IDB

Entrepreneurship Policy and Firm Performance

Chile's CORFO Seed Capital Program

Lucas Navarro

Entrepreneurship Policy and Firm Performance

Chile's CORFO Seed Capital Program

Lucas Navarro

IDB

Inter-American Development Bank

2014

http://www.iadb.org

Contact: Liora Schwartz, lioras@iadb.org

Entrepreneurship Policy and Firm Performance

Chile's CORFO Seed Capital Program

Lucas Navarro
lunavarr@uahurtado.cl
ILADES-Universidad Alberto Hurtado
Santiago, Chile

Abstract[*]

This paper uses administrative data from projects for which an application was made to CORFO's (Chile's main development agency) Seed Capital Program (SCP) during the 2008–12 period. This paper analyzes the impact of the program—which is a subsidy provided to new, innovative firms—on Start, Growth, and Survival. The projects are supported by sponsors in the application process. Results of our analysis indicate that, controlling for observed characteristics, projects that received the subsidy had a 9.5 percentage point higher probability of starting to sell. Among created firms, subsidized (Treated) firms showed a 17 percentage point higher probability of significant Growth (in sales) and a similar effect on Survival. The analysis also examined a change in the program rules in 2011, whereby sponsors were paid based on performance instead of fixed fees, as it was before 2011. For projects affected by the policy change, results indicate no overall association of the program with the probability of Start and a positive correlation with Growth and Survival. These results could be a consequence of sponsors making better project selections for funding. The change in rules means that the program contributes more to the Growth and Survival of new firms than to their Start, which would take place anyway. The data available for this study did not make it possible to control for potential selection biases, and thus the results need to be viewed with caution, and data collection standards need to improve to help identify the true effect of this type of program.

Introduction

Most governments in developed and developing countries spend money on subsidies, claiming to foster employment and productivity. Despite of their prevalence, the causal effect of these policies is still not well understood (Criscuolo et al., 2012). Less is known about their effects in Latin America, where a number of public programs to support small and medium enterprises (SME) have emerged in the past decade (Lopez-Acevedo and Tan, 2011). Among these policies, instruments to promote the creation of new, innovative firms—entrepreneurial policies—are of particular relevance in a region like Latin America, which has a large population of self-employed workers.

Following Rigby and Ramlogan (2013), entrepreneurship policies are typically justified based on distortions and market failures that result from information asymmetries (Audretsch, Grilo, and Thurik, 2007; Storey, 2005). First, financial institutions may find it difficult to assess the risks of projects being proposed by young firms. As a result, these firms tend to struggle to get credit in financial markets. Second, a significant proportion of the population may not be aware of the potential benefits of starting a business and of obtaining advice from experts. Third, there are positive externalities associated with creating new, innovative firms, and entrepreneurial policies attempt to mitigate these problems. Depending on the resources involved, policies can be classified as hard or soft (Storey, 2005). Soft policies include counselling activities before and after the startup stage, improving access to technology and financial assistance. Hard policies generally refer to loans and grants.

Through its development agency CORFO, Chile is one of the first countries in Latin America to implement entrepreneurship policies. Among the different programs implemented by CORFO to promote the creation of innovative startups, the Seed Capital Program (SCP; *Capital Semilla* in Spanish) is perhaps the oldest and largest in terms of number of beneficiaries. It was created in 2001 and more than a thousand projects have received funding. The program is designed to mitigate the effects of market failures due to information asymmetries in the early stages of business development that might severely restrict access to traditional sources of funding. Restricted access to funding may result in an inefficiently low rate of creation of new firms. The program targets innovative, dynamic projects that would not otherwise be able to start up or grow. Beneficiaries receive a subsidy to create and develop new innovative firms with high growth potential. The program's goals are clearly defined: generate sales, increase sales, and obtain external funding. Based on a unique dataset obtained from CORFO about projects for which the SCP had received applications for funding during the 2008–12 period, this paper analyzes the effect of the program on the Start, Growth, and Survival of small, new businesses.

The literature on impact evaluations of entrepreneurship programs in the region is very scarce.[1] For Chile, Bonilla and Cancino (2011) evaluated the impact of SERCOTEC's (another government development agency in the country) SCP using data from ad-hoc surveys of applicants for funding. The study used data from a 2008 survey of 85 beneficiaries of the program. The control group consisted of 75 firms that were eligible for the subsidy but did not receive funds for administrative reasons. The results showed mixed effects of the program on sales. Fuentes and Dresdner (2013) used administrative data for 76 firms that participated in the SCP in the Chilean Bio Bio region to analyze the effect of the policy instrument on firm survival. Their results showed a positive correlation between the size of the grant and the lifespan of a firm. La Paz, Cancino, and Miranda (2012) used a sample of 40 beneficiaries of CORFO's SCP to study the correlation between sponsor types and firm performance. Their data showed better performance in terms of sales, job creation, fundraising, and patenting by firms sponsored by universities.

As mentioned, the program is a subsidy to new, innovative firms. Sponsors, which are typically university incubators and private consulting firms, support the application for funding for projects. The data used in this paper include information on 543 projects, of which 376 (69 percent) received an SCP subsidy; this is the treatment group (Treated). The Control group consisted of projects that applied to the program but did not receive the subsidy either because they were rejected for funding by CORFO or they were eligible for funding but turned down the offer.

The natural question is whether the SCP is financing activities that would have gone ahead regardless of the program. Unfortunately, it was not possible to construct a longitudinal dataset of the projects in the Control and Treated groups and to use pseudo experimental techniques to evaluate the impact of the program. Instead, we had data about each firm's sales category—broken down into 12 brackets—at two points in time: at the time of the application and by October 2013. We also had data on the last year of reported income. This data showed whether the firm started to sell (Start) and if it reported income in 2013 (Survival). Additionally, we considered that a firm had expanded (Growth) if the value of sales was in a higher bracket in the final year than at the time of application to the program. The Growth variable ignores firms that increased sales but remained in the same category.

With the data available, we were forced to estimate a linear probability model to assess the effect of the program. We assumed the effect as meant to be exogenous, and we controlled for project characteristics such as sector, sponsor, and age. Results indicated that subsidized entrepreneurial projects show a more than 9 percentage point higher probability of Start. We considered a firm created if it started to sell during or after the year of application

---

[1] Tan (2009) and Arráiz, Henríquez, and Stucchi (2013) perform impact evaluations of other business support policies for SMEs in Chile but not of entrepreneurship programs.

to the program. Additionally, we found that of the new firms that were created, participating firms had a 17 percentage point greater probability of increasing their sales to a higher bracket. This effect can be considered large given our definition of Growth. Finally, we found a similarly large effect of the program on the probability of a firm's Survival.

We extended our analysis using a difference-in-difference approach to test for the effect of a change in the program rules that affected projects for which applications were made after 2010. Beginning in 2011, sponsors were paid based on the performance of the projects that received SCP funding; before 2011, sponsors were paid fixed fees for the services they provided to the funded projects. For projects for which applications were made after the rule change, results indicated no overall association of the program with the probability of Start and a positive association with Growth and Survival. Thus, results indicated that the change in the program rules had a negative effect on Start and no effect on Growth or Survival. The apparently overall null effect of the program on Start may be a consequence of sponsors making better project selections to apply for funding based on the new rules. The change in rules means that the program contributes more to Growth and Survival for new firms than to Start, which would take place regardless of obtaining the subsidy.

Program Description

This section describes the SCP rules, with special attention to the 2008–12 period, the dataset used in this study. The program targets entrepreneurial projects that have existed for less than two years and have sales of less than 100 million Chilean pesos (CLP; around US\$200,000) in the six-month period prior to application. Until July 2013, the program subsidized up to a maximum of 75 percent of the value of the project, with a cap of CLP\$40 million (US\$80,000) over two years. Financeable activities include operational expenses, human resources, and capital expenditures directly related to the project's core business. Examples include market studies, customer impact studies, knowledge acquisition, product development, supplier development, and protection of intellectual property rights.

There are two main participants in the program: the beneficiary and the sponsor (typically an incubator).[2] Until July 2013, any individual interested in applying for funding was obliged to contact a sponsor registered at CORFO who advised the entrepreneur in preparing the work plan. Sponsors were typically business incubators related to universities and private consulting firms. They assisted and supervised entrepreneurs in formulating their projects. They were also responsible for supporting the subsidized firms in the development and follow-up of their businesses.

---

[2] Eventually, associate partners can provide additional funding to the projects but in practice this is very rare.

The entrepreneur applies for funding to CORFO, which ultimately decides whether to give financial support to the program or not. This decision is based on criteria specified in the program rules that rely on the quality of the entrepreneurial project (40 percent) and the qualifications of the business team (60 percent). Until July 2013, applications were accepted at any time. Since November 2013, the program has adopted a contest format, with predefined application periods. In addition, entrepreneurs can now apply directly to CORFO, with no requirement to contact a sponsor in advance. Finally, the maximum subsidy was reduced to CLP$25 million over a period of 18 months (which can be extended to 24 months).

For projects funded between 2011 and mid-2013, the work plan was divided into two stages. Funding for stage one, which was typically devoted to developing the initial steps of the business plan, could not exceed CLP$7 million (US$14,000). By the end of stage one, the project was re-evaluated by CORFO and continued funding depended on the results of stage one (10 percent), the viability of the business plan (30 percent), the quality of the project (40 percent), and the qualifications of the applicants (20 percent). The program could provide a subsidy of up to CLP$33 million (US$66,000) for stage two. All activities related to the launch of the business were implemented in this stage of the project. Since November 2013, this two-stage working plan has been eliminated.

As a risk-sharing mechanism, the beneficiary, the sponsor, and the associate partners must contribute at least 25 percent of the total value of the project. The sponsor can buy up to 7 percent of the firm's capital once funding from CORFO is terminated. Sponsors are paid based on performance over the 48 months after application. Based on the rules of funding between 2011 and mid-2013, sponsors could get paid between CLP$7.5 million (US$15,000) and a maximum of CLP$60 million (US$120,000) for achieving goals in terms of (i) sales, (ii) growth in sales, and (iii) external sources of funding. There were minimum thresholds defined for these goals so that sponsors could start receiving payments, which could then increase as each of the goals was met. The rules applying since November 2013 are very similar, except that the maximum payout is now CLP$15 million (US$30,000).

The rules described above affect projects for which applications for funding were made between 2011 and the present. For those that participated in the program before 2011, rules were very different. The main difference between the current scheme and the previous one has to do with payments to sponsors. Before 2011, in stage one, the sponsor received CLP$1 million (US$2,000) of a maximum of CLP$6 million (US$12,000) in funding. In stage two, the payment was CLP$6 million (US$12,000) of a subsidy of up to CLP$40 million (US$80,000). Additionally, the maximum percentage of co-funding was 80 percent and 90 percent for stages one and two, respectively. Further, the original rules allowed a sponsor to apply for a subsidy for a project in stage two, with no prerequisite of having obtained stage one funding.

Data

We used administrative data from projects for which an application had been made to CORFO's SCP during the 2008–12 period. The CORFO dataset has detailed information for each of the applications on sector of activity, year of application, geographical region, grant size, and sponsor ID.[3] There is also information about the last year of income reported by the beneficiary and the range of sales broken into 12 brackets. The sales category variable is available at two points in time; by the time of application and by October 2013.[4] The available data shows whether a firm started to sell (Start), if it is still active (Survival), and if its sales increased over time (Growth).

The only projects that we could track over time and thus we considered for analysis were those for which there was an application for stage two funding because, before 2011, sponsors could apply for funding for a project in stage two, with no prerequisite of having gone through stage one. Since 2011, all the projects must apply for funding starting in stage one, which means any project in stage two must have been through stage one. This is important for the definition of the Control group. Firms applying for stage two before 2011 that did not get funding are part of the Control group. In the same pool are projects that applied in 2011 and 2012 that did not receive the stage one subsidy. Most of the observations in the Control group are from projects that were rejected for funding but there are also 28 cases of projects for which the funding was turned down. Interestingly, 15 of the 33 projects in the Control group from 2011–12 were selected for funding but chose not to participate in the program.

Table 1 reports the number of projects in the Control and Treated groups by year of application. There is information on a total of 543 applications, of which 376 projects (69 percent) obtained funding from the program. It is worth noting that the original dataset had 629 projects, but 86 observations were removed because their ID numbers could not be tracked over time.[5] The final sample, after cleaning the data, represented 86 percent of the total number of applications to the SCP received by CORFO between 2008 and 2012.

Table 1. Number of Projects by Year

	2008	2009	2010	2011	2012	Total
Control	15	30	89	16	17	167
Treated	98	104	75	45	54	376
Total	**113**	**134**	**164**	**61**	**71**	**543**

Source: CORFO.

---

[3] There is also information about duration of the project and gender of the applicant for a relatively small number of projects that was not considered for this analysis.

[4] It is also possible to obtain information about a firm's employment, but the data is incomplete or impractical for this analysis.

[5] Specifically, there were projects registered with a person's ID that was replaced by a business ID when the firm was created. This caused tracking problems that could not be solved for some information.

Table 1 shows the increase in the total number of applications to the SCP up to 2010, which declined significantly thereafter. One of the reasons for this decline was the availability of new programs through CORFO similar to the SCP, such as the Seed Fund SSAF (*Subsidio Semilla de Asignación Flexible* in Spanish). Another reason was the change in regulations during the 2011–13 period, which may have changed the incentives for sponsors, who were expected to be more selective in which endeavors to support. As mentioned earlier, while with the current regulations sponsors are paid by performance, with the previous rules they received a fixed payment regardless of how well the beneficiary did. The pay-for-performance scheme rewards sponsors only for results of the incubated businesses within four years of the application in terms of sales, growth in sales, and raising external capital. This gives sponsors stronger incentives for a more careful selection of projects with high potential for growth and short maturity. On the other hand, it could be the case that the number of applications peaked in 2010 in anticipation of the change in the program's rules in 2011.

Table 2 shows the distribution of applicants by sector. The sample was divided into two subperiods (2008–10 and 2011–12), which correspond to the two different program rules. Most of the businesses in the Control and Treated groups were in the Commerce and Services sector, which increased over time. Indeed, in 2011–12, almost 82 percent of the beneficiaries were in that sector. The top activities in this sector are Information and Communication Technologies (ICT) and Wholesale, shown at the bottom of the table. These two activities account for 29 percent of the beneficiaries of the program. ICT gained importance in the later years, with more than 22 percent of the funded projects in 2011–12. Other applicant activities not reported but worth mentioning include Professional Services, Advertising, and Retail.

Table 2. Distribution of Projects by Sector of Activity *(in percent)*

	2008–10		2011–12		2008–12	
	Treated	**Control**	**Treated**	**Control**	**Treated**	**Control**
Agriculture and Mining	10.1	6.0	5.1	6.1	8.8	6.0
Manufacturing	23.1	22.4	11.1	12.1	19.9	20.4
Construction	1.8	2.2	2.0	9.1	1.9	3.6
Commerce and Services	65.0	69.4	81.8	72.7	69.4	70.1
Total	**100**	**100**	**100**	**100**	**100**	**100**
Prominent Activities in Commerce and Services						
ICT	13.7	13.4	22.2	18.2	16.0	14.4
Wholesale	13.7	13.4	10.1	6.1	12.8	12.0

Source: CORFO.

It is also interesting to explore the application success rate across sectors in the two sub-periods. Table 3 shows the percentage of applications in the different sectors that received funding. The table shows that the probability of being in the Treated group increased to 75.0 percent in 2011–12 from 67.4 percent in 2008–10. Among the different

sectors, in 2011–12, entrepreneurial projects in ICT and Wholesale displayed the highest success rates; projects in the Construction sector showed the lowest success rates. Projects in Construction and Agriculture and Mining showed lower success rates in the second period under analysis, which can be related to sponsors preferring to support projects with shorter maturity periods under the pay-by-performance scheme. Shorter maturity would likely increase the chances of meeting outcomes earlier and therefore getting paid within 48 months of the application period. This pattern, together with the smaller number of applications shown in Table 1, might be another signal of more careful selection of projects by sponsors.

Table 3. Success Rate by Sector of Activity *(in percent)*

	2008–10	**2011–12**	**2008–12**
Agriculture and Mining	77.8	71.4	76.7
Manufacturing	68.1	73.3	68.8
Construction	62.5	40.0	53.8
Commerce and Services	65.9	77.1	69.0
Total	**67.4**	**75.0**	**69.2**
Prominent Activities in Commerce and Services			
ICT	67.9	78.6	71.4
Wholesale	67.9	83.3	70.6

Source: CORFO.

The distribution of applicants by geographical region is presented in Table 4. While on average most of the projects in the Control and Treated groups came from the country's capital region, the most recent data showed a relatively more balanced regional distribution. Indeed, the percentage of funded projects from Santiago declined to 62.6 percent in 2011–12 from 74.4 percent in 2008–10. Table 5 shows the percentage of applications that were successful by sub-period and region. Notably, the success rate for projects from the Santiago region increased to 77.5 percent in 2011–12 from 65.0 percent in 2008–10, whereas the success rate in the rest of the regions declined. Again, if projects implemented in the Santiago Metropolitan Region were expected to perform better than those in other regions, these figures would be consistent with the changes in the incentives for selection of projects by sponsors.

Table 4. Distribution of Projects by Region *(in percent)*

	2008–10		**2011–12**		**2008–12**	
	Treated	**Control**	**Treated**	**Control**	**Treated**	**Control**
Regions I to XII, XIV and XV	25.6	17.2	37.4	45.5	28.7	22.8
Region XIII (Santiago)	74.4	82.8	62.6	54.5	71.3	77.2
Total	**100**	**100**	**100**	**100**	**100**	**100**

Source: CORFO.

Table 5. Success Rate by Region *(in percent)*

	2008–10	2011–12	2008–12
Regions I to XII, XIV and XV	75.5	71.2	74.0
Region XIII (Santiago)	65.0	77.5	67.5
Total	**67.4**	**75.0**	**69.2**

Source: CORFO.

Methodology and Results

This section describes the methodology used to analyze the effect of the program on Start, Growth, and Survival. A typical concern in impact evaluation studies is that there might be selection of participants into the program. That is, it could be the case that projects that received an SCP subsidy (Treated) had different ex-ante observable and unobservable characteristics compared with projects in the Control group. In the case of the SCP, the decision to offer funding might have been precisely correlated with the potential prospects of the projects. One way to address the selection issue is to use pseudo experimental techniques combined with difference-in-difference techniques, as, for example, in Arráiz, Henríquez, and Stucchi (2013). These techniques involve first estimating a counterfactual by creating a Control group with similar characteristics to the Treated group before the subsidy. Second, with the sample of matched observations, a fixed effect model is estimated to control for observed and unobserved (invariant) factors affecting selection into the program and the outcome variables. Unfortunately, based on the information we had available, it was impractical to measure the impact of the SCP using pseudo experimental techniques. For such an analysis, we would at least need detailed data on sales and/or employment over time and more information on entrepreneurs' characteristics (e.g., age, education, experience, and labor market history). With data on sales or employment before and after the program, it would have been possible to control for selection and invariant unobservable factors affecting the outcomes and the decision to participate in the SCP. This data was not consistently available.

With the available data, we were able to estimate a linear probability model of the effect of the program on a firm's Start, Growth, and Survival. For that purpose, we created three dummy variables according to the following definitions:

i.   **Start:** A firm started if it reported sales at any time from the year of application.
ii.   **Growth:** A firm had grown if by October 2013 it was in a higher sales category than in the year of application.
iii. **Survival:** A firm had survived if the last year of reported income was 2013.

It should be pointed out that this definition of Growth is somewhat restrictive. As mentioned in the introduction, it could be the case that a firm expanded its sales but remained in the same sales category. More specifically, in this case, Growth captures only large increases in sales. Similarly, our definition of Start—a firm started if it reported

proceeds from its activities—is also a restrictive, as it does not consider firms that could exist but have not started to sell. Finally, the Survival variable should also be considered cautiously since it considers the life of the projects for a period of no longer than five years.

Table 6 shows the descriptive statistics of the three outcome variables considered in this study. The Start rate for the total sample was close to 90 percent, with higher rates in the Treated than in the Control group. The Growth variable showed that 40 percent of the projects were growing enterprises that significantly increased their sales. Again the percentage of firms with a large increase in sales was greater for projects that received the SCP subsidy than for firms in the Control group. Finally, the average Survival rate was 77 percent for the whole sample, but again much higher for Treated projects than for the Control group.

Interestingly, the Start and Survival rates were high in absolute terms in the whole sample. That is, whether they received a subsidy or not, most of the applicants to the program started to sell and remained active for up to five years. This pattern can be related to the sponsors' project selection process, especially for the last two years in the sample. If the sample of projects is ex-ante relatively homogeneous thanks to the pre-application sponsors' selection process, selectivity issues are mitigated.

Table 6. Descriptive Statistics, Outcome Variables (n=543)

| | Start | | Growth | | Survival | |
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Control	0.814	0.390	0.287	0.454	0.431	0.497
Treated	0.936	0.245	0.441	0.497	0.662	0.474
Total	0.899	0.302	0.394	0.489	0.591	0.492

Source: CORFO.

Using the described outcome variables of interest, we estimated the following linear model for each of the outcomes:

$$\Pr(\text{Outcome}_i=1) = \alpha + \beta_0 * \text{Age}_i + \beta_1 * \text{Metropolitan Region}_i + \beta_2 * \text{Treated}_i + \beta_3 * \text{Treated}_i * \text{Change Rules}_i + \sum_{j=1..J} \tau_j * \text{Year of Application}_i + \sum_{j=1..J} \gamma_j * \text{Sector of Activity}_i + \sum_{k=1..K} \delta_k * \text{Sponsor}_i + \varepsilon_0$$

Where *Outcome* = Start, Growth, and Survival. Metropolitan Region had a value of 1 if the project was developed in the country's capital and zero otherwise. Year of application, sector of activity, and sponsor were dummy variables. We considered about 30 different sponsors and four sectors: Agriculture and Mining, Industry, Construction, and Commerce and Services. Treated had a value of 1 if the project received funding from the program and zero otherwise. Further, Treated interacted with Change Rule captures the differential effect of the program in 2011–12 after the program rules had been modified.

The coefficient for this variable captured a difference-in-difference effect of the policy change on firm performance.

We note that the models for Growth and Survival are based on Start in that only firms that were created were included in the analysis for Growth and Survival. For the Start model, age is the difference between the year of application and the year in which the owner of the project registered its firm. For the Start model, age would be a proxy of experience of the entrepreneur previous to the application to the program. For the Growth and Survival models, age is defined as the difference between the last and first years of reported activity.

Table 7 reports the estimation results for the three outcomes. Columns (1) and (2) report the results for the effect of the SCP on Start. Columns (3) and (4) show the results for Growth and columns (5) and (6) the results for the effects on Survival. Models (1), (3), and (5) do not include the interacted effect of Treated with the change rules period variable. The models were estimated by Ordinary Least Squares (OLS) given that using a Probit in the presence of interacted terms would be impractical. Nonetheless, Probit estimations of (1), (3), and (5)—not reported—produced very similar results to the ones presented in Table 7.

Table 7. Average Effect, Linear Probability Model

	Start		Growth		Survival	
	(1)	(2)	(3)	(4)	(5)	(6)
Age	−0.0036	−0.0037	0.0003	0.0001	−0.0093	−0.0093
	[0.007]	[0.007]	[0.007]	[0.008]	[0.008]	[0.008]
Metropolitan region	−0.0215	−0.0205	−0.0155	−0.0157	0.0341	0.0342
	[0.044]	[0.044]	[0.081]	[0.081]	[0.073]	[0.073]
Treated	0.0946***	0.1255***	0.1699***	0.1826***	0.1696***	0.1667***
	[0.033]	[0.037]	[0.054]	[0.063]	[0.053]	[0.061]
Treated * Change Rules		−0.1243*		−0.0528		0.0121
		[0.077]		[0.125]		[0.114]
Observations	543	543	488	488	488	488
Adjusted R-squared	0.091	0.095	0.045	0.043	0.107	0.105
Treated + Treated * Change Rules		0.0011		0 .1298		0.1787*
		[0.060]		[0.110]		[0.098]

Source: Author's elaboration.
Notes: Robust standard errors in brackets: *** p<0.01, ** p<0.05, * p<0.1.
All regressions include Year of Application, Sector of Activity, and Sponsors dummy variables, not reported.
Models (3) to (6) were estimated using the sample of created firms only.

Results indicate a positive association of the SCP on Start. Indeed, according to the coefficient for Treated in (1) and controlling for other factors, Treated firms had a 9.5 percentage point higher probability of Start than firms in the Control group. Results are remarkably different considering the effect of the program once the rules changed. Indeed, the coefficient for the interacted term in (2) is negative at the 10 percent level. Moreover, the overall effect of the program under the modified rules is not different from zero.[6] This could be a consequence of the change in incentives for sponsors selecting projects for an SCP grant application. Given that in the modified regime intermediaries are paid by performance, it could that they prefer to support projects with good expected prospects so they get paid within four years of receiving a subsidy. If the program becomes more market driven, the quality of the pool of applicants for the grant would be expected to increase. Then, subsidizing these endeavors or not would not change their decision to develop their business projects, as suggested by the estimated coefficients in column (2) of Table 7.

We also found an even larger and positive coefficient for the SCP dummy in the Growth and Survival regressions for firms that had been Created. Indeed, as read from Table 7, the probability of Growth—moving to a higher sales bracket—is 17 percentage points higher for participants in the SCP (column (3)). No differences were found regarding the impact of the program on Growth under the modified rules. Finally, the results also suggest a similarly large effect of the program on Survival and no differential effect of the new rules on Survival. The overall effect indicates that treatment after 2011 is still related to increased probability of Survival of more than 17 percentage points.

The results shown in Table 7 are robust to alternative specifications (not reported but available on request). First, we estimated the model excluding the sponsors' dummy variables and the results did not change. We also performed likelihood ratio specification tests for the three outcome models to explore whether the sponsors' dummies increased the fit of the model. The test results indicated a better fit of the model with sponsors' effects only for Start, not for Growth or Survival. Second, we included different interaction terms between Treated and variables like sponsor type (incubators versus other type of sponsors), sector of activity, and region. None of these were statistically significant.

The previous analysis considered the probable effect of participating in the program on a venture's outcomes. As an extension, it seemed interesting to consider not only the participation status of the applicants to the program (extensive margin), but also how the value of the CORFO entrepreneurial project (intensive margin) was related to a firm's performance. Table 8 presents the corresponding results. The only difference from the estimates in Table 7 is that the Treated variable is continuous and refers to the natural log of the value of the project. Qualitatively, the results are very similar to the ones presented

---

[6] This result comes from the significance test for the linear combination of the coefficients of Treated and Treated*Change Rules reported at the end of Table 7.

above and they consistently indicate a positive effect of the program on Start, Growth, and Survival. The estimation results, including the change in rules interaction term, again suggest no effect of the program on Start. Nevertheless, the magnitude of the coefficients for the Treated variable is somewhat small in all the estimates in Table 8, suggesting that it is the extensive margin of participation in the SCP rather than the size of the subsidy that matters more.

Table 8. Project Size Effect, Linear Probability Model

	Start		Growth		Survival	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Age	−0.0039	−0.0039	−0.0004	−0.0002	−0.0100	−0.0098
	[0.007]	[0.007]	[0.008]	[0.008]	[0.008]	[0.008]
Metropolitan region	−0.0275	−0.0250	−0.0207	−0.0223	0.0275	0.0259
	[0.043]	[0.043]	[0.081]	[0.081]	[0.071]	[0.072]
Log grant size	0.0212***	0.0267***	0.0443***	0.0408***	0.0391***	0.0355***
	[0.007]	[0.007]	[0.013]	[0.014]	[0.012]	[0.013]
Grant size * Change Rules		−0.0269		0.0177		0.0182
		[0.019]		[0.031]		[0.028]
Observations	543	543	488	488	488	488
Adjusted R-squared	0.089	0.091	0.050	0.049	0.107	0.105
Grant size + Grant size * Change Rules		−0.0001 [0.0177]		0.0585** [0.027]		0.0537** [0.025]

Source: Author's elaboration.
Notes: Robust standard errors in brackets: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
All regressions include Year of Application, Sector of Activity, and Sponsors dummy variables, not reported.
Models (3) to (6) were estimated using the sample of created firms only.

Taken together, and ignoring selection issues, these results suggest a positive effect of the SCP on the outcomes it was designed for. The SCP seems to have a positive impact on the probability of starting to sell (Start), on sales (Growth), and on Survival. As suggested throughout this paper, the incentive effects of the program rules as modified in 2011 might have affected the impact of the SCP. The change in the payment system to sponsors—from fixed fees per project to payments related to the outcomes of the projects—may have led to a more careful selection of the pool of projects presented to CORFO. With a better selection of projects for which applications for funding are being made to CORFO, a firm's Start would depend less on receiving or not the subsidy. With the change in incentives for sponsors, the program may have become more helpful to the Growth and Survival of entrepreneurial projects than to the creation of startups. Under this rationale, the results of no effect on Start and the positive effects on Survival for projects Treated after 2010 are not surprising.

Conclusions

This paper analyzes the effect of CORFO's Seed Capital Program on the probability of a firm's Start, Growth, and Survival. It uses data from administrative records from CORFO for projects for which applications were made to the program between 2008 and 2012.

The sample used for the study includes information for a sample of 543 projects, of which 376 (69 percent) received the SCP subsidy. With the available data, we estimated a linear probability model to measure the effect of the program, controlling for project characteristics. Results show a positive association of the program with the probability of Start—started to sell. Indeed, Treated firms had a 9.5 percentage point higher probability of Start than the Control group. Additionally, among Created firms, Treated firms had a 17 percentage point higher probability of Growth—a large increase in sales—and a similarly large effect on Survival.

The analysis also considers the effect of a change in the program rules. Starting in 2011, sponsors were remunerated according to the performance of their projects; before 2011, sponsors received a flat fee for their services. Interestingly, results suggest no effect of the SCP on the probability of Start and a positive effect on Growth and Survival for projects affected by the modified rules. These results could be a consequence of sponsors making better project selections to apply for an SCP subsidy based on the new rules. With the new payment scheme, it could be the case that sponsors prefer to support projects with good expected performance so they increase their chances of getting paid. If the program becomes more market driven, the quality of the pool of applicants for a subsidy would be expected to increase. On this basis, subsidizing these presumably qualified entrepreneurs or not would not change their decision to develop their projects. In any case, our results suggest that the new program rules contribute more to Growth and Survival than to Start. What is not clear is whether this was a program objective or not. If firms are created whether or not they obtain funding from the program, then perhaps obtaining the subsidy would be unnecessary.

Since November 2013, the program has adopted a contest format and sponsors are no longer required for an application to be made. Our results predict that, with no sponsors involved in the application process, there will be fewer incentives to select the projects with the best prospects. On the other hand, the contest format will favor better identification of which projects deserve funding and which not. In any case, the program will more likely turn back again to promote the creation of projects that would not exist without its existence.

There are obvious concerns about this analysis. As mentioned throughout the text, there are data limitations that made it impossible to control for selection and unobserved factors affecting participation in the program and the evolution of the outcomes. There is no information available on variables such as characteristics of individuals (e.g., education and

labor market history), which would help us to better understand what determines entrepreneurship and participation in the program. Additionally, there was no information about the evolution of sales and employment before and after participation in the program, which would enrich the analysis.

References

Arráiz, I., F. Henríquez, and R. Stucchi. 2013. "Supplier Development Programs and Firm Performance: Evidence for Chile." *Small Business Economics*, 41: 277–93.

Audretsch, D.B., I. Grilo, and A.R. Thurik. 2007. "Explaining Entrepreneurship and the Role of Policy: A Framework." In D.B. Audretsch, I. Grilo, and A.R. Thurik (eds), *Handbook of Research on Entrepreneurship Policy*. Cheltanham: Edward Elgar.

Bonilla, C., and C. Cancino. 2011. "The Impact of the Seed Capital Program of SERCOTEC in Chile." IDB Working Paper Series IDB-WP-279. Washington, DC: Inter-American Development Bank.

Criscuolo, C., R. Martin, H. Overman, and J. Van Reenen. 2012. "The Causal Effects of an Industrial Policy." NBER Working Papers 17842. Cambridge, MA: National Bureau of Economic Research.

Fuentes, R., and J. Dresdner. 2013. "Survival of Micro-Enterprises: Does Public Seed Financing Work?" *Applied Economic Letters* 20: 754–7.

La Paz, A., C. Cancino, and J. Miranda. 2012. "Start-Ups Success Using Public Funds: University versus Industry Sponsorship." *Multidisciplinary Business Review* 5: 1.

Lopez-Acevedo, G., and H. Tan, eds. 2011. "Impact Evaluation of Small and Medium Enterprise Programs in Latin America and the Caribbean." Washington, DC: The World Bank.

Rigby, J., and R. Ramlogan. 2013. "The Impact and Effectiveness of Entrepreneurship Policy." Nesta Working Paper 13/01. London, UK: Nesta.

Storey, D.J. 2005. "Entrepreneurship, Small and Medium Sized Enterprises and Public Policies." In Z.J. Acs and D.B. Audretsch (eds.), *Handbook of Entrepreneurship Research: An Interdisciplinary Survey and Introduction (2nd Edition)*, 473–511. New York: Springer.

Tan, H. 2009. "Evaluating SME Support Programs in Chile Using Panel Firm Data." World Bank Policy Research Working Paper No. 5082. Washington, DC: The World Bank.