The 2007–2008 financial crisis and the availability of small business credit

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Abstract

The widespread consolidation in the banking industry has raised concerns about the declining availability of funds to small businesses. In this paper, we investigate the relationship between bank consolidation and the availability of small business lending in the aftermath of the financial crisis of 2007–2008. Using a dataset comprising banking institutions operating in the state of California, the empirical results indicate that higher consolidation in banking markets has had a negative impact on the level of small business lending in the period after the financial crisis. The findings do not supply any evidence indicating the impact of market consolidation on small business credit in the pre-crisis era.

Keywords: financial crisis, bank consolidation, small business lending, banking markets, commercial banks
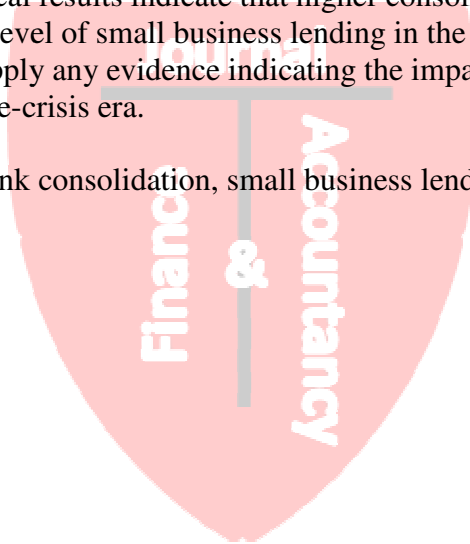
1. INTRODUCTION

The financial crisis of 2007–2008 is deemed by many the worst crisis since the Great Depression of the 1930s. While the crisis began in the financial sector, it quickly spread to the real economy, leading to the failure of a large number of financial and non-financial businesses, prolonged unemployment, and significant declines in consumer confidence and spending across the world. Governments around the world responded to the crisis by pursuing expansionary monetary and fiscal policies but economic growth has not been strong.

Access to external funds becomes increasingly difficult for most small businesses during economic downturns. The availability of bank credit to small businesses decreased considerably during the financial crisis of 2007–2008. The amount of small business lending (i.e., business loans under $1 million) provided by banking institutions declined by 8.3% from 2008 to 2010. Small business financing continued to decline from 2009 to 2010 even after the economy started to grow. Small business loans comprised 16.8% of total assets of banks in 2005 but it declined to 15.3% in 2010. Similarly, the ratio of small business loans to total loans declined from 81.7% to 68.9% between 2005 and 2010 which indicates the diminishing importance of small business lending for depository lenders (Haynes and Williams 2011a).

In the United States, small businesses play a vital role in the nation's economy.[1] According to the US Small Business Administration (n.d.), small businesses make up 99.7% of about 6 million employer firms and generate more than half of the non-farm gross domestic product (GDP). They employ slightly more than half of all private sector employees and accounted for 64% of the net new job-creation from 1998 through 2008. Small firms' ability to survive and grow depends on their access to credit. In a recent study, Cole (2010) finds that, for small businesses using bank credit, there is a positive relationship between profitability and liquidity, and the share of bank credit to total assets. Likewise, Haynes and Brown (2009) show that fast-growing small businesses are significantly more likely to use external credit, including different types of loans from commercial banks and finance companies, than small, non-growth firms.

In this paper, we use data comprising commercial banks and thrifts operating in the state of California to test whether the availability of small business loans changes with bank consolidation in the period after the financial crisis of 2007–2008. Why is this issue important? The changing structure of the banking industry in the last two decades raised questions about the competitive effects of consolidation on the availability of credit to small businesses. The issue becomes particularly critical during a credit crunch when bank credit tends to become less accessible for small firms and when the economic recovery depends on their viability. In a 2001 speech, the Federal Reserve (Fed) Chairman Ben Bernanke highlighted the importance of small businesses for the nation's economy by pointing out that "a full recovery will only be achieved once small firms begin to prosper" (Di Leo and Zibel 2011).

The empirical results of the present study indicate that increased market consolidation led to declines in small business lending in banking markets in the aftermath of the financial crisis. These findings suggest that the recent credit squeeze is likely to have imposed challenges on small businesses in terms of decreased availability of bank credit, particularly in more consolidated markets. Given the importance of small businesses for the nation's economy, the

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[1] Small businesses are defined as firms with less than 500 employees but almost 90% of all small businesses have less than 20 employees (US Census Bureau).

effects of the decline in the competitive position of these firms go beyond the local communities they operate in.

2. PRIOR EVIDENCE ON BANK CONSOLIDATION

As a result of the merger and acquisition activity of the 1980s and 1990s, the total number of institutions decreased sharply and a handful of institutions emerged to dominate the US banking industry. Many observers argue that bank consolidation may have reduced competition and increased market power of existing financial institutions hence, adversely affecting the viability of small banks as well as small businesses and communities which rely on them for credit. According to Avery and Samolyk (2000), small business lending is more likely to be affected by consolidation than some other banking services because it is mostly local in nature.[2] Local lenders are also better equipped to underwrite and monitor small business loans involving firms with specific credit needs and risks.

Small and large firms differ significantly in the way they obtain credit. Studies looking at the value of relationship lending to small businesses find that small borrowers benefit from forming long-term relationships with their banks in a number of ways. Berger and Udell (1995) show that small firms with longer banking relationships enjoy lower loan interest rates and collateral requirements. According to Petersen and Rajan (1994), establishing long-term relationships with and concentrating borrowing from a few lenders increase the availability of financing and reduce its cost for small businesses. Their findings also suggest that building a close relationship with a lender has a more significant effect on the availability rather than the price of credit.[3] In this regard, the declining number of banks (many of which are small institutions) due to the consolidation of the industry may have a negative effect on relationship-based small business lending.

Berger et al. (1999) review a large number of research literature (over 250 references) to design a framework for analyzing the causes, consequences, and future implications of financial services industry consolidation. According to Berger et al., a number of studies show that large banks have a disproportionately smaller portfolio of small business loans than small banks. Also, most research findings indicate that consolidations of large banks tend to decrease small business lending while consolidations of small institutions are likely to increase small business lending. Keeton's (1996) findings from the Fed's Tenth District states provide partial support for the view that banks lend less to local farms and businesses after being acquired by distant banking organizations or becoming junior partners in new organizations. Findings of Strahan and Weston (1998) suggest that consolidation among small banks increases the availability of credit to small businesses; however, they argue that large mergers and acquisitions do not have a significant impact on small business lending. According to Peek and Rosengren (1998), the size of the merging banks is not sufficient to determine the small business loan portfolio of the consolidated institution. They argue that the acquiring institution's pre-merger small business lending focus is an important determinant of its small business lending policy after the merger.

In their market-level analysis, Avery and Samolyk (2000) show that the effect of bank consolidation on small business lending depends on the nature of the market. Their findings suggest that small business loan growth was lower in rural markets affected by mergers and

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[2] According to Kwast et al. (1997), 84.9% and 10.9% of small businesses use financial services provided by local (operating within 30 miles) commercial banks and thrifts, respectively.
[3] Also see Cole (1998) and Scott (2004).

acquisitions than rural markets which did not experience consolidation during the mid-1990s. One exception was mergers among smaller banks which resulted in increased availability of small business credit in local banking markets. Bank consolidation had limited impact on small business lending in urban markets. However, concentrated urban markets experiencing within-market consolidation had lower small business lending growth, a result consistent with the view that bank consolidation may have anticompetitive effects. Similarly, Samolyk and Richardson (2003) find that small business loan growth was significantly lower in urban markets where within-market merger activity increased the local market share of the surviving institutions during the late 1990s. Their results also indicate that bank consolidation is likely to have a negative impact on small business borrowers and that antitrust concerns about small business credit markets may be valid.

Some analyses have demonstrated that the net effects of consolidation on the availability of small business lending depends on external factors. Using data on over 6,000 US bank mergers and acquisitions from the late 1970s to the early 1990s, Berger et al. (1998) find that consolidation substantially reduces small business lending; however, this decline is largely offset by the dynamic effects. In response to decreasing supply of small business loans associated with mergers and acquisitions, other banking institutions in the same market, and in some cases consolidating institutions themselves, increase their small business lending which mostly offsets the initial reduction. Berger et al. (2004) look at the effects of consolidation on market entry in the banking industry during the period from 1980 to 1998. Their findings suggest that mergers and acquisitions significantly increase the probability of entry into the markets where the consolidation activity is taking place. They argue that a decline in small business lending in a local banking market owing to consolidation may be partially offset by de novo entry. However, as we investigate in this paper, these external factors may not be strong enough to reverse declining availability of small business loans when there is a general decline in credit supply.

3. SMALL BUSINESS CREDIT DURING A CREDIT CRUNCH

A credit crunch is defined as a general decline in the availability of credit as financial institutions tighten their lending standards and raise the cost of borrowing. According to Ivashina and Scharfstein (2010), a credit crunch has important implications because declining supply of credit puts an upward pressure on interest rate spreads causing further declines in lending than one might see in a typical recession. Other than supply-side factors, demand-side effects may also play a role in the decline of bank credit. Contraction in business lending may be associated with decreasing demand for loans by borrowers following a general slowdown in economic activity. Even though a decrease in lending may be caused by a combination of the two factors, generally one of the factors tends to be more significant. For example, Bernanke and Lown (1991) show that during the (relatively mild) recession of the early 1990s, declining bank capital (or the "capital crunch" which is a supply-side factor) had a small effect on the availability of bank credit, whereas reduced demand for credit by borrowers played a more important role in the lending slowdown.

The Federal Reserve Board's Senior Loan Officer Opinion Surveys on Bank Lending Practices from 2008 and 2009 suggest that a number of supply-side factors contributed to declining business lending, both for large and small firms.[4] According to the surveys, the

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[4] The quarterly surveys are completed by approximately 80 large domestic banks and the US branches of foreign banks.

majority of banks tightened their lending standards and increased the margin between the interest charged on loans and the cost of funds in the post-crisis period. A significant share of institutions reported that increased losses, and diminished capital and liquidity positions negatively impacted their lending capacities which, as a result, contributed to the tightening of credit standards. The surveys also show that banks decreased the size of loans, shortened the maturity of lending, and imposed higher collateral requirements throughout the period.

A number of research reports published by the US Small Business Administration look at the changes in small business lending during the recent financial crisis.[5] The findings suggest dramatic declines in the volume as well as portfolio share of small business loans (to total assets and to total business loans) even after the economy stopped contracting in 2009. The total value of small business loans (which consists of commercial real estate loans, and commercial and industrial loans) by banks declined by 2.3% from 2008 to 2009 and by 6.2% from 2009 to 2010. The number of small business loans also declined in the post-crisis period: 14.8% from 2008 to 2009 and 3.9% from 2009 to 2010. Small businesses have also been less successful in competing with other borrowers (including large businesses) for credit. Between 2003 and 2008, the average proportion of total assets allocated to small business loans was 16.5%. The ratio declined to 15.9% and 15.3% in 2009 and 2010, respectively. Similarly, the average ratio of small business loans to total loans was 76.6% in the period from 2003 to 2008. In 2009 and 2010, it dropped to 69.9% and 68.9%, respectively.

One of the primary causes of the crisis is the collapse of the housing market in the United States after years of steadily increasing prices. Fueled by low interest rates and risky lending practices, the US housing market experienced a long-lasting boom which lasted until 2006. Between 1997 and 2006, the Standard and Poor's/Case-Shiller Home Price Indices, the leading measures for the US residential housing market, increased by 124% ("CSI: Credit Crunch" 2007). However, after the peaked in mid-2006, U.S house sales prices began their steep decline. From the 2006 peaks through May 2012, the prices dropped approximately 35%. In this respect, Udell (2009) argues that loans secured by real-estate, a major source of financing for small business owners using their personal residences as collateral, may be particularly difficult to obtain because of major problems in the real estate market. Udell also notes that increased lending by commercial finance companies helped offset the decline in bank credit during the 1992 credit crunch; however, they may not have played the same role in the recent credit squeeze as many large financial companies have disappeared or they have been acquired by banking institutions since 1992. Moreover, some finance companies may have experienced a credit crunch themselves as they rely on the commercial paper market (which experienced significant strain during the crisis) and banking institutions for financing.

There have been anecdotal newspaper reports of declining bank credit to small businesses in the aftermath of the financial crisis of 2007–2008. Even though there was a general decline in bank lending, small business credit decreased disproportionately more. According to a Congressional Oversight Panel report, large banks decreased their small business loan portfolios by 9% while their overall lending portfolios fell by 4.1% in 2009 from the previous year. Similarly, small business loan portfolios and overall loan portfolios dropped by 2.7% and 0.2%, respectively at the smallest banks for the same period (Maltby 2010).

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[5] Haynes and Williams (2011a); Haynes and Williams (2011b); Haynes and Williams (2010); US Small Business Administration (2010); US Small Business Administration (2009).

4. EMPIRICAL MODEL AND RESULTS

4.1. Description of the dataset

We utilize the database of the Federal Deposit Insurance Corporation (FDIC), which reports demographic and financial information on all FDIC-insured US commercial banks and thrifts. Our sample consists of 322 observations gathered from 46 banking markets in the state of California from 2004 to 2010, inclusively. Urban markets are defined as Metropolitan Statistical Areas (MSAs) and rural markets as non-MSA counties. The dataset is a representative sample of small businesses and banking institutions in the US economy. California is the most populous state in the nation, with a population of over 37 million as of 2011 (11.9% of the total US population). The state has the eighth largest economy in the world (with a gross state product of $1,936 billion in 201) producing 13.3% of the US GDP. California also had the highest number of bank offices in the US totaling 7,176 as of 2011.[6]

4.2. Description of variables and a priori expectations

Table 1 (Appendix) describes the variables used in this study. We define small business loans to include commercial real estate loans (CRE), and commercial and industrial loans (CI) under $1 million (as well as their sum). We calculate the annual estimates of each institution's small business loan volume by following the approach used by Avery and Samolyk (2004). Small business lending volume of a bank in a given market is estimated by multiplying the bank's deposit market share of the market by its total small business lending. The total small business lending volume of a market is then calculated by summing up the loan estimates of each institution operating in the market.

In order to test for possible effects of market consolidation on small business lending, we compare the periods before (i.e., 2004 through 2007) and after (i.e., 2008 through 2010) the financial crisis. Figure 1 (Appendix) graphs average small business lending in banking markets by loan type from 2004 through 2010. Overall, the figure shows that average small business lending peaked in 2007. Also, there is a slight increase in average small business lending from 2008 to 2009, followed by a significant decline from 2009 to 2010.[7]

Descriptive statistics for all variables for periods 2004–2007 and 2008–2010 are provided in Table 2 (Appendix). The data are annual (as of June 30) and all dollar amounts are converted to constant 2010 dollars using the Consumer Price Index (CPI) deflator. We employ the variable THREE (which denotes the three-firm concentration ratio) to study the relationship between the level of small business lending and market consolidation in banking markets in California. One would expect that higher market consolidation in a market has a negative impact on business loans on the assumption that low levels of competition leads to higher rates on loans as well as lower availability of loans, *ceteris paribus*. Small businesses lending would be expected to be particularly vulnerable since consolidation leads to the disappearance of many small banks which are the major providers of credit to small businesses.

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[6] The information about California is based on sources gathered from the US Census Bureau, the US Bureau of Economic Analysis, and the FDIC.

[7] The findings of Haynes and Williams (2011a) also suggest a significant decline in most CRE and CI loan categories from 2009 to 2010.

The coefficient on the interaction term POSTxTHREE (where POST is the time dummy variable which equals 0 for observations from the years 2004–2007 and 1 for observations from 2008 through 2010) indicates the change in the small business lending volume in the period after the financial crisis. In this respect, our main focus is the sign of the coefficients on POSTxTHREE which enables us to test whether or not the level of market consolidation has had an impact on the availability of small business lending in the aftermath of the crisis.[8] For example, a negative and significant coefficient on POSTxTHREE would suggest that an increase in market consolidation leads to a decline in small business lending in the post-crisis period, *ceteris paribus*. Based on anecdotal evidence indicating the relative financial strength of small banks (compared to large institutions) in the latest crisis, we hypothesize that the effect of the credit crunch on small business lending was more significant in consolidated banking markets dominated by larger institutions.

OFFICE serves as a proxy for market size. The coefficient on OFFICE would be expected to be greater than zero, assuming that the level of small business lending is higher in larger markets (measured in terms of offices held), *ceteris paribus*. We enter DEPOINS to control for the effect that average institution size (measured by deposits per institution) in a given banking market may have on the level of small business lending. HOLD is employed to control for the presence of institutions affiliated with a multibank holding company. A number of studies, including Berger et al. (1999) and Strahan and Weston (1998) argue that large banks are less likely to provide services to small businesses. Also, the findings of Keeton (1995) and DeYoung et al. (1999) suggest that multibank holding company affiliation has a negative impact on small business lending. We follow the findings of previous research and expect a negative sign on the coefficients of DEPOINS and HOLD, *ceteris paribus*.

OFFRATIO is the market average of the ratio of an institution's number of bank offices in a given market to its total number of offices. This variable is included to control for the level of presence of institutions in a given market. We control for the financial condition and performance of banking institutions in a market by entering ROA and CAPRATIO as explanatory variables. Finally, the variable UNEMP is employed to control for the effects that macroeconomic conditions may have on small business credit. Holding other factors constant, the level of small business lending is more likely to decline (due to both demand and supply factors) during times of slow economic activity and high unemployment.

4.3. Model specifications and regression results

We use a fixed effects model to explain variations in the level of small business lending in banking markets in California in the pre- and post-crisis era. The dependent variables as well as the independent variables, THREE, OFFICE, and DEPOINS are entered in natural logarithms. Since the relationship is specified as linear in the natural logarithms of these independent variables, their estimated coefficients can be interpreted as elasticities.

The regression model has the following general form:

$$Ln(Y) = b_0 + b_1 POST + b_2 Ln(THREE) + b_3 (POST \times Ln(THREE)) + b_4 LnOFFICE$$
$$+ b_5 LnDEPOINS + b_6 HOLD + b_7 OFFRATIO + b_8 ROA + b_9 CAPRATIO$$
$$+ b_{10} UNEMP + \alpha + \varepsilon$$

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[8] Note that interacting THREE with POST is equivalent to estimating two separate regression equations, one for the years before the financial crisis and one for the years afterwards (Wooldridge 2000, pp. 412–413).

where α is the market fixed effect which contains all factors that do not vary over time and ε is the idiosyncratic error term.

The estimated fixed effects model generates the regression results reported in Table 3 (Appendix) where we regress three dependent variables measuring small business lending activity on market consolidation and control variables. All estimated models are statistically significant at the 1% level. They explain 51.65%, 45.75% and 48.23% of the variation in the level of small business lending in California's banking markets, respectively.

The coefficients on THREE are negative in all estimated models however, they are not statistically significant. In this respect, our results do not supply any conclusive evidence indicating the impact of market consolidation on small business lending before the financial crisis. The coefficients on POSTxTHREE are negative and significant in all the models. This finding indicates that, holding other factors constant, market consolidation had a negative impact on the level of small business lending in banking markets in the aftermath of the financial crisis. For example, in column 1 of Table 3, the coefficient on THREE indicates that the elasticity of total small business lending with respect to the three-firm ratio was -0.14 in the pre-crisis-era (the result is not statistically significant). On the other hand, the negative and statistically significant coefficient on POSTxTHREE implies that the elasticity of total small business lending with respect to the three-firm ratio is higher in the post-crisis period versus the pre-crisis period, *ceteris paribus*, with each 10% increase in the three-firm ratio resulting in a 1.57% additional decrease in total small business lending.[9] These results indicate that the negative effect of market consolidation on small business lending became more pronounced after the financial crisis.

In all models estimated, the coefficients on OFFICE are positive and statistically significant at the 1% level. The findings suggest that the level of small business lending increases with market size, *ceteris paribus*. The coefficients on DEPOINS are positive and significant, a result which is not consistent with our *a priori* expectation. The findings indicate that the relationship between average institution size and the level of small business lending is positive. The coefficients on HOLD are negative and statistically significant at conventional levels in two of the models suggesting that increased presence of banks operating under a multibank holding company has a negative impact on small business lending, *ceteris paribus*. The coefficients on ROA are negative and statistically significant in all models. This result implies that the volume of small business loans declines at more profitable banking institutions, *ceteris paribus*. The coefficients on CAPRATIO are negative and only marginally significant in one of the models. Finally, the coefficients on UNEMP are negative and statistically significant in all models estimated indicating that small business lending of all types decline during times of high unemployment and economic downturn, *ceteris paribus*.

5. CONCLUDING REMARKS

The financial crisis of 2007–2008 did not only affect the financial services industry but it had a serious impact on the US real economy. Small businesses are particularly vulnerable to declining availability of bank credit during economic downturns since they have limited sources of external financing.

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[9] The results are similar in the regression models where CRE and CI are entered as the dependent variables.

Both demand and supply factors are likely to have played a role in declining bank credit in the period after the recent financial crisis; however, the latter factor may have been of particular significance since the crisis had a severe impact on the workings of the US banking system (determining the more dominant factor is beyond the scope of this paper). In this study, we develop and estimate an econometric model to test whether or not market consolidation has had a negative impact on small business lending banking markets in the aftermath of the financial crisis.

We use market-level data comprising commercial banks and thrifts from 2004 to 2010, inclusively. Our paper is one of the few analyses looking at the association between consolidation and small business credit at the market level. This study contributes to the literature that studies the effect of bank consolidation on small business lending in local banking markets. It also adds to the literature on the availability of small business loans during times of low bank credit supply. Our study has important policy implications. We find evidence indicating that small businesses located in consolidated banking markets are likely to have experienced challenges in accessing bank credit in the aftermath of the financial crisis of 2007–2008. The empirical results suggest that the level of small business lending was lower in more consolidated banking markets in the post-crisis period. In this respect, concerns over the adverse effect of consolidation and market concentration on small business credit seem to be valid, especially when there is a general decline in the supply of bank credit.

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APPENDIX

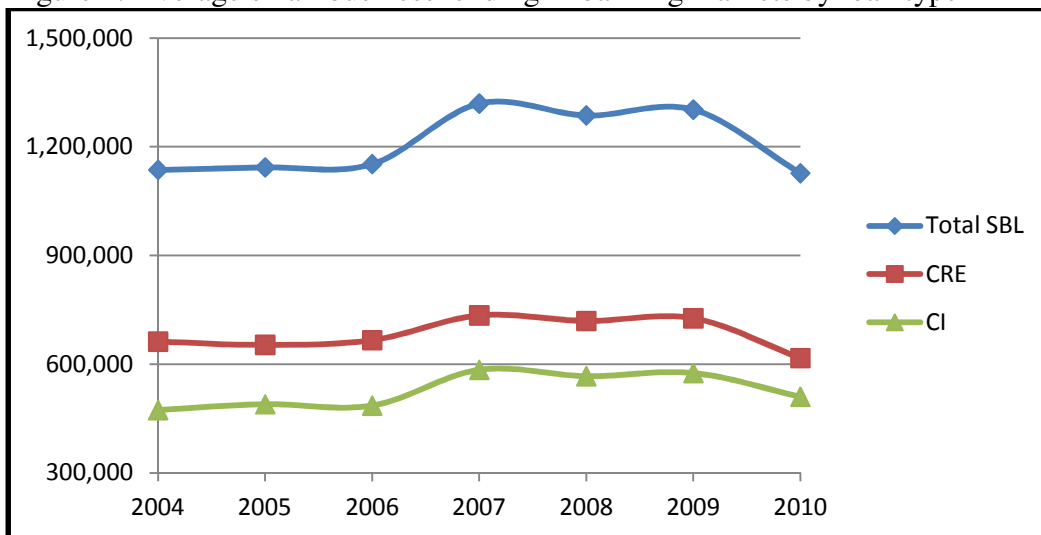Figure 1. Average small business lending in banking markets by loan type

Table 1. Description of variables

Variable name	Description
TSBL	Sum of commercial real estate loans, and commercial and industrial loans under $1 million (in 1000s)
CRE	Commercial real estate loans under $1 million (in 1000s)
CI	Commercial and industrial loans under $1 million (in 1000s)
POST	Equals 0 for observations from the years 2004–2007 and 1 for observations from 2008 through 2010
THREE	Three-firm concentration ratio measuring the deposit market share of the three largest institutions (%)
OFFICE	Number of bank offices in a market
DEPOINS	Deposits per institution in a market (in 1000s) (amount of deposits in a market / number of institutions in a market)
HOLD	Market share of institutions operating under a multibank holding company (%)
OFFRATIO	Market average of (number of offices of a bank in a market / the bank's total offices) (%)
ROA	Market average of return on assets (%)
CAPRATIO	Market average of core capital ratio (%)
UNEMP	Unemployment rate in a market (%)

Table 2. Descriptive statistics

	2004–2007		2008–2010	
	Mean	Std. Dev.	Mean	Std. Dev.
TSBL	1,187,834	3,421,957	1,238,771	3,622,725
CRE	679,304	1,941,609	687,733	2,013,898
CI	508,530	1,485,247	551,038	1,612,577
POST	0	0	1	0
THREE	63.68	18.67	63.68	17.97
OFFICE	147.07	368.54	158.62	399.70
DEPOINS	325,296	470,305	308,605	458,238
HOLD	45.66	17.48	54.70	19.61
OFFRATIO	16.31	13.93	16.79	14.08
ROA	1.22	0.35	-0.06	0.85
CAPRATIO	9.34	2.11	9.24	1.41
UNEMP	7.17	2.49	12.08	4.08
n	184		138	

Table 3. Effects of market consolidation on small business lending

	TSBL		CRE		CI	
	Coefficient	Std. Error	Coefficient	Std. Error	Coefficient	Std. Error
Intercept	3.818***	0.850	4.415***	0.981	1.301	0.909
POST	0.648***	0.240	0.572**	0.277	0.831***	0.257
THREE	-0.140	0.167	-0.165	0.193	-0.083	0.179
POSTxTHREE	-0.157***	0.057	-0.143**	0.066	-0.194***	0.061
OFFICE	1.312***	0.137	1.297***	0.158	1.367***	0.146
DEPOINS	0.394***	0.080	0.317***	0.092	0.487***	0.085
HOLD	-0.002**	0.001	-0.003***	0.001	-0.001	0.001
OFFRATIO	0.005**	0.002	0.007**	0.003	0.001	0.003
ROA	-0.040***	0.014	-0.044***	0.016	-0.030**	0.014
CAPRATIO	-0.010*	0.006	-0.010	0.007	-0.009	0.006
UNEMP	-0.160***	0.047	-0.161***	0.054	-0.166***	0.050
F-statistic	28.42		22.44		24.78	
p-value	<0.01***		<0.01***		<0.01***	
R^2 (with-in)	0.5165		0.4575		0.4823	
n	322		322		322	
# of groups	46		46		46	

***, **, and * denote 1%, 5%, and 10% significance, respectively.