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On Government Intervention in the Small-Firm Credit Market and its Effect on Economic Performance

by Ben R. Craig, William E. Jackson, III, and James B. Thomson

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In this paper we empirically test whether the Small Business Administration's main guaranteed lending program—the 7(a) program—has a greater impact on economic performance in low-income markets than in others. This hypothesis is predicated on our previous research (Craig, Jackson, and Thomson 2007b), where we investigate aggregate SBA guaranteed lending. In that research we found that the overall impact of SBA guaranteed lending on economic performance is significant and positive in low-income markets.

Using local labor market employment rates as our measure of economic performance, we find a quantitatively similar positive impact of SBA 7(a) guaranteed lending. This impact on economic performance is also significantly larger in low-income areas than in other areas. This result suggests that the 7(a) program, which is the largest SBA guaranteed lending program, is also the main contributor to the positive impact of SBA guaranteed lending on local market economic performance.

Key words: credit rationing, employment rates, small business, credit markets, loan guarantees.

JEL code: G38, H81, O16.

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1. Introduction

It is a well documented finding in the economics literature that economic growth and financial market development tend to be positively correlated. However, whether relatively higher levels of financial development actually cause higher levels of economic performance, or higher levels of economic performance cause higher levels of financial development, is an issue of debate that dates at least to the studies of Schumpeter (1911) and Robinson (1952).

Three important recent studies provide evidence that relatively higher levels of financial market development do indeed tend to lead to higher levels of one measure of economic performance. That is, higher rates of economic growth. Jayaratne and Strahan (1996), Rajan and Zingales (1998), and Guiso, Sapienza, and Zingales (2004), all report significant evidence supporting the proposition that the causal relationship runs from more financial market development to more economic growth.

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 low-income areas. We exploit the fact that there is a strong positive correlation between low-income markets and markets with relatively low levels of financial development. And, we use SBA guaranteed lending 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 choose the SBA guaranteed lending program because our previous research (Craig, Jackson, and Thomson, 2007b) suggests that SBA guaranteed lending in the aggregate has a larger positive influence on low-income markets. Our previous research used MSAs and non-MSA counties to represent local geographic financial markets. However, Craig, Jackson, and Thomson (2007b) did not investigate whether this positive relationship between SBA guaranteed lending and economic performance in low-income markets was primarily the result of SBA's main guaranteed lending program – the 7(a) program. As in Craig, Jackson, and Thomson (2007b), we use the level of labor market employment, or the employment rate, as our measure of economic performance. And, we test whether 7(a) program guaranteed lending alone has a differential impact for low-income markets.

Therefore, in this paper, our null hypothesis is that 7(a) program guaranteed lending does not impact low-income markets differently than higher income markets. And, our primary alternative hypothesis is that 7(a) program guaranteed lending has a greater impact on the employment rate in low-income markets. As in Craig, Jackson, and Thomson (2007b), this alternative hypothesis is predicated on priors related to four overlapping assumptions. These four assumptions are: (1) income levels proxy for relative development of the local financial market, (2) 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, (3) SBA guaranteed lending is likely to reduce these credit rationing problems -- thus, improving the level of

development of that local financial market, and (4) 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).

Our results suggest that low-income markets are positively impacted by 7(a) program guaranteed lending to a similar extent as aggregate SBA guaranteed lending. Moreover, as in Craig, Jackson, and Thomson (2007b), the impact for low-income markets is significantly larger than it is for higher income markets. These results suggests that the 7(a) program, which is the largest SBA guaranteed lending program, is also the main contributor to the positive impacted of SBA guaranteed lending on local market economic performance. These results also have important implications for public policy in general and the composition of the SBA guaranteed lending programs in particular.

The remainder of this article is organized as follows. Section 2 provides a discussion of the economics of small business credit markets. A potential rationale for SBA loan guarantees is presented in Section 3, where we also consider the underlying economic mechanisms that might allow a directed subsidy such as SBA guaranteed lending to result in better "observed" economic performance. In section 4, we focus on the net welfare effect of SBA administered subsidies and review the extant empirical literature examining the link between SBA loan guarantees and economic performance. We also include in this section a descriptive overview of the SBA 7(a) guaranteed lending program. In section 5, we provide the data, model, and results for testing the empirical links between SBA 7(a) loan guarantees and economic performance in low income markets. Section 6 offers our conclusion with a public policy discussion.

2. Small business credit markets

Lenders may 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 the failure of the credit market. Stiglitz and Weiss (1981) argue that banks consider both the interest rate they receive on the loan and its riskiness when deciding to lend. Information frictions 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 interest rate charged affects the nature of the transaction, it is unlikely that a rate will emerge that suits both the available buyers and sellers (that is, no interest rate will "clear the market"). The first effect, adverse selection, impedes the ability of markets to allocate credit using just the lending rate because it increases the high risk borrowers as a proportion of the pool of prospective borrowers. The second effect, moral hazard, reduces the ability of rates alone 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 likelihoods of repaying their loans, a probability known to the borrowers but not the lenders. 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. It is difficult to identify such borrowers; partially because the borrowers have more information than the lender (Myers and Majluf, 1984). 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 if borrowers

are willing to borrow at a higher interest rate because they perceive their probability of repaying the loan to be lower. 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 also likely to change. For instance, raising the interest rate decreases the payoffs of successful projects. 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 price a firm pays for credit may affect the riskiness of its investment decisions, which is the moral hazard problem.

As a result of these two effects, a bank's expected return may increase less than proportionately for an additional increase in the interest rate; and, beyond a certain point may actually decrease as the interest rate is increased. Clearly, it is conceivable that the demand for credit may exceed its supply in equilibrium. 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 will not lend to someone who offers to pay the higher interest rate, as this borrower is likely to be a worse risk than the average current borrower. The expected return on a loan to a borrower at the higher interest rate may be actually lower than the expected return on loans the bank is currently making. Hence, there are no pecuniary forces leading supply to equal demand, and credit is rationed.

Importance of lending relationships

Lending relationships have been recognized by economists as an important market mechanism for reducing credit rationing.[1] Lending is based on limited information on the quality of borrowers in the market, but a close and continued interaction between a firm and a bank may provide a lender with sufficient information about, and a voice in, the firm's affairs so as to lower the cost and increase the availability of credit. Conditional on its positive past experience with the borrower, the bank may expect future loans to be less risky, which should reduce its average cost of lending and increase its willingness to provide funds.

The relationship-lending literature suggests that in addition to being formed over time, relationships can be built through interaction over multiple products. That is, borrowers may obtain more than just loans from a bank. Borrowers may purchase a variety of financial services such as checking and savings accounts. These added dimensions of a relationship can affect the firm's borrowing cost in two ways. First, they increase the precision of the lender's information about the borrower. For example, the lender can learn about the firm's sales by monitoring the cash flowing through its checking account or by factoring the firm's accounts receivables. Second, the lender can spread any fixed costs of monitoring about the firm over multiple products.

Overall, the available evidence points to a significantly positive relationship between factors related to the strength and duration of the lending relationships among banks and small business customers and both the terms (lower loan rates and fewer loan covenants) and availability of credit. From the perspective of the banks, the stronger the

[1] See, for example, Kane and Malkiel (1965), Petersen and Rajan (1994), Berger and Udell (1995), and Stein (2002).

relationship, the more likely the borrower is to select the bank for future credit needs and other banking services.

3. Potential Role for SBA Loan Guarantees

The promotion of small businesses is a cornerstone of economic policy for a large number of industrialized countries. Public support for small enterprise appears to be based on the widely held perception that the small business sector is an incubator of economic growth -- a place where innovation takes place and new ideas become economically viable business enterprises. In addition, policymakers routinely point to small businesses as important sources of employment growth. Possibly as a result, there is widespread political support for government programs, tax breaks, and other subsidies aimed at encouraging the growth and development of small business in the United States, and increasingly, around the world (Bergström, 2000).

A particular area of concern for policymakers is whether small businesses have access to adequate credit. After all, a lot of 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 of 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. If small businesses face severe credit rationing, then they may also become credit constrained. That is, they may miss out on positive net present value projects because they can not raise the external capital necessary to fund the project. This suggests that to

the extent economically significant credit rationing persists in small business credit markets, a rationale exists for supporting small enterprises through government programs aimed at improving their access to credit.

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 as it represents a subsidy to small businesses (or lenders or both) at the expense of other groups.

One specific government intervention aimed at improving the private market's allocation of credit to small enterprises is the SBA guaranteed lending program. SBA loan guarantees are well established, and their volume has grown significantly 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 guaranteed 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, where small business loans are defined as any commercial and industrial loan with an initial amount of less than one million dollars (SBA, 2005). While these two sets of loan numbers are not directly comparable the relative magnitude of SBA activity to that of the commercial

banking industry suggests that the SBA is a major player in the small business loan market.[2]

The economic justification for any government-sponsored small business lending program or loan guarantee program must rest on a generally acknowledged failure of the private sector to allocate loans efficiently. Without 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.

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. 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.

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.

[2] There are a number of reasons why comparisons of SBA loan totals and small business loans reported for commercial banks on the call reports can be misleading. First, SBA guaranteed loan totals include a non-trivial amount of loans by non bank lenders. Second, banks only report business loans in amounts $1 million dollars and under while the SBA will guarantee loans up to $2 million. Finally, what is reported by banks on the call reports is small loans to businesses which would include loans to small businesses and loans under the $1 million threshold to large and medium sized firms.

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.

The program 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. It is also interesting to note that small firm credit markets are becoming better at addressing some of the problems SBA guarantees are said to address. For example, credit scoring technology may help alleviate some of the credit rationing problems in small firm credit markets.

As discussed in Berger and Frame (2006), small business credit scoring (SBCS) is a lending technology used by many financial institutions over the last decade to evaluate applicants for "micro credits" under $250,000 ($250K). SBCS analyzes consumer data about the owner of the firm and combines it with relatively limited data about the firm

itself using statistical methods to predict future credit performance. As these markets develop, and more financial institutions engage in SBCS based lending technologies, the degree to which small businesses face credit rationing may decline, which suggests that the value of SBA guaranteed lending may decline; at least to the extent that SBCS reduces frictions in the small firm credit market.[3]

One should not jump to the conclusion that the presence of a market imperfection, in this case credit market friction, means government intervention to correct it is desirable. By guaranteeing the loans of a certain class of small enterprises, the SBA selectively influences credit allocation. From Kane (1977) and Craig and Thomson (2003), we know that selective credit allocation is likely to be an inefficient and possibly counterproductive policy tool. In the case of financial institutions, the provision of subsidies tied to small enterprise lending is likely to have costly unintended effects. The welfare costs of these unintended consequences may include: deadweight losses associated with resource misallocation, wealth redistribution, and the possible reduced stability of the banking system. In the case of small businesses, the provision of subsidies tied to borrowing is likely to increase the amount of debt capital held by small firms and produce any resultant welfare costs associated with this differing capital structure. The subsidy associated with SBA guaranteed lending may have re-distributional effects that are inconsistent with conventional notions of social welfare. For example, it is likely that most of the wealth transfer will go to established small

[3] For more on credit scoring as a lending technology see: Berger and Frame (2006); Berger, Frame, and Miller (2005); Frame and Woolsey (2001); Frame, Padhi, and Woolsey (2004).

business owners or to the shareholders of the lending institutions, neither of which group represents the poorest or most disadvantaged in our society. [4]

Nonetheless, the net value of subsidizing small businesses will be positive if the benefits are greater than the costs. One of these benefits may be an increase in local market employment rates. And, this increase may have significant social benefits, especially in areas with chronic levels of low employment.

4. SBA Loan Guarantee Programs and Local Economic Performance

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). 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.

[4] See Craig and Thomson (2003) for more on this point.

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 2006a). 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.

The public policy rationale for SBA guarantees appears to be that credit market imperfections may 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. Our main point is that credit market frictions—primarily in the form of costly information and verification of a small firm's projects—can lead to lower levels of

credit allocation that negatively impact economic performance in the local market.[5] To the extent that SBA's guaranteed lending program mitigates credit market frictions, there should be a positive relationship between the SBA guaranteed lending and economic performance, especially across local markets where credit market frictions are likely to be a significant problem.[6]

Does more SBA-guaranteed lending lead to higher levels of local market economic performance? The results from Craig, Jackson, and Thomson (2007b) suggest that the answer to our question is yes; SBA guaranteed lending does lead to higher levels of local market economic performance. In that paper we empirically test whether aggregate SBA guaranteed lending has a greater impact on economic performance in low-income markets.

Using local labor market employment rates as our measure of economic performance, we find evidence consistent with this proposition. In particular, we find a positive and significant correlation between the average annual level of employment in a local market and the level of aggregate SBA guaranteed lending in that local market. And, the intensity of this correlation is relatively larger in low-income markets. Indeed, one interpretation of our results is that this correlation is positive and significant *only in low-income markets*.

In Craig, Jackson, and Thomson (2007a) we report regression results that are consistent with the hypothesis that aggregate SBA guaranteed lending produces positive,

[5] An implicit assumption here is that labor and capital are complements...at least for small firms.

[6] This empirical relationship is also supported by the economics literature that documents a significant positive correlation between economic growth and financial market development. This literature dates at least to the controversial studies of Schumpeter (1911) and Robinson (1952). More recent important studies that provide evidence that relatively higher levels of financial market development tend to lead to higher levels of economic performance include King and Levine (1993a, 1993b), Jayaratne and Strahan (1996), Rajan and Zingales (1998), and Guiso, Sapienza, and Zingales (2004).

albeit small, net social benefits. Specifically, we report consistent evidence that the level of SBA-guaranteed lending activity (per $1000 of deposits) is positively related to the growth of per capita income at the local market level – for both urban and rural markets. This impact of SBA-guaranteed lending on growth appears to be small. However, this small measurable economic impact of SBA loan guarantees on local economic growth would be expected given the limited role they play in the overall [small and large firm] credit intermediation process.

In Craig, Jackson, and Thomson (2007a), our sample consists of local economic markets for which we have complete SBA guaranteed lending data over the sample estimation period (1992 through 2001). Our sample contained more than 360,000 SBA loans aggregated to the local market level for each year in our sample. We estimated our models separately for urban (MSAs) and rural (non-MSA counties) markets. We used the instrumental variables (with the instruments from prior periods) and mean transformed data in our estimation procedures.

The results from both Craig, Jackson, and Thomson (2007a) and Craig, Jackson, and Thomson (2007b) should be interpreted with caution, however, 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 aggregate SBA loan guarantees are contributing to economic performance by helping to complete the market for small firm credit or are simply proxying for small business lending in the market. Second, we are not able to test whether SBA loan guarantees materially increase the volume of small business lending in a market – a question that is related to who captures the subsidy associated with SBA loan guarantees.

5. 7(a) Loan Guarantees and Low Income Markets

Previous research has examined the impact of SBA loan guarantees on economic growth for both urban and rural markets. While this research has found a link between the level of SBA loan guarantees scaled by deposits in a market and personal income growth, it provides only indirect evidence consistent with the hypothesis that SBA guarantees improve credit allocation in the small business market. Direct tests of this hypothesis are illusive however, as they would seem to require the types of information on potential small business borrowers that is not readily observable -- the lack of which is the likely cause a viable business might face credit rationing.

The SBA 7(a) guaranteed lending program is 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 financially less developed areas. If SBA loan guarantees indeed reduce credit rationing in these markets for 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 evident in financially less developed markets.

We take as our maintained hypothesis 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. [The 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 across less developed [low-income] financial 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 low-income areas. Our null hypothesis is that there are no discernible differences in the impact of SBA guaranteed lending on employment rates in low-income markets relative to higher income markets.

Data

To examine our differential impact of SBA 7(a) guaranteed lending on employment rates in less financially developed areas 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) from January 1991 through December 2001. We have over 320,000 loans, with an average size of $203,000, in our sample.

Our second source of data, on economic conditions, is 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. Our third source is data from the Federal Deposit Insurance Corporation's annual summary of deposit data (SUMD) files.

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. 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

Recall that our null hypothesis is that the impact of SBA 7(a) guaranteed lending on employment rates is not different in local markets that are relatively less financially developed. To test this hypothesis we simplify the analysis of Craig, Jackson, and Thomson (2007a). These authors estimate their models using classic Arellano and Bond panel regression estimation techniques. In this study, we estimate a simple cross-sectional OLS fixed effects regression model that is designed to explain differences in employment levels across markets over our sample period. Our basic model is:

$$EMPR_i = \alpha_0 + \alpha_1 PICAP_i + \alpha_2 HERF_i + \alpha_3 MSADUM_i + \alpha_4 DEPPOP_i$$

$$+ \alpha_5 SBAPOP_i + \varepsilon_i \qquad (1)$$

Equation (1) uses the average annual employment rate over our sample period (*EMPR*) at the local market level to proxy for economic performance. We are interested in how SBA 7(a) guaranteed lending affects cross-sectional changes in *EMPR*. For this study *EMPR* is defined as one hundred minus the unemployment percentage rate in the local market. The primary variable of interest on the right-hand side of Equation (1) is *SBAPOP,* which is the inflation-adjusted average annual dollar amount of SBA 7(a) guaranteed loans scaled by average population in the local market over our sample period.

Other right-hand side variables in our model are included as controls. For example, *DEPPOP* is a measure of market liquidity similar to the one used by King and Levine (1993a). *DEPPOP* is defined as the inflation-adjusted average annual dollar amount of commercial bank deposits scaled by average population in the local market over our sample period. *PICAP* is defined as the inflation-adjusted average annual per

capita income in the local market over our sample period. It is probably reasonable to assume that markets with higher *PICAP* and higher *DEPPOP* also have higher levels of employment, *EMPR*.

The deposit market Herfindahl index (*HERF*) is also included in equation (1) to control for the structure of the local market. Constructed at the market level using branch level deposit data from the SUMD database, *HERF* provides a measure of concentration, and presumably the competitiveness, of the local banking market. Equation (1) also includes a dummy variable *MSADUM* which is equal to one, zero otherwise, if the local market is a Metropolitan Statistical Area (MSA) as opposed to a non-MSA county.

We test our null hypothesis using a research design based on dividing our sample into a high financially developed local market subsample and a low financially developed local market subsample. We do not have a direct measure of local financial market development. Thus, we use an instrument variable for financial development of the local market. Following Jackson, Craig, and Thomson (2007a), we use PICAP as a proxy for financial market development. This assumes that financial services tend to gravitate to high income communities more so than low income communities. We believe this to be a reasonable assumption. Our high financially developed local market subsample consists of those local markets with a PICAP above the sample median. And, our low financially developed local market subsample includes those local markets with less than or equal to the overall sample median PICAP.

We estimate equation (1) for the high and low subsamples, as well as the entire sample. We next test whether the coefficients on the SBAPOP variable for the high and low subsample are equal. If the coefficients are not equal, we reject our null hypothesis.

And, if the coefficient on the low subsample SBAPOP variable is significantly larger than the coefficient on SBAPOP for the high subsample, we accept our main alternative hypothesis. That is, we conclude that SBA 7(a) guaranteed lending has a larger positive impact on levels of employment across local markets that are less financially developed.

The empirical results

Equation (1) is estimated using a simple OLS fixed effects method. Descriptive statistics for the variables used in the regression can be found in table 1, and a correlation coefficients matrix 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. For example, in Panel A of table 1, our employment rate percentage variable (*EMPR*) ranges from 98.67 percent to a low of 68.06 percent, with a mean of 93.67 percent.

Our per capita income variable (PICAP) has a mean of $15,562 with a high of $36,772 and a low of $6,637 and a standard deviation of $3,080. Our local market deposits per capita variable (*DEPPOP*) also displays a very wide range in Panel A of table 1. The high for *DEPPOP* is $106,313 deposits per capita, while the low is only $147 worth of deposits per capita, and the mean is $8,314 per capita. A similar story can be told for our measure of SBA 7(a) guaranteed lending activity in Panel A. Per capita SBA 7(a) guaranteed lending (*SBAPOP*) ranges from a high of $404.63 per capita to a low of $0.00 per capita, with a mean of $21.99 per capita over our sample period. Similar trends in dispersion are displayed in Panels B and C for the High and Low subsamples in table 1.

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 local market per capital income (*PICAP*), per capita deposits (*DEPPOP*), and SBA guaranteed lending per capita (*SBAPOP*). And, that the correlation coefficients for the first two of these relationships are rather large.

The correlation coefficients for our independent variables suggest that multicollinearity may be a concern for the relationships between local market per capita income (*PICAP*) and *MSADUM*, *HERF*, and *DEPPOP*. Variance-inflation-factor (VIF) tests provided strong evidence that multicollinearity was not a problem in this case.

In table 3 we present the main results for our study. These results are estimated using an OLS 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 levels of educational attainment and other human capital measures, technological endowment and advancement, and state level public policies designed to influence employment rates.

From table 3, our measure of per capita income in the local market (*PICAP*) has a positive and significant coefficient for the full sample, and both the high and low subsamples. This suggests a positive and significant impact on *EMPR* of greater per capita income in the local market. This is consistent with the correlations from table 2.

The results in table 3 suggest that local market deposit concentration (*HERF*) has a negative and significant impact on local market employment (*EMPR*) in the full sample and high subsample, but a positive and significant impact on local market employment in

the low subsample. This inconsistency across subsamples may be the result of the low subsample containing some markets where there are not any banks and thus a zero HERF. Such markets are also likely to be low employment rate markets.

Notice from table 3 that our measure of per capita bank deposits in the local market (*DEPPOP*) has a positive and significant coefficient for the full sample, and high and low subsamples. This suggests a positive and significant impact on *EMPR* of more per capita deposits in the local financial market.

To some extent *DEPPOP* is a measure of cross-sectional local market liquidity levels. A similar measure of liquidity was used by King and Levine (1993a, 1993b) to proxy for the level of financial development across countries. However, the issue of endogeneity is a concern for this variable. For it could be argued that higher levels of employment cause higher levels of per capita bank deposits as forcefully as it can be argued that higher levels of per capita bank deposits cause higher levels of employment. However, as mentioned in our introduction, recent studies such as Jayaratne and Strahan (1996), Rajan and Zingales (1998), and Guiso, Sapienza, and Zingales (2004), all report significant evidence supporting the proposition that the causal relationship runs from more financial market development to better economic performance.

Our main variable of interest in table 3 is *SBAPOP*. Notice that *SBAPOP* has a positive and significant coefficient in the full sample and the low subsample, but not in the high subsample. This suggests that the positive and significant impact of *SBAPOP* on *EMPR* in the full sample is driven by the positive and significant impact of *SBAPOP* on *EMPR* in the low subsample. It also suggests that there is a differential impact of *SBAPOP* on *EMPR* in the low subsample relative to the high subsample. A t-test

confirms that the coefficient on *SBAPOP* in the low subsample is significantly larger [at the one percent level] than the coefficient on *SBAPOP* in the high subsample.

But even for the low subsample, the impact of *SBAPOP* on *EMPR* appears to be economically small. For example, if you increased per capita SBA guaranteed lending in a low subsample local market by two standard deviations (approximately $50) the predicted result is an increase in the level of employment by 0.4 percentage points. Of course, this still may be a cost effective method of increasing employment relative to other policy tools.

Overall, the results from table 3 suggest that per capita SBA 7(a) guaranteed lending is significantly positively correlated with local market employment rates. And, the impact of SBA guaranteed lending on the level of employment is greater in financially less developed markets. These results lead to the rejection of our null hypothesis. Recall that our null hypothesis is that the impact of SBA 7(a) guaranteed lending on employment rates is not different in local markets that are relatively less financially developed.

Our results are also consistent with the notion that less developed financial markets benefit relatively more from governmental interventions in small firm credit markets. 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. As in Jackson, Craig, and Thomson (2007a), these results also suggest that SBA 7(a) guaranteed lending will have a larger positive impact on social welfare if it is targeted to certain financially less developed [or lower income] areas.

6. Conclusion

In our previous research (Craig, Jackson, and Thomson, 2007b) we found that SBA guaranteed lending in the aggregate had a larger positive influence on low-income markets. However, Craig, Jackson, and Thomson (2007b) did not investigate whether this positive relationship between SBA guaranteed lending and economic performance in low-income markets was primarily the result of SBA's main guaranteed lending program – the 7(a) program. As in Craig, Jackson, and Thomson (2007b), we use the level of labor market employment, or the employment rate, as our measure of economic performance. And, we test whether 7(a) program guaranteed lending alone has a differential impact for low-income markets.

Therefore, in this paper, our null hypothesis is that 7(a) program guaranteed lending does not impact low-income markets differently than higher income markets. And, our primary alternative hypothesis is that 7(a) program guaranteed lending has a greater impact on the employment rate in low-income markets. Overall, our results strongly suggest that per capita SBA 7(a) guaranteed lending is significantly positively correlated with local market employment rates. And, the impact of SBA 7(a) guaranteed lending on the level of employment is greater in financially less developed markets. These results lead to the rejection of our null hypothesis.

It should be noted that these results are very tentative and much more research is needed to declare a more definitive position. Therefore, all of 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 7(a) loan guarantees are contributing to economic performance by helping to complete the

market or are simply proxying for small business lending in the market. Second, we are not able to test whether SBA loan guarantees materially increase the volume of small business lending in a market – a question that is related to who captures the subsidy associated with SBA loan guarantees. Both of these questions relate to a larger question. That question is: What is the optimal level of SBA guaranteed lending for different local credit markets in the U.S.? Future research will seek to shed light on this larger question.

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Exhibit 1: Variable Definitions

Variable	Definition	Source
EMPR	Average employment percentage rate in the local market over the sample period	BLS
SBAPOP	Average per capita amount of new SBA 7(a) lending in the local market over the sample period	SBA, BLS
HERF	Average deposit market herfindahl over the sample period	FDIC SUMD
PICAP	Average per capita income in the local market over our sample period	BEA
MSADUM	Dummy variable equal to one if local market is an MSA, zero otherwise	BEA
DEPPOP	Average annual per capita bank deposits in the local market over the sample period	FDIC SUMD

Notes: SBA -- Small Business administration, FDIC SUMD -- Federal Deposit Insurance Corporation Summary of Deposit Data, BEA -- Bureau of Economic Analysis, BLS -- Bureau of Labor Statistics. SBAPOP, PICAP, and DEPPOP are inflation-adjusted. EMPR is calculated by subtracting the local market unemployment percentage rate from one hundred.

Table 1. Descriptive Statistics

Panel A. Full Sample (N=2358)

Variable	Mean	Min	Max	Std Dev
EMPR	93.67	68.06	98.67	3.00
HERF	0.53	0.03	1.00	0.28
PICAP ($000)	15.562	6.637	36.772	3.080
MSADUM	0.13	0	1.00	0.34
DEPPOP($000)	8.314	0.147	106.313	6.114
SBAPOP($)	21.99	0.00	404.63	27.34

Panel B. High Subsample (N=1178)

Variable	Mean	Min	Max	Std Dev
EMPR	94.86	84.26	98.42	2.10
HERF	0.46	0.03	1.00	0.26
PICAP ($000)	17.790	15.241	36.772	2.654
MSADUM	0.25	0	1.00	0.25
DEPPOP($000)	9.534	0.149	106.313	7.139
SBAPOP($)	27.04	0.00	404.63	29.04

Panel C. Low Subsample (N=1178)

Variable	Mean	Min	Max	Std Dev
EMPR	92.48	68.06	98.67	3.29
HERF	0.61	0.11	1.00	0.27
PICAP ($000)	13.332	6.637	15.239	1.410
MSADUM	0.02	0	1.00	0.12
DEPPOP($000)	7.092	0.147	49.966	4.565
SBAPOP($)	16.94	0.00	287.26	24.16

Notes: EMPR is the average annual employment rate in percentage points over the sample period. HERF is the average Herfindahl ratio, calibrated to be between zero and one, in market *i* over the sample period. PICAP is average per capita income in local market *i* over our sample period. MSADUM is an indicator variable equal to one [zero otherwise] if market *i* is a MSA (metropolitan statistical area). DEPPOP is the average annual per capita bank deposits in market *i*. SBAPOP is the average annual amount of (new) SBA 7(a) guaranteed lending in market *i* over our sample period. SBAPOP is calibrated in dollars in per capita, and DEPPOP is calibrated in thousands of dollars per capita. All dollar amounts are in 1990 dollars.

Table 2. Pearson Correlation Coefficients Matrix
Full Sample (N=2358)

	EMPR	PICAP	HERF	MSADUM	DEPPOP	SBAPOP
EMPR	---					
PICAP	**0.44 (0.00)**	---				
HERF	**-0.18 (0.00)**	**-0.29 (0.00)**	---			
MSADUM	**0.08 (0.00)**	**0.43 (0.00)**	**-0.31 (0.00)**	---		
DEPPOP	**0.27 (0.00)**	**0.28 (0.00)**	**-0.23 (0.00)**	**0.04 (0.08)**	---	
SBAPOP	**0.15 (0.00)**	**0.21 (0.00)**	**-0.05 (0.01)**	**0.04 (0.03)**	**0.06 (0.00)**	---

Notes: P-values are in parentheses. EMPR is the average annual employment rate in percentage points over the sample period. HERF is the average Herfindahl ratio, calibrated to be between zero and one, in market *i* over the sample period. PICAP is average per capita income in local market *i* over our sample period. MSADUM is an indicator variable equal to one [zero otherwise] if market *i* is a MSA (metropolitan statistical area). DEPPOP is the average annual per capita bank deposits in market *i*. SBAPOP is the average annual amount of (new) SBA 7(a) guaranteed lending in market *i* over our sample period. SBAPOP is calibrated in dollars per capita, and PICAP and DEPPOP are calibrated in thousands of dollars per capita.

Table 3. OLS Fixed Effects Regression Estimation of Equation (1)

This table provides parameter estimates for Equation (1): $\boldsymbol{EMPR_i = \alpha_0 + \alpha_1 PICAP_i + \alpha_2 HERF_i + \alpha_3 MSADUM_i + \alpha_4 DEPPOP_i + \alpha_5 SBAPOP_i + \varepsilon_i}$. EMPR is the average annual employment rate in percentage points over the sample period. PICAP is average per capita income in local market *i* over our sample period. HERF is the average Herfindahl ratio, calibrated to be between zero and one, in market *i* over the sample period. MSADUM is an indicator variable equal to one [zero otherwise] if market *i* is a MSA (metropolitan statistical area). DEPPOP is the average annual per capita bank deposits in market *i*. SBAPOP is the average annual amount of (new) SBA 7(a) guaranteed lending in market *i* over our sample period. SBAPOP is calibrated in dollars in per capita, and DEPPOP is calibrated in thousands of dollars per capita. This table provides estimates of Equation (1) for the Full sample, the High subsample, and the Low subsample. The Low [High] subsample contacts those observations where PICAP is less [greater] than the median PICAP for the Full sample. T-statistics are in parentheses. "*" indicates significant at the 1% level. "**"indicates significant at the 5% level. "***"indicates significant at the 10% level.

Parameter Estimates and T-statistics			
Variable	**Full Sample**	**High Subsample**	**Low Subsample**
Intercept	86.99 (250.62)*	92.48 (221.41)*	79.22 (86.45)*
PICAP	0.41 (19.76)*	0.13 (5.36)*	0.90 (14.05)*
HERF	-0.65 (-3.04)*	-0.81 (-3.41)*	0.69 (2.05)**
MSADUM	-1.17 (-6.43)*	-0.83 (-5.51)*	-2.43 (-3.46)*
DEPPOP	0.07 (7.53)*	0.06 (7.37)*	0.11 (5.39)*
SBAPOP	0.006 (3.13)*	0.003 (1.66)	0.008 (2.36)**
Adj – R^2	0.236	0.107	0.196
F- Statistic	144.29*	29.22*	58.39*
N=	2358	1178	1178

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