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Regional Commercial Bank Lending to Small Businesses in the Wake of the Great Recession

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The purpose of this paper is to document and explain the state by state variation in commercial bank lending to small businesses during the Great Recession. To accomplish this purpose will require several steps. These steps include showing the evidence of the variation in lending across states, the theoretical causes and the empirical findings of a capital supply gap based on market imperfections and employing OLS estimation method on carefully selected economic variables. The empirical results indicate that economic conditions, borrower characteristics and lender characteristics influence lending variation where these results can help in policy formulation.

Keywords: Recession, variation, lending, gap, capital

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Abstract

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INTRODUCTION

The motivation for this study is that communities or regions sometimes experience a capital supply gap. A capital supply gap or a capital market gap according to Seidman (2005) is a situation where capital markets are unable to provide capital to firms and projects or whole segments of firms or projects that generate a rate of return that is equivalent to one that's provided by other investments of a similar risk level. So, according to Seidman (2005) when there are market imperfections there is not an allocation of capital to firms and projects that would utilize capital in the most productive way.

Firms in particular play a big part in economic activity and hence a community's scheme of economic development. So, when firms are unable to raise capital there is likely to be a slowdown in economic activity since new firms are less likely to be created, existing firms may delay investments or otherwise may reduce their economic activity (Seidman 2005).

The purpose of this paper is to document and explain the state by state variation in commercial bank lending to small businesses during the Great Recession. To accomplish this purpose, the paper will be organized over the subsequent four sections in the following way, the second section will cover a brief explanation for the focus on small business lending, the literature review of (1.) small business financing and (2.) the theoretical causes and the empirical findings of a capital supply gap based on market imperfections. The third section of the paper

will cover the methodology and data. The fourth section will cover the estimation and results of the model. Finally, the fifth section of the paper will discuss the conclusions of the study.

**LITERATURE REVIEW AND FOCUS ON SMALL BUSINESS LENDING**

Sometimes firms have to rely on external financing because they might not have enough internal sources of funds and they can raise funds externally from the public or private capital markets. However, large corporate firms have greater access than smaller firms to public capital markets such as the bond and stock markets. Small firms have to rely on financial institutions such as commercial banks in the private capital market to raise capital because it is very expensive for small firms to raise funds in public capital markets. This makes public capital markets not a viable source for raising funds thus diverting small firms to financial institutions in the private capital market to raise funds.

Importantly "The Great Recession" span 2007 to 2009. Figure 1 shows the trend in bank lending over a longer period. The graph depicts the annual change in commercial and industrial loans to small and large businesses from 2005 to 2013. As the Figure shows at the national level there has been some variation in lending to businesses from 2005 to 2013. During the recessionary period of 2007 to 2008 lending to large businesses increased sharply from $68 billion to $159 billion respectively. During this same recessionary period lending to small businesses declined from $30 billion in 2007 to $10 billion in 2008.

This trend in lending may not be surprising since some firms during a recession might encounter financial hardships. So, banks may reduce their lending to these firms. Given the existence of a "liquidity trap" during "The Great Recession" the drop in lending to small businesses was inconsistent with expectations. One would expect to see an increase in lending to credit worthy small businesses like it was to large businesses. During the expansionary years of 2011 to 2013 lending to large businesses was much stronger than it was for small businesses. So,

looking at the figure the variability in lending to businesses might indicate evidence of a capital market gap.

Figure 1
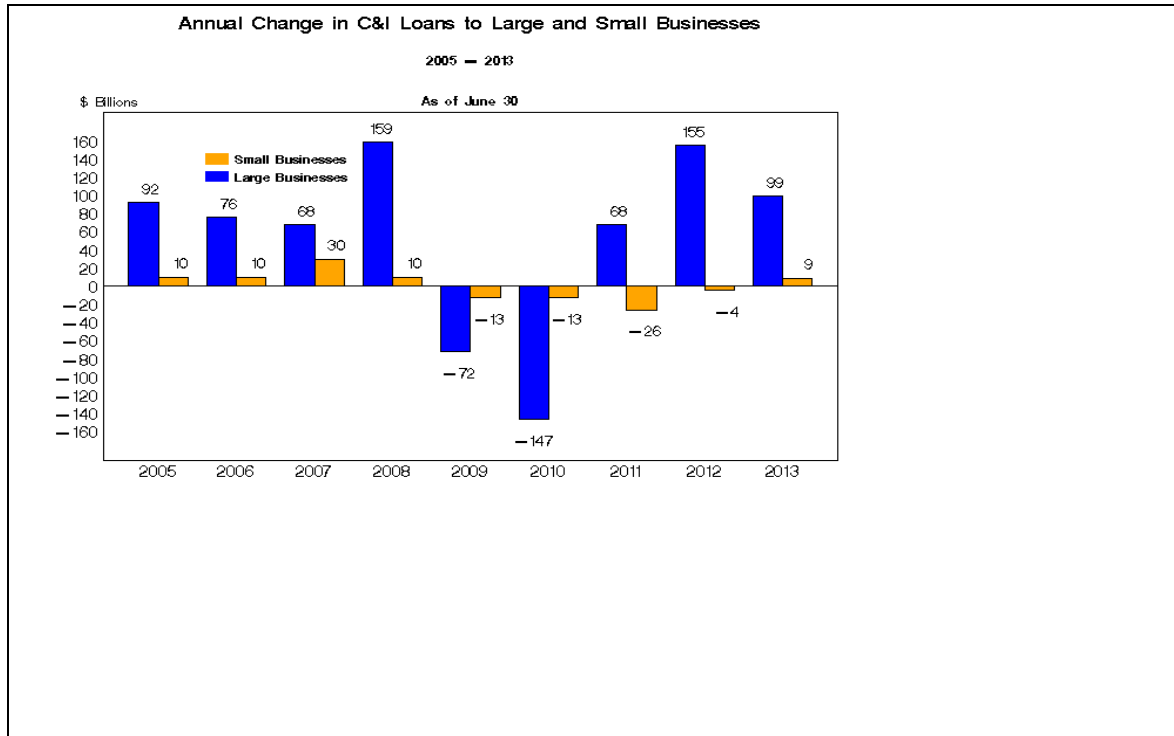
Source-Federal Deposit Insurance Corporation- https://www2.fdic.gov/qbp/grgraph.asp

So, the study of the capital supply gap will evaluate external financing in the form of financial institutions' loans in the private capital market to small businesses.

Small businesses depend on external financing in the form of bank loans as a means of raising capital and according to Colombo and Grilli (2007) new technology- based firms(NTBF's) seek out external financing when there are no more means of personal financing. Colombo and Grilli (2007) find that external credit in terms of bank loans to NTBF's are often times rationed. They note one explanation of this market imperfection affecting these firms is the uncertainty of their business prospects. Credit rationing in terms of external financing is also examined by Stiglitz and Weiss (1981) under the condition of imperfect information in the loan

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market from the evaluation of loan applications. They note that banks restricted the number of loans to borrowers rather than the size thereby rationing credit. This finding may imply that small business might be captured in credit rationing impacting the availability of bank loans to them. The finding of Berger, Saunders, Scalise and Udell (1998) show that mergers among small and medium size banking institutions raise lending to small businesses. In contrast Berger et al. (1997) found that mergers among large banking institutions were for the most part linked to a decrease in lending to small businesses.

According to microeconomic theory markets are assumed to be perfectly competitive but realistically there can be market imperfections. In terms of the suppliers and users of capital the U.S. banking industry is not perfectly competitive there are few large banks and many small banks. If the market is concentrated this might imply a lack of financing for firms especially firms that rely on external financing from banks. According to Berger et al. (2004), Peek and Rosengren (1998) and Strahan and Weston (1998) large U.S. banks that are part of mergers and acquisitions (M&A's) tend to reduce lending to small and medium size enterprises(SME's) considerably. The lack of information about small businesses' growth potential and financial condition create a problem for these institutions to raise funds externally. According to Colombo and Grilli (2007) information asymmetries-entrepreneurs have better information about the risk and returns of a project than lenders-for new technology based firms(NTBF'S) which will decrease their access to capital in particular bank loans. Transaction costs in terms of information costs can be problematic for firms. Hubbard (1998) showed that the higher the marginal cost for information the less external funding will be provided to borrowers.

Lender-side studies done by Wilkinson and Christensson (2011) and Frame et al. (2001) provide information on banks granting credit. Wilkinson and Christensson (2011) use cross

sectional data from 2001 to 2009 to look at policy strategy in the provision of capital. They analyzed community banks in the tenth Federal Reserve District. They find that policies to increase bank capital and decrease problem assets (problem loans) can increase small business lending. Policies to reduce problem assets indicate a larger increase in small business lending than policies to increase bank capital.

In their study Frame et al (2001) use cross sectional data from 1997 to look at credit scoring technology used by large U.S. banks. They find that on average, utilizing credit scoring raises the portfolio portion of small-business loans by 8.4 percent or approximately $4 billion for each institution. The greater the number of subsidiary banks the less likely they are to utilize credit scoring (a negative relationship). The greater the amount of branch networks the more likely they are to use credit scoring (a positive relationship). This paper adds to the broad literature on the challenges small businesses face in accessing capital.

This paper identifies the market imperfections that can inhibit the flow of funds to small businesses therefore creating a capital supply gap. Market imperfections would be an area for further research specifically regarding mergers and acquisitions that could shed more light on the capital supply gap faced by small businesses. Mergers and acquisitions commonly occur in the banking sector where there might be lending implications for small business lending resulting from such developments. Hence further research on the role mergers and acquisitions play in small business lending would be a warranted activity. The other contribution that this paper makes to the literature is demonstrating the volatility of small business lending during economic crisis by demonstrating the behavior of small business lending during a deep economic crisis such as the Great Recession.

METHODOLOGY AND DATA

In the model for this study the dependent variable is the ratio of small business loans to state gross domestic product. Small business loans are total commercial and industrial loans to U.S. addresses of $1,000,000 or less. The use of a ratio for the dependent variable is similar to the use by other researchers such as Cole (2013), McNulty et al. (2013) and Frame et al. (2001). There are three categories of variables that are used as independent variables in the model which are listed in Table 1 of the paper. The categories are economic conditions, characteristics of the borrower and lender characteristics.

TABLE 1

DESCRIPTION AND SOURCES OF DATA

Variable	Description	Units	Sources
SBL	Commercial and Industrial Loans	Thousands of Dollars	FDIC
SUNEM	State Unemployment Rates	Percentages	BLS
SGDP	State Nominal GDP	Thousands of Dollars	BEA
SPGDP	State Real Per Capita GDP	Thousands of Dollars	BEA
PCTFL100	Firm Size-Employees Less Than 100	Firms	USCB/AC
HHI	Index of Market Concentration	Index, 0-10,000 points	FDIC
TCAP	Tier I Capital of Banks	Thousands of Dollars	FDIC
NFPI	Personal Income NAICS Industry	Thousands of Dollars	BEA
LQ522	Location Quotients SIC Industry 522	Quotient ≤ 1 or ≥ 1	BLS

Notes:

Sample Period: 2007-2012

SBL-Total Commercial and Industrial Loans to U.S. Addresses of $1,000,000 or Less

HHI-The Herfindahl-Hirschman Index

NFPI-Personal Income by Major Component and Earnings by NAICS Industry(Table SA5N)

LQ522-The employment location quotients for the SIC industry with a code of 522 for each state-Credit Intermediation and Related Activities

FDIC: Federal Deposit Insurance Corporation

BLS: Bureau of Labor Statistics

BEA: Bureau of Economic Analysis

Notes (Contd.):

The economic conditions category consists of the state unemployment rate and state per-capita gross domestic product (GDP). Economic conditions within the state might impact business survival or otherwise reflect the difficulty firms may be facing in their daily business activity (Glennon and Nigro, 2005). State unemployment rate and state per-capita GDP are used to account for the changing and relative economic conditions that a state's firms face. Whether changes in unemployment lead to more or less lending depends on the balance between changes in loan demand, changes in firm creditworthiness, and changes in small business' ability to self-finance. If the unemployment rate increases, this would indicate a downturn in economic conditions and vice versa. Per capita state GDP is included to account for difference in states' general income levels. Higher or lower levels of income could potentially cause differences in lending across states. So, if per capita state GDP is rising this might indicate an upturn in economic activity and more lending might take place within a state and vice versa.

In the model borrower characteristics used are a proxy for firm profitability (non-farm proprietor income) and firm size (the percentage of firms less than 100 employees). Cole (2013) and Berger and Udell (2002) use return on assets(ROA) and return on equity(ROE) respectively as direct measures of profitability in their models and, while these may be superior choices, they are not available at the aggregate level. A rise in non-farm proprietor income may indicate higher expected profits for firms and they may borrow more to help with business expansion to gain profits and the opposite would be the case. So, a positive relationship between non-farm proprietor income and lending is expected.

The Small Business Administration(SBA) evaluates and provides loans to small businesses over a wide range of firm sizes (Glennon & Nigro, 2005). One way that the SBA defines businesses is by the number of employees. Often firms with less than 500 employees are classified as small businesses (Small Business Administration [SBA], n.d.). To account for firm size within a state, this study uses the percentage of firms with less than 100 employees to represent firm size. Bigger firms may have a greater ability to borrow funds relative to smaller firms. Bigger firms are more diversified and there is a lot more information available about large firms relative to small firms indicating an easier access to funds from banks by bigger firms compared to smaller firms (Cole, 2013). So, it's expected that firm size is positively related to lending.

Three variables are used to operationalize the lender characteristics category. The first is, tier 1 capital of banks. Banks maintain capital to cover depositors' losses and an increase in banks' capital gives banks more funds and greater ability to lend to small businesses (Wilkinson & Christensson, 2011). The expectation is that higher levels of tier 1 capital relate positively to small business lending. The second variable in the lender characteristics category is the employment location quotients for NAICS industry 522, credit intermediation and related activities. A high location quotient value indicates a relatively high level of employment in credit intermediation and related activities suggesting that a state might enjoy a competitive advantage in the industry. The expected sign on this variable is positive since the presumed competitive advantage should lead to more lending, for small businesses or otherwise.

The final variable in the lender characteristics category is the Herfindahl-Hirschman Index (HHI) which captures the degree of competition in the state banking market. The HHI is the sum of the squared market share of each firm in the market (Wilkinson & Christensson,

2011). The higher the index the more concentrated (less competitive) the market. The lower the

index the less concentrated (more competitive) the market. The highest the index can reach is

10,000 which indicates one firm in control of the market; this firm would be considered a

monopolist. Ultimately, economic theory suggests that higher level of concentration gives

market power to firms in the industry leading to higher prices (interest rates) and lower quantities

(in this case loans) leading to the prediction that the HHI will be negatively related to small

business lending. A priori expectations are summarized in Table 2 of the paper.

TABLE 2

A PRIORI EXPECTATIONS

Dependent Variable = SBL/SGDP			
Variable Name	Brief Description	Category	Expectations
SUNEM	State Unemployment Rate	Economic Conditions	−
SPGDP	State Per Capita GDP	Economic Conditions	+
PCTFL100	Firms w/less than 100 Emp's	Borrower Characteristics	+
TCAPGDP	Tier 1 Capital to State GDP	Lender Characteristics	+
HHI	Index of Market Concentration	Lender Characteristics	−
NFPIGDP	Non-Farm Prop. Inc. to GDP	Borrower Characteristics	+
LQ522	Location Quotient SIC 500	Lender Characteristics	+

Notes:

PCTFL100: The Percentage of Firms with Less Than 100 Employees as a Measure of Firm Size

TCAPGDP: The ratio of Tier 1 Capital to State GDP

HHI: The Index that Measures bank Market Concentration for Each State

NFPIGDP: The Ratio of Non-Farm Proprietor Income to State GDP

LQ522: The Employment Location Quotients for the Industry with a Code of 522

The present model is similar to that used by Wilkinson and Christensson (2011) and

McNulty et al (2013). The model incorporates several independent variables to operationalize the

categories as shown in equations (1) and (2) below:

$$L_Q = f(\text{Economic Conditions, Borrower Characteristics, Lender Characteristics}). \qquad (1)$$

$$Y_{ti} = \theta_{ti} + \omega_1 \text{ECOND}_{ti} + \omega_2 \text{BCHAR}_{ti} + \omega_3 \text{LCHAR}_{ti} + \epsilon_{ti.} \qquad (2)$$

In equation (2), the subscript t is for yearly time periods and i is for the number of states. The independent variables are Economic Conditions(ECOND) which is a set of variables consisting of state unemployment rate and state per capita GDP, Borrower Characteristics(BCHAR) which is a set of variables consisting of firm size and non-farm proprietor income and Lender Characteristics(LCHAR) which is a set of variables consisting of tier 1 capital of banks, employment location quotients and the Herfindahl-Hirschman Index (HHI).

The empirical model outlined in (2) is estimated by applying panel least squares analysis to a data pool including observations on the 50 states for the six year period, 2007-2012. By examination of the data set using scatter plots and residual graphs three states are identified as outliers. These states are Delaware, Nevada and South Dakota. These states have special incorporation or banking environments that cause them to behave differently than the other 47 states. According to Grasshopper Team (2014) Delaware doesn't charge any sales tax and provides an extensive package of incorporation services which includes a broad and readily available set of legal guidelines derived from their highly developed legal system. Delaware's laws also allow for a high limit on the interest rates lenders can charge to borrowers which gives it a high appeal for banks in particular.

The tax foundation ranked South Dakota as number one for incorporation in the entire country and one big factor is that the state has no corporate or personal income tax (Grasshopper Team, 2014). Additionally, according to South Dakota Maxfilings (2015), if business owners incorporate in South Dakota they have the limited liability protection given by a corporation as well as some potential for sheltering taxes. Over several decades, in spite of its status as an

otherwise economically small state, South Dakota has become a major player in financial

services to include banking (South Dakota Ready to Work, 2015). Whether by purpose or

historical accident the result for South Dakota, Delaware, and Nevada is that these states are

outliers in small business (and perhaps other types of) lending. This status seems to result from a

high concentration of either banks or corporations (or both) who find their connections to these

states beneficial.

The extent to which they are outliers is obvious when looking at Tables 3 where the

summary statistics are reported first for all 50 states and then for the 47 states that remain after

the three outlining observations are excluded.

TABLE 3

SUMMARY STATISTICS

50 STATES					
NAME	MEAN	STD. DEV	MINIMUM	MAXIMUM	CV
SBLGDP	0.038603	0.096164	0.002000	0.667000	2.49
SUNEM	7.098667	2.371260	2.600000	14.40000	0.33
SPGDP	46804.11	8789.996	30988.00	72281.00	0.19
PCTFL100	94.88157	1.312787	89.41000	97.50000	0.01
TCAPGDP	0.133190	0.431571	0.004000	5.113000	3.24
HHI	1066.761	874.4772	169.0600	6249.750	0.82
NFPIGDP	0.065857	0.014130	0.044000	0.132000	0.21
LQ522	1.067933	0.392799	0.640000	3.180000	0.37
47 STATES					
NAME	MEAN	STD. DEV	MINIMUM	MAXIMUM	CV
SBLGDP	0.020050	0.020632	0.002000	0.156000	1.03
SUNEM	7.104255	2.292208	2.600000	13.30000	0.32
SPGDP	46472.51	8731.595	30988.00	72281.00	0.19
PCTFL100	95.06365	1.027038	92.99000	97.50000	0.01
TCAPGDP	0.051117	0.073289	0.004000	0.371000	1.43
HHI	930.1683	635.0885	169.0600	4475.290	0.68
NFPIGDP	0.065926	0.014278	0.044000	0.132000	0.22
LQ522	1.003262	0.189280	0.640000	1.570000	0.19

Notes:

Sample Period: 2007-2012

Std. Dev.- Standard Deviation

CV: Coefficient of Variation

A simple comparison of the maximum values for four variables, SBLGDP, TCAPGDP, HHI, and LQ522 reveals the outlier problem. When the three outlier states are excluded, the maximum value of SBLGDP drops from 0.667 to 0.156. TCAPGDP drops from 5.113 to 0.371. HHI drops from 6249.75 to 4475.29. LQ522 drops from 3.18 to 1.57. Obviously this phenomenon needs to be accounted for in the empirical estimates.

The presence of the three outlying states influenced the empirical methods in three ways. First, the presence of the outliers introduced severe heteroscedasticity to the model. To deal with this a dummy variable identifying the outlying states was introduced into the model and interacted with all of the other independent variables. This allows separate intercept and slope estimates for the outlying states. Second, to deal with the remaining heteroscedasticity, panel adjusted standard errors (White's method) were used. Third, the outlying states were omitted from the model which was then re-estimated using the remaining 47 states and the results were compared to the full model. In addition a correction for AR (1) autocorrelation was incorporated. Variance inflation factors were calculated for the continuous variables and no severe multicollinearity problems were evident.

ESTIMATION AND RESULTS

Two regression equations are estimated one for the 50 states and the other for 47 states both for the period 2007 to 2012. The first equation which is the main equation is estimated using all 50 states. Seven interaction terms capture the interaction between the independent variables and the three-state dummy variable (DNSDDUM). DNSDDUM takes a value of one

for observations on the outlier states of Delaware, Nevada and South Dakota. A statistically significant parameter estimate on DNSDDUM will indicate that the intercept for the three outlier states is different from the 47 state intercept. Statistically significant parameter estimates on the interaction terms will indicate that the marginal effects of the original variable are different between outliers and the remaining states.

Table 4 provides estimates generated by the model for both the 50 and 47 state models.

TABLE 4

FIFTY AND 47 STATE MODELS

Dep Var SBLGDP	50 STATES		47 STATES	
NAME	COEFFICIENT	T-STATISTIC	COEFFICIENT	T-STATISTIC
CONSTANT	0.171602	4.523132*	0.182219	4.406422*
SUNEM	-0.002996	-9.052520*	-0.002790	-9.955604*
SPGDP	-1.69E-07	-3.307848*	-1.59E-07	-3.446834*
PCTFL100	-0.001451	-3.823117*	-0.001566	-3.695144*
TCAPGDP	0.230257	14.68693*	0.229817	14.88823*
HHI	-7.09E-06	-12.25530*	-7.22E-06	-12.66131*
NFPIGDP	-0.093796	-5.417979*	-0.098038	-5.220734*
LQ522	0.011050	6.996822*	0.011384	7.185582*
DNSDDUM	-1.502467	-0.715657		
DNSDDUM*SPGDP	-1.08E-05	-2.785836*		
DNSDDUM*SUNEM	-0.007807	-1.779462**		
DNSDDUM*PCTFL100	0.017375	0.845818		
DNSDDUM*TCAPGDP	-0.208540	-16.56439*		
DNSDDUM*HHI	2.42E-05	2.844436*		
DNSDDUM*NFPIGDP	4.154581	4.684013*		
DNSDDUM*LQ522	0.221734	43.21530*		
Y2008	0.003970	7.738402*	0.001645	5.940265*

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Y2009	0.009512	6.394528*	0.007537	6.688672*
Y2010	0.011587	6.473193*	0.008524	6.855190*
Y2011	0.005070	3.131243*	0.003378	3.146467*
Y2012	0.002694	1.790252**	0.000872	2.845104*
		R^2 :0.9875		R^2 :0.7672
		Adjusted R^2 : 0.9866		Adjusted R^2 : 0.7568

Notes:

*indicates significance at 0.01 level

**indicates significance at the 0.10 level

Sample Period: 2007- 2012

Number of Observations: 350

Panel Least Squares, 50 and 47 States

White Cross Section

Year dummies are included to capture the fixed effects for years 2008 through 2012. According to Gujarati and Porter (2009) dummy variables are used to capture the heterogeneity among subjects by allowing for the intercepts to differ across subjects (in this case fifty states). Statistically significant coefficients on the year dummies will indicate that there is some year-to-year variation in small business lending that has not been captured elsewhere in the model. Seven interaction terms in the model capture the interaction between the independent variables and the dummy variable for the outlying states. The interaction terms are (1.) DNSDDUM*SPGDP (2.) DNSDDUM*SPGDP (3.) DNSDDUM*PCTFL100 (4.) DNSDDUM*TCAPGDP (5.) DNSDDUM*HHI (6.) DNSDDUM*NFPIGDP and (7.) DNSDDUM*LQ522.

The second column of Table 4 provides the coefficient estimates and t-statistics for the fifty state interacted model. For the economic conditions category the variables are SUNEM and SPGDP. The results show that SUNEM has a negative sign as expected and the coefficient is

statistically significant at the 0.01 level. For every 1 percentage point change in the unemployment rate there is a near $3.00 SBLGDP change in the opposite direction. The unemployment rate appears to influence lending as expected.

The variable SPGDP has a negative sign and is statistically significant at the 0.01 level. This conflicts with the a priori expectation. One reason for the negative sign could be that as per capita GDP increases, small business owners will rely more on personal financial means rather than external sources of funds, thus less borrowing. This outcome is consistent with Colombo and Grilli (2007) who find that small businesses will use more personal means than external means to finance their businesses. This result is also consistent with Bates and Robb (2013) who note that nonminority-owned start-up firms and African American owned start-up firms use a smaller amounts of debt than equity.

For the borrower characteristics category the variables are PCTFL100 and NFPIGDP. PCTFL100 has a negative sign, different from the expected positive sign, and is statistically significant at the 0.01 level. The negative result is consistent with Cole (2013) who notes that larger firms have more access to funds from banks than smaller firms. This result is also consistent with the finding of Colombo and Grilli (2007) as discussed above. The results for NFPIGDP show a change from the expected sign of positive to negative but is statistically significant at the 0.01 level. The negative sign is consistent with Cole (2013) who notes that the more profitable a firm is the more it has in internally generated funds that it can tap into which reduces its need to borrow externally. This result is consistent with the finding of Colombo and Grilli (2007) discussed above.

For the lender characteristics category the variables are TCAPGDP, HHI and LQ522. The results show that the TCAPGDP variable has the expected positive sign and is statistically

significant at the 0.01 level. For every $1 TCAPGDP change the model predicts a $230 SBLGDP change. This positive result is consistent with Wilkinson and Christensson (2011) who note that an increase in banks' capital gives banks more funds and ability to lend to small businesses. The coefficient on the HHI variable is negative, as expected, and is statistically significant at the 0.01 level. The negative and statistically significant coefficient on the HHI variable is consistent with McNulty et al. (2013) who find that as bank asset size increases the propensity to lend to small businesses decreases.

The results show that LQ522 has the expected sign and is statistically significant at the 0.01 level. It appears that more employment in this industry leads to more lending to small businesses. The DNSDDUM dummy shows a negative sign but is statistically insignificant. This leads to the conclusion that the intercept for the three outlying states is not statistically different than the intercept for the other 47 states.

The differences between the two groups are revealed through the interaction terms. Five of the seven interaction dummy variables are statistically significant at the 0.01 level. The interaction dummy variable DNSDDUM*SUNEM is significant at the 0.10 level which is considered a statistically weak significance. For the three outlying states, the marginal effects (slopes) of SPGDP, TCAPGDP, HHI, NFPIGDP, and LQ522 are statistically different than those of the other 47 states.

All of the coefficients on year dummy variables are positive and, for the most part, statistically significant at the 0.01 level. The coefficients grow larger over the 2008-2010 period indicating an upward trend after 2007. The drop-off in coefficient size in 2011 and 2012 indicate lending beyond the 2007 level but also a weakening of the positive trend. The year dummy

variable for 2012 is statistically significant at the 0.10 level which is considered a weak statistical significance.

The results from the fifty state regression equation show that the explanatory variables in the three categories of economic conditions, borrower characteristics and lender characteristics are all statistically significant at the 0.01 level. The statistical significance along with the 0.9875 R-squared statistic indicate that the model has a great deal of explanatory value and can provide significant insight into state-by-state variations in small business lending.

The second regression equation estimated using only forty seven states is estimated primarily to provide a comparison to the fully interacted model. If the problems created by the three outlying states have been sufficiently treated by including the three-state dummy variable and interaction terms, the coefficient estimates from the 47 state model should approximate the coefficient estimates from the 50 state model. The third column of Table 4 reports the results of the regression equation for the forty seven states.

The first notable observation is that all of the explanatory variables have nearly identical coefficients as the coefficients in the first model. The second notable observation is that for the seven major independent variables all have the same signs as they are in the first model. The third notable observation is that all of the seven major independent variables are statistically significant at the 0.01 level just as they are in the first model. The fourth and final notable observation is that the R-squared statistic of 0.76718 is lower than that of the 50-state model but still indicates a great deal of explanatory power. Based on these four observations of the second model the conclusion is that the impact of the three outlying states is sufficiently accounted for and further interpretation of the 47 state model is unnecessary. Both models lead to the same conclusions.

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CONCLUSION

A preliminary inspection of small business loans provided by commercial banks appears to show a variation of these loans across the 50 states over a six-year period that includes "The Great Recession." Given evidence provided in the literature review, the major factors that appear to influence small business lending are placed in general categories of economic conditions, borrower characteristics and lender characteristics.

From these categories an empirical model is constructed to explain the variation in commercial bank lending to small businesses during "The Great Recession" and in the subsequent years of recovery. There are two regression equation estimations used in the empirical analysis of this study. The main regression equation estimation uses data from all fifty states and the second equation estimation uses data from forty seven states. The findings from the main regression equation will be discussed in general terms. The specifics are provided in Section IV.

From the empirical analysis the economic condition relating to the unemployment rate as measured by the variable SUNEM appears to have a tremendous influence on commercial banks lending to small businesses. The empirical results show that under the lender characteristics the variables TCAPGDP and HHI are statistically highly significant. Under the borrower characteristics the results of the empirical analysis show that both the NFPIGDP and PCTFL100 appear to have a statistically negative influence on small business lending in states. From a regional economic development perspective the empirical results indicate that economic conditions, borrower characteristics and lender characteristics should garner consideration in policy design to influence small business lending.

ACKNOWLEDGMENTS

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