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The Importance of Financial Market Development on the Relationship between Loan Guarantees for SMEs and Local Market Employment Rates

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We empirically examine whether a major government intervention in the small-firm credit market yields significantly better results in markets that are less financially developed. The government intervention that we investigate is SBA-guaranteed lending. The literature on financing small and medium size enterprises (SMEs) suggests that small firms may be exposed to a particular type of market failure associated with credit rationing. And SMEs in markets that are less financially developed will likely face a greater degree of this market failure. To test our hypothesis, we use the level of bank deposits per capita as our relative measure of financial market development, and we use local market employment rates as our measure of economic performance.

After controlling for the appropriate cross-sectional market characteristics, we find that SBA-guaranteed lending has a significantly more (less) positive impact on the average annual level of employment when the local market is relatively less (more) financially developed. This result has important implications for public policy directives concerning where SBA-guaranteed lending should be directed.

JEL codes: G38, H81, O16.

Key words: Less financially developed markets, market liquidity, employment rates, small business credit markets, loan guarantees, credit rationing.

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1. Introduction

Recent studies provide evidence that relatively higher levels of financial market development do indeed tend to lead to higher levels of economic performance. Jayaratne and Strahan (1996), Rajan and Zingales (1998), and Guiso, Sapienza, and Zingales (2004), all report significant evidence supporting the proposition that higher levels of financial market development lead to higher levels of economic growth. These papers are very careful to develop reasonable structural instruments to proxy for the relative amount of local financial market development.

In this paper, we investigate whether local financial market development helps to promote economic performance by focusing on a particular rationale for such a relationship. That rationale is financial market development may increase the amount of external finance available to small firms. Specifically, we examine whether a government intervention aimed at increasing small firms' access to bank credit has a relatively greater impact in less financially developed markets in the U.S. And, we use SBA loan guarantees as our government invention method. We choose the small firm credit market because of the high degree of information asymmetry that may be associated with it. And, because this information asymmetry may lead to a credit rationing problem as explained in Stiglitz and Weiss (1981).

We focus on the SBA guaranteed lending program because our previous research (Craig, Jackson, and Thomson, 2007) suggests that SBA guaranteed lending has a small positive influence on the rate of economic growth in local geographic markets. Also, our study is motivated by the important results reported in a recent paper by Riding and Haines (2001). Drawing on empirical evidence to compare costs and benefits, Riding

and Haines (2001) is one of the very few studies to demonstrate that the net contribution of a guaranteed lending program is positive. They conclude that the Canadian loan guarantee program resulted in substantial total and incremental employment creation, and had a net positive effect on economic welfare. Additionally, Craig, Jackson, and Thomson (2008) found that loan guarantees tend to have a greater impact on employment creation in less financially developed markets. The ideas that loan guarantee programs generally have net positive impacts on employment and that the magnitude of these impacts may differ across local geographic markets leads to the fundamental research question for this paper. That question is this: Does local market financial development tend to mitigate the positive impact that loan guarantees tend to have on the level of local market employment? In this paper, our null hypothesis is that SBA guaranteed lending does not impact less financially developed markets differently than more financially developed markets. And, our primary alternative hypothesis is that SBA guaranteed lending has a greater impact on the employment rate in less financially developed markets. This alternative hypothesis is based on three related assumptions. These three assumptions are: less developed financial markets are more likely to experience severe information asymmetry problems, and as Stiglitz and Weiss (1981) point out, that could lead to credit rationing, (2) SBA guaranteed lending is likely to reduce these credit rationing problems -- thus, improving the level of development of that local financial market, and (3) increased financial development helps to lubricate the wheels of economic performance and increase the effective level of labor utilization, or the employment rate (Rajan and Zingales, 1998).

We use a measure of liquidity based on local market bank deposits to measure financial market development. Our results suggest that less financially developed markets are more positively impacted by SBA guaranteed lending. Moreover, the positive impact of SBA guaranteed lending for high financially developed markets is economically insignificant. This result has important implications for public policy in general and SBA guaranteed lending in particular.

The remainder of this paper is organized as follows. In section 2 we provide some background on small business credit markets and economic performance. In section 3 we provide a brief review of the academic literature on credit rationing. This literature is consistent with the hypothesis that information problems in lending markets are particularly severe in the small firm credit market and hence provides a rationale for SBA loan guarantees. An analysis of SBA lending programs is presented in section 4. The data, our hypotheses, and empirical strategy are outlined in section 5. The results are presented in section 6. Finally, our conclusions and some discussion of the implications of our research are provided in section 7.

2. Background on small business credit markets and economic growth

A particular area of concern for policymakers is whether small businesses have access to adequate credit. Liquidity constraints prevent many would-be entrepreneurs from starting businesses because they must bear all of the risk (Evans & Jovanovich, 1989). Policy makers care about this issue because net increases in small businesses are positively related to overall economic activity (Kirchoff & Phillips, 1988) and states with higher proportions of very small business employment experience higher levels of productivity growth with less wage inflation and lower unemployment rates (Robbins,

Pantuosco, Parker, & Fuller, 2000). At the same time, however, most small firms are relatively young and have little or no credit history. Lenders may also be reluctant to fund small firms with new and innovative products because of the difficulty associated with evaluating the risk of such products. These difficulties are classic *information* problems—problems obtaining sufficient information about the parties involved in a transaction—and they may prevent otherwise creditworthy firms from obtaining credit. If information problems are substantial, they can lead to credit rationing, that is, loans are allocated by some mechanism other than price (Stiglitz & Weiss, 1981). To the extent that credit rationing significantly affects small business credit markets, a rationale exists for supporting small enterprises through government programs aimed at improving small business access to credit.

One specific government intervention aimed at improving the private market's allocation of credit to small enterprises is the Small Business Administration (SBA) guaranteed lending program. SBA loan guarantees are well established, and their volume has grown over the past decade. Nearly 20 million small businesses have received direct or indirect help from one or another of the SBA's programs since 1953. The SBA's business loan portfolio of roughly 240,000 loans was worth about $60 billion in 2004, making it the largest single financial backer of small businesses in the United States. To place this amount in perspective, consider that in June 2004 commercial banks reported a total of about $522 billion dollars of small business loans outstanding (SBA, 2005). [1]

While not directly comparable because SBA guaranteed loan numbers include loans by nonbank lenders and include loans above the $1 million loan maximum reported by banks annually on the June call report, it is clear that the SBA is an important player

in the small business lending market. After all, SBA guaranteed loans could reasonably account for as much as 10% of total commercial bank small business loans outstanding. And, commercial banks provide the majority of small business credit supplied in the USA.

To illustrate its importance to small businesses, Bitler, Robb, and Wolken (2001) report that commercial bank lending represents about one-third of total debt capital for these firms. Using the 1998 Survey of Small Business Finances, they report that fifty-five percent of small firms (firms with 500 or fewer employees) in the Survey report some amount of outstanding loans, capital leases or lines of credit. And, ninety-two percent of the largest small firms (those with 100-500 employees) reported having outstanding loans, capital leases, or lines of credit. Additionally, of all firms reporting, about 89 percent received at least one financial service (checking account, loan, cash management service, etc.) from a commercial bank.

The rationale for SBA guarantees appears to be that credit market imperfections can result in small enterprises being credit rationed—particularly for longer-term loans for purposes such as capital expansion. If SBA loan guarantees indeed reduce credit rationing in the markets for small business loans, then there should be a relationship between measures of SBA guaranteed lending activities and economic performance. Craig, Jackson, and Thomson (2007), for example, found a positive (although small) and significant relationship between the level of SBA lending in a local market and future per capita income growth in that market. Overall, their empirical results were consistent with a positive impact on the social welfare of SBA guaranteed lending. Craig, Jackson, and Thomson's (2007) research focused primarily on the impact of credit markets on

economic growth, however, and therefore they did not need to include several variables from the economic development literature in their analysis. However, we believe the inclusion of several of these variables is appropriate for this paper. In general, we include control variables that have been demonstrated to effect local market employment rates.

We recognize that the private and public resources available to a community or local area will have a profound impact on its employment level. This is also true for the depth and organizational structure of it capital, labor, and other markets. Additionally, the operations of its institutions (e.g., local government) will impact educational attainment, public service levels, the overall quality of life, and the areas' ability to attract and retain high quality employers. We consider the impact of these characteristics in this study. In particular, in this study we use a simplified version of the analysis in Craig, Jackson, and Thomson (2007) to evaluate a potential determinant of economic performance in less financially developed markets, or communities. Specifically, we test whether SBA guaranteed lending to small firms has a relatively greater impact on the average level of labor employment in local markets that are less financially developed. We find that it does.

In the next section, we provide a brief discussion of the economics of small firm credit markets. This discussion focuses on a highly select group of theoretical and empirical articles that help explain the severe credit allocation problems caused by imperfect information in small firm credit markets. These articles also provide insight into the mechanism that allow a government intervention, such as the SBA guaranteed

lending program, to result in higher economic performance in less financially developed markets.

3. The economics of small firm credit markets

The economic justification for any government-sponsored small business lending program or loan guarantee program must rest on a generally acknowledged failure of private markets to allocate loans efficiently. Absent such a clearly identified problem with private sector lending to small businesses, the SBA's activities would simply seem a wasteful, politically motivated subsidy to this sector of the economy.

Joseph Stiglitz and Andrew Weiss (1981), suggest that private lending institutions may indeed fail to allocate loans efficiently because of fundamental information problems in the market for small business loans. These information problems may be so severe that they lead to credit rationing and constitute failure of the private credit market. Stiglitz and Weiss (1981) argue that banks consider both the interest rate they receive on the loan and the riskiness of the loan when deciding to make a loan. But the lack of perfect information in loan markets may cause two effects that allow the interest rate itself to affect the riskiness of the bank's loan portfolio. When the price affects the nature of the transaction, it is unlikely that a price will emerge that suits either the available buyers or sellers. That is, no price will "clear the market". The first effect, adverse selection, impedes the ability of markets to allocate credit using price (e.g., interest rates). This may occur because an increase in interest rates may also increase the proportion of high risk borrowers in the set of likely borrowers. The second effect, moral hazard, reduces the ability of interests rates to clear lending markets because it influences the *ex post* actions of borrowers.

The adverse selection effect is a consequence of different borrowers having different probabilities of repaying their loans. The expected return to the bank on a loan obviously depends on the probability of repayment, so the bank would like to be able to identify borrowers who are more likely to repay. But it is difficult to identify such borrowers. Typically, the bank will use a variety of screening devices to do so. The interest rate that a borrower is willing to pay may act as one such screening device. For example, those who are willing to pay a higher interest rate are likely to be, on average, worse risks. These borrowers are willing to borrow at a higher interest rate because they perceive their probability of repaying the loan to be lower. In turn, this worsens the pool of firms that seek external financing from banks (Stiglitz & Weiss, 1981). So, as the interest rate rises, the average "riskiness" of those who are willing to borrow increases, and this may actually result in lowering the bank's expected profits from lending.

Similarly, as the interest rate and other terms of the contract change, the behavior of the borrower is likely to also change. For instance, raising the interest rate decreases the profitability of projects which succeed because of the associated higher interest payments. Higher interest rates may thus induce firms to undertake riskier projects – projects with lower probabilities of success but higher payoffs when successful. In other words, the interest rate a firm pays for credit may affect the investment decisions it makes after it gets the credit. This is the moral hazard problem.

As a result of these two effects, a bank's expected return may increase less for an additional increase in the interest rate; and, beyond a certain point may actually decrease as the interest rate is increased. Clearly, under these conditions, it is conceivable that the demand for credit may exceed the supply of credit in equilibrium (Berger & Udell, 1998;

Hyytinen, A., & Väänänen, L. 2006). Although traditional analysis would argue that in the presence of an excess demand for credit, unsatisfied borrowers would offer to pay a higher interest rate to the bank, bidding up the interest rate until demand equals supply, it does not happen in this case. This is because the bank would not lend to someone who offered to pay the higher interest rate, as such a borrower is likely to be a worse risk than the average current borrower. The expected return on a loan to this borrower at the higher interest rate may be actually lower than the expected return on the loans the bank is currently making. Hence, there are no competitive forces leading supply to equal demand, and credit is rationed.

Stiglitz and Weiss (1981) argue that when borrowers are distinguishable, the lender may decide to deny credit to an entire group. This is their classic redlining argument. We expect the likelihood of this type of credit rationing to be higher in less financially developed communities. Furthermore, because the value of collecting information on borrowers may be lower in less financially developed markets, the levels of imperfect information may be higher in less financially developed markets.

4. Small Business Administration loan guarantee programs

SBA loan guarantees may improve credit allocation by providing a mechanism for pricing loans that is independent of borrower behavior. By reducing the expected loss associated with a loan default, the guarantee increases the expected return to the lender – without increasing the lending rate. In the absence of adverse selection, lenders could simply offer loan rates to borrowers that reflected the average risk of the pool of borrowers.[2]

With the guarantee in place, the lender could profitably extend credit at loan rates below what would be dictated by the risk of the average borrower. The reason for this is that the guarantee increases the profitability of the loan by reducing the losses to the bank in those instances when the borrower defaults. To the extent that the loan guarantees reduce the rate of interest at which banks are willing to lend, external loan guarantees will help mitigate the moral hazard problem. This is because the lower lending rates afforded by external guarantees reduce the bankruptcy threshold and thereby increase the expected return of safe projects vis-à-vis riskier ones. Additionally, lowering the lending rate increases the number of low risk borrowers applying for credit which, in turn, increases the likelihood that the average risk of firms applying for loans is representative of the pool of borrowers. Hence, external loan guarantees also help mitigate the adverse selection problem. Thus, in theory, SBA loan guarantees should reduce the probability that a viable small business is credit rationed.

A number of authors [for instance, Kane and Malkiel (1965), Petersen and Rajan (1994) and Petersen (1999)] have suggested that lending relationships are a market-based solution to credit rationing. However, because relationships may be more costly for small businesses to establish relative to large businesses, and because lack of relationships may lead to severe credit rationing in the small business credit market, some form of government intervention to assist small businesses in establishing relationships with lenders may be appropriate. However, the nature of intervention must be carefully evaluated. SBA's guaranteed lending programs may well be a reasonable intervention as they serve as a substitute for small business collateral. The program also reduces the risk to the lender of establishing a relationship with informationally opaque small business

borrowers. Finally, the SBA loan guarantee programs may improve the intermediation process by lowering the risk to the lender of extending longer-term loans, ones that more closely meet the needs of small businesses for capital investment. (See Appendix B for a discussion of the details about the SBA guaranteed lending process.)

5. The hypotheses, data, and empirical strategy

One method likely to reduce the costs of credit rationing is to reduce the amount of asymmetric information in these credit markets. One very practical method for doing this is to encourage lenders to make creditworthy loans that they would not otherwise make. And, in so doing the lender develops a "relationship" with the borrower. This relationship allows for the low-cost collection of borrower-specific information through basic monitoring of the loan. This reduces future levels of asymmetric information and reduces credit rationing by fostering a continuing relationship between the small business and the lending entity located in the less financially developed market.

We choose to study the impact of SBA guaranteed lending programs because this is where the empirical evidence is likely to be strongest concerning the impact of government intervention in small business credit markets. This conclusion is based on three observations. First, the SBA guaranteed lending programs are relatively large and have operated for a long time—more than a half a century. Second, SBA loan guarantees are more likely to resolve the agency problems that give rise to credit rationing in these markets than most other approaches, like that of the Federal Home Loan Banks. And, third, SBA guaranteed lending programs encompass all types of small business lenders, from community banks and thrifts to bigger banks.

We take as our motivating proposition that credit market frictions—primarily in the form of costly information and verification of a small firm's projects—can lead to a socially suboptimal credit allocation that negatively impacts the labor employment rate in the local market. Our implicit assumption here is that labor and capital are complements...at least for small firms. To the extent that SBA guaranteed lending programs mitigate credit market frictions, there should be a positive relationship between SBA guaranteed lending and the level of employment, especially in less financially developed markets. Therefore, we test for whether SBA loan guarantees lessen credit market frictions by testing whether a measure of the normalized amount of SBA guaranteed lending in a local market is correlated with relatively higher levels of employment in less financially developed markets. Our specific null hypothesis is:

Ho: There are no significant differences in the impact of SBA guaranteed lending on employment rates in less financially developed markets relative to more financially developed markets.

Data

To examine our hypothesis, we utilize data from three sources. Our first source is loan-specific data—including borrower and lender information—on all SBA-guaranteed 7(a) and 504 loans from 2 January 1991 through 31 December 2001. A breakdown of loan size, total credit and number of loans under each guarantee program is displayed in tables A1 through A3 of the appendix. Note that we have over 360,000 loans in our sample. Our loan information is based on the local market of the borrower, not the lender.

Our second set of data is taken from the National Bureau of Economic Research (NBER), the Bureau of Labor Statistics (BLS) and the Bureau of Economic Analysis

(BEA) from 1991 through 2001. These data sets provide our information on cross-sectional economic conditions. Our third source of data is the Federal Deposit Insurance Corporation's annual summary of deposit data (SUMD) files. This data provides our proxy for the level of financial market development.

All of our individual loan data are aggregated to the local market level. For this study, we also aggregate over time to produce cross-sectional observations for our local markets. As in studies by Rhoades (1982), Berger and Hannon (1989), Calem and Carlino (1991), Jackson (1992a, 1992b), Shaffer (1994, 2004), and Berger (1995), we use Metropolitan Statistical Areas (MSAs) to define the relevant local market for urban areas and non-MSA counties as the local market for rural areas.

Empirical Strategy

To test our null hypothesis we simplify the analysis of Craig, Jackson, and Thomson (2007). These authors estimate their models using classic Arellano and Bond panel regression estimation techniques. In this study, we estimate a simple cross-sectional Generalized Least Squares (GLS) fixed-effects regression model that incorporates measures of employment levels over our sample period. Our basic model is:

$$EMPR_i = \alpha_0 + \alpha_1 SBAPOP_i + \alpha_2 DEPPOP_i + \alpha_3 HIGH_i + \alpha_4 SBAHIGH_i + \beta\,[\text{Conditioning Set}]_i + \varepsilon_i \quad (1)$$

Equation (1) uses *EMPR* to proxy for local market economic performance. *EMPR* is the average annual employment percentage rate over our sample period [1991 to 2001] in the local market. Each annual employment rate is calculated as one minus the annual

unemployment rate. The annual unemployment rates are taken from the website for the Bureau of Labor Statistics (BLS).

We are interested in how SBA guaranteed lending affects the cross-sectional levels of *EMPR*. The primary variables of interest on the right side of Equation (1) are *SBAPOP, HIGH,* and *SBAHIGH. SBAPOP* is the average annual per capita dollar amount of SBA guaranteed loan originations in the local market. Before averaging, each of these annual per capita dollar amounts of SBA guaranteed loans was inflation adjusted to 1990 dollars using the consumer price index. The information about these loans was provided by the Small Business Administration.

DEPPOP is the average of the annual per capita bank deposits in the local market over the sample period. It is measured in thousands of dollars per capita. Before averaging, each of these annual per capita bank deposit amounts was inflation adjusted to 1990 dollars using the consumer price index. We use *DEPPOP* as a proxy for the total credit and liquidity available in the local market over our sample period. King and Levine (1993a) suggest that the local market deposit base is a reasonable measure of market liquidity and financial development. This is also consistent with previous research such as Peterson and Rajan (1995). Our local market per capita bank deposits are calculated using FDIC Summary of Deposit data and the U.S. Census Bureau population data.

The dummy variable *HIGH* is equal to one, zero otherwise, if the local market average annual per capita bank deposits over the sample period is greater than the seventy-fifth percentile (third quartile) average annual level for our sample. *SBAHIGH* is

an interaction variable equal to the dummy variable (*HIGH*) times local market average annual per capita SBA guaranteed lending (*SBAPOP*).

SBAHIGH is our main variable of interest. A negative and significant coefficient on *SBAHIGH* would imply that the impact of *SBAPOP* is smaller in areas with higher levels of average annual per capita bank deposits, or higher levels of financial market development. Or, stated differently, SBA guaranteed lending has a relatively larger positive impact in those local markets that are less financially developed.

Conditioning Set of Variables

Following Levine (1997) and Shaffer (2006), we add a set of control, or conditioning, variables to Equation (1) that have been shown to be significant in previous economic growth or economic development studies. These variables include *PICAP*, *HERF*, *MSADUM*, *EDUCAT*, *GOVT*, *RETAIL*, and *OFFICE*. Definitions and data sources for these variables are as follows.

PICAP is the average annual per capita income level in the local market over our sample period. It is measured in thousands of dollars per capita. Before averaging, each annual per capita income level was inflation adjusted to 1990 dollars using the consumer price index. Local market per capita income data was collected from the website of the U.S. Census Bureau.

HERF is the average sum of squares of the deposit shares of the commercial banks in the local market over our sample period. *HERF* is intended to be a measure of the competitiveness of the local banking market. However, it is often difficult to interpret. We calculate *HERF* using the FDIC's Summary of Deposit (SUMD) database.

It is calculated on an annual basis using yearend data. These annual calculations are then averaged over the 1991-2001 time period to get the local market *HERF* for our study.

MSADUM is an indicator variable equal to one [zero otherwise] if the local market is a Metropolitan Statistical Area (MSA). If the local market is not an MSA, it is typically a non-MSA county. We use this indicator variable to distinguish between urban and rural areas. Dummy variables of this sort have been shown to be significant in previous studies (Craig, Jackson, and Thomson, 2007). Data for this variable was collected from the Bureau of Economic Analysis.

EDUCAT is the percentage of local population over the age of 25 with at least four years of college as of yearend 1990. It was collected from the website of the U.S. Census Bureau. It is our measure of human capital differences across local markets.

GOVT is a measure of local government expenditures (in thousands of dollars) per capital (1991-1992). This is similar to the measure used by Shaffer (2006). It was collected from the website of the U.S. Census Bureau.

RETAIL is the percentage share of employment in retail (as opposed to manufacturing, or services) as of yearend 1990 in the local market. This data was also collected from the website of the U.S. Census Bureau.

Lastly, *OFFICE* is the average number of commercial bank offices in the local market over the sample period. It is calculated from the FDIC's Summary of Deposit database using yearend counts of the number of offices and averaging those counts over the 1991 to 2001 period.

6. The Empirical Results

Before discussing our results, we briefly summarize the conditions of the bank credit market for small firms over our sample period (1991-2001). Data from the Federal Reserve Board's Senior Loan Officer Surveys (Surveys) suggest three major trends over this period. First, the demand for bank commercial and industrial (C&I) loans by small firms rose moderately during the first third of the period, remained strong and steady during the second third, and declined sharply during the last third. Second, the Surveys report a steady easing of underwriting standards during the first two-thirds of the period and a reversal or tightening of standards during the final third of the period. Lastly, the Surveys indicate that spreads on loans to small firms increased slightly during the first third, declined rapidly during the second third, and increased sharply during the final third of the period. Nonetheless, there are no indications from the Surveys that the C&I bank loan market caused a severe constraint on the credit available to small firms over our study period. Indeed, the evidence supports the notion of a well functioning small firm credit market.

Equation (1) is estimated using a GLS fixed-effects method. Descriptive statistics for the variables used in the regression can be found in Table 1, and a correlation coefficients matrix for our main variables is presented in Table 2. Our regression estimation results are presented in Table 3. Notice from Table 1 that our primary variables of interest display large dispersions. *EMPR*, our employment rate percentage, ranges from 98.67 percent to a low of 68.06 percent, with a mean of 93.67 percent.

Per capita SBA guaranteed lending (*SBAPOP*) ranges from a high of $416.39 per capita to a low of $0.00 per capita, with a mean of $28.33 per capita over our sample period. Our measure of local market financial development---deposits per capita (*DEPPOP*), displays a wide range also. The high for *DEPPOP* is over $10 million of deposits per capita, while the low is only $70 worth of deposits per capita, and the mean is $135, 200 per capita. A similar story can be told for our measure of per capita income.

In Table 2 we present a correlation matrix for our main variables. There are several correlation coefficients in Table 2 worth mentioning. For example, notice that the local market employment rate (*EMPR*) is significantly positively correlated with SBA guaranteed lending per capita (*SBAPOP*), per capita deposits (*DEPPOP*), local market per capital income (*PICAP*), the percentage of local population over the age of 25 with at least four years of college as of yearend 1990 (*EDUCAT)*, local government expenditures per capital (*GOVT*), and the percentage share of employment in retail (*RETAIL*) in the local market. And, several of these correlation coefficients are rather large.

These correlation coefficients for our independent and control variables suggest that multicollinearity may be a concern for the relationships between several of our variables. These concerns about multicollinearity were evaluated using a variance-inflation-factor (VIF) method.

In Table 3 we present the main results for our study. These results are estimated using a GLS fixed-effects method. The fixed-effects class variable is the state in which the local market is located. Focusing on individual states as our fixed effect allows us to control for variations in state specific factors associated with systematic influences on employment levels within the same state. Examples of these state specific factors are

human capital endowments unrelated to measures of educational attainment, technological endowments and advancement, and state level public policies designed to influence employment rates.

Notice from Table 3, model 1, that the coefficient (0.016) on *SBAPOP* is positive and significant at the one percent level. However, in model 2 of Table 3, where our conditioning variables are added, the coefficient for *SBAPOP* is much smaller (0.008) but still statistically significant. A similar story is observed for the independent variable *DEPPOP*.

The coefficient on *HIGH* is positive, economically large, and significant at the one percent level in both model two (1.91) and three (1.94). This strongly suggests that local markets at the high end of our financial developed scale tend to exhibit higher employment levels. This is what was expected.

Our main result for this study is associated with the coefficient on *SBAHIGH*. The coefficient on *SBAHIGH* is negative and statistically significant in both models. It is a negative 0.015 in model two and 0.007 in model three. The results for *SBAPOP* and *SBAHIGH* taken together strongly suggest that the impact of SBA guaranteed lending has a more positive and significant impact on employment in less financially developed markets. The negative and statistically significant coefficient on *SBAHIGH* implies that the positive and significant impact of SBA guaranteed lending per capita (*SBAPOP*) on local market employment is reduced from a coefficient of 0.008 to a coefficient of 0.001 (0.008+(-0.007)). Or, stated differently, the impact of SBA guaranteed lending on local market employment in less financially developed markets is eight times its impact in

highly financially developed markets. These results have very significant public policy implications for how SBA guaranteed lending should be directed.

Conditioning Variables

The coefficients on most of our conditioning (or control) variables are consistent with our expectations and with previous literature such as Shafter (2006) and Levine (1997). For example, *P1CAP* has a large, positive and significant coefficient (0.42) in Table 3, model 3. This suggests that higher per capita incomes are associated with higher rates of employment.

Our next conditioning variable, *HERF,* exhibits a large, positive, and statistically significant coefficient in Table 3, model 3. Thus, the results from Table 3 suggest that local market deposit concentration (*HERF*) has a positive and significant impact on local market employment (*EMPR*). However, *HERF* may act as a proxy for low-density rural markets. So, we do not accredit any competitive interpretation to this coefficient.

MSADUM is our next conditioning variable. The insignificant coefficient on *MSADUM* in Table 3 suggests that on average over our sample period employment rates tended to be similar in metropolitan statistical areas (MSA) as they were in non-MSA counties.

Our next four conditioning variables were selected to link our analysis more closely to the economic development and economic growth literatures (Shaffer 2006). These variables include *EDUCAT*, *GOVT*, *RETAIL*, and *OFFICE*. Recall that *EDUCAT* is the percentage of the population in the local market over the age of 25 who have completed at least four years of college. *GOVT* is a measure of local government expenditures (in thousands of dollars) per capital (1991-1992). *RETAIL* is the percentage

share of employment in retail (as opposed to manufacturing, or services) as of yearend 1990 in the local market. And, *OFFICE* is the average number of commercial bank offices in the local market over the sample period.

As might be expected, the coefficient (0.10) on *EDUCAT* is positive and statistically significant at the one percent level. This also true for the variable *GOVT* and *RETAIL*. Additionally, the coefficient on *OFFICE* is negative and significant, but economically small.

Overall, these results lead to the rejection of our null hypothesis. Recall that our null hypothesis is that the impact of SBA guaranteed lending on employment rates in lower financially developed markets is the same as it is in higher financially developed markets.

Our results imply that less financially developed local markets benefit relatively more from governmental interventions in the small firm credit market. This relatively higher benefit is consistent with a credit rationing argument such as Stiglitz and Weiss (1981), where the intervention serves to ameliorate a market failure in the small firm credit market. More specifically, the results also suggest that SBA guaranteed lending will have a much larger positive impact on social welfare if it is targeted to less financially developed local markets.

Robustness Checks

Several robustness checks were performed for Equation (1). In particular, we estimated Equation (1) separately for MSAs and non-MSA counties and using disaggregated guaranteed lending variables for the 7(a) and 504 lending programs.

Additionally, we estimated Equation (1) using a stacked regression (OLS) approach with our panel data.

All of these robustness checks yielded results qualitatively consistent with those reported in Table 3. Additionally, because of the potential for multicollinearity in our regressors in Equation (1), we conducted a variance-inflation-factor (VIF) analysis. Our VIF results suggest that multicollinearity was not a problem for the results reported in Table 3. We also tested the standard errors in our regressions for possible heteroskedasticity and found that this was not a significant problem.

Additionally, we performed our analysis using different magnitudes for our measure of local market financial development. For example, our results do not change qualitatively if we change the definition of the dummy variable *HIGH* by using the median instead of the third quartile. That is, if we changed the definition of *HIGH* to equal one, zero otherwise, if the local market average annual per capita bank deposits over the sample period is greater than the median, rather than the third quartile, average annual level for our sample.

7. Conclusion and discussion

SBA guaranteed lending programs are one of many government sponsored market interventions aimed at promoting small business. The rationale for these guarantees is often based on the argument that credit market imperfections can result in small enterprises being credit rationed—particularly those in less financially developed markets. If SBA loan guarantees indeed reduce credit rationing of small business loans, then there should be a relationship between measures of SBA guaranteed lending

activities and economic performance, and this relationship should be more apparent in less financially developed markets.

We find evidence consistent with this proposition in this study. In particular, we find a positive and significant correlation between the average annual level of employment in a local market and the level of SBA guaranteed lending in that local market. And, the intensity of this correlation is relatively larger in less financially developed markets. Indeed, one interpretation of our results is that this correlation is eight times larger in less financially developed markets.

The public policy implications of our research are undeniable. It strongly suggests that the SBA should directly consider the financial development of the local market when determining the optimal allocation procedures for the budgeted quantity of lending guarantees. Local markets that are highly developed financially should receive a much lower priority in the overall guaranteed lending program. However, before we advocate this particular public policy directive, we must mention some limiting factors associated with this current empirical research.

For example, our results should be interpreted with caution for at least two reasons. First, we are unable to control for small business lending at the local market level and hence, we do not know whether SBA loan guarantees are contributing to economic performance by helping to complete the market or are simply serving as a proxy for small business lending in the market. However, even if SBA guaranteed lending is indeed just an instrument (or proxy) for overall lending to the local market, we are still led to the strong possibility that at the margin, additional credit allocation to less financially developed areas has a relatively higher level of economic impact on

employment. Second, our study does not capture the effects of education or managerial experience on the access to SBA loan guarantees. Kim, Aldrich, and Keister (2006), for example, find that while neither financial nor cultural capital resources are necessary conditions for entrepreneurial entry, high levels of human capital can provide entrepreneurs with significant advantages for entrepreneurial entry. The idea of certain unknown factors controlling access to SBA lending may influence our results.

Both of these questions relate to a larger question. That question is: What is the optimal level of SBA guaranteed lending in U.S. credit markets. Future research should seek to shed light on this larger question.

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Notes

1. These numbers do not include credit card balances outstanding at small firms.

2. This is because each loan made would reflect a random draw from the pool of borrowers. If the bank made a large number of small loans to borrowers in the pool then the bank's loan portfolio would have the same risk and return characteristics of the pool of borrowers.

3. Beginning in fiscal year 2005, the subsidy from the U.S. Government to help pay for the guaranty was eliminated. The fees charged to 7(a) borrowers and lenders [supposedly] the entire costs of the guaranty. The SBA estimates that that this new fee system will save U.S. Taxpayers over $100 million annually.

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Table 1. Descriptive Statistics (N=2358)

Variable	Mean	Min	Max	Std Dev
EMPR	93.67	68.06	98.67	3.00
SBAPOP	28.33	0.00	416.39	29.48
DEPPOP	135.20	0.07	10, 201.00	447.72
HIGH	0.25	0.00	1.00	0.43
SBAHIGH	8.28	0.00	416.39	23.64
PICAP	15.562	6.637	36.772	3.080
MSADUM	0.13	0.00	1.00	0.34
HERF	0.32	0.06	1.00	0.06
EDUCAT	18.05	9.80	30.51	2.14
GOVT	3.65	0.26	7.67	0.49
RETAIL	15.96	9.80	24.77	1.74
OFFICE	32.68	1.00	426.50	35.42

Notes: *EMPR* is the average annual employment percentage rate over our sample period [1991 to 2001] in the local market. *SBAPOP* is the average annual amount of SBA guaranteed loan originations per capita in market *i* over our sample period. *DEPPOP* is the average over the sample period of the annual per capita bank deposits in the local market. It is calculated from the FDIC's Summary of Deposit database. It is measured in thousands of dollars per capita. *HIGH* is an indicator variable equal to one, zero otherwise, if the local market average annual per capita bank deposits level is higher than the third quartile (or 75 percentile) of the average annual level for our sample. *SBAHIGH* is equal to *SBAPOP* times *HIGH*. *PICAP* is the average annual per capita income level in the local market over our sample period. It is measured in thousands of dollars per capita. *MSADUM* is an indicator variable equal to one [zero otherwise] if market *i* is a MSA (metropolitan statistical area). *HERF* is the average Herfindahl ratio, calibrated to be between zero and one, in market *i* over the sample period. *EDUCAT* is the percentage of local population over the age of 25 with at least four years of college as of yearend 1990. *GOVT* is a measure of local government expenditures (in thousands of dollars) per capital (1991-1992). *RETAIL* is the percentage share of employment in retail (as opposed to manufacturing, or services) as of yearend 1990 in the local market. *OFFICE* is the average number of commercial bank offices in the local market over the sample period. It is calculated from the FDIC's Summary of Deposit database using yearend counts of the number of offices and averaging those counts over the 1991 to 2001 period. All dollar amounts are in 1990 dollars.

Table 2. Correlation Matrix for Main Variables (N=2358)

	EMPR	*SBAPOP*	*DEPPOP*	*HIGH*	*SBAHIGH*	*PICAP*	*EDUCAT*	*GOVT*	*RETAIL*
EMPR	**1.00** **(0.00)**								
SBAPOP	**0.18** **(0.00)**	**1.00** **(0.00)**							
DEPPOP	**0.16** **(0.00)**	**0.10** **(0.00)**	**1.00** **(0.00)**						
HIGH	**0.25** **(0.00)**	**0.09** **(0.00)**	**0.40** **(0.00)**	**1.00** **(0.00)**					
SBAHIGH	**0.19** **(0.00)**	**0.56** **(0.00)**	**0.32** **(0.00)**	**0.60** **(0.00)**	**1.00** **(0.00)**				
PICAP	**0.44** **(0.00)**	**0.20** **(0.00)**	**-0.01** **(0.63)**	**-0.05** **(0.01)**	**0.03** **(0.14)**	**1.00** **(0.00)**			
EDUCAT	**0.20** **(0.00)**	**0.02** **(0.37)**	**0.06** **(0.00)**	**0.07** **(0.00)**	**0.03** **(0.15)**	**0.24** **(0.00)**	**1.00** **(0.00)**		
GOVT	**0.17** **(0.00)**	**0.01** **(0.61)**	**0.10** **(0.00)**	**0.10** **(0.00)**	**0.05** **(0.01)**	**-0.01** **(0.67)**	**0.21** **(0.00)**	**1.00** **(0.00)**	
RETAIL	**0.14** **(0.00)**	**0.04** **(0.08)**	**0.01** **(0.55)**	**0.02** **(0.38)**	**0.03** **(0.12)**	**0.02** **(0.31)**	**0.04** **(0.05)**	**0.03** **(0.17)**	**1.00** **(0.00)**

Notes: *EMPR* is the average annual employment percentage rate over our sample period [1991 to 2001] in the local market. *SBAPOP* is the average annual amount of SBA guaranteed loan originations per capita in market *i* over our sample period. *DEPPOP* is the average over the sample period of the annual per capita bank deposits in the local market. It is calculated from the FDIC's Summary of Deposit database. It is measured in thousands of dollars per capita. *HIGH* is an indicator variable equal to one, zero otherwise, if the local market average annual per capita bank deposits level is higher than the third quartile (or 75 percentile) of the average annual level for our sample. *PICAP* is the average annual per capita income level in the local market over our sample period. It is measured in thousands of dollars per capita. *EDUCAT* is the percentage of local population over the age of 25 with at least four years of college as of yearend 1990. *GOVT* is a measure of local government expenditures (in thousands of dollars) per capital (1991-1992). *RETAIL* is the percentage share of employment in retail (as opposed to manufacturing, or services) as of yearend 1990 in the local market. All dollar amounts are in 1990 dollars. And, P-values are in parentheses.

Table 3. GLS Regression Estimation of Equation (1)

Variable	Model 1	Model 2	Model 3
Intercept	93.07 (2194.94)*	92.65 (1917.76)*	77.69 (140.92)*
SBAPOP	0.016 (16.48)*	0.021 (16.28)*	0.008 (7.77)*
DEPPOP	0.001 (9.88)*	0.0005 (9.64)*	0.0004 (9.05)*
HIGH		1.91 (22.33)*	1.94 (25.39)*
SBAHIGH		-0.015 (-8.75)*	-0.007 (-5.11)*
PICAP	---		0.42 (32.31)*
MSADUM	---		-0.13 (-1.40)
HERF	----		2.67 (6.79)*
EDUCAT	---		0.10 (8.48)*
GOVT	---		0.77 (14.21)*
RETAIL	---		0.21 (13.33)*
OFFICE	---		-0.005 (-6.79)*
Adj – R^2	0.051	0.093	0.317
F-statistic	189.33*	374.09*	274.10*

This table provides parameter estimates for Equation (1): $\boldsymbol{EMPR_i = \alpha_0 + \alpha_1 SBAPOP_i + \alpha_2 DEPPOP_i + \alpha_3 HIGH_i + \alpha_4 SBAHIGH_i + \beta\,[Conditioning\ Set]_i + \varepsilon_i}$ *EMPR* is the average annual employment rate in percentage points over the sample period in local market *i*. *SBAPOP* is the average annual amount of (new) SBA guaranteed lending in market *i* over our sample period. *DEPPOP* is the average over the sample period in the local market *i* of the annual per capita bank deposits. It is measured in thousands of dollars per capita. *HIGH* is an indicator variable equal to one, zero otherwise, if the local market average annual per capita bank deposits level is higher than the third quartile (or 75 percentile) of the average annual level for our sample. *SBAHIGH* is equal to *SBAPOP* times *HIGH*. The conditioning variables include *PICAP*, *MSADUM*, *HERF*, *EDUCAT*, *GOVT*, *RETAIL*, and *OFFICE*. *PICAP* is the average annual per capita income level in the local market over our sample period. It is measured in thousands of dollars per capita. *MSADUM* is an indicator variable equal to one [zero otherwise] if market *i* is a MSA (metropolitan statistical area). *HERF* is the average Herfindahl ratio, calibrated to be between zero and one, in market *i* over the sample period. *EDUCAT* is the percentage of local population over the age of 25 with at least four years of college as of yearend 1990. *GOVT* is a measure of local government expenditures (in thousands of dollars) per capital (1991-1992). *RETAIL* is the percentage share of employment in retail (as opposed to manufacturing, or services) as of yearend 1990 in the local market. *OFFICE* is the average number of commercial bank offices in the local market over the sample period. It is calculated from the FDIC's Summary of Deposit database using yearend counts of the number of offices and averaging those counts over the 1991 to 2001 period. All dollar amounts are in 1990 dollars. T-statistics are in parentheses. "*" indicates significant at the 1% level. "**"indicates significant at the 5% level. "***"indicates significant at the 10% level. The model is estimated using generalized least squares (GLS) with fixed-effects conditioned on State of local market.

Appendix A
Characteristics of Loans Issued under the SBA 7(a) and 504 Loan Guarantee Programs

Table IA
Average SBA Loan $

	Urban			Rural			Total
Year	**504**	**7A**	**Total**	**504**	**7A**	**Total**	**Sample**
1991	262,159	207,984	213,260	300,958	205,233	213,592	213,345
1992	302,788	244,221	249,582	316,912	232,181	238,305	246,923
1993	325,592	250,624	258,006	346,530	244,144	252,845	256,859
1994	341,261	205,738	218,756	334,919	184,367	195,604	213,855
1995	350,786	150,363	169,179	364,684	125,882	145,227	164,796
1996	376,730	190,938	213,915	341,966	145,963	168,762	206,933
1997	369,753	224,912	238,320	310,629	174,399	188,908	231,171
1998	385,883	236,159	253,764	308,272	199,479	212,395	247,994
1999	412,650	253,674	270,483	335,416	195,475	211,379	263,591
2000	427,095	260,575	277,788	343,140	197,743	213,899	269,633
2001	440,611	241,833	264,551	361,987	195,511	216,531	257,741
Sample	377,773	221,391	237,727	335,527	184,414	199,225	231,391

Source: United States Small Business Administration and authors' calculations

Table IIA
Total SBA Loans ($000)

	Urban			Rural			Total
Year	**504**	**7A**	**Total**	**504**	**7A**	**Total**	**Sample**
1991	168,044	1,235,636	1,403,680	58,687	418,265	476,952	1,880,632
1992	380,301	3,043,969	3,424,270	96,975	912,007	1,008,982	4,433,252
1993	564,577	3,978,656	4,543,233	148,315	1,125,014	1,273,329	5,816,562
1994	1,015,593	5,761,698	6,777,291	207,985	1,419,439	1,627,423	8,404,715
1995	1,165,310	4,821,247	5,986,557	234,127	916,799	1,150,926	7,137,483
1996	1,727,682	6,204,515	7,932,197	269,811	874,902	1,144,713	9,076,910
1997	1,219,816	7,273,196	8,493,012	199,424	939,313	1,138,736	9,631,748
1998	1,464,425	6,725,796	8,190,221	191,437	919,600	1,111,037	9,301,258
1999	1,521,028	7,908,288	9,429,316	175,423	797,344	972,767	10,402,083
2000	1,319,722	6,984,461	8,304,183	166,766	768,827	935,593	9,239,776
2001	1,238,118	5,266,396	6,504,514	185,699	694,065	879,765	7,384,279
Sample	11,784,617	59,203,858	70,988,475	1,934,647	9,785,575	11,720,223	82,708,698

Source: United States Small Business Administration and authors' calculations

Table IIIA Total Number of SBA Loans							
	Urban			Rural			Total
Year	504	7A	Total	504	7A	Total	Sample
1991	641	5,941	6,582	195	2,038	2,233	8,815
1992	1,256	12,464	13,720	306	3,928	4,234	17,954
1993	1,734	15,875	17,609	428	4,608	5,036	22,645
1994	2,976	28,005	30,981	621	7,699	8,320	39,301
1995	3,322	32,064	35,386	642	7,283	7,925	43,311
1996	4,586	32,495	37,081	789	5,994	6,783	43,864
1997	3,299	32,338	35,637	642	5,386	6,028	41,665
1998	3,795	28,480	32,275	621	4,610	5,231	37,506
1999	3,686	31,175	34,861	523	4,079	4,602	39,463
2000	3,090	26,804	29,894	486	3,888	4,374	34,268
2001	2,810	21,777	24,587	513	3,550	4,063	28,650
Sample	31,195	267,418	298,613	5,766	53,063	58,829	357,442

Source: United States Small Business Administration and authors' calculations

Appendix B

More details on the Small Business Administration loan guarantee programs

(from Craig, Jackson, and Thomson, 2008)

It is interesting to note that the problem of long-term credit for small businesses was one of the primary reasons stated by Congress for establishing the SBA.

The Small Business Administration was born on July 30, 1953. The SBA received most of its powers from two agencies that were dissolved at its birth. These agencies were the Reconstruction Finance Corporation (RFC) and the Small Defense Plants Agency (SDPA).[3] The SBA received the authority to make direct loans and guarantee bank loans to small businesses from the RFC. It was also assigned the RFC's role of making loans to victims of natural disasters. As was the function of the SDPA, the SBA received the authority to help small businesses procure government contracts, and to help small business owners by providing managerial, technical, and businesses training assistance.

Recognizing that private financial institutions are typically better than government agencies at deciding on which small business loans to underwrite, the SBA began moving away from making direct loans and toward guaranteeing private loans in the mid-1980s. Currently, the SBA makes direct loans only under very special circumstances. Guaranteed lending through the SBA's 7(a) guaranteed loan program and the 504 loan program are the main form of SBA activity in lending markets.

The more basic and more significant of these two programs is the 7(a) loan program. The name of the program is in reference to Section 7(a) of the Small Business Act. This is the section of the Act that authorizes the agency to provide business loans to small businesses. All 7(a) loans are provided by commercial lenders. A very large percentage of

American commercial banks participate in the 7(a) program, as do a number of finance companies, credit card banks, and other nonbank lenders.

It is important to note that 7(a) loans are made available only on a guaranty basis. This means that they are provided by lenders who choose to structure their own loans in accordance with SBA's underwriting requirements and then apply for and receive a guaranty from the SBA on a portion of the loan. The SBA does not fully guaranty 7(a) loans. The SBA guaranty is usually in the range of 50 to 85 percent of the loan amount. The maximum 7(a) loan is $2,000,000 and the maximum guaranty on that loan is $1,500,000 (SBA 2006). For the maximum loan the SBA will guarantee no more than 75 percent of the loan amount. Because of this, the lender and the SBA share the risk that a borrower will not repay the loan in full.[4]

The 504 loan program is a long-term financing tool for economic development within a community. The 504 program provides growing businesses with long-term, fixed-rate financing for major fixed assets, such as land or buildings, through a certified development company (CDC). A CDC is a nonprofit corporation set up to contribute to the economic development of its community. CDCs work with the SBA and private-sector lenders to provide financing to small businesses. There are about 270 CDCs nationwide. Each CDC covers a specific geographic area (SBA 2006).

Typically, a 504 project includes a loan from a private-sector lender covering up to 50 percent of the project cost, a loan from the CDC (backed by a 100 percent SBA-guaranteed debenture) covering up to 40 percent of the cost, and a contribution of at least 10 percent equity from the small business being helped. The SBA-backed loan from the CDC is usually subordinate to the private loan, which has the effect of insulating the private lender from loss in the event of default. (For more on the 504 or 7(a) programs see SBA, 2006).