

Entrepreneurship and Credit Constraints

Evidence from a French Loan Guarantee Program*

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Abstract

We use information on a French loan guarantee program in order to assess the consequences of credit constraints for new ventures. Loan Guarantee Programs, as implemented in France, are an effective instrument to help young firms grow faster, both in terms of employment and capital. These effects are quite persistent, since they are still significant four years after obtaining the guarantee. Loan guarantees also allow firms to pay cheaper interest rate, but a potential drawback of this policy consists in guaranteed ventures adopting riskier strategies and thus filing more often for bankruptcy. Last, we find no effect, at the industry level, on creation rates.

1 Introduction

Many countries around the world have programs to help entrepreneurs raising external finance. These programs have been implemented for years, while evaluation has long been lagging behind. This task has been taken up in a recent literature. Some papers have looked at the performance of directed lending programs (e.g. Bach [1] for France, Banerjee and Duflo [3] for India, Prantl [16] for Germany) or start-up subsidies for the unemployed (Crépon and Duguet [12]). Others have studied policies designed to specifically help innovative start-ups (Lerner [14] for the US, Brander, Egan and Hellmann [6] for Canada). All these policies share the common feature that they are *direct* subsidies, that come in the form of low interest rates or very cheap equity finance.

In this paper, we evaluate the effects of a Loan Guarantee Program, which is an *indirect* subsidy: the agencies in charge of these programs provide insurance to the lender against default risk. The (often subsidized) insurance premium is paid for by the borrower. These programs can be found in many countries, as for instance in the US (SBA's 7a Loan Program, described by Graig, Jackson and Thompson [9]), the UK (Small Firms Loan Guarantee, started in 1981), or France (SOFARIS, started in the late 1980s). Yet, to the best of our knowledge, these programs have not been evaluated using firm level data. This paper attempts to fill that

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gap.

The effects of such policies are typically difficult to evaluate. The main pitfall of such studies is a selection bias: firms that apply successfully to the program may be the fastest growing and the most promising ones. These firms would have had no trouble raising external finance on regular financial markets. They enter the program both (1) because the agency in charge of the policy prefers firms with potential and (2) because these firms enjoy lower cost of external finance as part of it is subsidized. When such selection occurs, firm level studies will systematically overestimate the benefits of the program. Very few papers to date have sought to alleviate this concern (Bach [1] and Banerjee and Duflo [3] are important exceptions).

In this paper, we solve this problem by exploiting a quasi natural experiment in the French Loan Guarantee Program. This program existed since the late 1980s, but was restricted to manufacturing firms and corporate services. In 1995, the endowment of the program was increased and new industries (construction, retail and wholesale trade, transportation, hotels and restaurants and personal services) were suddenly eligible. We thus use 1995 as a break point and focus on these newly eligible sectors to provide clean difference in difference estimates of the program. The control group is made of already eligible firms, while the treated group is constituted of firms that suddenly became so.

We find little evidence, in the French case, of selection issues, while most (if not all) of our results suggest that the LG program indeed alleviates credit constraints. Firms that are targeted by this program are found to raise systematically more external finance, pay lower interest expenses and enjoy higher growth rates than other firms. The impact is shown to be causal, which suggests that such programs are effective at helping small, credit constrained, firms to grow. We do not find, however, any evidence that they foster actual entry into entrepreneurship. Most of the action therefore takes place at the *intensive margin*, i.e. by helping existing new firms to grow, rather by allowing more new firms to be created.

The absence of such selection issues is suggestive that the program is well designed: to enjoy loan guarantees, eligible firms have to agree to pay an extra fee that substantially increases the financial burden of the loan. This fee is apparently high enough to deter unconstrained firms from applying to the program, and low enough to allow constrained firms to take on debt. This does not mean, however, that such programs are free from perverse effects. We find that the guarantee also *causes* firms to become more likely to go bankrupt. Since the French program enforces the entrepreneur's limited liability by design, it seems that risk shifting concerns may be of first order in this context. All in all, however, the growth enhancing gains by far outstrip these cost. A back of the envelope calculation suggests that the subsidy amounts to approximately 4,200€ per long term job created. The question is, however, whether these program are actually scalable.

Our article is organized as follows: we first present the French Loan Guarantee Program in terms of institutional background (Section 2). We then provide some basic economic intuitions for the functioning of such a program (Section 3). We present the data we use (Section 4), describe our estimation strategies 5 before presenting our results 6. We then conclude in Section 7.

2 Institutional Design

SOFARIS (now called “OSEO-Garantie”) is a French implementation of the SBA 7(a) Loan programs and was created in 1982 by Jacques Delors, a socialist finance minister. It is a semi-public agency: the French State owns 50%, while a consortium of private bank and public financial institutions (the “Caisse des Dépôts et Consignations”) owns the remaining 50%. Bruneau [7], Bachelot [2], and Direction de la prévision [11] provide good description of the early system.

The French government decides upon the creation of the various funds and defines their respective objectives while the main source of financing is the French state budget. Therefore, the main goals are entirely imposed to the agency, but it has full autonomy to choose the ways to realize them.

SOFARIS is divided into several funds, each of them having specific goals:

- The “Development Fund” aims at improving access to external finance for old, mature SMEs. The backed medium-to-long term loans are mainly supposed to finance capital expenditures.
- The “Export Fund” is designed to help French SMEs to settle into foreign markets.
- The objective of the “Transmission Fund” is to secure firms’ transmission, most frequently when the owner get retired. These periods are among the most risky of the SMEs’ life cycle (Betemps and Salette [5]).
- Lastly, the “Creation Fund” improves credit access of new ventures, mostly through medium-to-long term loans.

Each fund has its own eligibility conditions, most frequently linked to the firm’s industry, its age, its size (in terms of total sales) and its group affiliation. In most cases, only independent firms can benefit from subsidized loans.

Conditional on firm’s eligibility, all applications for a SOFARIS guarantee are made by banks, and not the firms themselves. Once granted, a guarantee allows the bank to recover a pre-specified amount of the remaining loan principal in case the firm defaults. This fraction usually varies between 40% and 70%, and is not set case by case, but rather at the fund-year level, mostly to manage aggregate risk for the SOFARIS agency. The counterpart of these guarantees is that the “benefiting” firm has to pay a fee (also set at the fund-year level) that comes on top of the interest rate it must pay to the Bank. This fee usually varies between 50 and 150 basis points.

In contrast to the U.S. SBA’s 7a Loan Program, firms do not have to prove that they were not able to obtain credit on the regular market. Furthermore, the regulation of the French system is only made through prices (fraction guaranteed and fee paid to SOFARIS); there is no “quantity” rationing.

The financial performances of the various funds, and the implied public subsidies, are quite contrasted (see table 1). Assuming that the average ROE in the bank and insurance industries is about 15%, the Creation Fund would benefit from the largest subsidy (about 36 millions euros, or FF 236 millions), partly (11 millions euros, FF 72 millions) financed by the Development Fund.

In what follows, we will focus on the Creation Fund, which aims at fostering entrepreneurship specifically. In 2005, the amount of loans backed by this latter fund represented one third (1.5 out of the 4.5 billions euros) of the total debt guaranteed by SOFARIS. 26,000 firms (of the total 40,000) benefited from such early stage loans.

3 Some Basic Intuitions

Credit Constraints originally stem from either (i) adverse selection or (ii) moral hazard. Loan Guarantee programs have a priori no impact on such informational asymmetries, because they are only ex post redistributive policies from public funds to banks. Therefore, such programs cannot increase overall welfare unless:

- There are some non-convexities in the production function: for instance, there is a minimum level of investment (indivisibility) needed to start a company (see e.g. Galor and Zeira [13]).
- There are some positive “social” externalities associated to firms’ creation. This may be the case when, for instance, an unemployed is creating a new venture: there is a positive externality through the Unemployment Insurance fund in this latter case. Another possibility is that labor is imperfectly mobile across regions.

Within an industry, SOFARIS uses two instruments: the up-front fee and the amount of the loan that is guaranteed in case of the firm’s default. Combining these two instruments should allow SOFARIS to determine both: the optimal lowest risk level of firms (entrepreneurs) willing to apply for a SOFARIS guarantee, and the highest risk level of firms that are able to obtain a SOFARIS guarantee and the corresponding external funding. The first-best situation is characterized by two features: first, no (low-risk) firm able to obtain credit on the “regular” market without any SOFARIS intervention applies for a guarantee. Second, all risky projects that are also socially desirable obtain a financing thanks to a guarantee. Intuitively, combining a high up-front fee with a high amount guaranteed makes low risk firms reluctant to apply while allowing high risk firms to obtain funding from their banks.

In a corporate finance setting with fixed investment size projects (see Tirole [17]) and a pool of entrepreneurs with heterogeneous levels of risk, one can show that a loan guarantee program can be set so as to reach first-best this first-best equilibrium: the two instruments available enable to attain the two socially optimal thresholds. However, with several sources of heterogeneity (in net worth for instance), there are fewer instruments than the number of targets to reach (two thresholds for each level of net worth, and only two instruments).

Therefore, the second-best solution trades-off risk (i.e. either firms with inefficient risk obtain financing with a guarantee or firms with efficient risk cannot be financed even when obtaining a guarantee) against participation (i.e. firms who would obtain funding even in the absence of the subsidized system apply for the guarantee).

4 Estimation Strategy

We face a standard evaluation problem and use two settings, one at the firm level, the other at the industry level, in order to evaluate the impact of SOFARIS guarantees on the future development of newly created ventures.

4.1 General Firm Level Set-Up

Estimated Equation

The baseline evaluation equation is of the following form:

$$Y_{i,j,t}^{(T)} = \alpha + \beta.SOF_{i,j,t+1-T} + \mu.t \times \delta_j + \xi.X_{i,j,t-T}^{(0)} + \delta_t + \delta_j + \epsilon_{i,j,t} \quad (1)$$

where i denotes firms, j their industry, and t denotes time; this specification allows for eligible-industry specific trends. T (term) describes whether the outcome Y is observed in the short (two year after firm creation), medium (four years) or long (six years) term. The analyzed outcomes Y are respectively: debt, employment and capital growths; interest rate or probability of bankruptcy filing. Furthermore, $SOF_{i,j,t+1-T}$ denotes whether the firm has been subsidized one year after its creation (at date $t + 1 - T$); $X^{(0)}$ stands for a set of observable characteristics observed in the year of the firm’s creation ($T = 0$) i.e. before treatment. The choice of these controls is partly determined by data availability: initial employment, capital and debt, and also geographical location, legal form and month of firm creation. Year (δ_t) and industry (δ_j) fixed effects are also included in all regressions.

If selection in the group of SOFARIS subsidized firms is correctly accounted by the observed characteristics $X^{(0)}$, δ_t and δ_j , then OLS estimates are consistent. We present them as a benchmark for our empirical analysis. One-to-one nearest neighbor matching estimators are also computed, which also rely on the same difference in observable characteristics assumption but which do not rely on an homogeneous treatment assumption.

The obvious limitation of this first (benchmark) approach is that (self)-selection is potentially driven by unobservable characteristics, e.g. manager ability, risk or profitability of the underlying projects. As an exemple, for a given level of risk, entrepreneurs having more profitable projects are more likely to accept to pay the upfront fee associated with a SOFARIS guarantee. This would lead to an upward bias on γ in equation 1 if $Y^{(2)}$ is a measure of profitability since this coefficient would then partly reflect the self-selection process, in addition to the “true” impact of benefiting from a SOFARIS guarantee.

Exploiting a Quasi-Natural Experiment

In order to solve this endogeneity problem, we take advantage of the history of the SOFARIS system. In particular, we argue that the 1995 extension can be considered as a valid quasi-natural experiment and provide an exogenous variation in the probability of getting a guaranteed loan that does not affect firms' behavior after having contracted the guaranteed loan.

The recent history of SOFARIS was marked by two major shocks:

1. In 1993, the right-wing government of Balladur came to power extended these small-business oriented program widely. Between 1993 and 1995, the funds available to SOFARIS were almost multiplied by three.

Unfortunately this large shock doesn't provide much identifying variation since it affected all eligible firms the same way and at the same date. Therefore, it is very difficult to disentangle the effects of the extension of the SOFARIS program and other conjonctural shocks affecting the French economy during this period.

2. In 1995, the right-wing government of Chirac decided to keep on increasing this loan guarantee scheme by further increasing the budget allocated to SOFARIS - and therefore increasing the amount of subsidized loans in already eligible industries - but also by enlarging the eligibility conditions to additional industries. Construction, retail and wholesale trade, transportation, hotels and restaurants and personal services became eligible at this date while manufacturing industries and corporate services remained eligible. This latter event is more interesting than the previous one, since under the assumption that new eligibility was not decided in anticipation of (negative) shocks affecting specifically the corresponding newly eligible industries (and not the previously eligible ones), then we are in a standard difference-in-difference setting.

Graph ?? depicts the overall evolution of the various SOFARIS funds over the last decades, whereas graph ?? focus on the "Creation Fund". In 1995, the number of SOFARIS backed firms in already eligible industries was multiplied by 2.5, whereas it was multiplied by 20 in the newly eligible ("treated") industries. It is also noticeable that some firms belonging to the not yet eligible industries already benefitted from a SOFARIS guarantee before 1995, which can be explained by changes in industry classification over the period and possibly by measurement errors.

Taking advantage of this differential shock, we adopt an IV approach to our evaluation problem. We first estimate a first-stage probit equation explaining the probability of obtaining a guaranteed loan (one year after creation):

$$\begin{aligned}
 SOF_{i,j,t} = a &+ b.POST_t \times TREAT_j + m.(t) \times TREAT_j \\
 &+ c.(t) \times POST_t \times TREAT_j + g.X_{i,j,t-1}^{(0)} + d_t + d_j + e_{i,j,t}
 \end{aligned} \tag{2}$$

where $POST$ is a dummy equal to 1 if t is later than 1995 (excluding 1995), $TREAT$ is a dummy equal to 1 if the industry j (of firm i), became newly eligible after 1995 and 0 if it was

already eligible before. t is a simple time trend. Our specification allows for eligible-industry specific trends, and eligible-industry-post specific trends. Therefore, the coefficient b is identified on the increase, after 1995, of the probability of getting a guaranteed loan in newly eligible industries relative to already eligible industries.

Note that due to the small size of the program, the probability of getting a guaranteed loan conditional on eligibility is on average as low as 0.7%. Therefore, a simple linear model could not be implemented here since identification relies on an adequate modeling of the tails of the distribution. However, our estimates are not sensitive to the choice of probit or logit specifications (see below).

In a second stage, we then implement an Heckman selection model¹ to take account of the potential endogeneity issues in equation 1:

$$\begin{aligned}
Y_{i,j,t}^{(T)} = & \alpha + \beta \cdot SOF_{i,j,t+1-T} + \mu \cdot t \times TREAT_j + \gamma \cdot t \times POST_{t+1-T} \times TREAT_j & (3) \\
& + \xi \cdot X_{i,j,t-T}^{(0)} + \theta \cdot \left(SOF_{i,j,t+1-T} \cdot \frac{\varphi_{i,j,t+1-T}}{\Phi_{i,j,t+1-T}} + (1 - SOF_{i,j,t+1-T}) \cdot \frac{\varphi_{i,j,t+1-T}}{1 - \Phi_{i,j,t+1-T}} \right) \\
& + \delta_t + \delta_j + \epsilon_{i,j,t}
\end{aligned}$$

where $\varphi_{i,j,t-1}$ and $\Phi_{i,j,t-1}$ are computed from equation 2 (Mill's ratios). In this setting, the coefficient of interest, β , is not identified on the specific parametric (gaussian) assumption, but on the following exclusion restriction: the interaction $POST_{t-1} \times TREAT_j$ is used as an instrument for (SOFARIS) treatment.

All regressions are also clustered at the industry-post level (Bertrand, Duflo and Mulainathan [4]).

4.2 Industry Level Regressions

Analyzing the impact of the SOFARIS loan guarantee program on firms' creation relies on a further analysis carried on at an industry level. Our research design consists here in investigating whether industries with more SOFARIS loans are characterized by higher firm creation rates. As in our firm level setting, we face important endogeneity issues, first of all due to simultaneities: in growing industries, there are more newly created ventures, and therefore more firms applying for SOFARIS loans.

We use the same quasi-natural experiment and the same implied difference-in-difference identification strategy. Estimation relies here on a simple two-stage-least-square approach, as the "treatment", the number of SOFARIS backed firms, is now a continuous variable. Specifically, we estimate a first-stage regression of the following form (similar to equation 2):

¹An other way to proceed would be to use the predicted value from equation 2 as an instrument in a two-stage-least-square regression of equation 1 (see Wooldridge [18]). This specification provides qualitatively similar results to ours, but coefficients (and standard errors) tend to be fairly high.

$$\begin{aligned}
\ln(\text{SOF. Firms})_{j,t} = a &+ b.POST_t \times TREAT_j + m.t \times TREAT_j \\
&+ c.t \times POST_t \times TREAT_j + g_1.X_{j,t}^{(0)} + g_2.POST_t \times X_{j,t}^{(0)} \\
&+ d_t + d_j + e_{j,t}
\end{aligned} \tag{4}$$

with the same notations as before, and where $X_{j,t}^{(0)}$ stands for lagged industry level controls: ROA, leverage, employment and capital of firms aged 3 years or less.

The second stage regression takes the following form:

$$\begin{aligned}
\ln(\text{firm creation})_{j,t} = \alpha &+ \beta.\widehat{\ln(\text{SOF. Firms})}_{j,t} + \mu.t \times TREAT_j \\
&+ \gamma.t \times POST_t \times TREAT_j + \xi_1.X_{j,t}^{(0)} + \xi_2.POST_t \times X_{j,t}^{(0)} \\
&+ \delta_t + \delta_j + \epsilon_{j,t}
\end{aligned} \tag{5}$$

where $\widehat{\ln(\text{SOF. Firms})}_{j,t}$ is the predicted value obtained from equation 4. We analyze three different measures of firm creation: the (annual) number of newly created firms, the amount of employment and capital of newly created firms. All regressions are also clustered at the industry-post level.

5 Data and Descriptive Statistics

5.1 Sample Construction

Our information about the SOFARIS (Creation Fund) backed loans is directly sourced from the SOFARIS' Information System and includes firm and loan-level information over the 1989-2000 period, in particular: the date at which a guarantee was granted, the amount of the backed loan, the fraction of the loan that is guaranteed and the upfront fee paid to SOFARIS. These files also include unique firm's identifying codes (Siren code) allowing to match these information with complementary firm level data.

The SIRENE files report the yearly creations of French firms and are built at the Firm Demography Department of the French National Institute of Statistics (INSEE). Firm level information about employment and geographical location is also sourced from these files.

The BRN ("Bénéfice Réel Normal" tax regime) files consist of firms' balance sheets collected yearly by the "Direction Générale des Impôts" (Fiscal Administration) and provide firm level accounting information (value added, capital investment, debt, financial fees, etc.). This tax regime is mandatory for companies having a level of sales higher than FF. 3.8 million (per year), but can also be also chosen by smaller firms.² 63% of SOFARIS firms choose this tax regime, while only 29% of eligible companies are in these BRN files. Information about the other firms (choosing a "simplified" tax regime or even the personal income tax) is so scarce that it is unfortunately impossible to further analyze this potential selection.

²The corresponding files include around 600,000 firms, in the private non-financial, non- agricultural sectors each year and covers around 80% of total output in the French economy.

Lastly, bankruptcy files also provide an exhaustive list of all bankruptcy filings in France since 1987, with the identifying number of the corresponding bankrupt companies.

We match these four datasets in order to be able to track all corporations or limited liability firms that were created over the 1988-1999 period and which provided information to the fiscal administration (BRN files) within their first year of life. The “treated” firms obtained a guarantee within their second year of life; they represent 75% of the firms backed by the Creation Fund. We thus exclude from our analysis:

- Firms which were subsidized during their first year because we can not get any pre-treatment observable information for them.
- The few firms which were subsidized in their third year, for homogeneity concerns.

“Control” firms are all other (corporation or limited liability) firms, which have not been backed by the SOFARIS Creation Fund. Our final sample contains 1,362 treated firms and 205,852 control firms, resulting in a sample of 207,214 enterprises. All these firms are observed in their first year of existence, and then in their third and seventh year.

5.2 Descriptive Statistics

Table 2 reports descriptive statistics about the whole firm level estimation sample. Only 0.7% of all newly created firms get a SOFARIS loan, which indicates that this program is a very small one. 51% of the sample firms belong to industries that became eligible after 1995 only (“treated industries”). The average size of newly created firms, in their first year of life, is around 2 employees, and the financial burden for such young firm is extremely high: the median interest rate (defined as total financial costs over debt) is 12%. Dispersion is high (or this variable is quite noisy³) since its mean is as high as 27%. 24% of all firms get bankrupted and file-in in this procedure. Unfortunately, we are not able to accurately track the other ways of exiting the market: mergers or death without formal legal bankruptcy procedure.

Table 3 reports the main features of SOFARIS firms. Their level of employment at creation is higher than the average of all newly created firms (2.6 vs. 1.8 employees) but their average start-up capital and initial debt are halved as compared to the average of all newly created firms (FF 977,000 and FF 358,000 as compared to FF 2,175,000 and FF 659,000 respectively). The subsequent evolution of the SOFARIS firms is also noticeable: whereas their debt (and the corresponding financial burden) catch up those of the other young firms, their employment growth does not slow down and remains at a higher level than the average growth rate of non-subsidized firms. This also results in higher rates of bankruptcy filings, both in the medium (16% against 9% four years after creation) and in the long terms: 37% of all observed SOFARIS firms end up in a bankruptcy procedure, whereas this rate is no higher than 24% in the full sample.

³Variables that are not closely linked to the fiscal computations are less precisely reported.

Lastly, table 4 reports the main features of our industry level sample. Data were aggregated at the two-digit level and we end up with 264 industry-year observations over the 1989-2000 period. On average, 27 firms per year benefited from a SOFARIS guarantee in each sector, while more than 8,000 firms were created yearly, so that the rate of subsidized firms is below 1% in most industries. The average ratio of total guaranteed loans over outstanding financial debt is 1.5%, but the median is also below 1%. Most of newly created firms are very small since on average less than one full-time employee was declared at creation over the observation period.

6 Results

6.1 First Stage Estimation

The first-stage equation enables to check that the quasi-natural experiment provides a significant identifying shock on the probability of getting a guaranteed loan, since the interaction $POST_t \times TREAT_j$ is highly significant whatever the (logit or probit) specification. The corresponding student statistic is above 3.5 in each case (see table 5).

Due to the small size of the program, the absolute magnitude of this shock is not higher than 0.25 percentage point (see table 6) for firms in “treated” (newly eligible) industries, but since the base was on average around 0.7% (and much lower in “treated” industries), this shock represents an increase of 36% in the rate of subsidized firms.

Estimations results are robust to the (logit or probit) specification, and significance of the IV is preserved when including treatment-industry and treatment-industry-post specific trends.

6.2 Impact on Access to Credit: Debt Growth and Financial Burden

We first investigate whether getting a guaranteed loan causally implies that firms take on more debt. Under the credit constraint assumption, subsidized firms benefit from more favorable borrowing conditions and from an easier access to banking credit. Therefore, in this case, SOFARIS guarantees enable firms to be more leveraged than other firms. On the contrary and the pricing scheme is inadequate (low enough), a windfall effect could be that unconstrained firms only benefit from SOFARIS guarantees, with lower interest rates than on the un-subsidized credit market since the loan is now partly secured. In this latter “winner picking” case, SOFARIS firms do not have a higher debt but show a lower financial burden.

We test these two predictions by estimating equation 3 with the two-, four- and six-year growth rate⁴ of bank debt (table 7)) and the level of financial burden after two, four or six years respectively as dependent variables. In table 8 we measure financial burden as the average interest rate, i.e. firms’ financial expenditures divided by their financial debt. This ratio is a more precise measure of the marginal interest rate in the first years, but it becomes noisier as time goes by, since it then mixes various debt issuances.

⁴Our estimation results are all potentially affected by an attrition bias as, for instance, SOFARIS firms exiting the sample might have more debt than the average firm exiting the sample. We do not address this issue yet.

In the case of debt evolution, results obtained from the selection model are overall fairly similar to results obtained either from the matching or from the OLS approaches⁵ and are quantitatively important: the growth of bank debt in the first two years is higher by 0.69 percentage point (around 0.5 standard deviation) if firms get a guaranteed loan, and after controlling for the initial level of debt, which could express non-convexities and threshold effects. This effect is also long lasting, since this difference persists with the same magnitude four years after the date of the SOFARIS guarantee. The further analysis of firms' financial burden enables to disentangle whether this long term effect is due to a more favorable access to longer term loans or whether it is due to a more favorable sequence of debt contracts, e.g. in the case trust building with the firms' banks.

Indeed, results in this latter case show that obtaining a guaranteed loan decrease significantly the obtained interest rate in the very short run, by 6 percentage points according to matching/OLS estimates, and up to 23 percentage points (ie. 0.70 standard deviation of the interest rate variable) according to the selection model. Results from the selection model are statistically different from the OLS/matching estimates in this case, which means that matching/OLS estimates are probably affected by attenuation endogeneity bias. We find no statistically significant impact on financial burden in the longer run, which we interpret as evidence in favor of the trust building hypothesis: only the first loan is guaranteed and benefits from lower interest rates. The measure financial burden in the longer run adds up new, un-guaranteed and more expensive loans. These results remains however purely descriptive since in the absence or a pricing model, loan sizes and interest rates are obviously not independent and their empirical evolution is difficult to interpret.

6.3 Impact on Firm Development: Employment and Capital Growth

Do credit constraints hinder firm development? First insights regarding this aspect are obtained estimating a reduced form based on equation 3. The dependent variables under analysis are then two-, four- and six- year employment and capital growth respectively.

Estimates for employment growth are reported in table 9. As for financial burden, estimates obtained from the selection model are higher than estimates from OLS/matching methods. These latter estimates are thus potentially affected by downward endogeneity biases: firms having lower growth perspectives than the average self-select into SOFARIS backed loans. Taking selection explicitly into account and controlling for initial level of employment, we obtain that SOFARIS firms experience higher employment growth both in the short run (growth rates higher by 49 percentage points, i.e. 0.42 standard deviation after two years) and in the long run (70 percentage points, i.e. 0.61 standard deviation after six years). OLS and matching estimates are perhaps more reasonable: the obtained growth premiums are around 25 percentage point in the short run, and 16 percentage points in the longer run. Since a typical firm in the sample has around 2.6 employees in its first year of creation, this implies that SOFARIS backed loans enable firms to create an additional 0.65 job in the short run, and 0.42 job in the long run.

⁵Endogeneity issues do not seem to be a serious problem in this case.

Beyond employment, the increased debt capacity brought by a guaranteed loan can be used to increase investment, and therefore firms' capital growth. Results obtained (reported in table 10) are robust to the estimation methods; if anything, OLS and matching estimates lead to under-estimate the true impact on the dynamic of firms' capital. Controlling for initial size, a guaranteed loan has a permanent, significant and sizeable impact on capital growth, although results obtained from the selection model are barely significant. Guaranteed firms see their capital grow faster by around 55 percentage points, both in the short and medium run. This represents about 0.5 standard deviation of capital growth rates in this population of young firms.

6.4 Bankruptcy Probability

Reduced credit constraint should induce a more balanced development over the firm's life cycle and therefore fewer failures. On the other hand, a potential concern with loan guarantee programs is that they should induce more risk taking by both entrepreneurs and banks.

A first argument relies on the deformation of the entrepreneurs' objective function induced by SOFARIS. Even without external guarantees, entrepreneurs are theoretically limited liable. However, it is fairly common that banks require personal guarantees from entrepreneurs (like mortgage on their private real estate). An important feature of the SOFARIS system is that it is explicitly forbidden to ask for such additional private guarantee when the loan is already backed by SOFARIS, so that entrepreneurs become de facto limited liable and have thus theoretically more incentives to adopt risky strategies.

The second argument relies on banks' behaviour. Indeed, banks have lower incentives to monitor SOFARIS backed loans (i.e. investigate firms' use of assets, etc.). The entrepreneur, who is residual claimant on its firm, should anticipate this behaviour and adopt riskier strategies.

In order to investigate which effect is dominating in the French case, we simply use the probability of bankruptcy (after two or four years, or at any point in time) as a dependent variable in equation 3.

We obtain (*cf.* table 11) that firms getting a guaranteed loan experience subsequently a significant and sizeable increase in their default probability: from 6 percentage points in the first two years, to 29 percentage points overall, which represents some 0.8 standard deviation of average bankruptcy probability. Note that these figures are supposed to be purged from any selection bias thanks to the Heckman procedure. An alternative interpretation of these results is that, conditional on exit, guaranteed firms have more incentives to file for bankruptcy e.g. because there are more stake-holders in the company. However, using an alternative measure of firms' failures (exits from the BRN tax files⁶) provides similar results (although less significant).

⁶The main drawback of this alternative measure is that we are not able to distinguish "true" deaths from potential "successful" exits (mergers and acquisitions).

6.5 Assessing the Impact on Firm Creation

We now turn to the industry level sample in order to assess the impact of early stage credit constraints on entrepreneurship and firm creation.

First stage estimates are reported in table 12 and show that the institutional shock we use as a quasi-natural experiment has a strong explanatory power on industry level number of guaranteed loans since the F-statistic obtained in the most complete specification for the instrumental variable ($\text{Post} \times \text{Treatment}$) is above 24. Being in a “newly eligible⁷” industry after 1995 almost triples the number of guaranteed loans as compared to the situation before 1993, and relative to industries that remained eligible. This shock explains some 0.4 standard deviation of the $\ln(\text{SOF. Firms})$ variable in the industry sample.

In the equation of interest (see table 13), OLS estimates suggest that there is a positive correlation between the number of SOFARIS loans and industry level firms’ creation rates, but two-stage-least-square estimates are not statistically significant and reject any causal impact of the SOFARIS intervention on creation rates. However, OLS and IV estimates suggest that guaranteed loans enable newly created firms to hire more employees and to invest in more early stage capital. This effects are quantitatively large: a 1% increase in the number of SOFARIS loans implies a 0.18% increase in the number of employees in newly created firms. In other words, at the sample mean industry, additional 2.6 SOFARIS backed firms induce 1.7 additional jobs created at earliest stage of these firms’ development. This 0.65 additional job per subsidized firm obtained with an industry level analysis is in line with the result obtained in the short term when controlling for individual heterogeneity at firm level.

6.6 Orders of Magnitude

Due to the small size of the program, it is very difficult to get any significant result on firms’ creation. However, we find that this program is efficient for alleviating financial constraints in the short and long term, which favours both employment and capital creation, even in the long term.

Without any precise pricing model, it is difficult to assess the gains in terms of financial fees for SOFARIS backed firms, and to compare this amount to the equivalent subsidy associated to the SOFARIS creation fund. Another indirect way to assess the magnitude of credit constraints is to take a policy evaluation point of view, i.e. evaluating what is the cost per long term job induced by the SOFARIS intervention, and compare with alternative public targeted interventions.

Treated firms hire 2.6 employees on average at birth. When surviving until their fourth year, their employment growth rate exceed by 16 percentage point on average those of non-treated firms, which corresponds to an additional 0.42 job. However, they go bankrupt 12 percentage points more often, and this excess bankruptcy rate adds-up to the 10% average. The net effect on employment creation is therefore as high as 0.33 job by treated firms. Since

⁷See above: some SOFARIS guarantees were granted before 1993 in theoretically non eligible (yet) sectors.

26,000 firms were treated in 2006 and the estimated corresponding equivalent subsidy was about FF 236 millions (36 millions euros), this imply that the average cost per long term job is about FF 27,600 (4,200 euros).

This cost can be compared with an alternative policy, which consists of lowering payroll taxes for low skilled workers. Such a policy has been successfully implemented in France, and is considered responsible in some studies for having created some 500,000 additional jobs (Crépon and Desplatz [10]). Yet, its overall budgetary cost (in terms of unpaid payroll taxes) is usually considered to be lie between 10 and 20 billions euros. This puts the cost of each job created by this policy to at least 20,000€. This very high cost comes from the fact that the subsidy is not only paid to new job created, but also all existing jobs in the economy.

7 Conclusion

Guaranteed loans are efficient tools to help firms increase their debt capacity. The consequence of this increased debt capacity is, on the medium run, job creation and capital accumulation. However, an important drawback of these loan guarantee programs is that they induce more risk taking from guaranteed firms. On the extensive margin, these programs seem to have no impact at all. This result is not completely surprising, since the literature has emphasized various motives for the decision into entrepreneurship other than credit constraints: private benefits or regulation among others. Relevant public policies aiming at increasing the pool of entrepreneurs should rather target regulation of entry (start-up capital requirement, etc.).

How much does cost a job created thanks to this loan guarantee program? We tried to provide a rough estimate in order to compare it with other employment policies... Future work would require a more structural evaluation of these programs in order to be able to assess welfare implications more precisely.

An important question is whether such programs are really scalable (for the moment, we estimate that the program creates approximately 11,000 long term jobs per year): keeping on increasing these programs make the marginal firms more and more risky, and thus may be welfare destroying.

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8 Figures

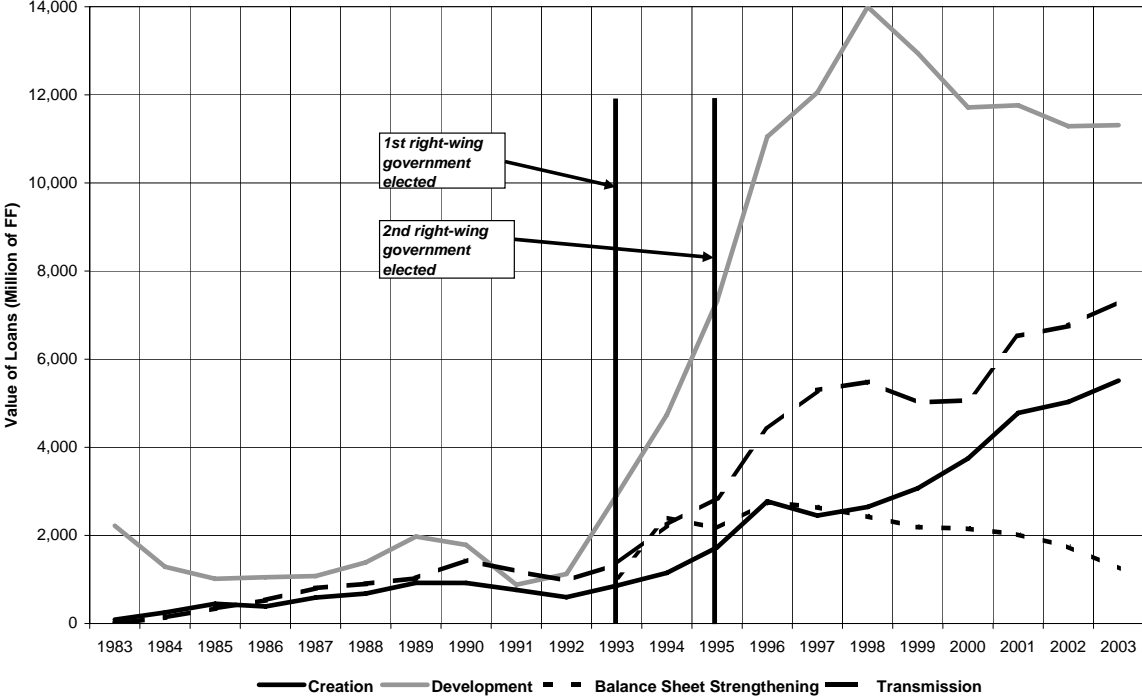


Figure 1 – Loans Guaranteed by SOFARIS, by Program (Fund)

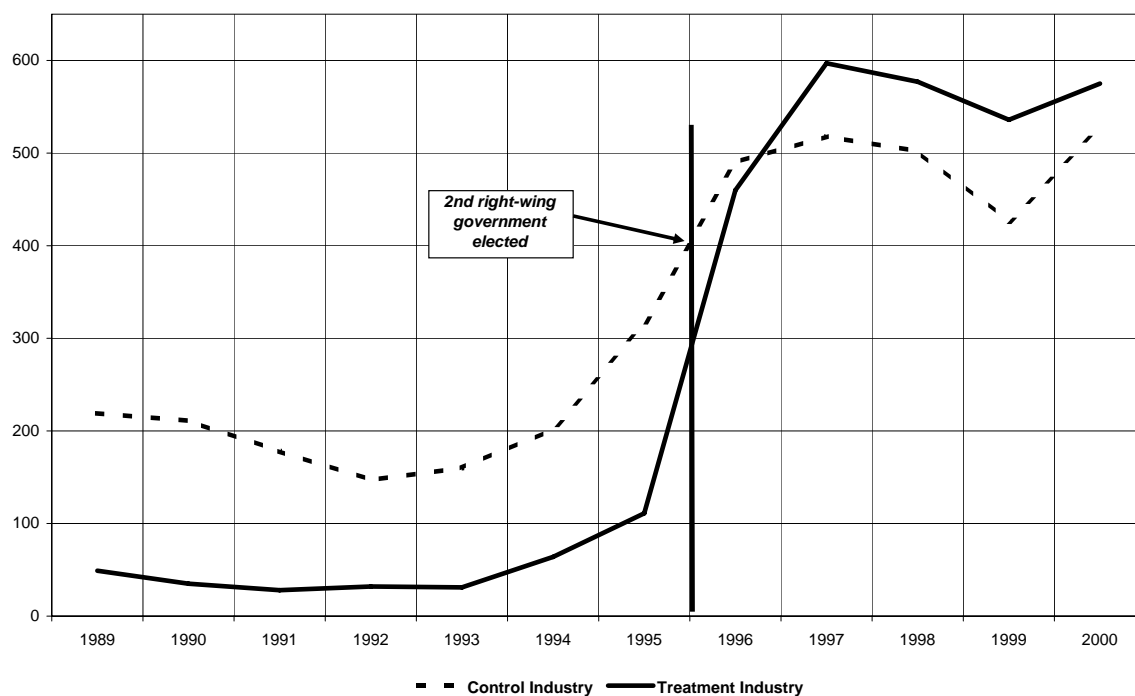


Figure 2 – Number of Guaranteed Firms, Creation Fund Only (Treatment vs. Control Industries)

9 Tables

Table 1: Description of the Various SOFARIS Funds (2005)

Main funds	Size	Equity	Financial perf.	Other financial earnings	Operat. costs	Earnings	ROE (%)	Equival. subsidy
Development	354	79	28	5	11	22	28	-11
Transmission	394	88	18	5	12	11	13	2
Financial Restructuring	181	40	-5	2	5	-8	-20	14
Creation	375	84	-18	5	11	-24	-28	36
All funds	1,582	354	37	21	47	11	3	42

Table 2: Summary Statistics: Firm Level Data, First Year after Creation

	Mean	Median	Std. Dev.	Min	Max	Number of Observations
Guaranteed Loan	.007	0	.08	0	1	207,214
Treatment (Treated Industries)	.51	1	.49	0	1	207,214
Employment ⁽⁰⁾	1.82	0	5.85	0	640	188,634
Start-up Capital ⁽⁰⁾	2175	50	87,447	50	2.6 10 ⁷	207,214
Debt ⁽⁰⁾	659	1	21,714	0	5 10 ⁶	207,214
Employment Growth ^(0/2)	.96	1.2	1.14	-2	+2	127,734
Employment Growth ^(0/4)	1.02	1.4	1.14	-2	+2	109,262
Employment Growth ^(0/6)	1.04	1.42	1.15	-2	+2	112,247
Debt Growth ^(0/2)	.4	0	1.23	-2	+2	172,643
Debt Growth ^(0/4)	.38	0	1.39	-2	+2	143,795
Debt Growth ^(0/6)	.31	0	1.46	-2	+2	112,247
Capital Growth ^(0/2)	.66	.61	1.01	-2	+2	159,138
Capital Growth ^(0/4)	.59	.76	1.20	-2	+2	134,889
Capital Growth ^(0/6)	.57	.82	1.26	-2	+2	106,113
Average Int. Rate ⁽²⁾	.26	.12	.31	0	.99	109,446
Average Int. Rate ⁽⁴⁾	.27	.12	.33	0	1.05	94,204
Average Int. Rate ⁽⁶⁾	.27	.12	.35	0	1.13	71,976
Bankruptcy ⁽²⁾	.017	0	.13	0	1	207,214
Bankruptcy ⁽⁴⁾	.09	0	.29	0	1	207,214
Bankruptcy ^(∞)	.24	0	.42	0	1	207,214

Source: BRN and SIRENE Files for the 1989-2000 period.

Notes: Guaranteed Loan is a dummy equal to 1 when the firm received a guaranteed loan within the first year after creation (period 1). Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Employment⁽⁰⁾, Start-Up Capital⁽⁰⁾ and Debt⁽⁰⁾ are number of employees, initial start-up capital and initial financial debts measure in the year of creation(0). Employment growth (resp. Debt and Capital Growth) (i/j) stands for growth of employment (resp. financial debt and total assets) between year i and year j , where period (0) is the year of creation. Average interest rate is measured as financial expenses divided by total financial debt. Bankruptcy (resp. Bankruptcy⁽²⁾, Bankruptcy⁽⁴⁾ and Bankruptcy^(∞)) are dummies indicating whether the firm files for bankruptcy at some point (resp. in the second year after creation, in the fourth year after creation, or at some date).

Table 3: Summary Statistics: Firm Level Data – Firms with Guaranteed Loan

	Mean	Median	Std. Dev.	Min	Max	Number of Observations
Treatment (Treated Industries)	.35	0	.47	0	1	1,362
Employment ⁽⁰⁾	2.61	1	5.3	0	60	1,154
Start-up Capital ⁽⁰⁾	977	250	4,000	50	45,000	1,362
Debt ⁽⁰⁾	358	9.5	1,142	0	19,251	1,362
Employment Growth ^(0/2)	1.28	1.57	.85	-2	+2	1,001
Employment Growth ^(0/4)	1.32	1.71	.9	-2	+2	856
Employment Growth ^(0/6)	1.29	1.69	.96	-2	+2	591
Debt Growth ^(0/2)	1.0	1.52	1.15	-2	+2	1,243
Debt Growth ^(0/4)	.81	1.6	1.38	-2	+2	1,045
Debt Growth ^(0/6)	.43	.96	1.57	-2	+2	755
Capital Growth ^(0/2)	.84	1.02	.99	-2	+2	1,152
Capital Growth ^(0/4)	.73	1.01	1.13	-2	+2	975
Capital Growth ^(0/6)	.59	.93	1.23	-2	+2	699
Average Int. Rate ⁽²⁾	.19	.10	.25	0	.99	1,125
Average Int. Rate ⁽⁴⁾	.24	.11	.29	0	1.05	954
Average Int. Rate ⁽⁶⁾	.27	.12	.33	0	1.13	618
Bankruptcy ⁽²⁾	.03	0	.18	0	1	1,362
Bankruptcy ⁽⁴⁾	.16	0	0.37	0	1	1,362
Bankruptcy ^(∞)	.37	0	.48	0	1	1,362

Source: BRN and SIRENE Files for the 1989-2000 period.

Notes: Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Employment⁽⁰⁾, Start-Up Capital⁽⁰⁾ and Debt⁽⁰⁾ are number of employees, initial start-up capital and initial financial debts measure in the year of creation(0). Employment growth (resp. Debt and Capital Growth) (i/j) stands for growth of employment (resp. financial debt and total assets) between year *i* and year *j*, where period (0) is the year of creation. Average interest rate is measured as financial expenses divided by total financial debt. Bankruptcy⁽²⁾, Bankruptcy⁽⁴⁾ and Bankruptcy^(∞) are dummies indicating whether the firm files for bankruptcy at some point (resp. in the second year after creation, in the fourth year after creation, or at some date).

Table 4: Summary Statistics: 2-Digit Industry Level Data

	Mean	Median	Std. Dev.	Min	Max	Number of Observations
Number of Guaranteed Firms	26.48	12	35.21	0	182	264
log(Number of Guaranteed Firms)	2.61	2.56	1.22	0	5.21	264
Firms Creation	8,379	2,623	11,845	28	43,565	264
log(Firms Creation)	7.67	7.87	1.93	3.33	10.68	264
Employment Creation	7,866	3,686	9,986	77	44,559	264
log(Employment Creation)	8.09	8.21	1.51	4.36	10.70	264
Treatment	0.36	0	0.48	0	1	264
ROA ⁽⁰⁾	0.157	0.145	0.159	-0.188	0.541	264
Leverage ⁽⁰⁾	0.515	0.502	0.187	0.199	0.928	264
log(Assets) ⁽⁰⁾	16.01	15.89	1.23	13.42	19.01	264
log(Employment) ⁽⁰⁾	9.69	9.71	1.30	6.62	11.75	264
$\frac{\#Sofaris\ Firms}{\#Eligible\ Firms}$	0.010	0.005	0.012	0	0.060	264
$\frac{\text{Amount of Guaranteed Loan}}{\text{Outstanding Debt of elig. firms}}$	0.015	0.009	0.020	0	0.105	264

Source: BRN, RSI and SIRENE Files for the 1989-2000 period.

Notes: log(Number of Guaranteed Firms) is the logarithm of the total number of firms with a guaranteed loan, defined at the 2-digit industry level. Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Except when specified, all variables refer to firms aged 3 years or less. ROA⁽⁰⁾ (resp. Leverage⁽⁰⁾) is defined, at the industry level, as the sum of EBITDA (resp. financial debt) divided by the sum of total assets in the industry and is measured in 1989. log(Assets)⁽⁰⁾ (resp. log(Employment)⁽⁰⁾) is the logarithm of the sum of assets (resp. employment) in the industry measured in 1989. $\frac{\#Sofaris\ Firms}{\#Eligible\ Firms}$ is the fraction of firms in the industry with a guaranteed loan.

$\frac{\text{Amount of Guaranteed Loan}}{\text{Outstanding Debt of elig. firms}}$ is the amount of guaranteed loan among overall debt of eligible firms in the industry. *Control Industries:* Manufacture of Wearing Apparel, Dressing and Furs (18), Manufacture of Wood and Wood Products (20), Publishing, Printing and Reproduction of Recorded Media (22), Manufacture of Chemicals and Chemical Products (24), Manufacture of Rubber and Plastic Products (25), Manufacture of Basic Metals (27), Manufacture of Fabricated Metal Products, excluding Machinery and Equipment (28), Manufacture of Machinery and Equipment n.e.c. (29), Manufacture of Office Machinery and COmputers (30), Manufacture of Electrical Machinery and Apparatus n.e.c. (31), Manufacture of Medical, Precision and Optical Instruments, Watches and Clocks (33), Computer and Related Activities (72), Research and Development (73), Other Business Activities (74).

Treated Industries: Construction (45), Sale, Maintenance and Repair of Motor Vehicles and Motorcycles, Retail Sale of Automotive Fuel (50), Wholesale Trade and Commission Trade, except of Motor Vehicles and Motorcycles (51), Hotels and Restaurants (55), Land Transport, Transport via Pipelines (60), Post and Telecommunications (64), Recreational, Cultural and Sporting Activities (92), Other Service Activities (93).

Table 5: First Stage: Probability of Guaranteed Loan and Industry Eligibility (1989-2000)

(Sample mean=0.007)	Probability of Guaranteed Loan					
	Logit Model			Probit Model		
	(1)	(2)	(3)	(4)	(5)	(6)
Post×Treatment	1.1*** (.13)	1.3*** (.17)	.99*** (.25)	.31*** (.051)	.44*** (.06)	.32*** (.091)
Treatment×t			.1 (.063)			.035 (.022)
Post×Treatment×t			-.15* (.088)			-.055* (.031)
Decile of Employment ⁽⁰⁾	NO	YES	YES	NO	YES	YES
Decile of Start-Up Capital ⁽⁰⁾	NO	YES	YES	NO	YES	YES
Decile of Debt ⁽⁰⁾	NO	YES	YES	NO	YES	YES
Region FE	NO	YES	YES	NO	YES	YES
Legal Form FE	NO	YES	YES	NO	YES	YES
Month of Creation FE	NO	YES	YES	NO	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Number of Observations	188,720	151,618	151,618	188,720	151,618	151,618

Source: BRN and SIRENE Files for the 1989-2000 period.

Notes: The dependent variable is a dummy equal to 1 when the firm obtained a guaranteed loan in the first year after creation (current year). Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Post is a dummy equal to 1 observations posterior to 1995 (excluding 1995). t is a linear trend. Decile of Employment (resp Start-Up Capital and Debt) stands for 10 dummies equal to 1 for each decile of initial employment (resp. start-up capital and financial debt). Region is a dummy variable for each region of location (21 regions). Legal Form is a dummy equal to 1 when the firm is the firm is a limited liability company. Month of Creation are 12 dummies for each month of creation. Column 1, 2 and 3 uses a logit specification, while column 4, 5 and 6 uses a probit specification. Each regression uses year and industry fixed effects. Observations are clustered at the industry–post level. ***, ** and * means significantly different from zero at the 1%, 5% and 10% confidence level.

Table 6: First Stage: Probability of Guaranteed Loan and Industry Eligibility (1989-2000)

	Marginal Effects \times 100 Reported					
	(Sample mean=0.007)					
	Probability of Guaranteed Loan					
	Logit Model			Probit Model		
	(1)	(2)	(3)	(4)	(5)	(6)
Post \times Treatment	0.562*** (0.082)	0.377*** (0.069)	0.243*** (0.088)	0.451*** (0.088)	0.356*** (0.069)	0.231*** (0.091)
Treatment \times t			0.018 (0.010)			0.018 (0.011)
Post \times Treatment \times t			-0.027* (0.014)			-0.029* (0.015)
Decile of Employment ⁽⁰⁾	NO	YES	YES	NO	YES	YES
Decile of Start-Up Capital ⁽⁰⁾	NO	YES	YES	NO	YES	YES
Decile of Debt ⁽⁰⁾	NO	YES	YES	NO	YES	YES
Region FE	NO	YES	YES	NO	YES	YES
Legal Form FE	NO	YES	YES	NO	YES	YES
Month of Creation FE	NO	YES	YES	NO	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Number of Observations	188,720	151,618	151,618	188,720	151,618	151,618

Source: BRN and SIRENE Files for the 1989-2000 period.

Notes: The dependent variable is a dummy equal to 1 when the firm obtained a guaranteed loan in the first year after creation (current year). Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Post is a dummy equal to 1 observations posterior to 1995 (excluding 1995). t is a linear trend. Decile of Employment (resp. Start-Up Capital and Debt) stands for 10 dummies equal to 1 for each decile of initial employment (resp. start-up capital and financial debt). Region is a dummy variable for each region of location (21 regions). Legal Form is a dummy equal to 1 when the firm is a limited liability company. Month of Creation are 12 dummies for each month of creation. Column 1, 2 and 3 uses a logit specification, while column 4, 5 and 6 uses a probit specification; marginal effects at the sample mean reported. Each regression uses year and industry fixed effects. Observations are clustered at the industry-post level. ***, ** and * means significantly different from zero at the 1%, 5% and 10% confidence level.

Table 7: Debt Growth and Guaranteed Loans

	Debt Growth 0/2 years (sample mean=0.40)			Debt Growth 0/4 years (sample mean=0.38)			Debt Growth 0/6 years (sample mean=0.31)		
	OLS (1)	Matching (2)	Selection Model (4)	OLS (5)	Matching (6)	Selection Model (8)	OLS (9)	Matching (10)	Selection Model (12)
Guaranteed Loan	.6*** (.041)	.64*** (.06)	.69*** (.2)	.46*** (.051)	.61*** (.075)	.56*** (.046)	.2*** (.061)	.41*** (.097)	.38*** (.061)
Treatment × t			.0045 (.0065)			.013* (.0071)			.0034 (.0063)
Treatment × Post × t			-.028*** (.0091)			-.04*** (.011)			-.024 (.015)
Mills Ratio			-.032 (.084)			-.04 (.099)			-.27** (.13)
Decile of Employment ⁽⁰⁾	NO	YES	YES	NO	YES	YES	NO	YES	YES
Decile of Start-Up Capital ⁽⁰⁾	NO	YES	YES	NO	YES	YES	NO	YES	YES
Decile of Debt ⁽⁰⁾	NO	YES	YES	NO	YES	YES	NO	YES	YES
Region FE	NO	YES	YES	NO	YES	YES	NO	YES	YES
Legal Form FE	NO	YES	YES	NO	YES	YES	NO	YES	YES
Month of Creation FE	NO	YES	YES	NO	YES	YES	NO	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of Observations	157,858	138,990	125,824	130,182	116,662	104,561	101,033	89,723	79,747
Effect of a Guaranteed Loan in Terms of Dep. Variable SD	.49	.51	.56	.33	.44	.41	.13	.28	.26
									-.21

Source: BRN and SIRENE Files.

Notes: The dependent variable is financial debt growth between the year of creation (0) and the second year after creation (2) in columns 1, 2, 3 and 4, the fourth year after creation (4) in columns 5, 6, 7 and 8, the sixth year after creation (6) in columns 9, 10, 11 and 12. Guaranteed Loan is a dummy variable equal to 1 when the firm received a guaranteed loan in the first year after creation (1), which is also the current year (t). Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Post is a dummy equal to 1 observations posterior to 1995 (excluding 1995). t is a linear trend. Decile of Employment (resp Start-Up Capital and Debt) stands for 10 dummies equal to 1 for each decile of initial employment (resp. start-up capital and financial debt), in the year of creation (0). Region is a dummy variable for each region of location (21 regions). Legal Form is a dummy equal to 1 when the firm is a limited liability company. Month of Creation are 12 dummies for each month of creation. Each regression uses year and industry fixed effects. Observations are clustered at the industry–post level. ***, ** and * means significantly different from zero at the 1%, 5% and 10% confidence level.

Table 8: Financial Burden and Guaranteed Loans

	Average Interest Rate, 2 nd year (sample mean=.26)		Average Interest Rate, 4 th year (sample mean=.27)		Average Interest Rate, 6 th year (sample mean=.27)		Selection Model	Selection Model				
	OLS Matching	OLS	OLS Matching	OLS	OLS Matching	OLS						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Guaranteed Loan	-0.057*** (.011)	-0.06*** (.014)	-0.06*** (.012)	-0.23*** (.059)	-0.013 (.012)	-0.02 (.019)	-0.03** (.013)	-0.15* (.089)	.026* (.015)	.03 (.02)	.015 (.018)	-0.057 (.087)
Treatment × t			.00019 (.002)	.00023 (.0012)			-.002 (.002)	-.002 (.001)			.002 (.0019)	-.002 (.0017)
Treatment × Post × t			.0015 (.0029)	.0013 (.0031)			.009** (.004)	.008** (.004)			-.007 (.0046)	-.0071 (.0043)
Mills Ratio				.067*** (.021)				.052 (.03)				.029 (.032)
Decile of Employment ⁽⁰⁾	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Decile of Start-Up Capital ⁽⁰⁾	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Decile of Debt ⁽⁰⁾	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Region FE	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Legal Form FE	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Month of Creation FE	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of Observations	100,390	87,141	79,188	79,188	85,345	76,201	68,399	68,399	64,711	57,517	51,107	51,107
Effect of a Guaranteed Loan in Terms of Dep. Variable SD												
	-.18	-.16	-.19	-.71	-.04	-.05	-.09	-.44	.07	-.10	.04	-.16

Source: BRN and SIRENE Files.

Notes: The dependent variable is the average interest rate in the second year after creation (2) in columns 1, 2, 3 and 4, the fourth year after creation (4) in columns 5, 6, 7 and 8, the sixth year after creation (6) in columns 9, 10, 11 and 12. Guaranteed Loan is a dummy variable equal to 1 when the firm received a guaranteed loan in the first year after creation (1), which is also the current year (t). Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Post is a dummy equal to 1 observations posterior to 1995 (excluding 1995). t is a linear trend. Decile of Employment (resp Start-Up Capital and Debt) stands for 10 dummies equal to 1 for each decile of initial employment (resp. start-up capital and financial debt), in the year of creation (0). Region is a dummy variable for each region of location (21 regions). Legal Form is a dummy equal to 1 when the firm is the firm is a limited liability company. Month of Creation are 12 dummies for each month of creation. Each regression uses year and industry fixed effects. Observations are clustered at the industry-post level. ***, ** and * means significantly different from zero at the 1%, 5% and 10% confidence level.

Table 9: Employment Growth and Guaranteed Loans

	Employment Growth 0/2 years (sample mean=.96)			Employment Growth 0/4 years (sample mean=1.02)			Employment Growth 0/6 years (sample mean=1.04)							
	OLS Matching	OLS (3)	Selection Model (4)	OLS Matching	OLS (5)	Selection Model (6)	OLS Matching	OLS (7)	Selection Model (8)	OLS Matching	OLS (9)	Selection Model (10)	OLS Matching	OLS (11)
Guaranteed Loan	.25*** (.029)	.16*** (.047)	.49*** (.14)	.22*** (.033)	.16*** (.054)	.18*** (.027)	.16*** (.042)	.8*** (.22)	.16*** (.042)	.10 (.065)	.13*** (.035)	.7*** (.27)		
Treatment × t	.0065 (.0059)	.0065 (.0059)	.0064** (.0029)	.0057 (.0059)	.0057 (.0059)	.0055* (.0028)	.0055* (.0028)	.0095 (.0037)	.0095 (.0037)	.0095 (.0037)	.0095 (.0037)	.0093** (.0037)		
Post × Treatment × t	-.0063 (.007)	-.0063 (.007)	-.0061 (.0054)	-.0038 (.0072)	-.0038 (.0072)	-.0033 (.005)	-.0033 (.005)	-.0051 (.0099)	-.0051 (.0099)	-.0051 (.0099)	-.0051 (.0099)	-.0047 (.0082)		
Mills Ratio			-.12** (.054)			-.25*** (.085)						-.23** (.1)		
Decile of Employment ⁽⁰⁾	NO	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES		
Decile of Start-Up Capital ⁽⁰⁾	NO	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES		
Decile of Debt ⁽⁰⁾	NO	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES		
Region FE	NO	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES		
Legal Form FE	NO	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES		
Month of Creation FE	NO	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES		
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES		
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES		
Number of Observations	115,836	113,299	102,703	98,120	96,896	86,994	76,182	86,994	76,182	75,729	67,442	67,442		
Effect of a Guaranteed Loan in Terms of Dep. Variable SD		.21	.17	.19	.14	.16	.14	.69	.14	.09	.12	.61		

Source: BRN and SIRENE Files.

Notes: The dependent variable is employment growth between the year of creation (0) and the second year after creation (2) in columns 1, 2, 3 and 4, the fourth year after creation (4) in columns 5, 6, 7 and 8, the sixth year after creation (6) in columns 9, 10, 11 and 12. Guaranteed Loan is a dummy equal to 1 when the firm received a guaranteed loan in the first year after creation (1), which is also the current year (t). Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Post is a dummy equal to 1 observations posterior to 1995 (excluding 1995), t is a linear trend. Decile of Employment (resp Start-Up Capital and Debt) stands for 10 dummies equal to 1 for each decile of initial employment (resp. start-up capital and financial debt), in the year of creation (0). Region is a dummy variable for each region of location (21 regions). Legal Form is a dummy equal to 1 when the firm is a limited liability company. Month of Creation are 12 dummies for each month of creation. Each regression uses year and industry fixed effects. Observations are clustered at the industry-post level. ***, ** and * means significantly different from zero at the 1%, 5% and 10% confidence level.

Table 10: Capital Growth and Guaranteed Loans

	Capital Growth 0/2 years (sample mean=.66)			Capital Growth 0/4 years (sample mean=.59)			Capital Growth 0/6 years (sample mean=.57)					
	OLS (1)	Matching (2)	OLS (3)	Selection Model (4)	OLS (5)	Matching (6)	OLS (7)	Selection Model (8)	OLS (9)	Matching (10)	OLS (11)	Selection Model (12)
Guaranteed Loan	.2*** (.037)	.38*** (.05)	.28*** (.038)	.58* (.34)	.25*** (.05)	.36*** (.06)	.35*** (.05)	.59* (.34)	.24*** (.066)	.34*** (.08)	.32*** (.071)	.56 (.38)
Treatment × t			.00066 (.0099)	.00057 (.0029)			.0017 (.01)	.0016 (.0038)			.01 (.015)	.01** (.005)
Treatment × Post × t			.016* (.0099)	.016* (.0083)			.026 (.017)	.026* (.014)			.013 (.016)	.013 (.014)
Mills Ratio				-.12 (.12)				-.097 (.13)				-.097 (.16)
Decile of Employment ⁽⁰⁾	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Decile of Start-Up Capital ⁽⁰⁾	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Decile of Debt ⁽⁰⁾	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Region FE	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Legal Form FE	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Month of Creation FE	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of Observations	145,519	128,059	115,954	115,954	122,128	109,363	98,040	98,040	95,516	84,784	75,372	75,372
Effect of a Guaranteed Loan in Terms of Dep. Variable SD	.20	.37	.28	.56	.21	.31	.30	.51	.19	.28	.25	.45

Source: BRN and SIRENE Files.

Notes: The dependent variable is capital growth between the year of creation (0) and the second year after creation (2) in columns 1, 2, 3 and 4, the fourth year after creation (4) in columns 5, 6, 7 and 8, the sixth year after creation (6) in columns 9, 10, 11 and 12. Guaranteed Loan is a dummy equal to 1 when the firm received a guaranteed loan in the first year after creation (1), which is also the current year (t). Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Post is a dummy equal to 1 observations posterior to 1995 (excluding 1995). t is a linear trend. Decile of Employment (resp Start-Up Capital and Debt) stands for 10 dummies equal to 1 for each decile of initial employment (resp. start-up capital and financial debt), in the year of creation (0). Region is a dummy variable for each region of location (21 regions). Legal Form is a dummy equal to 1 when the firm is a limited liability company. Month of Creation are 12 dummies for each month of creation. Each regression uses year and industry fixed effects. Observations are clustered at the industry-post level. ***, ** and * means significantly different from zero at the 1%, 5% and 10% confidence level.

Table 11: Bankruptcy Probability and Guaranteed Loans

	Default Probability within 2 nd year (sample mean=.017)			Default Probability within 4 th year (sample mean=.09)			Default Probability at some date (sample mean=.24)					
	OLS Matching	OLS	Selection Model	OLS Matching	OLS	Selection Model	OLS Matching	OLS	Selection Model			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Guaranteed Loan	.013*** (.0053)	.009 (.007)	.0055 (.0064) .0016***	.065** (.026) .0016	.072*** (.011)	.080*** (.015)	.064*** (.013) .0071***	.12* (.069) .0071**	.15*** (.014)	.17*** (.021)	.16*** (.017) .0068***	.29*** (.085) .0068*
Treatment $\times t$			(.00057) -.002	(.001) -.002			(.0017) -.014***	(.0032) -.014**			(.0027) -.013***	(.0036) -.013*
Treatment $\times Post \times t$			(.0013)	(.0017) -.024**			(.0037)	(.0063) -.023			(.0043)	(.0074) -.053
Mills Ratio				(.0097)				(.025)				(.033)
Decile of Employment ⁽⁰⁾	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Decile of Start-Up Capital ⁽⁰⁾	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Decile of Debt ⁽⁰⁾	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Region FE	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Legal Form FE	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Month of Creation FE	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of Observations	188,720	168,068	151,618	151,618	188,720	168,068	151,618	151,618	188,720	168,068	151,618	151,618

Source: BRN and SIRENE Files.

Notes: The dependent variable is a dummy equal to 1 if the firm filed for bankruptcy in the second year after creation (2) in columns 1, 2, 3 and 4, the fourth year after creation (4) in columns 5, 6, 7 and 8, at some point in columns 9, 10, 11 and 12. Guaranteed Loan is a dummy equal to 1 when the firm received a guaranteed loan in the first year after creation (1), which is also the current year (t). Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Post is a dummy equal to 1 observations posterior to 1995 (excluding 1995). t is a linear trend. Decile of Employment (resp Start-Up Capital and Debt) stands for 10 dummies equal to 1 for each decile of initial employment (resp. start-up capital and financial debt), in the year of creation (0). Region is a dummy variable for each region of location (21 regions). Legal Form is a dummy equal to 1 when the firm is a limited liability company. Month of Creation are 12 dummies for each month of creation. Each regression uses year and industry fixed effects. Observations are clustered at the industry-post level. ***, ** and * means significantly different from zero at the 1%, 5% and 10% confidence level.

Table 12: Industry Level First Stage Regression: Number of Guaranteed Loans and Industry Eligibility (1989-2000)

	log(Number of Guaranteed Firms)		
	(1)	(2)	(3)
Post \times Treatment	1.8*** (.17)	1.3*** (.26)	1.1*** (.22)
Treatment \times t		.068** (.032)	.068** (.032)
Post \times Treatment \times t		.057 (.077)	.057 (.078)
Post \times ROA ⁽⁰⁾			-1.9*** (.35)
Post \times Leverage ⁽⁰⁾			-.69** (.34)
Post \times log(Assets) ⁽⁰⁾			-.21** (.084)
Post \times log(Employment) ⁽⁰⁾			.51*** (.11)
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Number of Observations	264	264	264
R^2	.89	.89	.91

Source: BRN, RSI and SIRENE Files for the 1989-2000 period.

Notes: The dependent variable is the logarithm of the total number of firms with a guaranteed loan, defined at the 2-digit industry level. Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Post is a dummy equal to 1 observations posterior to 1995 (excluding 1995). t is a linear trend. All control variables refer to firms aged 3 years or less. ROA⁽⁰⁾ (resp. Leverage⁽⁰⁾) is defined, at the industry level, as the sum of EBITDA (resp. financial debt) divided by the sum of total assets in the industry and is measured in 1989. log(Assets)⁽⁰⁾ (resp. log(Employment)⁽⁰⁾) is the logarithm of the sum of assets (resp. employment) in the industry measured in 1989. Each regression uses year and industry fixed effects. Observations are clustered at the industry-post level. ***, ** and * means significantly different from zero at the 1%, 5% and 10% confidence level.

Table 13: Industry Level Second Stage Regression: Number of Guaranteed Firms and Firm Creation

	log(Firms Creation)		log(Employment Creation)		log(New Capital)	
	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)
log(Number of Guaranteed Firms)	.17*** (.059)	.037 (.15)	.13** (.063)	.18* (.11)	.26*** (.1)	.46* (.26)
Treatment \times t	.061 (.038)	.086 (.056)	.041* (.025)	.033 (.033)	-.027 (.048)	-.073 (.072)
Post \times Treatment \times t	-.068 (.063)	-.055 (.048)	.011 (.048)	.0061 (.042)	-.012 (.12)	-.014 (.11)
Post \times ROA ⁽⁰⁾	.076 (.3)	-.22 (.42)	.15 (.24)	.25 (.27)	.45 (.7)	.9 (.84)
Post \times Leverage ⁽⁰⁾	-.27 (.34)	-.35 (.34)	-.49*** (.18)	-.46*** (.16)	-.46** (.23)	-.38* (.23)
Post \times log(Assets) ⁽⁰⁾	.31*** (.094)	.28*** (.089)	.17** (.07)	.18*** (.066)	.46*** (.13)	.5*** (.14)
Post \times log(Employment) ⁽⁰⁾	-.45*** (.11)	-.37*** (.13)	-.29*** (.093)	-.32*** (.094)	-.67*** (.18)	-.78*** (.21)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	264	264	264	264	242	242
<i>Marginal Effect of a one SD Increase (35) in the Number of Guaranteed Firms</i>						
# firms (col. 1, 2) or workers (col. 3, 4)	1,322	267	922	1,277	8.18 10 ⁶	15.56 10 ⁶
as a % of level dependent variable SD	0.112	0.023	0.092	0.076	0.108	0.205

Source: BRN, RSI and SIRENE Files for the 1989-2000 period.

Notes: The dependent variable is the logarithm of the total number of firms created at the 2-digit industry level (column 1 and 2) and the logarithm of total employment in newly created firms at the 2-digit industry level (column 3 and 4). Log(Number of Guaranteed Firms) is the logarithm of the total number of firms with a guaranteed loan in the industry. Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Post is a dummy equal to 1 observations posterior to 1995 (excluding 1995). t is a linear trend. Except when specified, all variables refer to firms aged 3 years or less. ROA⁽⁰⁾ (resp. Leverage⁽⁰⁾) is defined, at the industry level, as the sum of EBITDA (resp. financial debt) divided by the sum of total assets in the industry and is measured in 1989. log(Assets)⁽⁰⁾ (resp. log(Employment)⁽⁰⁾) is the logarithm of the sum of assets (resp. employment) in the industry measured in 1989. Each regression uses year and industry fixed effects. Observations are clustered at the industry-post level. ***, ** and * means significantly different from zero at the 1%, 5% and 10% confidence level.

Table 14: APPENDIX TABLE / Employment Growth and Guaranteed Loans: IV Evidence

Firm Level Regression

	Employment Growth		
	(0/2) IV (1)	(0/4) IV (2)	(0/6) IV (3)
Guaranteed Loan	1*** (.32)	1.2*** (.37)	.96*** (.36)
Treatment \times t	.0064 (.0058)	.0056 (.0057)	.0095* (.0058)
Treatment \times Post \times t	-.0056 (.007)	-.0036 (.0072)	-.0056 (.01)
Decile of Employment ⁽⁰⁾	YES	YES	YES
Decile of Start-Up Capital ⁽⁰⁾	YES	YES	YES
Decile of Debt ⁽⁰⁾	YES	YES	YES
Region FE	YES	YES	YES
Legal Form FE	YES	YES	YES
Month of Creation FE	YES	YES	YES
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Number of Observations	102,703	86,994	67,442

Source: BRN and SIRENE Files.

Notes: IV estimation of the impact of Guaranteed Loan on Employment Growth. The dependent variable is the growth of employment between year of creation (0) and second year (2) in column 1, fourth year (4) in column 2 and sixth year (6) in column 3. Guaranteed Loan is a dummy equal to 1 when the firm received a guaranteed loan within the first year after creation (period 1). Treatment is a dummy variable equal to 1 for industries that became eligible from 1995. Post is a dummy equal to 1 observations posterior to 1995 (excluding 1995). t is a linear trend. Decile of Employment (resp Start-Up Capital and Debt) stands for 10 dummies equal to 1 for each decile of initial employment (resp. start-up capital and financial debt). Region is a dummy variable for each region of location (21 regions). Legal Form is a dummy equal to 1 when the firm is the firm is a limited liability company. Month of Creation are 12 dummies for each month of creation. Each regression uses year and industry fixed effects. Observations are clustered at the industry–post level. ***, ** and * means significantly different from zero at the 1%, 5% and 10% confidence level.