaged in mergers and acquisitions, as in the study by Strahan and Weston (1996) or use interest rates to make inferences about market dynamics as in Hendrickson and Rauch (2004). This carries several significant limitations, as discussed above in the literature review, since studying firms engaged in mergers cannot tell us how other firms react to changes in competitor behavior. In addition, studies which rely on interest rates cannot concretely infer the impact on the supply of credit. Although each of these methodologies are useful in analyzing different aspects of the lending market, they do not inform conclusions regarding the impact which market concentration has on the lending market as a whole. As outlined above, I decided to use a dataset which would allow me to study the relationship between market concentration and quantity of lending more directly than aforementioned methods. To this end, I employ a panel data analysis across all 50 states and DC in the period from 1997-2018 to determine the extent of the relationship between the variables identified.

4.1 Tests

The assumptions underlying panel regressions require the use of Heteroskedasticity and Autocorrelation robust standard errors. This is because the entities in the regression naturally correlate with themselves, and will otherwise confound the regression. I apply a test of overidentifying restrictions which is a test used to detect correlation between any of the regressors and the error term. It is used in panel data analysis to determine if fixed entity and time effects are necessary. The null hypothesis is that random effects should be used because there is no correlation between the regressors, and the error

term and the alternative hypothesis is that fixed effects should be used to isolate this variation. This test strongly indicates that the fixed effects model is appropriate, finding that there is no systematic difference in coefficients with over 99% confidence. Thus, I use entity and time fixed effects by state and year for my regression model.

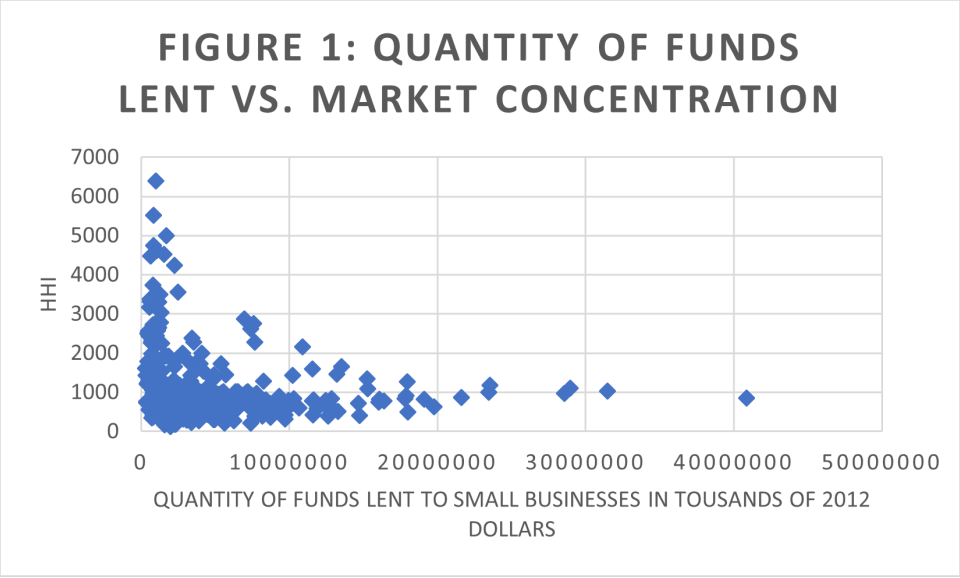
$$\begin{gathered}\text{Test of overidentifying restrictions: fixed vs random effects} \\ \text{Cross-section time-series model: xtreg re robust cluster(st)} \\ \text{Sargan-Hansen statistic 137.678 Chi-sq(7) P-value} = 0.0000\end{gathered} \tag{1}$$

4.2 Model Specification

Using the fixed effects regression model, my null hypothesis is that market concentration has no impact on lending to small businesses. The alternative hypothesis is that greater market concentration reduces the amount of funds available to small businesses. The equation for this regression is outlined below.

$$\begin{gathered}\ln(\text{Total Dollar amount of loans issued to small businesses in each state in a given year}) = \\ \beta_0 + \beta_1(HHI)_{it} + \beta_2(\ln StateGDP)_{it} + \beta_3(\%\text{Change in State GDP})_{it} + \\ \beta_4 + (\text{Population Density})_{it} + \beta_5(\text{State Unemployment})_{it} \\ + \beta_6 + (\text{Survival Rate of Buisinesses founded in the previous year}) \\ + \beta_7(\ln \text{Total \$ value of Nonperforming Loans for Commercial Banks in each state}) + \\ + Y_1E_1 + Y_2E_2 + ... + Y_{n-1}E_{n-1} + \sigma_1T_1 + \sigma_2T_2 + ... + \sigma_{t-1}T_{t-1} + \epsilon_{it}\end{gathered} \tag{2}$$

The left-hand side of my model includes the amount of small business lending by state in real 2012 dollars, while the right-hand side will include the HHI of bank deposit market-share in that state. The right-hand side of the equation will also include the control variables: state GDP in the previous year, change in state GDP, state population density, and state unemployment rate. I chose to linearize my values for State GDP, quantity of funds lent, and value of nonperforming loans. This involves taking the natural log of each of these values before computing the regression. I am doing this in order to flatten the exponential curve observable in the data as shown in figure 1, so this will allow me to compare these variables more easily with others in my regression which did not exhibit this relationship. The difference can be seen in Figure 2 where the HHI is compared with the linearized data on quantity of funds lent. The beta values on each of these variables indicate the degree of influence each of them has on small business lending during that period, with a 1 unit change in one of the independent variables equating to a β change in the dependent variable.



The entity fixed effects variables on the right-hand side of the equation will allow me to control for factors specific to each state which might influence small business lending, these entity fixed effects

are denoted by $E_{1-(n-1)}$. State-to- state variations in public policy choice would naturally impact the market for small business credit given that much of bank regulation remained under state control to some degree. An example of state policy which we would expect to influence small business lending is that the state of North Dakota has a state-owned bank which supports lending to small businesses. These sorts of variations are naturally difficult to capture, the benefit of the fixed effects model is that it allows me to employ catchall entity fixed effect variables which capture these time invariant differences between the states.

The time fixed effects, denoted by $T_{1-(n-1)}$, allow me to control for variations in economic conditions between years which are uncorrelated with the regression terms. For instance, the global financial crisis of 2008 likely had a much larger effect on small business lending than what would be predicted based on the change in GDP given that the recession was driven by a collapse of the financial system. Indeed, since the economy varies significantly from year to year, it is important to make sure that the entity invariant changes in annual economic conditions do not impact the results of the analysis. By controlling for these variables, this model will analyze the variables of interest more effectively than previous studies. The results of this analysis are shown in Table 2 and discussed below.

5 Results and Analysis

Table 2: Panel Regression Results for Linearized Data

Variable	OR (95%) CI	p-Value
Dependent: Linearized Quantity of Funds Lent Population Density	.0002151 (.00012003 .0003098)	**0.000
Linearized State GDP in The Previous year	-.6317271 (-.9234497, -.3400045)	**0.000
Percentage Change in State GDP from the previous year	-.0018497 (-.0129039, .0092045)	0.738
Herfindahl-Hirschman Index	-.000065 (-.0001248, -5.25e-06)	*0.034
Business Failure rate	.0101588 (-.0006941, .0210118)	0.066
Linearized Real loan failures	-.0657994 (-.1239737, -.007625)	* 0.027
State Unemployment Rate	-.01087 (-.0326639, .0109239)	0.321
Constant	22.65695 (19.249, 26.06486)	**0.000

In my regression of HHI values over loan quantities between 1997-2018, controlling for: linearized state GDP in the previous year, change in state GDP, state population density, and state unemployment rate, business survival rate from the previous year, and quantity of non-performing loans, I find that the market concentration does have a statistically significant negative impact on quantity of funds lent at $\alpha = .05$. with a $P > |z|$ of .034. As shown in Table 2, the coefficient on the HHI term was -.000065, while the standard error was .0000298. The model explains a relatively high degree of the variation in the model with an R^2 of .73. This result is a rejection of the null hypothesis and lends support to the alternative hypothesis that a more concentrated banking sector causes a contraction in lending to small businesses. Although it is important to note that the effect I found is relatively small, with a shift from a competitive market with an HHI value of 1,500 to a more concentrated one around 2,500, resulting in only a 65$ drop in lending. This indicates that, while market concentration does affect small business lending, the effect is negligible.

Additionally, as shown in Table 2, my findings indicate a statistically significant positive relationship between population density and small business lending, significant at the 99 percent level of significance. This may indicate that urban areas have better access to small business lending than less densely

populated areas. The results shown in Table 2 also show that while the business survival rate does not have a statistically significant impact on lending the quantity of non-performing loans does. The quantity of non-performing loans has a significant negative relationship with small business lending. This is relatively expected; indeed, it would be strange if past loan failures bore no relationship to new lending activity.

This result may indicate that as larger banks reduce their role in the small business credit market, smaller banks are unable to step up their lending operations to fill the void. Much of the literature I examine above finds that mergers and other actions which increase market concentration lead to those institutions reducing their small business lending. These studies are clear to point out, however, that economic theory would indicate that new firms would enter the market to replace those that exited. Whatever the reason, my finding does not seem to show this to be the case.

6 Conclusion

These findings raise questions about arguments advanced in some of the existing literature on concentration and small business lending. Strahan and Weston (1996) concluded that small business borrowers would not face credit constraints because consolidating institutions would not reduce their lending, and if they did, others would fill the void. My finding is more in line with the research of Keeton (1995), who found that larger banks would be less willing to lend to small businesses. This basic conclusion was shared by Hendrickson and Ruach (2004) as well as Udell and Berger (1995). Where my result differs is that these researchers were unable to draw conclusions regarding the market for small business lending as a whole because of their methodological focus on a few firms in specific situations. By looking at aggregate state lending data over time, I am able look at more general associations. My findings provide interesting evidence in support of the hypothesis that a more concentrated banking sector reduces the quantity lent to small businesses. This result may support the notion that there are diseconomies of scale in banking arising from organizational complexity, which reduces large bank's ability to engage in relationship lending, as suggested by Keeton (1995).

An important caveat is that these results do not conclusively prove that higher market concentration reduces small business lending. There are several variables which I would have liked to include where the data was not available. For instance, the existing level of debt held by small businesses in each state would likely have an impact on annual lending. However, these data were aggregated at the national level and not available at the state level. Importantly, while my findings show that bank concentration has a significant negative statistical association with small business lending, the coefficient value does not indicate a substantive effect.

Future research should build upon the work done in this paper by refining the model and adding more relevant variables to the regression. One of the major factors which limits the scope of the regression model employed in this paper is the lack of data available at the state level. There are many useful data sources maintained by the federal government which aggregate data only at the national level, particularly data relating to other measures of market concentration. This is unfortunate, both because a complete analysis of this issue would consider more variables, like interest rates, which are only aggregated nationally, and because many decisions regarding bank regulation are still controlled at the state level. State policy makers should have access to all of the data necessary to make decisions about issues which affect their states.

Future analyses should also consider using survey data and other sources to study the behavior of smaller banks during the late 1990s and 2000s. This would help to confirm the suspicion raised in this paper and by other researchers such as Hendrickson and Rauch (2004) that smaller banks will expand their lending in order to fill the void left as other banks consolidate. Studies may also focus on documenting the number of new banks started each year, in order to document the propensity for new entrants to fill the vacant niche left by merging banks.

7 Appendices

7.1 Appendix A: Stata Output

```
. xtreg lnrloan popd lnsgdpt pdsgdp hhi bfr sue lnrlf, fe vce(robust)

Fixed-effects (within) regression               Number of obs      =       408
Group variable: st                              Number of groups   =        51

R-sq:                                           Obs per group:
     within  = 0.2242                                         min =         8
     between = 0.8925                                         avg =       8.0
     overall = 0.7332                                         max =         8

                                                F(7,50)            =     15.34
corr(u_i, Xb)  = -0.9657                        Prob > F           =    0.0000

                                  (Std. Err. adjusted for 51 clusters in st)
------------------------------------------------------------------------------
             |               Robust
    lnrloan |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------+----------------------------------------------------------------
       popd |   .0002151   .0000472     4.56   0.000     .0001203    .0003098
    lnsgdpt |  -.6317271   .1452397    -4.35   0.000    -.9234497   -.3400045
     pdsgdp |  -.0018497   .0055035    -0.34   0.738    -.0129039    .0092045
        hhi |   -.000065   .0000298    -2.18   0.034    -.0001248   -5.25e-06
        bfr |   .0101588   .0054033     1.88   0.066    -.0006941    .0210118
        sue |    -.01087   .0108505    -1.00   0.321    -.0326639    .0109239
      lnrlf |  -.0657994   .0289632    -2.27   0.027    -.1239737    -.007625
      _cons |   22.65695   1.696696    13.35   0.000     19.24903    26.06486
------------+----------------------------------------------------------------
    sigma_u |  1.7315156
    sigma_e |  .29543002
        rho |  .97171252   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Bibliography

George W. Haynes, Charles Ou, and Robert Berney. 1999. *SMALL BUSINESS BORROWING FROM LARGE AND SMALL BANKS.* Federal Reserve System Research Conference; Business Access to Capital and Credit. Arlington: Federal Reserve Board. 287-327.

Hendrickson, James H. Rauch and Jill M. 2004. *Does Bank Consolidation Hurt the Small Business Borrower?* Small Business Economics 219-226.

Joe Peek, Eric S. Rosengren. 1995. *Small Business credit availability.* Working Paper, Boston: Federal Reserve Bank of Boston.

Keeton, William R. 1995. *Multi-Office Bank Lending to Small Businesses: Some New Evidence.* Working paper, Kansas City: FEDERAL RESERVE BANK OF KANSAS CITY.

Rodrigo Canales, Ramana Nanda. 2012. *A darker side to decentralized banks: Market power and credit rationing in SME lending.* Journal of Financial Economics 353-366.

Udell, Allen N. Berger and Gregory F. 1995. *Relationship Lending and Lines of Credit in Small Firm Finance.* The Journal of Business 351-381.

Weston, Philip E. Strahan and James. 1996. *Small Business Lending and Bank Consolidation: Is There Cause for Concern?* Federal Reserve Bank of New York: Current Issues in Economics and Finance (Federal Reserve Bank of New York) 1-6.

Weston, Philip Strahan and James. 1998. *Small business lending and the changing structure of the banking industry.* Journal of Banking & Finance 821-845