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Chapter Author: Claire Lelarge, David Sraer, David Thesmar

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Entrepreneurship and Credit Constraints
Evidence from a French Loan Guarantee Program

Claire Lelarge, David Sraer, and David Thesmar

8.1 Introduction

Public schemes aiming at facilitating small and medium-sized enterprises (SMEs) and young firms' access to external finance are pervasive around the world. While these programs have been implemented for years, their evaluation has long lagged behind. This task has, however, been taken up in recent literature. Several contributions propose an assessment of the performance of directed lending programs (e.g., Bach [2005] for France, Banerjee and Duflo [2004] for India, Prantl [2006] for Germany) or start-up subsidies for the unemployed (Crépon and Duguet 2002). Another strand of the literature focuses on policies specifically designed to support innovative start-ups (Lerner [1999] for the United States; Brander, Egan, and Hellmann [2008] for Canada). All of these public interventions share the common feature that they are *direct* subsidies, which take the form of low interest rates or cheap equity finance.

In the present contribution, we evaluate the effects of a loan guarantee program, which is to be considered as an *indirect* subsidy. Indeed, agencies

Claire Lelarge is a researcher at CREST-INSEE, France. David Sraer is an assistant professor of economics at Princeton University. David Thesmar is an associate professor of economics at HEC Paris, and research fellow at CEPR.

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in charge of these programs provide insurance to lenders against borrowers' risk of default, while the (often subsidized) insurance premium is paid for by the borrower. The main rationale for this type of public intervention is the widespread belief that the lack of collateral hinders the access of new firms to external finance. Credit guarantee programs can be found in most Organization for Economic Cooperation and Development (OECD) countries (OECD 2002; Green 2003); as, for instance, in the United States (Small Business Administration's [SBA's] 7a Loan Program, described by Craig, Jackson and Thomson [2005]), the United Kingdom (Small Firms Loan Guarantee, launched in 1981), or France (SOFARIS, launched in the late 1980s). Yet, although widespread, these programs have rarely been evaluated using firm level data.[1] In this chapter, we rely on an exhaustive, large-scale data set to fill this gap.

The impact of any directed policy is typically difficult to evaluate, primarily because of potential selection biases: firms that successfully apply to the program may be those that have the best growth prospects; that is, those that would have had no trouble raising external finance on financial markets. They may enter the program both because the agency in charge might prefer attracting high-potential firms and because these firms find it profitable to apply to the program in order to benefit from a subsidized, lower cost of external finance. When such selection occurs, firm level analyses will systematically overestimate the benefits of the program. To date, few papers have sought to alleviate this concern, although Bach (2005) and Banerjee and Duflo (2004) are important exceptions.

In this chapter, we take advantage of a quasi-natural experiment to provide a causal assessment of the effectiveness of the French loan guarantee program. The "SOFARIS" program was set up in the late 1980s and was initially restricted to firms active in the manufacturing and business services industries. In 1995, the public endowment of the program was increased and new industries (construction, retail and wholesale trade, transportation, hotels and restaurants, and personal services) became eligible. Using firms already eligible before 1995 as a control group, we focus on the behavior of firms active in these newly eligible industries before and after 1995 to provide difference-in-differences type of estimates of the impact of the program on various outcomes: debt, employment, and capital growth, as well as financial expenses and bankruptcy probability.

Our results suggest that the French loan guarantee program significantly impacted the development of newly created firms. Firms targeted by the program are found to raise systematically more external finance, pay lower interest expenses, and enjoy higher growth rates than other similar firms.

1. Two notable exceptions are Uesugi, Sakai, and Yamashiro 2006 and Glennon and Nigro 2005, who provide evaluations of the Japanese and US schemes, respectively, using firm level data sets. However, both of these contributions lack a proper identification strategy, in that they do not exploit exogenous variations in the probability of obtaining a guaranteed loan.

These results are shown to be causal, suggesting that this program is effective at helping small, credit constrained firms to grow. Focusing on industry level data, we find that the program is mostly effective on the *intensive* margin: while the availability of loan guarantees allows newly created firms to be larger, it does not trigger an increase in the overall number of firms created.

A surprising feature of our results is that the ordinary least squares (OLS) and the instrumental variable (IV) (difference-in-differences) analysis provide similar estimates, although the quasi-natural experiment we consider has a strong predictive power on the probability of obtaining a guarantee. This absence of a selection bias suggests that the program is well designed. To obtain loan guarantees, eligible firms have to agree to pay an extra fee that substantially increases the financial burden attached to the loan; this fee appears to be sufficiently high to deter unconstrained firms from applying to the program, and low enough to allow some constrained firms to do so. This does not mean, however, that the program is fully efficient. A particular concern emerges from our finding that loan guarantees *cause* firms to become more likely to go bankrupt. This result is not surprising: loan guarantees make limited liability strict[2] and can thus provide entrepreneurs with risk-shifting incentives. The overall efficiency of the program thus boils down to the trade-off between increased growth and increased risk.

Our chapter is organized as follows: we first present the French Loan Guarantee Program in terms of institutional background (section 8.2). We then provide some basic economic intuitions for the functioning of such a program (section 8.3). We present the data we use (section 8.4), and describe our estimation strategies (section 8.5) before presenting our results (section 8.6). We then conclude in section 8.7.

8.2 Institutional Design

Recently relabeled as "OSEO-Garantie," "SOFARIS," was created in 1982 as a French implementation of the SBA 7a Loan program. It is a semipublic agency: the French State owns 50 percent of voting rights, while a consortium of private banks and public financial institutions (the "Caisse des Dépôts et Consignations") owns the remaining 50 percent.

Bruneau (1990), Bachelot (1992), and a report issued by the French Ministry of Finance (Direction de la Prévision 1993) provide a good description of the main features of the program. The French government has total discretion for the creation of the various funds and, furthermore, decides upon their respective, broadly defined "objectives," while the main source of

2. While banks can in general ask entrepreneurs for personal guarantees, making the entrepreneur almost fully liable, they cannot do so if the loan they provide is guaranteed by SOFARIS.

financing is the French state budget. More specifically, SOFARIS is divided into four main funds, each of them having specific objectives:

- The "Development Fund" aims at improving access to external finance for old, mature SMEs. In this case, the backed medium to long-term loans are mainly supposed to finance capital expenditures.
- The "Export Fund" is designed to help French SMEs settle into foreign markets.
- The objective of the "Transmission Fund" is to secure firms' transmission, most frequently when the owner gets retired. These periods are among the most risky of the SMEs' life cycle (Betemps and Salette 1997).
- Lastly, the "Creation Fund" improves credit access for new ventures, mostly through medium to long-term loans.

These broad objectives are imposed to SOFARIS, but the agency has full autonomy to choose the ways to reach them. In most cases, this translates into eligibility conditions that are specific to each fund and that are defined in terms of industry affiliation, firm age, size (total sales), and group affiliation. In most cases, only independent firms can benefit from subsidized loans. Conditional on firms' eligibility, all applications for SOFARIS guarantees are made by banks, and not by the firms themselves. Once granted, a guarantee allows the bank to recover a prespecified amount of the remaining loan principal in case the firm defaults. This fraction usually varies between 40 percent and 70 percent, and is not set case by case, but rather at the fund-year level, with the view to manage the aggregate risk faced by the SOFARIS agency. The counterpart of these guarantees is that the "benefiting" firm has to pay a fee, which is also set at the fund-year level, and that adds to the interest rate it has to pay to the bank. This fee usually varies between 50 and 150 base points. In contrast to the US SBA's 7a Loan Program, firms do not have to prove that they were unable to obtain credit on the regular market. It is also worth noting that the regulation of the French system is only made through prices (fraction guaranteed and fee paid to SOFARIS), while there is no "quantity" rationing.[3]

The financial performances of the various funds—and the implied public subsidies—are quite contrasted, as shown in table 8.1. Assuming that the average return on equity (ROE) in the bank and insurance industries is about 15 percent, the Creation Fund would benefit from the largest subsidy (about 36 million euros, or French franc [FF] 236 million), partially (11 millions euros, FF 72 million) cross-financed by the Development Fund.

In the remainder of the chapter, we focus on this latter Creation Fund, which specifically aims at fostering entrepreneurship and firm creation.

3. For certain funds, only the largest applications are scrutinized on a case-by-case basis by the agency.

Table 8.1 **Description of the various SOFARIS funds (2005)**

Main funds	Size	Equity	Financial perf.	Other financial earnings	Operating costs	Earnings	ROE (%)	Equivalent 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

In 2005, the amount of loans backed by this fund represented one-third (1.5 out of the 4.5 billion euros) of the total amount of debt guaranteed by SOFARIS. There were 26,000 firms (of the total 40,000 firms backed by a SOFARIS guarantee) that benefited from such early stage loan guarantees.

8.3 Some Basic Intuitions about Credit Guarantee Programs

The previous literature has long since outlined the main mechanisms inducing credit constraints (Hubbard 1996; Tirole 2006).

Adverse selection on one hand impedes the ability of the market to allocate credit through prices (interest rates) only, because it increases the proportion of high-risk investors in the pool of prospective borrowers (Stiglitz and Weiss 1981). However, in absence of an informational advantage, it is unclear how public intervention may alleviate this source of credit rationing (Gale 1991). Bester (1985) showed that collateral might be used to screen safe from risky investors when collateral is relatively more costly for risky borrowers, but if the price of the credit guarantee cannot be differentiated according to the (unobservable) risk of entrepreneurs lacking collateral, it is impossible to replicate this self-revealing mechanism. In such an adverse selection setting, the introduction of a loan guarantee program might, however, increase the set of financed projects, be they in some cases excessively risky, depending on the price (up-front fee) and guaranteed share set by SOFARIS. The public agency precisely chose to combine a high up-front fee with a high level of guarantee, thus making low-risk and collateral-rich firms that do not need to be subsidized reluctant to apply, while allowing riskier or less wealthy entrepreneurs to obtain more external financing. In the presence of several sources of heterogeneity, however (risk of the project, net initial worth, profitability of project, etc.), the two available instruments are not sufficient to precisely target a specific population of firms defined over all relevant dimensions. This induces potential selection issues (see section 8.4) or increased social inefficiencies. For example, firms with inefficient

risk may obtain financing with a guarantee while firms with efficient risk would not get financed, or firms that might have obtained financing anyway would find it profitable to apply to the program.

Moral hazard, on the other hand, reduces the ability of prices alone to clear lending markets because once the loan is extended the actions of the borrower are not independent of the lending rate (Myers and Majluf 1985). The problem may be partly alleviated if the debtor is able to pledge private collateral to be transferred to the bank in case of project failure. Credit guarantees, however, do not reallocate risk between debtor and lender, but to the government instead, so that these schemes decrease the overall risk faced by both parties, and do not generically alleviate moral hazard.[4] This reasoning suggests that loans issued with public credit guarantees may be riskier than nonbacked loans (Chaney and Thakor 1985). Moreover, public support schemes in general are likely to have deleterious impact on efficiency, since (conversely) credit-constrained entrepreneurs have strong incentives to find ways of cutting costs.

The previous developments alone show that the expected impact of the launching of a loan credit guarantee program might increase the set of entrepreneurs obtaining finance, but at the cost of subsidizing riskier projects and lower efforts of both the entrepreneur and the lender (screening and monitoring costs) such that the net effect on total welfare might even be negative. Additional arguments explain why such programs may, however, be appealing; for example:

- There are some nonconvexities 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 1993).
- Credit guarantees might correct for unequally distributed endowments, if lack of collateral is more acute for certain individuals or in poorer geographical areas (Craig, Jackson, and Thomson 2005).
- Guarantee schemes can help diversify risk across lenders with different sectoral or geographic specialization.
- Credit guarantees help starting relation-based relationships between banks and entrepreneurs (Petersen and Rajan 1994), which may be fruitful in the future.
- There are some positive "social" externalities associated to increased entrepreneurial dynamism: fostering innovative and informational spillovers, infant industry, or learning-by-doing arguments (Honohan

4. Arping, Loranth, and Morrison (2009) show that guarantees might in some cases enhance welfare when entrepreneurs having positive NPV investment projects are excluded from the credit market due to lack of collateral. More specifically, the authors show that for sufficiently small guarantees, the borrower's incentives are increasing in the size of the guarantee, and hence, so is welfare. However, as previously stated, the actual SOFARIS guarantee is quite large.

2008), and so forth.[5] This kind of argument reaches obviously further away from young firms' financing concerns.

We argue that the program evaluation that follows will provide some evidence about the existence of credit constraints faced by entrepreneurs in case the program proves to increase young firms' external financing, either on the extensive or intensive margins, and if the underlying additional projects have a total net present value (NPV), which is greater than the implied public subsidy. However, we also recognize that these conditions are neither necessary[6] nor sufficient since the cost of the program may be higher than the subsidy.[7]

8.4 Estimation Strategy

We face a standard evaluation problem and implement two different estimation strategies, 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.

8.4.1 General Firm Level Setup

Estimated Equation

The baseline evaluation equation is of the following form:

$$(1) \qquad Y_{i,j,t}^{(T)} = \alpha + \beta.\mathrm{SOF}_{i,j,t+1-T} + \mu.t \times \delta_j + \xi.X_{i,j,t-T}^{(0)} + \delta_t + \delta_j + \varepsilon_{i,j,t}$$

where i denotes firms, j their industry, and t denotes time; this specification allows for industry-specific trends. Variable T (term) describes whether the outcome Y is observed in the short- (two years 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, $\mathrm{SOF}_{i,j,t+1-T}$ is a dummy variable indicating 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 ($T = 0$); that is, 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 calendar month of firm creation. Year (δ_t) and industry (δ_j) fixed effects are included in all regressions.

5. 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 (Crépon and Duguet 2002).

6. If the program scheme is not designed in a suitable way, it will not be able to alleviate credit constraints.

7. Li (2002) shows that general equilibrium (mis-)allocation effects might be large.

If self-selection in the group of SOFARIS-subsidized firms is correctly accounted for 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 unconfoundedness assumption (Rosenbaum and Rubin 1983) but do not rely on an homogeneous treatment assumption.

The obvious limitation of this first (benchmark) approach is that self-selection is potentially driven by characteristics that are unobservable in the data; for example, manager ability, risk, or profitability of the underlying projects. As an example, for a given level of risk, entrepreneurs having more profitable projects are more likely to accept to pay the up-front fee associated with a SOFARIS guarantee. This would lead to an upward bias on β in equation (1) if $Y^{(T)}$ 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. Conversely, it may be the case that for a given level of risk, the SOFARIS agency only selects projects that are profitable enough to be socially desirable (on the basis of an information set that is larger than the information available to the econometrician), but not profitable enough to access private funding. This would lead to a downward bias on the parameter of interest. It is difficult to anticipate beforehand which of the two previous effects is empirically relevant.

Exploiting a Quasi-Natural Experiment

In order to solve these potential endogeneity issues, we take advantage of the history of the SOFARIS system. More specifically, we argue that its 1995 extension can be considered as a valid quasi-natural experiment, which provides an industry level variation in the probability of getting a guaranteed loan. Moreover, we argue that this shock most probably did not affect the average post-grant behavior of backed firms.

Indeed, the recent history of SOFARIS was marked by two major shocks:

1. In 1993, a newly elected right-wing government extended this small-business oriented program widely. Between 1993 and 1995, the funds available to SOFARIS were almost multiplied by three.

Unfortunately, this large shock does not provide much identifying variation since it affected all eligible firms the same way and at the same date. Therefore, it is difficult to disentangle the effects of the extension of the SOFARIS program from those resulting from alternative cyclical shocks experienced by the French economy over this period.

2. In 1995, a subsequent right-wing government decided to keep on increasing this loan guarantee scheme not only 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 so.

This latter event appears to provide a better identification opportunity than the previous one, since under the assumption that new eligibility was not decided in anticipation of (negative) cyclical shocks affecting specifically the corresponding newly eligible industries—and not the previously eligible ones—then we are able to take advantage of this shock in a standard difference-in-differences (IV) setting.

Figure 8.1 depicts the overall evolution of the various SOFARIS funds over the last decades, whereas figure 8.2 focuses 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 a few 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.

We adopt a simple Heckman approach to our evaluation problem, in which the previously described differential shock provides us with a natural exclusion restriction to use as an instrumental variable for program participation. To begin, estimate a first-stage probit equation explaining the probability of obtaining a guaranteed loan (one year after creation):

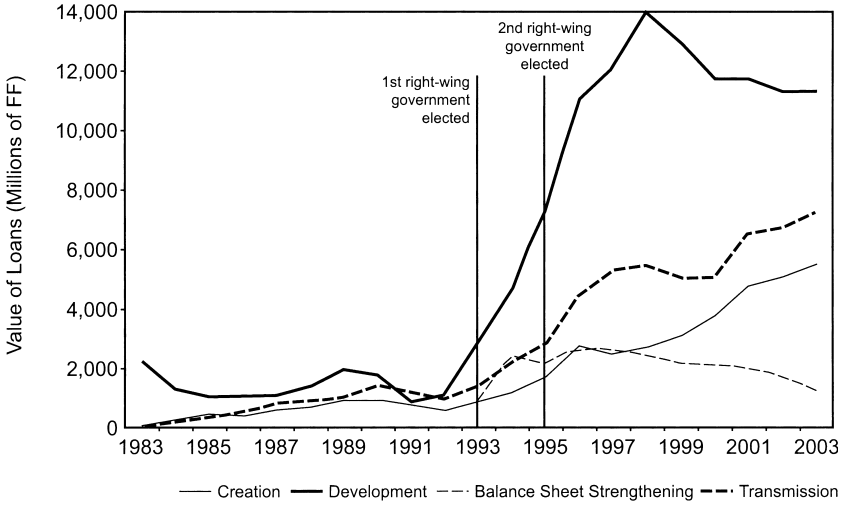

Fig. 8.1 Loans guaranteed by SOFARIS, by program (fund)

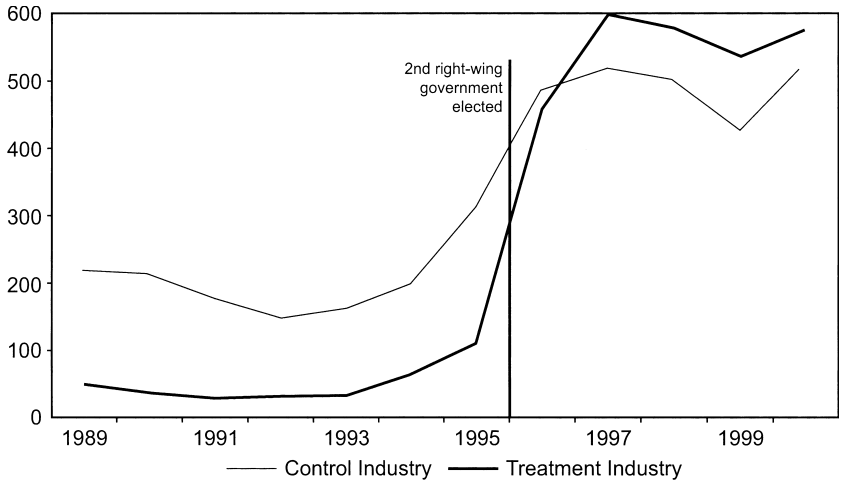

Fig. 8.2 Number of guaranteed firms, creation fund only (treatment versus control industries)

$$(2)\quad \mathrm{SOF}_{i,j,t} = a + b.\mathrm{POST}_t \times \mathrm{TREAT}_j + m.(t) \times \mathrm{TREAT}_j + c.(t) \times \mathrm{POST}_t \times \mathrm{TREAT}_j + g.X^{(0)}_{i,j,t-1} + d_t + d_j + e_{i,j,t},$$

where POST is a dummy equal to 1 if t is strictly later than 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 this date. Variable 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 post-1995 increase in the probability of getting a guaranteed loan in newly eligible industries relative to already eligible ones. Note that due to the small size of the program, the probability of getting a guaranteed loan in the first year after firm creation, conditional on eligibility, is on average as low as 0.7 percent. Simple linear models were therefore found to be too coarse to adequately investigate the tails of the firms' distribution, which are precisely of interest in our setting. Hence, identification relies partly on distributional assumptions, but our estimates are not sensitive to the choice of probit or logit specifications (see the following).

In a second-stage estimation, we then implement a Heckman selection model[8] to take account of the potential endogeneity issues in equation (1):

8. Another 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 2002). This specification provides qualitatively similar results to ours, but coefficients (and standard errors) tend to be fairly high.

$$(3)\quad Y_{i,j,t}^{(T)} = \alpha + \beta.\mathrm{SOF}_{i,j,t+1-T} + \mu.t \times \mathrm{TREAT}_j + \gamma.t \times \mathrm{POST}_{t+1-T} \times \mathrm{TREAT}_j + \xi.X_{i,j,t-T}^{(0)} + \theta.\left(\mathrm{SOF}_{i,j,t+1-T}.\frac{\varphi_{i,j,t+1-T}}{\Phi_{i,j,t+1-T}} + (1 - \mathrm{SOF}_{i,j,t+1-T}).\frac{\varphi_{i,j,t+1-T}}{1 - \Phi_{i,j,t+1-T}}\right) + \delta_t + \delta_j + \varepsilon_{i,j,t},$$

where $\varphi_{i,j,t-1}$ and $\Phi_{i,j,t-1}$ are computed from equation (2) (Mill's ratios). Here, the coefficient of interest, β, is not uniquely identified on the specific parametric (Gaussian) assumption, since identification also relies on an exclusion restriction: the interaction $\mathrm{POST}_{t-1} \times \mathrm{TREAT}_j$ is used as an instrumental variable for (SOFARIS) treatment (standard difference-in-differences setting).

All regressions are also clustered at the industry post-1995 period level (Bertrand, Duflo, and Mullainathan 2004).

8.4.2 Industry Level Regressions

Our analysis of the impact of the SOFARIS loan guarantee program on firm creation relies on a further analysis carried on at an industry level. In this setting as well as at the firm level, we face important potential endogeneity issues, first of all induced by simultaneities: for example, growing industries generate increased firm creation rates and therefore increased SOFARIS applications, thus leading to an upward bias on OLS estimates.

We therefore rely on the same quasi-natural experiment and on a similar identification strategy, based on the same implied exclusion restriction. Here estimation relies on a simple two-stage-least-square approach. More specifically, we estimate a first-stage industry level equation of the following form (similar to equation [2]):

$$(4)\quad \ln(\text{SOF. Firms})_{j,t} = a + b.\mathrm{POST}_t \times \mathrm{TREAT}_j + m.t \times \mathrm{TREAT}_j + c.t \times \mathrm{POST}_t \times \mathrm{TREAT}_j + g_1.X_{j,t}^{(0)} + g_2.\mathrm{POST}_t \times X_{j,t}^{(0)} + d_t + d_j + e_{j,t}$$

using the same notations as in equation (2), and where $X_{j,t}^{(0)}$ stands for lagged industry level controls: return on assets (ROA), leverage, employment, and capital of firms aged three years or less.

The second-stage equation takes the following form:

$$(5)\quad \ln(\text{firm creation})_{j,t} = \alpha + \beta.\ln(\widehat{\text{SOF.Firms}})_{j,t} + \mu.t \times \mathrm{TREAT}_j + \gamma.t \times \mathrm{POST}_t \times \mathrm{TREAT}_j + \xi_1.X_{j,t}^{(0)} + \xi_2.\mathrm{POST}_t \times X_{j,t}^{(0)} + \delta_t + \delta_j + \varepsilon_{j,t},$$

where $\ln(\widehat{\text{SOF.Firms}})_{j,t}$ is the predicted value obtained from equation (4). We analyze three different measures of firm creation: the (annual) unweighted

number of newly created firms, and the employment or capital weighted numbers of firm creations. All regressions are also clustered at the industry post-1995 period level.

8.5 Data and Descriptive Statistics

8.5.1 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 to 2000 period, specifically: the date at which any 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 the official (and unique) firm identifiers (Siren code) allowing to match this information with complementary firm level data sets.

The SIRENE files reporting the yearly creations of French firms 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 fiscal administration ("Direction Générale des Impôts") 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 annual sales higher than FF 3.8 million, but can also be chosen by smaller firms.[9] Of SOFARIS firms, 63 percent choose this tax regime, while only 29 percent of the total of eligible companies are retrieved in the BRN files. Accounting information about the remaining firms (which chose a "simplified" tax regime or even the personal income tax) is so scarce that it is unfortunately impossible to further analyze this potential selection.

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

We matched these four data sets in order to track all corporations or limited liability firms that were created over the 1988 to 1999 period and that provided information to the fiscal administration (BRN files) within their first year of life. We restricted the definition of "SOFARIS" treatment to firms obtaining a guarantee within their second year of life; they represent 75 percent of the total number of firms backed by the Creation Fund. We thus exclude from our analysis:

9. The corresponding files include around 600,000 firms, in the private nonfinancial, nonagricultural sectors each year and cover around 80 percent of total output in the French economy.

- Firms that were subsidized during their first year because no pretreatment observable information is available in their case.
- The few firms that were subsidized in their third year of life, 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 of these firms were observed in their first year of existence, and then (conditional upon surviving) in their third and seventh year.

8.5.2 Descriptive Statistics

Table 8.2 reports descriptive statistics about the whole firm level estimation sample. Only 0.7 percent of all newly created firms obtained a SOFARIS

Table 8.2 Summary statistics: Firm level data, first year after creation

	Mean	Median	Standard deviation	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$^{(\infty)}$	.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 after 1995. "Employment$^{(0)}$," "Start-up capital$^{(0)}$" and "Debt$^{(0)}$" are number of employees, initial start-up capital and initial financial debts in the year of creation(0), respectively. "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$^{(\infty)}$" are dummies indicating whether the firm filed for bankruptcy at some point (resp. in the second year after creation, in the fourth year after creation, or at some date).

loan, which indicates that this program is a very small one. Of the sample firms, 51 percent belong to industries that became eligible after 1995 ("treated industries"). The average size of newly created firms is around two employees in their first year of life, and the financial burden for such a young firm is extremely high: the median interest rate (defined as total financial costs over debt) is 12 percent. Dispersion is high (or this variable is quite noisy[10]) since the mean of this variable is as high as 27 percent. Of all firms, 24 percent get bankrupted and file-in in this legal procedure. Unfortunately, we are not able to accurately track the alternative ways of exiting the market; for example, mergers or deaths without formal legal bankruptcy procedure.

Table 8.3 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 versus 1.8 employees) but their average start-up capital and initial debt are halved as compared to the average over 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 SOFARIS firms is also noticeable: whereas the level of their debt (and the corresponding financial burden) catches up with those of nontreated young firms, their employment growth does not slow down and remains at a higher level than the average growth rate of nonsubsidized firms. This also results in higher rates of bankruptcy filings, both in the medium- (16 percent against 9 percent in the fourth year after creation) and in the long-terms: 37 percent of all observed SOFARIS firms end up in a bankruptcy procedure, whereas as previously stated, this rate is no higher than 24 percent in the full sample.

Lastly, table 8.4 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 to 2000 period. On average, twenty-seven 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 percent in most industries. The average ratio of total guaranteed loans over outstanding financial debt is 1.5 percent, but the median is also below 1 percent.

8.6 Results

8.6.1 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 $\text{POST}_t \times \text{TREAT}_j$ is highly significant whatever the (logit or probit) specification. The obtained student

10. Variables that are not closely linked to the fiscal computations are less precisely reported in the BRN files.

Table 8.3 Summary statistics: Firm level data—firms with guaranteed loan

	Mean	Median	Standard deviation	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$^{(\infty)}$	.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 after 1995. "Employment$^{(0)}$," "Start-up capital$^{(0)}$," and "Debt$^{(0)}$" are number of employees, initial start-up capital, and initial financial debts in the year of creation(0), respectively. "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$^{(\infty)}$" are dummies indicating whether the firm filed for bankruptcy at some point (resp., in the second year after creation, in the fourth year after creation, or at some date).

statistic is above 3.5 in each case (see table 8.5) and significance of the IV is preserved when including treatment industry and treatment industry post-1995 period-specific trends.

Due to the small size of the program, the absolute magnitude of this shock is not higher than 0.25 percentage point (see table 8.6) for firms in "treated," newly eligible industries, but since the base was on average around 0.7 percent, and even lower in "treated" industries, this shock represents a sizable increase of 36 percent in the rate of subsidized firms.

8.6.2 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. If firms are credit constrained, and under the further assumption that the scheme is properly calibrated, subsidized firms benefit from more favorable borrowing conditions and from an easier access to banking credit. Therefore, in this case, SOFARIS guarantees enable eli-

Table 8.4 **Summary statistics: 2-digit industry level data**

	Mean	Median	Standard deviation	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
$\frac{Amount\ of\ guaranteed\ loan}{Outstanding\ debt\ of\ elig.\ firms}$	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 after 1995. Except when specified, all variables refer to firms aged three 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. "#Sofaris firms/#Eligible firms" is the fraction of firms in the industry with a guaranteed loan. "Amount of guaranteed loan/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).

gible firms to be more leveraged. On the contrary, if the pricing scheme is inadequate (low enough), a windfall effect could occur, that unconstrained firms only apply for SOFARIS guarantees in order to get lower interest rates than on the nonsubsidized credit market.[11] In this latter "winner picking" case, SOFARIS firms would not show higher levels of debt but a lower financial burden.

We test these two predictions by estimating equation (3) with the two-,

11. This may be the case since the backed loan is partly secured.

Table 8.5 First stage: Probability of guaranteed loan and industry eligibility (1989–2000)

	Probability of guaranteed loan					
	Logit model			Probit model		
(Sample mean = 0.007)	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treatment	1.1***	1.3***	.99***	.31***	.44***	.32***
	(.13)	(.17)	(.25)	(.051)	(.06)	(.091)
Treatment × *t*			.1			.035
			(.063)			(.022)
Post × Treatment × *t*			–.15*			–.055*
			(.088)			(.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 after 1995. "Post" is a dummy variable equal to 1 for observations posterior to 1995 (excluding 1995). Variable *t* is a linear trend. "Decile of employment" (resp., "Start-up capital" and "Debt") stands for ten 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 (twenty-one regions). Legal Form is a dummy equal to 1 when the firm is the firm is a limited liability company. "Month of Creation" are twelve dummies for each month of creation. Columns (1), (2), and (3) report results obtained from a logit specification, while columns (4), (5), and (6) report results obtained from a probit specification. Each regression includes year and industry fixed effects. Observations are clustered at the industry post level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

four- and six-year growth rate[12] of bank debt (table 8.7) and the level of financial burden after two, four, or six years, respectively, (table 8.8) as dependent variables. We measure financial burden as the average interest rate; that is, the ratio of firms' financial expenditures over financial debt. This ratio is a quite 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.

Concerning the evolution of debt, results obtained from the selection

12. Our 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.

Table 8.6 **First stage: Probability of guaranteed loan and industry eligibility, 1989–2000 (marginal effects × 100 reported)**

	Probability of guaranteed loan					
	Logit model			Probit model		
(Sample mean = 0.007)	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treatment	0.562***	0.377***	0.243***	0.451***	0.356***	0.231***
	(0.082)	(0.069)	(0.088)	(0.088)	(0.069)	(0.091)
Treatment × t			0.018			0.018
			(0.010)			(0.011)
Post × Treatment × t			–0.027*			–0.029*
			(0.014)			(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 after 1995. "Post" is a dummy variable equal to 1 for observations posterior to 1995 (excluding 1995). Variable t is a linear trend. "Decile of employment" (resp "Start-up capital" and "Debt") stands for ten 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 (twenty-one regions). "Legal form" is a dummy equal to 1 when the firm is a limited liability company. "Month of creation" are twelve dummies for each month of creation. Columns (1), (2), and (3) report results obtained from a logit specification, while columns (4), (5), and (6) report results obtained from a probit specification; marginal effects at the sample mean reported. Each regression includes year and industry fixed effects. Observations are clustered at the industry post level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

model are overall fairly similar to results obtained either from the matching or from the OLS approaches[13] and are quantitatively large: the growth of bank debt in the first two years is higher by 0.69 percentage point (around 0.5 standard deviation) when firms get a guaranteed loan, and after controlling for the initial level of debt, which could generate nonconvexities and threshold effects. This effect is also long lasting, since the difference persists with the same magnitude four years after the date of the SOFARIS grant. The further analysis of firms' financial burden enables to disentangle whether

13. Endogeneity issues do not seem to be a serious problem here.

Table 8.7 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)	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	.6***	.64***	.61***	.69***	.46***	.61***	.56***	.66***	.2***	.41***	.38***	–.3
	(.041)	(.06)	(.043)	(.2)	(.051)	(.075)	(.046)	(.24)	(.061)	(.097)	(.061)	(.35)
Treatment × t			.0045	.0045**			.013*	.013***			.0034	.0037
			(.0065)	(.0022)			(.0071)	(.0028)			(.0063)	(.0049)
Treatment × post × t			–.028***	–.028***			–.04***	–.04***			–.024	–.025
			(.0091)	(.0051)			(.011)	(.0093)			(.015)	(.016)
Mills ratio				–.032				–.04				.27**
				(.084)				(.099)				(.13)
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	157,858	138,990	125,824	125,824	130,182	116,662	104,561	89,723	101,033	89,723	79,747	79,747
Effect of a guaranteed loan in terms of dependent variable standard deviation	.49	.51	.49	.56	.33	.44	.41	.48	.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 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 after 1995. "Post" is a dummy variable equal to 1 for observations posterior to 1995 (excluding 1995). Variable t is a linear trend. "Decile of employment" (resp., "Start-up capital" and "Debt") stands for ten 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 (twenty-one regions). "Legal form" is a dummy equal to 1 when the firm is a limited liability company. "Month of creation" are twelve dummies for each month of creation. Each regression includes year and industry fixed effects. Observations are clustered at the industry post level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 8.8 **Financial burden and guaranteed loans**

	Average interest rate, 2nd year (sample mean = .26)				Average interest rate, 4th year (sample mean = .27)				Average interest rate, 6th year (sample mean = .27)			
	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	–.057***	–.06***	–.06***	–.23***	–.013	–.02	–.03**	–.15*	.026*	.03	.015	–.057
	(.011)	(.014)	(.012)	(.059)	(.012)	(.019)	(.013)	(.089)	(.015)	(.02)	(.018)	(.087)
Treatment × t			.00019	.00023			–.002	–.002			.002	.002
			(.002)	(.0012)			(.002)	(.001)			(.0019)	(.0017)
Treatment × Post × t			.0015	.0013			.009**	.008**			–.007	–.0071
			(.0029)	(.0031)			(.004)	(.004)			(.0046)	(.0043)
Mills ratio				.067***				.052				.029
				(.021)				(.03)				(.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 dependent variable standard deviation	–.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 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 after 1995. "Post" is a dummy variable equal to 1 for observations posterior to 1995 (excluding 1995). Variable t is a linear trend. "Decile of employment" (resp., "start-up capital" and "Debt") stands for ten 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 (twenty-one regions). "Legal form" is a dummy equal to 1 when the firm is a limited liability company. "Month of creation" are twelve dummies for each month of creation. Each regression includes year and industry fixed effects. Observations are clustered at the industry post level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

this long-term effect is driven by a more favorable access to longer-term loans, or whether it is driven by a more favorable sequence of debt contracts; for example, in the case of trust building with the firm's bank.

Indeed, results in this latter case show that obtaining a guaranteed loan decreases 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 (i.e., 0.70 standard deviation of the interest rate variable) according to the parametric selection model. Results obtained using the latter estimation strategy are statistically different from the OLS/matching estimates, which means that matching/OLS estimates are probably affected by attenuation endogeneity biases. We do not obtain any statistically significant impact of the program on financial burden in the longer run, which we interpret as evidence in favor of the trust building hypothesis: only the first loan is backed by a subsidized guarantee and is associated to low interest rates, while the measure of financial burden in the longer run adds up new, nonsubsidized—and therefore more expensive—loans. These results remain, however, purely descriptive since loan sizes and interest rates are obviously not independent and their empirical evolution is difficult to interpret in the absence of a proper structural (pricing) model.

8.6.3 Impact on Firm Development: Employment and Capital Growth

Do credit constraints hinder firm growth? First, insights regarding this aspect are obtained estimating a reduced form equation also based on equation (3). At this stage, the dependent variables are the two-, four-, and six-year employment and capital growth, respectively.

Estimates for employment growth are reported in table 8.9. As in the case of financial burden, estimates obtained from the selection model are higher than estimates obtained from OLS/matching methods. These latter estimates are thus potentially affected by downward endogeneity biases: firms having lower growth perspectives than average self-select into SOFARIS-backed loans, or are selected by their bank or by the SOFARIS agency. This result may alternatively be driven by the fact that SOFARIS firms also correspond to larger firms at birth in terms of employment which, absent any SOFARIS intervention, would therefore have experienced relatively smaller subsequent employment growth due to a standard "regression toward the mean" phenomenon.

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, conditional on surviving, in the long run (70 percentage points; i.e., 0.61 standard deviation after six years). The OLS and matching estimates appear more sensible: the obtained growth premiums reach around 25 percentage points in the short run, and 16 percentage points in the longer run. Since a typical firm in the sample

Table 8.9 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 (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	.25***	.16***	.2***	.49***	.22***	.16***	.18***	.8***	.16***	.10	.13***	.7**
	(.029)	(.047)	(.024)	(.14)	(.033)	(.054)	(.027)	(.22)	(.042)	(.065)	(.035)	(.27)
Treatment × t			.0065	.0064**			.0057	.0055*			.0095	.0093**
			(.0059)	(.0029)			(.0059)	(.0028)			(.0059)	(.0037)
Post × Treatment × t			–.0063	–.0061			–.0038	–.0033			–.0051	–.0047
			(.007)	(.0054)			(.0072)	(.005)			(.0099)	(.0082)
Mills ratio				–.12**				–.25***				–.23**
				(.054)				(.085)				(.1)
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	115,836	113,299	102,703	102,703	98,120	96,896	86,994	86,994	76,182	75,729	67,442	67,442
Effect of a guaranteed loan in terms of dependent variable standard deviation	.21	.14	.17	.42	.19	.14	.16	.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 after 1995. "Post" is a dummy variable equal to 1 for observations posterior to 1995 (excluding 1995). Variable t is a linear trend. "Decile of employment" (resp., "Start-up capital" and "Debt") stands for ten 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 (twenty-one regions). "Legal form" is a dummy equal to 1 when the firm is a limited liability company. "Month of creation" are twelve dummies for each month of creation. Each regression includes year and industry fixed effects. Observations are clustered at the industry post level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

has around 2.6 employees in its first year after 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 longer run.

Beyond employment, the increased debt capacity brought by a guaranteed loan can be allocated to increased investment and faster capital growth. Results obtained (reported in table 8.10) are robust to the estimation method; OLS and matching estimates lead to underestimate, if anything, the true impact on the dynamics of firms' capital. Controlling for initial size, a guaranteed loan has a permanent, significant, and sizable impact on capital growth, although results obtained from the selection model are not precisely estimated. Guaranteed firms experience faster capital growth 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.

8.6.4 Probability of Bankruptcy

Reducing the burden of credit constraints should induce a more balanced development over the firm's life cycle and therefore fewer failures. On the other hand, as previously stated, a potential concern with loan guarantee programs is that they might induce more risk taking by both entrepreneurs and banks.[14]

In order to investigate which effect dominates 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 (results reported in table 8.11) that firms obtaining a guaranteed loan experience a subsequent significant and sizable increase in their default (exit) probability: this increase ranges from 6 percentage points in the first two years, to 29 percentage points overall, which represents some 0.8 standard deviation of the average probability of bankruptcy. An alternative interpretation of these results might, however, be that, conditional on exit, guaranteed firms have more incentives to file for a formal bankruptcy procedure (rather than exiting the market in a more informal way); for example, because there are more stakeholders in the company.[15]

14. A first argument relies on the deformation of the entrepreneurs' objective function induced by SOFARIS. Even in absence of external guarantees, entrepreneurs theoretically benefit from a limited liability. However, it is fairly common that banks require private guarantees from entrepreneurs (like mortgage on their private real estate). An important feature of the SOFARIS system is that it is explicitly forbidden to require such additional private guarantees when the loan is already backed by SOFARIS, so that entrepreneurs de facto have a limited liability and thus incentives to adopt riskier strategies. The second argument is indirect and relies on banks' behavior. 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 behavior and adopt riskier strategies.

15. However, using an alternative measure of firms' failures (exits from the BRN tax files) provides similar results, though less significant. The main drawback of this latter alternative measure is that we are not able to distinguish "true" deaths from potential "successful" exits (mergers and acquisitions).

Table 8.10 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***	.38***	.28***	.58*	.25***	.36***	.35***	.59*	.24***	.34***	.32***	.56
	(.037)	(.05)	(.038)	(.34)	(.05)	(.06)	(.05)	(.34)	(.066)	(.08)	(.071)	(.38)
Treatment × t			.00066	.00057			.0017	.0016			.01	.01**
			(.0099)	(.0029)			(.01)	(.0038)			(.015)	(.005)
Treatment × Post × t			.016*	.016*			.026	.026*			.013	.013
			(.0099)	(.0083)			(.017)	(.014)			(.016)	(.014)
Mills ratio				–.12				–.097				–.097
				(.12)				(.13)				(.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 dependent variable standard deviation	.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 after 1995. "Post" is a dummy variable equal to 1 for observations posterior to 1995 (excluding 1995). Variable t is a linear trend. "Decile of employment" (resp., "Start-up capital" and "Debt") stands for ten 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 (twenty-one regions). "Legal form" is a dummy equal to 1 when the firm is a limited liability company. "Month of creation" are twelve dummies for each month of creation. Each regression includes year and industry fixed effects. Observations are clustered at the industry post level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 8.11 Bankruptcy probability and guaranteed loans

	Default probability within 2nd year (sample mean = .017)				Default probability within 4th year (sample mean = .09)				Default probability at some date (sample mean = .24)			
	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	.013***	.009	.0055	.065**	.072***	.080***	.064***	.12*	.15***	.17***	.16***	.29***
	(.0053)	(.007)	(.0064)	(.026)	(.011)	(.015)	(.013)	(.069)	(.014)	(.021)	(.017)	(.085)
Treatment × t			.0016***	.0016			.0071***	.0071**			.0068***	.0068*
			(.00057)	(.001)			(.0017)	(.0032)			(.0027)	(.0036)
Treatment × Post × t			–.002	–.002			–.014***	–.014**			–.013***	–.013*
			(.0013)	(.0017)			(.0037)	(.0063)			(.0043)	(.0074)
Mills ratio				–.024**				–.023				–.053
				(.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 after 1995. "Post" is a dummy variable equal to 1 for observations posterior to 1995 (excluding 1995). Variable t is a linear trend. "Decile of employment" (resp., "Start-up capital" and "Debt") stands for ten 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 (twenty-one regions). "Legal form" is a dummy equal to 1 when the firm is a limited liability company. "Month of creation" are twelve dummies for each month of creation. Each regression includes year and industry fixed effects. Observations are clustered at the industry post level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 8.12 **Industry level first-stage regression: Number of guaranteed loans and industry eligibility (1989–2000)**

	log(number of guaranteed firms)		
	(1)	(2)	(3)
Post × Treatment	1.8***	1.3***	1.1***
	(.17)	(.26)	(.22)
Treatment × t		.068**	.068**
		(.032)	(.032)
Post × Treatment × t	.057	.057	
		(.077)	(.078)
Post × ROA$^{(0)}$			–1.9***
			(.35)
Post × Leverage$^{(0)}$			–.69**
			(.34)
Post × log(Assets)$^{(0)}$			–.21**
			(.084)
Post × 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 after 1995. "Post" is a dummy variable equal to 1 for observations posterior to 1995 (excluding 1995). Variable 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 includes year and industry fixed effects. Observations are clustered at the industry post level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

8.6.5 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 industry level entrepreneurial dynamism and firm creation. First-stage estimates are reported in table 8.12 and show that the institutional shock we use as a quasi-natural experiment has a strong explanatory power on the industry number of guaranteed loans, since the F-statistic obtained in the most complete specification for the instrumental variable (Post × Treatment) is above 24. Being in a "newly eligible"[16] industry after 1995 almost triples the number of guaranteed loans as compared

16. See previously: some SOFARIS guarantees were granted before 1993 in theoretically non-(yet) eligible sectors.

to the situation before 1993, and relative to industries that remained eligible. This shock explains some 0.4 standard deviation of the log-number of SOFARIS-backed firms (ln (*SOF.* Firms)) in the industry level sample.

In the equation of interest (see table 8.13), OLS estimates suggest that

Table 8.13 **Industry level second-stage regression: Number of guaranteed firms and firm creation**

	log(firms creation)		log(employment creation)		log(new assets)	
	OLS (1)	IV (2)	OLS (3)	IV (4)	OLS (5)	IV (6)
log(number of guaranteed firms)	.17***	.037	.13**	.18*	.26***	.46*
	(.059)	(.15)	(.063)	(.11)	(.1)	(.26)
Treatment × *t*	.061	.086	.041*	.033	–.027	–.073
	(.038)	(.056)	(.025)	(.033)	(.048)	(.072)
Post × Treatment × *t*	–.068	–.055	.011	.0061	–.012	–.014
	(.063)	(.048)	(.048)	(.042)	(.12)	(.11)
Post × ROA$^{(0)}$	.076	–.22	.15	.25	.45	.9
	(.3)	(.42)	(.24)	(.27)	(.7)	(.84)
Post × Leverage$^{(0)}$	–.27	–.35	–.49***	–.46***	–.46**	–.38*
	(.34)	(.34)	(.18)	(.16)	(.23)	(.23)
Post × log(assets)$^{(0)}$	.31***	.28***	.17**	.18***	.46***	.5***
	(.094)	(.089)	(.07)	(.066)	(.13)	(.14)
Post × log(employment)$^{(0)}$	–.45***	–.37***	–.29***	–.32***	–.67***	–.78***
	(.11)	(.13)	(.093)	(.094)	(.18)	(.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
Marginal effect of a one SD increase (35) in the number of guaranteed firms						
# 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 (columns [1] and [2]), the logarithm of total employment in newly created firms at the 2-digit industry level (columns [3] and [4]) and the logarithm of total assets in newly created firms at the 2-digit industry level (columns [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 after 1995. "Post" is a dummy variable equal to 1 for observations posterior to 1995 (excluding 1995). Variable *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 includes year and industry fixed effects. Observations are clustered at the industry post level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

there is a positive correlation between the number of SOFARIS loans and industry level firms' creation rates, but two-stage least squares (2SLS) estimates are not statistically significant and do not show any causal impact of the SOFARIS intervention on creation rates. However, and consistently with firm level analyses, OLS and IV estimates suggest that guaranteed loans enable newly created firms to hire more employees and to invest in more early stage capital: a 1 percent increase in the number of SOFARIS loans implies a 0.18 percent 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 the earliest stage of these firms' development. Reassuringly, 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 the firm level.

8.7 Conclusion

Motivated by perennial concerns about the role of capital market imperfections in entrepreneurship and the prevalence of government programs focused on encouraging new business formation, this chapter evaluates the impact of a French loan guarantee program on new business formation and growth. Our empirical strategy exploits an exogenous regulatory shift in the mid-1990s, which led to an increase in the overall size of the program and to the new eligibility of several industries. Using a detailed data set with information on all new French firms founded between 1988 and 1999, we provide a difference-in-differences estimation of the impact of the loan guarantee program on the creation and growth of start-up firms. At the industry level, the availability of loan guarantees has no impact on the overall number of firms created, but makes the average new venture larger, both in terms of assets and employment. At the firm level, the obtention of a loan guarantee helps newly created firms grow faster. However, it also significantly increases their probability of default, suggesting that risk shifting may be a serious drawback of such loan guarantee programs.

Our results raise a number of questions requiring further inquiry. As previously stated, in absence of a thorough structural model, it is difficult to interpret whether our results are mainly driven by the magnitude of credit constraints, or by the unavoidable distortions induced by the specific features of the SOFARIS loan guarantee scheme. As pointed out by Beck, Klapper, and Mendoza (2008), prices and coverage ratios (but also the assignment of responsibilities among government), private sector, and donors might be important for the incentives of lenders in screening and monitoring lenders properly. Disentangling the relative contribution of the nested principal-agent relationships between public agencies, lenders, and borrowers would require a more structural approach than the reduced-form estimation strategy proposed in our contribution, which we let for future research.

Appendix

Table 8A.1 **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***	1.2***	.96***
	(.32)	(.37)	(.36)
Treatment × t	.0064	.0056	.0095*
	(.0058)	(.0057)	(.0058)
Treatment × Post × t	–.0056	–.0036	–.0056
	(.007)	(.0072)	(.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 after 1995. "Post" is a dummy equal to 1 observations posterior to 1995 (excluding 1995). Variable t is a linear trend. "Decile of employment" (resp., "Start-up capital" and "Debt") stands for ten 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 (twenty-one regions). "Legal form" is a dummy equal to 1 when the firm is a limited liability company. "Month of creation" are twelve dummies for each month of creation. Each regression uses year and industry fixed effects. Observations are clustered at the industry post level.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

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