Paper Title: "Estimating the Growth Effects of SBA Loans using Universal Panel Data and Longitudinal Methods"

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Extended Abstract: We investigate the impact of Small Business Administration-guaranteed (SBA) loans on firm growth, performance, and survival using linked SBA loan program and annual Census Bureau longitudinal business data (LBD) from 1976 to 2009.

It is conceptually ambiguous whether small business loans create jobs. Easier access to finance may enable expansion. However, government-backed loan programs could simply substitute for other loans, firms with loans could grow at the expense of competitors, the money could be wasted, or loan-financed capital could substitute for labor.

Absent an experiment, it is empirically difficult to identify loan effects on growth. Growth could vary by industry, region, firm size, age, and other characteristics. Selection bias may be present, as loans could be awarded to firms with the most growth potential. Though the firm growth literature is vast, little of it has rigorously studied the connection between loan programs and growth. SBA loans are targeted toward firms unable to get formal financing elsewhere, an ideal group for a study of financing effects.

The SBA data contain information about all recipients of 7(a) and 504 loans from inception in 1953 to 2010. The 7(a) loans are made by commercial lenders. The SBA provides a guarantee of a certain percentage of the loan amount, typically 50-85 percent. Prior to 2008 the loan maximum was $2,000,000, and the loan guarantee maximum was $1,500,000. The median loan size is $90,000. The 504 program loan program involves three financing sources for each project: a loan from a private-sector lender covering up to 50 percent of the project, a 100 percent SBA-backed loan from a Certified Development Company covering up to 40 percent of the cost, and a

minimum of 10 percent equity from the recipient. The median loan size for the 504 program is $342,000. In both lending programs, lenders must sign a statement saying that they would not have been willing to provide the loan without SBA participation, and the financial assistance would not otherwise be available to the recipient on reasonable terms.

To date we have matched 549,094 SBA loan recipients to the LBD, which represents 41 percent of loan recipients. Approximately another 10 percent of the loan recipients have been linked to the Census Bureau's nonemployer database, which is out of scope for the current study. The remaining firms have not been matched due to a combination of factors, such as the loan application address being the owner's residence rather than the business location. An analysis of the matched and non-matched recipients shows that new firms, sole proprietorships and partnerships, minority-owned or female-owned businesses, and smaller firms are less likely to be matched.

We construct a control group of firms in the LBD that have never received an SBA loan, exact matching on loan year, four-digit industry, county, and age category (age 0, 1-2, 3-5, 6-10, and greater than 10). For this group we do propensity score matching from a probit regression including lagged employment and employment growth in the four years prior to the treated firm's loan receipt, age, average wage, and single vs. multi-unit firm. We restrict treated and control firms to a common support and a 0.9 to 1.1 bandwidth. We apply kernel weights to the control firms in the employment effects regressions. The employment effects regressions are difference-in-differences regressions, including a post-loan treatment dummy (equal to 1 in all years after the year of loan receipt for the treated firms only), year of loan dummies (common to both the treated firms and their matched controls), year effects, and firm fixed effects. In a second set of regressions we include treatment dummies for four years before the loan through 10 or more years after the loan in place of a single post-loan treatment dummy. This allows us to see the dynamics of the loan effect, as well as to conduct a Heckman-Hotz (1989) pre-program test for equality of the treated and control firms.

The results from a regression with the single post-loan dummy suggest that employment rises by 30 percent on average in the years after a loan. For a firm with ten employees, this would mean an addition of three workers. A specification with separate treatment dummies by year before/after a loan shows that treated and non-treated firms have similar employment 4 and more years before the treated firm receives a loan, but then the treated firm's employment declines relative to non-treated firms in the three years before the loan. This suggests that SBA loan recipients may be experiencing below-average performance prior to getting a loan. The recipients' employment rises sharply in the year of the loan and the year after, then grows gradually through five years after a loan before leveling out. The loan effect is thus both immediate and lasting.

A regression interacting the post-loan treatment dummy with year of loan receipt shows that the average loan effect on employment has declined over time, from a 40 percent increase in the late

1970's to 20 percent in 2008. We plan to study what is behind this decline. Other regressions explore how the loan effects vary with various characteristics, such as unemployment (more positive when unemployment is high), establishment age (higher for younger firms), establishment size (higher for larger firms), economic sector, owner race/ethnicity (higher for whites), owner gender (higher for males), veteran status (lower for veterans), and legal form (higher for partnerships).