How does Social Capital Impact SBA Loan Approvals in US Counties?

Adham CHEHAB[1]
Yibo XIAO[2]

DOI: 10.24818/mer/2024.02-12

ABSTRACT

The purpose of this paper was to evaluate the determinants of the Small Business Administration (SBA) gross loan approval in a US county. Our main research variable was a county's social capital. We hypothesised that the higher the county's social capital, the larger the SBA gross loan approval for the county. We also evaluated the impact of other control variables on SBA gross loan approvals. The social capital of individual US counties was available for 1990, 1997, 2005, 2009, and 2014 while other variables were not available as early as 1990. Therefore, we limited our research period to 1997 through 2014. We followed the published literature and linearly interpolated social capital for the non-observed years. The final sample included more than 30,000 county-year observations. The regression results showed that a county's social capital was a positive and significant determinant of its aggregate SBA gross loan approvals. The results also showed that total banking assets, number of banking employees, population, per capita income, and whether the county is rural were also positive and significant determinants of aggregate SBA gross loan approvals in a US county. In addition, increases in a county's total banking loans and leases, and its unemployment level were negatively and significantly associated with SBA gross loan approvals. All the regression coefficients were significant at the 1% level.

KEYWORDS: *social capital, SBA Loans, Small Business Lending, Business Loan Guarantees.*

JEL CLASSIFICATION: *G20*

1. INTRODUCTION

In the US, small businesses represent a large part of the economy. Yallapragada & Bhuiyan (2011) and Yu et al. (2019) stated that small businesses represent 39% of the economy and create 2 of every 3 jobs in the US. However, small businesses have unreliable access to commercial bank loans when compared to large firms. Large firms have more options when seeking credit and better access to capital markets than entrepreneurs and small businesses. Amel & Mach (2017) and Cole & Damm (2020) showed that after the financial crisis of 2008, commercial lending declined for all firms. However, during 2010, large firm credit returned to its original upward trajectory while bank lending to small businesses continued to decline. Yu et al. (2019) argued that small businesses have difficulty obtaining credit because they lack clear financial information and credit ratings. Therefore, without government financial support, small businesses would not reliably access the capital they need to succeed. The government's support materialised in the form of providing loans and loan approvals through the Small Business Administration.

The US government realised the need to support small business early in the twentieth century. The US Congress created the United States Small Business Administration (SBA) in 1953 to support small businesses. The SBA website, www.sba.gov, states that "SBA works to ignite

[1] Professor of finance, College of Business, University of La Verne, USA, achehab@laverne.edu, Corresponding author.
[2] Associate professor of finance, College of Business, University of La Verne, USA, cxiao@laverne.edu.

change and spark action so small businesses can confidently start, grow, expand, or recover". Since its establishment, the SBA has supported small business by providing loans, loan guarantees, contracts, counselling sessions, and other forms of assistance. According to the SBA website, the loans are offered in two types, SBA 504 and SBA 7(a), to small businesses and startups to facilitate their success and growth. SBA 504 loans are mainly used to finance owner-occupied real estate or large equipment purchases. Currently, most SBA 504 loans range from $125,000 to $20 million, require a 10% down payment, are fixed-interest rate, and do not require additional collateral. The SBA 504 real estate loans have a maturity of 25 years as of April 2018; the original maturely for real estate loans was 20 years. SBA 7(a) loans, on the other hand, are usually higher risk which may be used to finance a business purchase, equipment, or to obtain working capital. SBA 7(a) can be variable-interest loans and tied to the prime rate. The minimum required down payment is 10%; however, it is often between 20 and 30%. The SBA 7(a) real estate loans have a maturity up to 25 years; business acquisition and equipment loans have a maturity up to 10 years; working capital loans have a maturity of 5 to 7 years; and a weighted average maturity is used for mixed-use loans.

SBA lending has been extensively studied in the published literature. However, the literature did not evaluate the impact of local characteristics of a community on the size of received SBA loan approvals. An important characteristic of a community that has been ignored by the literature is its social capital. Social capital can be an important determinant of SBA lending due to its impact on business and consumer lending in general. The term Social Capital has been used intermittently since the late nineteenth century; but it has become much more widely accepted and used in the late twentieth century. Coleman (1988) and Putnam (1993) have developed the concept and forms of social capital more extensively. Putnam (1993) describes social capital, including trust, norms, and networks, as a "public good", which can be cumulative, cooperative, productive, and transferable for mutual gain, within the structure, whether personal or corporate.

Jha and Chen (2015) argued that social capital is a measure of trust in a community. A higher level of social capital in a county may increase the level of trust between individuals and entities. In addition, by increasing the flow of information, social capital may reduce the risk associated with asymmetry of information. Choe & Lee (2016) argued that higher levels of social capital may enhance investment since it can reduce opportunistic behaviour by enhancing social cooperation and facilitating the transmission of information in a community. SBA loans vary from one county to another. The data shows a range from $3,000 to more than $355 million in SBA gross loan approvals per county.

The paper attempts to investigate the impact of a US county's social capital and other characteristics on its SBA loan approvals by addressing the following two research questions:

1. Would the SBA be more willing to provide credit to communities with higher social capital indices?
2. What determines SBA gross loan approvals in a US county?

The following section of the paper, literature review and discussion, we present the discriminated research on social capital and other community characteristics that may impact their level of SBA gross loan approvals.

The social capital index for US counties was downloaded from the Northeast Regional Center for Rural Development (NERCRD) at the Pennsylvania State University. While the rest of the data were downloaded from various US government departments and from the Deposit Insurance Corporation (FDIC), Statistics on Depository Institutions (SDI). Data availability

limited our analysis period to 1997 through 2014. A detailed description of the dependent and independent variables is provided in the methodology section of the paper.

To address the research questions, regression analysis was used to analyse the data. Since some of the variable, specifically, the level of education and gross domestic product (GDP) for US counties were not available for the entire research period, we applied the regression analysis using three models. The first model included more than 30,000 county-year observations, excluded education and GDP. The second model included education had more than 10,000 observations. While the third model, which included GDP instead of education, had more than 24,000 observations. The empirical results section of the paper details the regression analysis and their results.

Finally, the summary and conclusion section of the paper presents the analysis results for the empirical investigation which attempts to address the research questions. We found that a county's social capital is a significant determinant of SBA lending in a US county. We also found that SBA lending increased with a county's total banking assets, number of banking employees, population, per capita income, and whether the count is rural and decreased with increases in total banking loans and leases and its unemployment level.

2. LITERATURE REVIEW AND DISCUSSION

In this section, we review the disseminated literature related to the determinants of SBA lending in a geographical area. We begin with our main research variable, the social capital index. We followed social capital by other control variables.

2.1 Social Capital and Lending

The literature points to two factors resulting from higher social capital in a community. Firstly, the literature shows that a higher social capital in a community would increase the availability of credit and reduce its costs due to increases in trust and potentially a reduction in defaults. For example, Boudreaux et al. (2021) showed that higher social capital may lead to increased borrowing from business suppliers and family members and also increased lending to consumers.

Secondly, the literature also shows that the cost of debt is reduced with increases in social capital in a community. Hmaittane et al. (2021) studied the effects of social capital on the cost of debt during the financial crisis. They found that borrowers with high social capital paid less interest when the lenders had high social capital. DeYoung et al. (2019) found that the default rates on loans decreased by about 5% for a one standard deviation increase in social capital.

Although microfinance is different from SBA lending, it provides an insight of the relationship between social capital and access to credit. Akram & Routray (2013) argued based on investigating the causal link between social capital and microfinance that increases in social capital may lead in better access to microfinance. Similarly, Kamukama & Natamba (2013) found that social intermediation and social capital are true drivers of access to micro finance.

The disseminated literature points to a positive relationship between social capital and gross SBA loan approvals. Therefore, we hypothesise that an increase social capital would increase in a US county's gross SBA loan approvals.

2.2 Local Banks

The literature pointed to two opposing views on the impact of local banks on SBA lending. On the one hand, the literature shows that local banks are needed to facilitate SBA loans. For example, Brown et al. (1989) stated that "Banks play a key role in promoting SBA services to the small business community". The SBA utilises local banks to provide the loans it guarantees. However, it is up to the bank to participate or not. Many banks seem to steer away from SBA lending. Small Business Finance reported in June 1988 that banks are not making Small Business Administration (SBA) and Farmers Home Administration (FHA) loans. On the other hand, the literature shows that SBA loans can be a substitute for bank loans. For example, Battersby (1994) argued that SBA loans can be an alternative to bank lending for small businesses. The two opposing arguments provide an opportunity to further investigate the impact of local banking on SBA gross loan approvals in a US county. We proxy the presence of banks using two variables, total banking assets, and the number of banking employees in a county. Banks total assets reflect the degree of the presence of banks in a county, and the number of employees reflects the banks human capital and its ability to serve its customers. Schneider & Bowen (1985) used a survey to show that the number of bank employees and their training impact customer turnover. Therefore, we proxied local banks and their loans separately. Based on the literature, we hypothesise that although banking loans are an alternative to SBA lending, having more banking assets in a community facilitates SBA lending.

2.3 Net Loans and Leases

This paper posits that bank loans and leases are an alternative to SBA loans. Ekpu & Paloni (2016) showed that business lending was a leading determinant of bank profits. Therefore, an increase in bank lending would cause a reduction in SBA loans applications. The argument is consistent with the existing literature. Hagaman et al. (1992) showed that SBA lending was an alternative to bank lending when firm are unable to secure credit. Similarly, Rappaport & Wyatt (1993) found that securitisation of small business loans increased after the inception of SBA loans which causes an increase in business lending. Securitisation is defined as packaging loans by maturity and risk and then selling them in the secondary market. Also, Bachas et al. (2021) showed that increased generosity in SBA loan guarantees cause bunching in the loan distributions on the side of more generous loan guarantees, and they also found that loan supply is positively responsive and highly sensitive to loan guarantee rates. Additionally, in the news, Trumbull (1992) reported that the SBA piloted a program in New Hampshire to provide small business credit after local bank failure. Therefore, we hypothesise that net loans and leases in a county would have a negative relationship with the aggregate SBA loan approvals in a US county.

2.4 Population

Areas with larger populations would be attractive to businesses since increases in population would increase the labour resource and the customer base for a business. The increase in business activity would increase the credit requirement for a geographic area. This argument is consistent with the literature. Sun & Liu (2023) found that increases in population and population density caused an increase in the availability of credit in a geographical area. Another effect of a large population is the availability of skilled labour. Indeed, Ruland (2013) argued that areas with large populations offered businesses more access to specialised labour with better training and productivity compared to less populated ones. Therefore, we hypothesise that an increase in population would cause an increase in SBA lending in a US county, and that a county's population would have a positive relationship with its aggregate SBA loan approvals.

2.5 Per Capita Income

There was limited literature on the relationship between existing per capita income and business lending. However, in this paper, we posit that a higher per capita income reduces the risk of default on a loan. Also, lower income entrepreneurs may avoid or reduce their borrowing to avoid default. Hence a higher per capita income would cause increased SBA borrowing. The argument we present is consistent with the literature, for example, Craig et al. (2007) found that SBA loans caused a growth in per capita income in local economies. The results are consistent with the findings of Adetiloye et al. (2023) who found a positive relationship between per capita income and credit availability. We, therefore, hypothesise that increases in per capital income in a county would lead to increases in SBA gross loan approvals for the area.

2.6 Unemployment Rate

In a related issue to per capital income, a higher unemployment rate would cause a reduction in income and therefore, consumer spending. SBA lending would be negatively associated with unemployment rates since credit availability increases business activities, which would cause an increase in employment levels. Indeed, Craig et al. (2008) found that SBA guaranteed loans have a positive impact on economic performance, measured by employment rates in the local labour market. The economic performance impact from SBA guaranteed lending is significantly larger in low-income areas. Brown and Earle (2017) implied an increase in employment associated with SBA loans. Orzechowski (2020) using quarterly panel data showed that employment levels increase with SBA lending per capita, at the state level. Similarly, other published literature found that small businesses employ the majority of the workforce in most areas (Moreno-Monroy & Euse, 2016). Therefore, we hypothesise that a higher unemployment rate would lead to reduced SBA loan approval in a community.

2.7 Rural Counties

The literature presented two opposing arguments regarding extending credit to rural areas. On the one hand, the more recent literature showed that loans in urban areas have a bigger impact on the firm's growth than in rural areas (Kärnä & Stephan; 2022). Therefore, firms in rural areas may experience credit constraints. On the other hand, the older literature showed that rural areas may be more attractive to lenders. Another rural versus urban effect is the default rates on loans. Ruland (2013) findings showed that conducting business in smaller cities is less costly and tend to outperform those in major areas. The increased performance of businesses in rural areas would be associated with reduced default rates. From the point of view of lenders, a lower probability of default is important when extending credit even if the loan is guaranteed by the SBA. For example, DeYoung et al. (2019) found that SBA loans in rural areas had lower default rates than in urban areas. Also, potential borrowers in rural areas may have more assets available collateralising than their urban counterparts. Gustafson (2004) showed that rural businesses have similar access to technology, but have more real and depreciable assets and rely less on credit cards than urban firms. Based on the literature, we posit that the trend is towards reduced lending in rural areas. Therefore, we hypothesise that SBA lending is reduced in rural areas.

2.8 Education Level

A more educated population would produce a more skilled labour force. Hence, business loans may be more prevalent in areas with a higher percentage of educated individuals in the population. The argument is consistent with the findings of Coleman (2004) who found that banks are more likely to approve loan to small firms with more highly educated business owners. In addition, the literature showed that more educated borrowers tend to borrow more than others. Also, Nguyen et al. (2021) found that entrepreneur's education level is proportional

to borrowing. A less educated entrepreneur would borrow less than an educated one. Similarly, Xu et al. (2020) found that the higher the level of the borrower education the larger the loan and the lower the interest rate in the peer-to-peer credit market. Therefore, we hypothesise that the education level would have a positive effect on the volume of SBA loans in a US county.

2.9 GDP Level in Each US County

The disseminated literature does not present a clear view of the relationship between GDP level and SBA lending. On the one hand, Craig et al. (2007) found that SBA-guaranteed lending has a positive relationship with the future per capita GDP income growth. On the other hand, Higgins et al. (2021) employed more than 3,000 county data, and a larger set of control variables, and found that a county's SBA lending per capita is associated with negative effects on income growth rates, both directly in local counties, and indirectly in neighbouring counties. However, Lee (2018) examines the impact of government guaranteed SBA guaranteed loans on regional growth, across 316 metro areas between 1993 and 2002. The research finds a positive relationship between SBA loans and regional growth. However, after controlling endogeneity, it found no significant growth effect on employment or income. Therefore, the impact of a county's GDP on SBA lending is indeterminate and we look to the regression analysis for guidance.

3. METHODOLOGY

Each of the 3,143 counties in the US has a unique Federal Information Processing System (FIPS) Code. The FIPS code is a five-digit number, the first two are the state code and the rest are the county code. We used county FIPS to construct the dataset panel from the different data sources for the analyses. Social capital of individual US counties was available for 1990, 1997, 2005, 2009, and 2014. We follow previous studies, for example Hilary and Hui (2009), Kumar et al. (2011), and Jha and Chen (2015), and linearly interpolate the data for the missing years. However, other variables were not available as early as 1990. Therefore, we limited our research period to 1997 through 2014. The paper presents the availability and sources of the data below.

We used regression analysis for the empirical analysis. The dependent variable was SBA gross loan approvals for a US county. Since not all independent the variables were available for the entire period, we ran the regression analysis in three models. All models included social capital index, population, per capita income, and the unemployment rate for a US county as common independent variable. Model one used all the independent variable available for 1997 through 2014. In addition to the common variables, Model one used whether a county was rural or not, aggregate banking assets, number of banking employees, and aggregate net loans and leases as explanatory variables. Eliminating the observations with missing data resulted in county-year observation for Model one of 31,925.

Model two added education level to the common variables. The level of education data was available starting in the year 2000. In addition, education level data were available for only 802 counties. Therefore, Model two regression limited the research period to 2000 through 2014 and the available county-year observations to 10,586. Finally, Model three added GDP to the common variables. Since the GDP per county was available starting in the year 2001, the research period for Model three was 2001 through 2014 and the available number of county-year observations was 24,255. The following parts of this section detail the sources and construction of each variable used in the regression analysis.

3.1 SBA Gross Credit Approvals by US County

To address the research questions of this paper, we used the gross SBA loan approvals in a US county, *SBA_LOAN*, as the dependent variable. The SBA gross credit approvals are the aggregate of the individual SBA's 504 and 7(a) business loans in a US county in a particular year between 1997 and 2014. Tables 1 and 2 show the summary statistics and data distribution quartiles. Figure 1 shows a plot of the SBA loan approvals and their natural logs. As Figure 1 shows, the values of the approvals change exponentially and, as Tables 1 and 2 show, the mean of the gross SBA loan approvals was much greater than its median with a large standard deviation. In addition, the majority of the SBA loan approvals are concentrated in the top quartile, which may introduce skewness in the data. Therefore, the natural log of the SBA loan approvals is used in the regression analysis. We downloaded the data from the Small Business Administration Datasets website. SBA gross loan approvals data are available starting 1991. The number of county-year observation was 31,925.

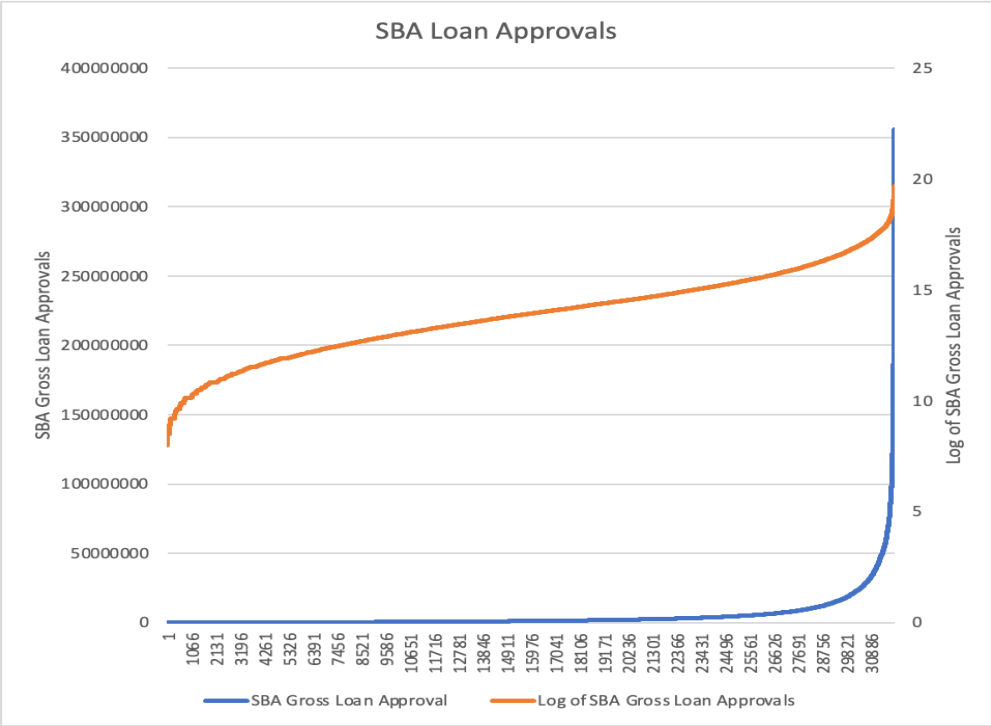

Figure 1. The Level and Natural Log of SBA Gross Loan Approval in a US County.
Source: www.SBA.gov

3.2 Independent Regression Variables

As Table 2 shows, the majority of the variables are concentrated in the top quartile, which may introduce skewness in the data. Therefore, the natural log of the variables was used in the regression analysis. The bias in data toward the largest quartile would be expected since this quartile had the largest population and geographical areas.

Table 1. Summary Statistics of the variables used in the paper

Variable	Mean	Median	Standard Deviation	Minimum	Maximum	Count
SBA_LOAN	5,192,249	1,126,000	14,664,353	3,000	355,807,958	31,925
SOCIAL	0	0	1	-4	6	31,925
POPULATION	117,714	38,966	272,808	737	5,373,418	31,925
INCOME	30,481	28,863	9,644	8,846	201,029	31,925

Variable	Mean	Median	Standard Deviation	Minimum	Maximum	Count
UNEMPLOYMENT	4.924%	4.812%	1.391%	1.099%	12.977%	31,925
BANK_ASSTS (000s)	5,286,002	381,245	64,365,957	5,050	2,913,835,670	31,925
LOANS (000s)	2,914,768	241,510	31,760,816	29	1,426,802,709	31,925
EMPLOYEES (000s)	969	123	9,694	3	432,367	31,925
EDUCATION	19%	17%	7%	4%	61%	10,586
GDP (000s)	6,181,496	1,367,704	20,721,491	20,853	563,067,752	24,255

Table 2. Quartiles of the variables used in the paper

Variable	Quartile 1	Quartile 2	Quartile 3	Maximum
SBA_LOAN	287,350	1,125,000	3,774,400	355,807,958
SOCIAL	-1	0	0	6
POPULATION	18,488	38,941	97,539	5,373,418
INCOME	23,935	28,865	35,104	201,029
UNEMPLOYMENT	4.10%	5.40%	7.30%	12.977%
BANK_ASSTS (000s)	171,122	380,820	916,172	2,913,835,670
LOANS (000s)	101,209	241,330	595,121	1,426,802,709
EMPLOYEES (000s)	56	123	276	432,367
EDUCATION	13.5	17.4	22.5	61%
GDP (000s)	592,684	1,366,937	4,037,593	563,067,752

(a) *SOCIAL*, Social Capital Index for a US county, the main research variable. Rupasingha and Goetz (2006, with updates) show the calculation methodology for index. We downloaded the social capital index from the Northeast Regional Center for Rural Development (NERCRD) at the Pennsylvania State University. As Table 1 shows, the social capital index ranges between -4 and 6. Since the mean is equal to the median, the index did not exhibit skewness in the data. The number of county-year observation was 31,925.
The website is: https://nercrd.psu.edu/data-resources/county-level-measure-of-social-capital/.

(b) *POPULATION*, Natural log of population per county. As Table 1 shows, the population per county varied between by a large amount, between 737 and 5,373,418, with the mean much larger than the median, 117,714 versus 38,966. The difference between may indicate that the data exhibits a skewness. To correct for skewness, the natural log of the population level was used in the regression analysis. We downloaded the population-per-county data from the Department of Commerce / Bureau of Economic Analysis / Regional Economic Accounts. The population level per county data are available starting 1969. The number of county-year observation was 31,925.
The website is: www.bea.gov/data/economic-accounts/regional

(c) *INCOME*, The natural log of the per capita income. As Table 1 shows, the annual per income in a US county varied between 8,846 and 201,029 with a mean and median of 30,481 and 28,863 respectively. We downloaded the per capital income per county from the Department of Commerce / Bureau of Economic Analysis / Regional Economic Accounts. The per capita income data are available starting 1969. The number of county-year observation was 31,925.
The website is: www.bea.gov/data/economic-accounts/regional

(d) *UNEMPLOYMENT*, the unemployment rate for a US county. The unemployment rate ranged between 1.099% and 12.977% with a mean and median of 4.924% and 4.812%, respectively. The data on unemployment rates is presented in Table 1. We obtained the unemployment rate from the US Bureau of Labor Statistics. The unemployment rate is available starting 1990. The number of county-year observation was 31,925.
The website is: www.bls.gov

(e) *RURAL*, the calculated variable, Rural, is a dummy variable equal 1 if the county's population density is below the median and 0 otherwise. We calculated the population density as county's population divided by its area. The land area per county data is available for download from the US Census Bureau. The number of county-year observation was 31,925.
The website is: www.census.gov/data/tables/1990/dec/1990-places-land-density.html.

(f) *BANK_ASSETS*, the natural log of the aggregate of the banks' total assets in a county where their headquarters are located. The range for banking assets varied between, in thousands of US Dollars, 5,050 and 2,913,835,670 with a mean and median of 5,286,002 and 381,245 respectively. The natural log of the variable was calculated due to the difference between the mean and the median. The data on banking assets is presented in Table 1. The source of the data was the Federal Deposit Insurance Corporation (FDIC), Statistics on Depository Institutions (SDI). The Statistics on Depository Institutions data are available staring 1992. The number of county-year observation was 31,925.
The website is: www.fdic.gov/foia/ris/id-sdi/index.html.

(g) *LOANS*, the natural log of the aggregate net loans and leases for banks in a US county. As Table 1 shows, the aggregate banking loans and leases for a US county varied, in thousands of US Dollars, between 29 and 1,426,802,709 with a mean and median of 2,914,768 and 241,510 respectively. We downloaded the data from the Federal Deposit Insurance Corporation (FDIC), Statistics on Depository Institutions (SDI). The data are available starting 1992. The number of county-year observation was 31,925.
The website is: www.fdic.gov/foia/ris/id-sdi/index.html.

(h) *EMPLOYEES*, the natural log of the aggregate number of banking employees in a US county. As Table 1 shows, the range of the number of banking employees in a US county varied, in thousands, between 3 and 432,367 with a mean and median of 969 and 123 respectively. Due to the difference between the mean and the median, we used the natural log of the aggregate number of banking employees in the regression analysis. We downloaded the data on bank employees from the Federal Deposit Insurance Corporation (FDIC), Statistics on Depository Institutions (SDI). Banking employees' data are available starting 1992. The number of county-year observation was 31,925.
The website is: www.fdic.gov/foia/ris/id-sdi/index.html.

(i) *EDUCATION*, the percentage of individuals in a US county who are 25 years or older with a bachelor's degree. As Table 1 shows, Education exhibited a very large range, between 4% and 61% with a mean and median of 19% and 17% respectively. The data shows that the mean and the median were close. The data were downloaded from the US Census Bureau. Education level data are available starting 2000. The number of county-year observation was 10,586.
The website is: www.census.gov/topics/education/educational-attainment.html.

(j) *GDP*, the natural log of the GDP level in each county. The GDP per US county varied, in thousands of US Dollars, between 20,853 and 563,067,752 6,181,496 and 1,367,704. Table 1 shows the GDP per US county. The data were downloaded from the Department of Commerce /

Bureau of Economic Analysis / Regional Economic Accounts. The GDP level per county data are available starting 2001. The number of county-year observation was 24,255.
The website is: www.bea.gov/data/economic-accounts/regional

4. EMPIRICAL RESULTS

This section presents the results of the regression analysis. It shows to what degree the Social Capital Index affects Small Business Administration loans by county in the US. The impact of the other control variables on SBA loan approvals is also presented. The regression results are tabulated in Tables 3 through 5.

Table 3. Regression Results for Model One

Variable	**Estimated Coefficients (P-value)**
Intercept	-3.6614*** (0.000)
SOCIAL	0.1750*** (0.000)
POPULATION	1.0427*** (0.000)
INCOME	0.6990*** (0.000)
UNEMPLOYMENT	-0.0309*** (0.000)
RURAL	-0.2891*** (0.000)
BANK_ASSETS	0.0999*** (0.004)
EMPLOYEES	0.0592*** (0.009)
LOANS	-0.1603*** (0.000)
Adjusted R Square	0.6014
Observations	31,908

*** Indicates significance at the 1% level

The paper hypothesised that the higher the social capital index in a US county, the greater the SBA gross loan approval. The regression results show that the coefficient for SOCIAL was positive and significant all the regression models (0.1750, 0.0728, 0.1623; $p < 1\%$ for all models). The finding indicates that the higher degree of trust in a community, the higher the likelihood that the SBA would increase credit availability to it. As the literature showed, a higher social index in an area potentially may indicate a reduced probability of default. In addition, a higher social index may ensure that the borrowed funds would be used for its intended purpose. The findings are consistent with the published literature (Woolcock 2001; Rupasingha et al., 2006; Jha and Chen, 2015). The coefficient for POPULATION was positive and significant in all models (1.0427, 1.0655, 0.9214; $p < 1\%$ for all models). The results indicate that the SBA loan approvals tended to increase in counties with increased population and per capita income. An increase in population would increase the size of the local market for a potential business venture and therefore increase the probability of its success. In addition, a larger population would offer potential business endeavours better labour support (Ruland, 2013).

Table 4. Regression Results for Model Two

Variable	Estimated Coefficient (P-value)
Intercept	-6.5400*** (0.000)
SOCIAL	0.0728*** (0.000)
POPULATION	1.0655*** (0.000)
INCOME	0.8665*** (0.000)
UNEMPLOYMENT	-0.0159*** (0.000)
RURAL	-0.0047 (0.831)
EDUCATION	0.0142*** (0.000)
R-SQUARE	0.7167
Observations	10586

*** Indicates significance at the 1% level

Table 5. Regression Results for Model Three

Variable	Estimated Coefficient (P-value)
Intercept	-6.4581*** (0.000)
SOCIAL	0.1623*** (0.000)
POPULATION	0.9214*** (0.000)
INCOME	0.7785*** (0.000)
UNEMPLOYMENT	-0.0315*** (0.000)
GDP	0.1822*** (0.000)
Adjusted R Square	0.5971
Observations	24,255

*** Indicates significance at the 1% level

The coefficient for INCOME was positive and significant (0.6990, 0.8665, 0.7885; $p < 1\%$ for all models). Areas with a higher per capita income would be more attractive to potential businesses. This argument is consistent with the findings of Koju et al. (2020) who showed that higher income areas provided businesses with more stability and higher probability of success. The finding also lend support to the argument that areas with higher per capita income provide businesses with a population with higher disposable income (Williams, 2015).

As hypothesised, the coefficient for the UNEMPLOYMENT was negative and statistically significant (-0.0309, -0.0159, -0.0315; $p < 1\%$ for all models). SBA loans and business development are associated with higher employment rates. In the United States where small

businesses who rely on SBA loans for credit employ most of the workforce (Robbins et al., 2000).

The coefficient for RURAL was negative and significant (-0.2891, -0.0047; $p < 1\%$ for all models). The results indicate consistency with the argument presented in the more recent literature such as Kärnä & Stephan (2022) as opposed to the older publications such as Garmhausen (2011).

We modelled local banks as two variables, banking assets, and number of banking employees. The regression coefficient for BANK_ASSETS was positive and statistically significant (0.0999; $p < 1\%$ for all models). Also, the coefficient for EMPLOYEES was positive and significant (0.0592; $p < 1\%$ for all models). As mentioned above, the literature provides opposing views on the impact of local banks. Our results are consistent with Brown et al. (1989) and Schneider & Bowen (1985), but not Battersby (1994).

Bank loans are an alternative to SBA loans. The coefficient of LOANS was negative and significant (-0.1063; $p < 1\%$ for all models). The results are consistent with the literature (Bennett, 1993). In addition, the literature pointed out that SBA loans have increased in areas where other credit is restricted. Hagaman (1992) and Rappaport & Wyatt (1993) reported similar results.

As hypothesised, the coefficient for EDUCATION level was positive and significant (0.0142; $p < 1\%$ for all models). An educated workforce would be more productive and increase the probability of business success. This is consistent with Kapoor and Shushma (2024), who found that the level of education increases the probability of business success in farming. The SBA would be more inclined to provide business loans to businesses in areas where the population has increased education level.

The coefficient for GDP level in each county was positive and significant (0.1822; $p < 1\%$ for all models). The result is consistent with the side of the literature that show increased GDP is associated with SBA loans (Craig et al., 2007; Lee, 2018). SBA loans in addition to their other business support activities are associated with increased business success and would produce increased growth in GBP. The results are not consistent with the opposing view presented by the literature (Higgins et al., 2021).

5. SUMMARY AND CONCLUSIONS

In this paper, we investigated the determinants of the aggregate SBA loan guarantees in US counties. Our main research variable was the social capital index for each county. In addition, we used control variables to account for other county characteristics. The control variables were total banking assets, number of banking employees, population, per capita income, whether the count is rural or not, total banking loans and leases, and unemployment level for each county. We used each county's unique five-digit Federal Information Processing System (FIPS) Code and year to construct the panel data from different sources. Due to data availability, we limited our sample to 1997 through 2014. The resultant dataset contained more than 30,000 county-year observations.

Discussion of social capital dates back to the nineteenth century. Social capital is a measure of trust in a community which reduces the risk associated with asymmetry of information and

opportunistic behaviour in a community. Therefore, a high social capital would enable a community to function effectively.

We use the social capital index developed by Rupasingha and Goetz (2006, with updates) at the Northeast Regional Center for Rural Development (NERCRD) at the Pennsylvania State University as a measure of social capital in a US county. We hypothesised that an increase in social capital would cause an increase in SBA loan approvals in US counties. The results of the regression analysis showed that increase in the social capital index led to an increase in the aggregate loan SBA loan guarantees for a US county. The coefficient of social capital index was positive and significant at the 1% level.

We also analysed other control variables. However, since not all the variables were available for the entire period, the regression analysis was carried out using three models. The regression analysis also showed that the control variables were also statistically significant. We found that increases in total banking assets, number of banking employees, population, per capita income, bank commercial and industrial loans, and whether the count is rural caused an increase in the aggregate SBA loans for a US county. We also found a negative relationship between gross SBA loan approvals and the county's total banking loans and leases, and its unemployment level.

5.1 Discussion of Model Limitations

Since the data were not available for all the variables for the entire research period, it was necessary to run the regression as three models to maximise the number of observations. Dividing the data into three models reduces the interaction between the data which were included in different models. To run a single comprehensive model would have reduced the number of observation by two thirds and, therefore, greatly reduce the reliability of the results.

5.2 Future Research Directions

Since the unemployment rate had a very large range, it begs the question: would SBA loans have an impact on labour mobility. Basically, would labour move from low to high lending areas in pursuit of employment.

Another research avenue that arises from this paper is the impact of SBA lending on different industries. Did the DBA support one industry over another?

ACKNOWLEDGEMENTS

The authors are grateful for the comments provided by the editor of the journal, Professor Carmen Nadia Ciocoiu and by an anonymous referee. Their comments greatly improved the content of the paper. However, the authors remain solely responsible for all errors and omissions.

REFERENCES

Adetiloye, K.A., Nkwodimmah, P., Babajide, A.A., & Osuma, G. (2023). Agricultural Financing, Poverty and Unemployment Reduction in Nigeria. *African Journal of Business and Economic Research, 18*(1), 165-165-184.

Akram, S., & Routray, J.K. (2013). Investigating causal relationship between social capital and microfinance: Implications for rural development. *International Journal of Social Economics*, *40*(9), 760-776.

Amel, D., & Mach, T. (2017). The Impact of the Small Business Lending Fund on Community Bank Lending to Small Businesses. *Economic Notes, 46*(2), 307-328.

Anonymous (June 1988). Small Business Finance: Sooner Success Story. *American Bankers Association. ABA Banking Journal, 80*(6), 29.

Bachas, N., Kim, O.S., & Yannelis, C. (2021). Loan Guarantees and Credit Supply. *Journal of Financial Economics, 139*(3), 872-894.

Battersby, M.E. (1994). Loan Trouble with The Banks? Try the SBA. *Veterinary Economics, 35*(6), 61.

Bennett, J. (1993). SBA Loans in Area Rise 25% as Bank Lending Still Tight. *Jacksonville Business Journal, 8*(29), 3.

Boudreaux, C., Clarke, G., & Jha, A. (2021). Social capital and small informal business productivity: the mediating roles of financing and customer relationships. *Small Business Economics, 59*(3), 955-976.

Brown, J.D., & Earle, J.S. (2017). Finance and Growth at the Firm Level: Evidence from SBA Loans. *The Journal of Finance, 72*(3), 1039-1080.

Brown, S.M., Thompson, H., & Ashcraft, P. (1989). The Small Business Administration Guaranteed Loan: Victim of a Low Profile? *The Kentucky Journal of Economics and Business, 9*, 131-138.

Choe, J. & Lee, K. (2016). Does Social Capital Matter in the Location Decision of Foreign Direct Investment? Evidence from Korea. *Asian Economic Papers, 15*(2), 71-101.

Cole, R.A., & Damm, J. (2020). How Did the Financial Crisis Affect Small-Business Lending in the United States? *The Journal of Financial Research, 43*(4), 767-820.

Coleman, J.S. (1988), Social Capital in the Creation of Human Capital, *American Journal of Sociology, 94*(1), S95-S120

Coleman, S. (2004). The Role of Education and Experience in Small Firm Access to Bank Loans: Is There a Link? *Journal of Business and Entrepreneurship, 16*(1), 1-16.

Craig, B.R., Jackson, W.E., & Thomson, J.B. (2007). Small Firm Finance, Credit Rationing, and the Impact of SBA-Guaranteed Lending on Local Economic Growth. *Journal of Small Business Management, 45*(1), 116-132.

Craig, B.R., Jackson, W.E., & Thomson, J.B. (2008). On government intervention in the small-firm credit market and economic performance. *Entrepreneurship in Emerging Domestic Markets: Barriers and Innovation*, 47-67.

DeYoung, R., Glennon, D., Nigro, P.J., & Spong, K. (2019). Small Business Lending and Social Capital: Are Rural Relationships Different? *The Journal of Entrepreneurial Finance, 21*(2), 4.

Ekpu, V., & Paloni, A. (2016). Business lending and bank profitability in the UK. *Studies in Economics and Finance, 33*(2), 302-319.

Garmhausen, S. (2011). SBA Revamps Lending for Underserved Markets. *U.S. Banker, 121*(3), 34-35.

Gustafson, C.R. (2004). Rural Small Business Finance: Evidence from the 1998 Survey of Small Business Finances. *Agricultural Finance Review, 64*(1), 33-43.

Hagaman, T.C. (1992). Small Business Loans: SBA to the Rescue. *Management Accounting (USA), 74*(2), 8-9.

Higgins, M.J., Lacombe, D.J., Stenard, B.S., & Young, A.T. (2021). Evaluating the Effects of Small Business Administration lending on growth. *Small Business Economics, 57*(1), 23-45.

Hilary, G., & Hui, K.W. (2009). Does Religion Matter in Corporate Decision Making in America? *Journal of Financial Economics, 93*(3), 455-473.

Hmaittane, A., Mnasri, M., Bouslah, K., & M'Zali, B. (2021). Social Capital and Cost of Bank Loans During the Financial Crisis. [Capital social et coût des prêts bancaires durant

la crise financière El capital social y el coste de los préstamos bancarios durante la crisis financiera] *Management International, 25*(2), 107-123.

Iyer, S., Kitson, M., & Toh, B. (2005). Social Capital, Economic Growth and Regional Development. *Regional studies, 39*(8), 1015-1040.

Jha, A., & Chen, Y. (2015). Audit Fees and Social Capital. *The Accounting Review, 90*(2), 611-639.

Kamukama, N., & Natamba, B. (2013). Social capital: mediator of social intermediation and financial services access. *International Journal of Commerce and Management, 23*(3), 204-215.

Kärnä, A., & Stephan, A. (2022). Do Firms in Rural Regions Lack Access to Credit? Local Variation in Small Business Loans and Firm Growth. *Regional Studies, 56*(11), 1919-1933.

Kapoor, S., & Shushma, H. (2024). Measuring the Effectiveness of Agricultural Credit in Increasing Farm Productivity: An Empirical Analysis. *International Management Review, 20*(1), 32-41, 94

Koju, L., Koju, R., & Wang, S. (2020). Macroeconomic Determinants of Credit Risks: Evidence from High-Income Countries. *European Journal of Management and Business Economics, 29*(1), 41-53.

Kumar, A., Page, J.K., & Spalt, O.G. (2011). Religious Beliefs, Gambling Attitudes, and Financial Market Outcomes. *Journal of Financial Economics, 102*(3), 671-708.

Lee, Y.S. (2018). Government Guaranteed Small Business Loans and Regional Growth. *Journal of Business Venturing, 33*(1), 70-83.

Moreno-Monroy, A., Yu, S., & Euse, V. (2016). Urban Employment in Small Businesses and the Level of Economic Development: Evidence from Chinese Cities. *Growth and Change, 47*(1), 53-71.

Nguyen, H.T., Nguyen, H.M., Troege, M., & Nguyen Anh, T.H. (2021). Debt aversion, education, and credit self-rationing in SMEs. *Small Business Economics, 57*(3), 1125-1143.

Orzechowski, P.E. (2020). U.S. Small Business Administration Loans and U.S. State-level Employment. *Journal of Economics and Finance, 44*(3), 486-505.

Putnam, R. (1993). The Prosperous Community: Social Capital and Public Life. *The American, 4*.

Rappaport, A., & Wyatt, R.W. (1993). An Overview of the Securitization of SBA Guaranteed Loans Originated by Commercial Banks. *Small Business Economics, 5*(3), 215-220.

Robbins, D.K., Pantuosco, L.J., Parker, D.F., & Fuller, B.K. (2000). An Empirical Assessment of the Contribution of Small Business Employment to US State Economic Performance. *Small Business Economics, 15*, 293-302.

Ruland, W. (2013). Are Big City Businesses More Profitable than Other Firms? *Managerial Finance, 39*(11), 1100-1119.

Rupasingha, A., Goetz, S.J., & Freshwater, D. (2000). Social Capital and Economic Growth: A County-Level Analysis. *Journal of Agricultural and Applied Economics, 32*(3), 565-572.

Rupasingha, A., Goetz, S.J., & Freshwater, D. (2006, with updates). The Production of Social Capital in US Counties. *Journal of Socio-Economics, 35*, 83-101

Schneider, B., & Bowen, D.E. (1985). Employee and Customer Perceptions of Service in Banks: Replication and Extension. *Journal of Applied Psychology, 70*(3), 423-433.

Sun, X., & Liu, L. (2023). Determinants of branching decisions of State-controlled commercial banks: evidence from China. *The International Journal of Bank Marketing, 41*(6), 1389-1413.

Trumbull, M. (1992). New Hampshire Firms Bolstered by SBA Lifeline. *The Christian Science Monitor*

Williams, D.A. (2015). Entrepreneurial Training and Business Discontinuation: a Cross Country Study. *Journal of Business and Entrepreneurship*, *26*(3), 79-102.

Woolcock, M. (2001). The Place of Social Capital in Understanding Social and Economic Outcomes. *Canadian journal of policy research*, *2*(1), 11-17.

Xu, J., Hilliard, J., & Barth, J.R. (2020). On Education Level and Terms in Obtaining P2P Funding: New Evidence from China. *International Review of Finance, 20*(4), 801-826.

Yallapragada, R.R., & Bhuiyan, M. (2011). Small Business Entrepreneurships in The United States. *Journal of Applied Business Research*, *27*(6), 117-122.

Yu, S., Chi, G., & Jiang, X. (2019). Credit Rating System for Small Businesses Using the K-S Test to Select an Indicator system. *Management Decision, 57*(1), 229-247.