IMPACT OF PUBLIC SUBSIDIES ON MICRO AND SMALL BUSINESS DEVELOPMENT IN GEORGIA

Sophiko Skhirtladze
ISET Policy Institute, Tbilisi, Georgia

Zurab Abramishvili
International School of Economics at Tbilisi State University, Georgia

Irakli Barbakadze
ISET Policy Institute, Tbilisi, Georgia

Giorgi Papava
ISET Policy Institute, Tbilisi, Georgia

ABSTRACT

The study evaluates the government's subsidy program for micro and small businesses in Georgia. Firms that submitted business ideas that scored over a predetermined cutoff level received investment subsidies from the program. To analyze the effect of public support on firm-level financial and economic results, we use a sharp discontinuity design applied to firm-level survey data of beneficiary and non-beneficiary enterprises. The survey data is complemented by administrative data collected by the implementing agency, Enterprise Georgia. We find a significant positive impact on participating firms' investment in the program's first year. We also find weak evidence of public subsidies crowding out private investments in subsequent years. The state support program appears to have not affected sales, employment, or access to additional finance for beneficiary firms, even in the program's early stages. The results are robust to sensitivity analysis.

Keywords: regression discontinuity design; state support program; policy evaluation

DOI: http://dx.doi.org/10.15549/jeecar.v9i6.918

INTRODUCTION

There is little debate about the existence of market imperfections that constrain small businesses from accessing finance; however, the debate around the effectiveness of business support programs is much less settled. The recent emphasis on inclusive growth, with substantial resources going to small and medium enterprises (SMEs), has made this debate even more relevant. The OECD estimates that in 2014 alone, around USD 135 billion was committed to SME development by OECD member countries through multiple channels and programs (OECD, 2014). In the realm of limited budgets, the efficiency of government support programs is an important policy priority.

Despite the great interest of many scholars in resolving these inquiries, this area still requires evidence-based analysis due to the abundance of endogeneity problems that arise when addressing the subject. Obviously, multiple policies and circumstances can affect SME development, and disentangling policy effects is thus extremely difficult. Reverse causality is also a critical issue in SME financing, as better-performing SMEs are better able to obtain the financing that would help them improve even further.

Therefore, any opportunities to shed light on these difficult questions should be embraced whenever possible. The design of micro and small business support program implemented in Georgia creates a unique environment for program evaluation using robust methodologies such as regression discontinuity design (RDD). Since 2015, the Government of Georgia has been financing micro and small enterprises using a uniform selection methodology (described below). Existing companies or start-ups can obtain funding if their proposed business plans score above a certain threshold. Around this threshold, the applicants are very similar in quality and characteristics. This research aims to compare the companies around the threshold using the RDD method to identify the causal effect of receiving public investment. This approach eliminates self-selection bias, as described more in-depth in the methodology section below.

This paper makes several contributions to the existing literature on government support programs. First of all, program's design introduces a discontinuity in the assignment of grants which allows for robust estimation of the impacts compared to other types of support assignment mechanisms. Moreover, this study is one of the few studies implemented in a developing environment. While the country is still in the process of major structural transformation, public sector institutions in Georgia are mostly free of corruption practices. As a result, the study's findings provide the most robust picture yet of the effects on government support programs in newly industrialized countries. Finally, the report uses a one-of-a-kind dataset—a blend of a survey gathered specifically for this study and administrative data. This allows us to investigate wide-ranging results beyond the publicly available financial performance indicators often reported in the existing literature.

We find a significant positive impact on participating firms' investment in the program's first year. We also find weak evidence of public subsidies crowding out private investments in subsequent years. The state support program appears to have not affected sales, employment, or access to additional finance for beneficiary firms, even in the program's early stages. The results are robust to sensitivity analysis, including the use of various kernel functions and intervals around the cutoff level.

LITERATURE REVIEW

This study expands upon an earlier paper by Skhirtladze et al. (2020) to provide a more nuanced analysis of the state support program's impact on firm-level outcomes. It also analyzes additional dimensions of the potential impact of the Georgian government's support program. These papers are most immediately related to recent studies that have advanced the literature on the impact of government subsidy programs on various firm-level outcomes using innovative RDD identification strategies applied to firm-level data. These studies, in general, find that investment subsidy programs positively impact firm-level outcomes; however, their impact on productivity is less straightforward. Decramer and Vanormelingen (2016) investigate the impact of a small and medium-sized firm investment subsidy scheme in Flanders. They discover a positive impact on investment, employment, production, and productivity at the company level, but only for smaller businesses. However, according to their evidence, the cost of the subsidy does not outweigh its benefits. Cerqua and Pellegrini (2014), examining Italian Law 488/92, also find a positive impact on capital assets, revenue, and job creation, while the impact on productivity seems to be negative, albeit insignificant. Pellegrini and Muccigrosso (2017) analyze the impact of the same program on firm-level survival and find the risk of default in subsidized start-ups to be lower compared to the control group. Bernini et al. (2017) use a Stochastic Frontier Analysis to deconstruct total-factor productivity (TFP) and find that investment subsidies negatively influence TFP growth in the short run but a favorable effect beyond 3-4 years. Most importantly, this positive

effect mainly comes through technological change and not from economies of scale per se.

In a related strand of literature, Howell (2017) uses an RDD approach to evaluate R&D subsidies issued by the US Department of Energy's SBIR grant program. Firms receiving R&D subsidies at the early stage of their development are twice more likely to access venture capital financing later on. The grant program also positively impacts patent creation and revenue of the beneficiary firms. These results seem to be driven by more financially constrained firms due to actual R&D outcomes, such as technology prototyping, rather than the certification effect, signaling information about a firm's quality to potential investors. In an earlier paper, Bronzini and Iachini (2014) also evaluate an R&D subsidy program, the "Regional Program for Industrial Research, Innovation and Technological Transfer," as implemented in northern Italy. They find this had a significant increase in investment by small enterprises, while larger firms did not show significant changes in their investment behavior.

More generally, our paper relates to the vast literature studying the relationship between government-sponsored programs and firm-level outcomes. For a recent comprehensive analysis of the evidence, see Dvouletý et al. (2020). The authors provide a structured overview of 30 studies analyzing the impact of public investment on firms' performance in 13 EU countries. These studies indicate that government subsidy schemes have largely favorable effects on business survival, job creation, capital investment, and revenues. (Srhoj et al., 2019; Koski & Pajarinen, 2013; Criscuolo et al., 2019; Cerqua & Pellegrini, 2017; Karhunen & Huovari, 2015), with inconclusive findings related to labor productivity and total factor productivity. Recent evidence also supports the certification argument, whereby government support programs serve as a signal of quality for finance-seeking enterprises (Srhoj et al., 2019; Martí & Quas, 2018).

The study adds to the body of research on how economic policies affect firm-level investment choices and outcomes in developing countries, particularly in less-studied regions like Eastern Europe and Central Asia. The marginal effective tax rates of Azerbaijan, Kazakhstan, Georgia, and Belarus were examined by Ahmadov (2022), who concluded that these nations' present tax depreciation rates do not provide additional incentives for investment activity. According to Odintsov et al. (2020), the economic performance of Ukrainian agricultural firms is affected by the tax burden. The authors demonstrate that minimizing the tax burden on agricultural firms makes it possible to divert resource potential to boost agricultural production volumes and raise industrial tax receipts. In anticipation of Ukraine's land reform, which was expected to enhance capital investments in the agriculture sector, Onegina et al. (2020) studied the influence of capital investments on labor productivity in the agricultural sector. Authors established a statistical dependency between labor productivity and the value of fixed capital per worker.

The literature analyzing government support programs in developing countries is much scarcer. This is partly due to the deficient monitoring and evaluation instruments in these settings and lack of available firm-level data. In one rare study, McKenzie et al. (2017) analyze the impact of government subsidies on firms' innovation through Randomized Controlled Trials (RCTs) in Yemen. Firms receiving matching grants in the program's first year innovated more, upgraded their accounting systems, engaged in more marketing and capital investments, and reported higher sales growth. In an earlier study, Özçelik and Taymaz (2008) used matching techniques to investigate the influence of Turkish state R&D assistance programs on private R&D investments. They find such programs had positive and significant effects, especially for smaller firms.

MICRO AND SMALL BUSINESS SUPPORT (MSBS) PROGRAM

The vast majority of active Georgian businesses are small (98.4 %), including micro and medium (1.4%), yet their contribution to key economic indicators is moderate. Despite employing more than 60% of the private sector's formal workforce, their contribution to overall capital formation and value addition remains at or below 50%. Access to capital has been identified as one of the most significant obstacles to micro, small, and medium-sized firm (MSME) participation in the Georgian economy. The International Finance Corporation (IFC) estimates the MSME financing gap in Georgia to

be $2.5 billion, double the present loan portfolio size for MSMEs. According to the 2019 World Bank Enterprise Survey, 26 percent of Georgian businesses identify access to financing as the most significant challenge to their operations. This proportion has been rising over prior survey waves.

The MSBS program, administered by Enterprise Georgia, an institution under the Ministry of Economy and Sustainable Development of Georgia in charge of business development, is one of the few business support programs that provide micro and small firms outside of the capital city with limited grant financing. The program, which was launched in 2015, intends to promote the formation of new enterprises and the expansion of existing ones across all economic sectors. This article examines the outcomes of enterprises that received public subsidy grants in 2016.

In 2016, the amount of financial assistance granted by the program varied between 5,000 Georgian Lari ($2,100) and 15,000 Georgian Lari ($6,200), depending on the number of partners in the business proposal. The program included an obligation for co-financing. Beneficiaries who successfully completed all phases of the selection process were required to invest 20 percent of the project's total cost.

The grants were awarded via a two-step screening process. The first step consists of a contest for business ideas, which pre-screening committee judges based on a one-page overview of the submitted business idea. The selected business concepts are then eligible for the second phase, after candidates have received optional training on business plan formulation. In the second step, participants submit comprehensive business concepts to a committee of independent experts for review. The committee assesses the proposals and assigns points for each of the following criteria: business plan characteristics (maximum of 12 points), managerial considerations (maximum of 36 points), and financial creditworthiness (52 points maximum). Those micro and small businesses with a score above a predetermined threshold receive a subsidy, while those with a score below that threshold do not. This design in the allocation of grants makes our data suitable for the RDD methodology as described below. Since the funding threshold is exogenously determined, business proposals around the cutoff point are considered comparable, whereby financial outcomes for businesses that did not receive funding serve as a good counterfactual for those companies that did receive the funding. This exogenous allocation of supposedly very similar firms to the program and, thereby, the treatment allows us to mitigate self-selection bias that often plagues the academic policy evaluation literature.

Although 2015 was the program's first year, public awareness of the program at that time might have been limited, leading to selection bias. Studying the results from 2016 resolves this awareness issue while still allowing enough time between allocating the grants and conducting our survey (in Q4 2018) to observe at least short-term outcomes.

The 2016 MSBS program was administered by four different contractor organizations, each covering about a quarter of the country. The contractor organizations were provided with a standard methodology (described above) on evaluating the business plans, but the actual implementation differed slightly across each contractor. After a thorough quality control of the data provided by the four contractor organizations, we concluded that only one of the organizations fully complied with the suggested methodology. The evidence indicates that the other three organizations either inflated scores around the threshold intending to boost the number of applicants selected or assigned extra scores to enterprises located in neighborhoods where the funding quota had not been filled. To reduce the bias induced by variances in data collection processes, it was determined to collect data on all participating firms under the same contractor that carefully followed the stated methodology rather than randomly selecting observations from several contractors. As a result, this study concentrates only on the Samtskhe-Javakheti and Shida-Kartli regions, which were coordinated by the organization that followed the suggested methodology.

METHODOLOGY

In recent decades, the Regression Discontinuity Design (RDD) has become one of the most trustworthy non-experimental research methodologies for examining causal treatment effects. (Cattaneo et al., 2019). The distinguishing characteristic of the RDD is that all observation units in the study are assigned a score which

cannot be manipulated by them; a treatment is offered to those units whose score exceeds a predetermined threshold and denies to all units whose score falls below the threshold. Under the assumption that the characteristics of the units do not change abruptly at the cutoff, the empirical strategy aims to correctly estimate the discontinuity of the outcome variable at the cutoff (Imbens & Lemieux, 2008, Lee, 2008; Lee & Lemieux, 2010). As described above, the methodology by which firms are assigned to treatment through MSBS program is fully aligned with the RDD assumptions.

Following Cattaneo, Titiunik, and Vazquez-Bare (2017), we use the most common approach for RDD analysis, the continuity-based framework, which relies on the assumption of continuity of the conditional expectations of potential outcomes given the score. It defines the basic parameter of interest as an average treatment effect at the cutoff as the default approach for analysis. It does not require parametric modeling assumptions and automatically accounts for misspecification. If the assumptions of RDD hold, then all observed and unobserved factors are balanced, and their inclusion as additional explanatory variables are unnecessary. While, in general, verifying the assumption of continuity is impossible, there are some empirical regularities that we expect to hold when the assumption is satisfied. One such regularity, which could be credibly tested, is that the treatment should not affect pre-treatment characteristics.

Nevertheless, estimates and inferences based on nonparametric local approximations near the cutoff present obstacles. Estimation in RDD necessitates the specification of a neighborhood or bandwidth surrounding the cutoff for approximating the regression function. In actual practice, the most prevalent bandwidth selection criterion in the RDD continuity-based framework is the mean squared error (MSE) criterion, which is based on a tradeoff between the bias and variance of the RDD point estimator. The bandwidth defines which observations near the cutoff will be used for analysis. Choosing a very narrow bandwidth around the cutoff will lower the approximation's misspecification error and bias. An extremely narrow bandwidth, however, necessitates eliminating a substantial proportion of the observations, hence reducing the sample size and resulting in estimators with a greater variance. Therefore, based on this tradeoff, the objective of bandwidth selection techniques is to identify the bandwidth that optimally balances bias and variation.

In general, the most prevalent method for point estimate in the continuity based RDD framework is local polynomial approaches, which include fitting a polynomial of order p independently on either side of the cutoff, but only for observations inside the bandwidth. This weighting strategy is often based on a kernel function. Most typically employed is the triangular kernel, which assigns zero weight to every observation outside the optimal interval and positive weight to every observation inside this interval. The weight is highest at the cutoff and decreases symmetrically and linearly as a score gets farther away from the cutoff. The other widely used kernel function is Epanechnikov which assigns a decaying quadratic weight to observations within the interval and zero weight to the rest.

Our basic identification strategy utilizes MSE optimal bandwidth with a triangular kernel function. The continuity assumption is tested by analyzing treatment effects on pre-treatment variables. Sensitivity analysis is carried out using more narrow and wider bandwidths and Epanchenikov kernel functions. For the sake of brevity, the presented results do not control for covariates but are robust to the inclusion of explanatory variables.

DATA

Our econometric evaluation is based on administrative data from Enterprise Georgia and surveys from all participating enterprises, including beneficiaries and non-beneficiaries. Key businesses project characteristics such as the allocated score, the amount of funding granted, and the geography and industry in which the business operates are all included in the administrative data.

The financial and economic metrics of the participating businesses are not included in this dataset, although they were obtained through in-person firm-level questionnaires. Financial indicator data on sales, employment, and investments were collected beginning in 2015, a year before the grant award. This, albeit imperfect measure of financial standing before the program participation, is used to test the continuity assumption required for the

applicability of RDD methodology. This was the only possible source of information, as the official financial statements of these companies are not publicly available. On the other hand, one advantage of our survey-based technique is that it allowed us to collect data on various additional factors, such as access to alternative sources of funding and company owner perspectives.

After combining the data from the two databases, we ended up with a sample of 284 firms, of which 122 got funding and 162 did not. The first section of our questionnaire asks about the characteristics of the company's executives, including their age, level of education, years of managerial experience, sources of income, and assessment of personal well-being. All respondents completed this section of the survey. Questions concerning the company's attributes and accomplishments make up the second section. We excluded respondents who applied for the grant as a start-up but did not receive funding and did not continue in the same business activity. Due to the changes in their commercial activity profile, these companies could no longer serve as a reliable control group. As a result, out of 284 firms surveyed, 206 respondents completed the questionnaire, and 78 respondents only participated in the first part.

Tables 1 and 2 below show the distribution of firms by location and sector. We notice large concentrations of firms in Akhaltsikhe (43%), followed by Borjomi (10%) and Aspindza (8%). In terms of sectoral distribution, a significant number of firms operate in the agriculture (41%), manufacturing (17%), and hotel industry (12%) sectors. The concentration of firms in a few locations and industries improves our evaluation exercise because it allows us to compare homogeneous firms.

Table 1: Distribution of Firms by Industry

Economic Sector	Frequency	Share (%)
Agriculture, hunting and forestry	84	41%
Manufacturing Industry	34	17%
Hotels	24	12%
Trade; Repair of cars/household goods	20	10%
Utility, social and personal service	9	4%
Service	8	4%
Other sectors	27	12%
Total	**206**	**100%**

Table 2: Distribution of Firms by Municipality

Municipality	Frequency	Share (%)
Akhaltsikhe	89	43%
Borjomi	21	10%
Aspindza	16	8%
Tetritskaro	15	7%
Akhalkalaki	14	7%
Gardabani	12	6%
Other	39	19%
Total	**206**	**100%**

Figure 1 presents the distribution of scores for the surveyed firms. Overall, the score density is approaching a normal distribution, but we observe a discontinuity just below and above the cutoff value (score=55). One of the possible explanations for this might be that scores close to the threshold have been artificially adjusted downwards to ensure that those who did not receive funding were sufficiently far away from the threshold to avoid subsequent excessive inquiries from applicants. The other option is that, up to the budget limit, some scores close to

the threshold may have been adjusted upward under the assumption that the threshold had been predetermined. Still, not enough applications had scored beyond it. In either case, such score assignment methods do not contradict our evaluation strategy.

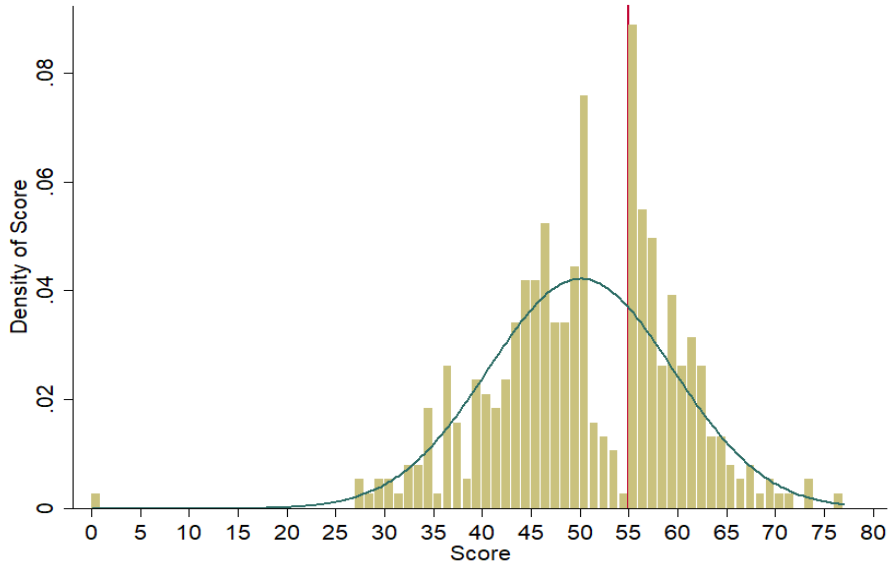

Figure 1: Distribution of Scores
Source: authors' work.

EMPIRICAL RESULTS

This section reports the results of our econometric estimations. First, it examines the effectiveness of the MSBS program on firm-level annual results. We are primarily interested in three main variables: firm sales, employment, and investments. The results for each variable are reported in separate tables. Table 3 summarizes the results for firm sales, Table 4 reports employment results, and the impact on firms' investments is outlined in Table 5. We examine firm-level results for each variable in 2015, the year before the subsidy transfer, to check whether the beneficiary businesses' pre-treatment characteristics are similar to those of the non-beneficiary firms. This allows us to test the continuity assumption as described above. Each table presents the results from local RDD regressions using Triangular and Epanechnikov kernel functions applied to three bandwidths: optimal, 75%, and 150% of the optimal bandwidth for additional sensitivity analysis.

We find no evidence of statistically significant pre-treatment differences for the sales and investment variables, as reported in Tables 3, 4, and 5. Treated firms tend to be smaller in sales, investments, and employment, but these differences are not statistically significant, except for employment. In other words, the firms around the threshold which ended up receiving a subsidy from the government in the following year were not, prior to the program, systematically different from the firms that did not receive the same funding, at least in terms of their sales, investment and employment. For this reason, any differences in outcomes between these firms in the subsequent years can be interpreted as an impact of the government program.

Table 3 displays the results for the businesses' total sales. On average, the program's economic impact at the cutoff point appears to be large and negative, and it is robust to most sensitivity analyses. However, the results are not statistically significant. Enterprises that were selected for the subsidy program seem to have performed worse than non-beneficiary enterprises in both the short and medium run. These results hold true for enterprises with assigned scores in the optimal bandwidth and largely for those whose assigned scores to fall in the 75% and %150 optimal bandwidth interval. The finding of no impact is less robust for the enterprises that are further away from the threshold, i.e., fall within the 150% interval, which means that looking at the wider group of

program participants, grant recipient enterprises performed worse than the ones that did not receive the funding. While the difference is statistically significant, we cannot interpret this as an impact of the program as firms away from the optimal bandwidth are not credibly comparable.

Table 3: Empirical Results for Sales Outcomes

	Triangular			Epanechnikov		
Sales	Optimal Bandwidth	%75 of Optimal	%150 of Optimal	Optimal	%75 of Optimal	%150 of Optimal
2015	-8,634	-16,024	-6,462	-7,983	-15,865	-5,914
	(6,782)	(11,337)	(4,996)	(6,422)	(10,944)	(4,669)
N	171	171	171	171	171	171
2016	-7,625	-7,306	-5,460	-7,748	-7,593	-4,641
	(6,325)	(10,036)	(4,594)	(5,859)	(9,529)	(4,160)
N	162	162	162	162	162	162
2017	-6,524	-6,524	-9,584 *	-7,310	-7,310	-9,486*
	(9,686)	(9,686)	(5,536)	(9,252)	(9,252)	(5,001)
N	163	163	163	163	163	163
2018	-10,715	-6,551	-9,847*	-12,246 *	-9,258	-7,939
	(8,015)	(12,086)	(5,758)	(6,535)	(10,465)	(5,146)
N	158	158	158	158	158	158

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

When looking at the program's influence on company size as measured by employment, comparable results can be found. As seen in Table 4, we again see a negative, albeit statistically insignificant, local estimate at the cutoff point. The lower negative magnitude of estimates in the years after the award was made, as compared to pre-treatment differences, could be interpreted as being a positive program impact on firm employment; To put it differently, it is possible that the firms that received the funding had lower employment before the grant award than the firms that did not receive the funding; however, their employment leveled off with comparable non-recipient firms over the next few years, so the difference between the two groups is not statistically significant.

Table 4: Empirical Results for Employment Outcomes

	Triangular			Epanechnikov		
Employment	Optimal Bandwidth	%75 of Optimal	%150 of Optimal	Optimal	%75 of Optimal	%150 of Optimal
2015	-2.274*	-3.562*	-1.195	-3.241**	-3.241**	-1.225
	(1.272)	(1.990)	(0.930)	(1.650)	(1.650)	(0.945)
N	182	182	182	182	182	182
2016	-0.931	-0.931	-0.627	-0.884	-0.884	-0.618
	(1.181)	(1.181)	(0.734)	(1.223)	(1.223)	(0.716)
N	179	179	179	179	179	179
2017	-0.857	-0.738	-0.625	-0.835	-0.835	-0.620
	(1.145)	(1.341)	(0.709)	(1.183)	(1.183)	(0.692)
N	180	180	180	180	180	180
2018	-0.831	-0.831	-0.717	-0.792	-0.761	-0.721
	(1.265)	(1.265)	(0.742)	(1.308)	(1.356)	(0.717)
N	174	174	174	174	174	174

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

In each year, we also examine the impact of the support program on capital investments made by enterprises. As anticipated, the recipient group's investment rose significantly in the program's first year (Table 5). Yet, there has been no considerable rise in the amount invested in succeeding years. Moreover, the negative, albeit insignificant, estimates of program impacts in 2017 and 2018 provide limited evidence of private investment being crowded out by the government subsidy program. Those companies that received financial support seem to have reduced their investments compared to those that did not receive the support, and the cumulative negative impact seems to outweigh the positive impact on investments seen in 2016. This is a critical finding from the study because it signals that not only did the MSBS Program have no effect on real firm outcomes, but it also may have had a negative impact on total public welfare because government spending, when compared to private spending, carries deadweight costs.

Table 5: Empirical Results for Investment Outcomes

	Triangular			Epanechnikov		
Investment	Optimal Bandwidth	%75 of Optimal	%150 of Optimal	Optimal	%75 of Optimal	%150 of Optimal
2015	-5,465	-7,657	-3,517	-5,242	-5,868	-2,703
	(5,626)	(7,773)	(3,827)	(5,042)	(6,388)	(2,761)
N	171	171	171	171	171	171
2016	3,253*	3,639**	3,549**	2,658*	2,658*	2,660*
	(1,841)	(1,773)	(1,436)	(1,604)	(1,604)	(1,584)
N	160	160	160	160	160	160
2017	-2,993	-2,993	-2,964	-2,993	-2,993	-2,197
	(3,840)	(3,850)	(2,506)	(3,840)	(3,840)	(2,041)
N	164	164	164	164	164	164
2018	-3,274	-3,274	-1,353	-1,201	-2,416	-254
	(3,384)	(3,384)	(1,884)	(1,817)	(2,161)	(1,227)
N	158	158	158	158	158	158

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Finally, we use the additional financial variables collected through the survey to evaluate the impact of the government subsidy program on beneficiaries' access to additional financial resources. Through this analysis, we test the certification argument, whereby the government support program may serve as a signal of quality for finance-seeking enterprises (Srhoj et al., 2019; Martí & Quas, 2018). While there is no information on the pre-treatment values of these variables, it is nevertheless worthwhile to observe if there is a systematic difference in access to financing outcomes between treated and non-treated enterprises post-treatment.

Respondents were asked several questions regarding their use of, and access to, different financial services (for either personal or business use), as well as their subjective assessment of access to finance constraints for the growth and development of their businesses. Model (1) in Table 4 reports gaps in the responses of firms' owners on their personal use of financial services or products in the last five years, while Model (2) evaluates gaps in responses to the question assessing their current use of financial products and services. Model (3) evaluates the impact of the government program on the probability of an enterprise having a business loan from a financial institution. Through Models (4) and (5), we test systematic differences in how business executives assess their access to finance, whether they name this as their key constraint, and how severe, on a range from one to four, they evaluate the severity of this constraint.

Table 6, below, shows mixed results of our econometric tests. Those respondents who received public subsidies are less likely to have used or to be currently using personal financial services, are more likely to have a business loan from a financial institution, and are less likely to name access to finance as their top constraint.

They also evaluate this constraint less severely than those who did not receive government funding. However, at the cutoff point, these estimates are statistically insignificant except for Model (5). Further analysis is therefore needed to conclude the certification argument.

Table 6: Empirical Results for Access to Finance Outcomes

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Use of Personal Financial Services (in the last 5 years)	Use of Personal Financial Services (currently)	Business Loan from Financial Institutions	Key Constraint : Access to Finance	Severity of Access to Finance Constraint
RD_Estimate	-0.192	-0.314	0.279	-0.145	-1.660***
	(0.379)	(0.443)	(0.191)	(0.171)	(0.583)
Observations	187	187	187	187	197

Note: Standard errors in parentheses. All five models are estimated using a local triangular kernel function with a polynomial of order one and MSE optimal bin size. *** p<0.01, ** p<0.05, * p<0.1

CONCLUSION AND RECOMMENDATION

The study assesses the government's subsidy program for micro and small businesses in Georgia. Firms that submitted business ideas that scored over a predetermined cutoff level received investment subsidies from the program. To analyze the effect of public support on firm-level financial and economic results, we use a sharp discontinuity design applied to firm-level survey data of beneficiary and non-beneficiary enterprises. We find a significant positive impact on participating firms' investment in the program's first year. We also find weak evidence of public subsidies crowding out private investments in subsequent years. The state support program appears to have not affected sales, employment, or access to additional finance for beneficiary firms, even in the program's early stages. The results are robust to different specifications.

These findings are mainly in line with the literature on the subject, which shows that government subsidy schemes have a favorable influence on business investment (Srhoj et al., 2019; Koski & Pajarinen, 2013; Criscuolo et al., 2019; Cerqua & Pellegrini, 2017; Karhunen & Huovari, 2015). However, contrary to the literature, we could not locate any evidence of the program's impact on employment or sales. Furthermore, program participation had little impact on firm or executive-level access to additional finance.

This study has an important policy implication. The evidence presented points to significant flaws in the program setup. The selection criteria used by the MSBS program fails to target high-potential yet cash-constrained enterprises. Independent of targeting, the program's ineffectiveness could be explained by the inadequacy of funding to the needs of cash-constrained enterprises. While it is difficult to isolate the causes and consequences of individual shortcomings, the empirical exercise establishes the overall inefficiency of the program, the negative impacts of which could be further exacerbated by adverse political economy outcomes. This again calls for further investigation into the efficiency of public subsidy programs.

ACKNOWLEDGEMENT

The Shota Rustaveli National Science Foundation graciously funded this research in Tbilisi, Georgia. Grant N FR17_313.

REFERENCES

Ahmadov, B. (2022). Comparative Assessment of Capital Income Taxation in Azerbaijan, Kazakhstan, Georgia, and Belarus. *Journal of Eastern European and Central Asian Research (JEECAR),* 9(2), 217-228.

Bernini, C., Cerqua, A., & Pellegrini, G. (2017). Public subsidies, TFP and efficiency: A tale of complex relationships. *Research Policy*, 46(4), 751-767.

Bronzini, R., & Iachini, E. (2014). Are incentives for R&D effective? Evidence from a

regression discontinuity approach. *American Economic Journal: Economic Policy*, 6(4), 100-134.

Cattaneo, M. D., Idrobo, N., & Titiunik, R. (2019). A practical introduction to regression discontinuity designs: Foundations. *Cambridge University Press.*

Cattaneo, M. D., Titiunik, R., & Vazquez-Bare, G. (2017). Comparing inference approaches for RD designs: A reexamination of the effect of head start on child mortality. *Journal of Policy Analysis and Management*, 36(3), 643-681.

Cerqua, A., & Pellegrini, G. (2017). Industrial policy evaluation in the presence of spillovers. *Small Business Economics*, 49(3), 671-686.

Cerqua, A., & Pellegrini, G. (2014). Do subsidies to private capital boost firms' growth? A multiple regression discontinuity design approach. *Journal of Public Economics*, 109, 114-126.

Criscuolo, C., Martin, R., Overman, H. G., & Van Reenen, J. (2019). Some causal effects of an industrial policy. *American Economic Review*, 109(1), 48-85.

Decramer, S., & Vanormelingen, S. (2016). The effectiveness of investment subsidies: evidence from a regression discontinuity design. *Small Business Economics*, 47(4), 1007-1032.

Dvouletý, O., Srhoj, S., & Pantea, S. (2020). Public SME grants and firm performance in European Union: A systematic review of empirical evidence. *Small Business Economics*, 1-21.

Howell, S. T. (2017). Financing innovation: Evidence from R&D grants. *American Economic Review*, 107(4), 1136-64.

Imbens, G. W., & Lemieux, T. (2008). Regression discontinuity designs: A guide to practice. *Journal of Econometrics*, 142(2), 615-635.

Karhunen, H., & Huovari, J. (2015). R&D subsidies and productivity in SMEs. *Small Business Economics*, 45(4), 805-823.

Koski, H., & Pajarinen, M. (2013). The role of business subsidies in job creation of start-ups, gazelles and incumbents. *Small Business Economics*, 41(1), 195-214.

Lee, D. S. (2008). Randomized experiments from non-random selection in US House elections. *Journal of Econometrics*, 142(2), 675-697.

Lee, D. S., & Card, D. (2008). Regression discontinuity inference with specification error. *Journal of Econometrics*, 142(2), 655-674.

Lee, D. S., & Lemieux, T. (2010). Regression discontinuity designs in economics. *Journal of Economic Literature*, 48(2), 281-355.

Martí, J., & Quas, A. (2018). A beacon in the night: government certification of SMEs towards banks. *Small Business Economics*, 50(2), 397-413.

McKenzie, D., Assaf, N., & Cusolito, A. P. (2017). The additionality impact of a matching grant programme for small firms: experimental evidence from Yemen. *Journal of Development Effectiveness*, 9(1), 1-14.

Odintsov, O., Yevtukhova, T., Vasylkonova, E., & Kunchenko-Kharchenko, V. (2020). Influence of tax burden on economic development of agricultural enterprises in Ukraine. *Journal of Eastern European and Central Asian Research (JEECAR)*, 7(1), 150-162.

OECD (2014), Financing SMEs and Entrepreneurs 2014: An OECD Scoreboard, *OECD Publishing*, Paris, https://doi.org/10.1787/fin_sme_ent-2014-en

Onegina, V., Megits, N., Antoshchenkova, V., & Boblovskyi, O. (2020). Outcome of capital investment on labor productivity in agriculture sector of Ukraine. *Journal of Eastern European and Central Asian Research (JEECAR)*, 7(1), 12-25.

Özçelik, E., & Taymaz, E. (2008). R&D support programs in developing countries: The Turkish experience. *Research Policy*, 37(2), 258-275.

Pellegrini, G., & Muccigrosso, T. (2017). Do subsidized new firms survive longer? Evidence from a counterfactual approach. *Regional Studies*, 51(10), 1483-1493.

Skhirtladze, S., Abramishvili, Z., Papava, G., & Barbakadze, I. (2020). Impact Assessment of the State Support Program for Micro and Small Enterprises in Georgia. *Economics Bulletin*, 40(2), 1075-1082.

Srhoj, S., Škrinjarić, B., & Radas, S. (2019). Bidding against the odds? The impact

evaluation of grants for young micro and small firms during the recession. *Small Business Economics*, 1-21.

ABOUT THE AUTHORS

Sophiko Skhirtladze, email: s.skhirtladze@iset.ge

Dr. Sophiko Skhirtladze is a research fellow at ISET Policy Institute in Tbilisi, Georgia. She received her Ph.D. in Public Economics and Finance from the Catholic University of the Sacred Heart in Milan, Italy. Her research interests include small and medium enterprise development, state support programs, and policy impact evaluation.

Dr. Zurab Abramishvili is a resident faculty at the International School of Economics at Tbilisi State University in Tbilisi, Georgia. He received his Ph.D. in Economics from CERGE-EI in Prague, Czech Republic, in 2017. His research interests include policy impact evaluation and the economics of education, Applied Microeconomics, and cross-sectional econometric analysis.

Irakli Barbakadze is a research fellow at ISET Policy Institute and a Ph.D. student at Henley Business School in Reading, UK. He specializes in the effects of the institutional environment on the investment strategies of multinational enterprises.

Giorgi Papava is a Lead Economist at ISET Policy Institute and Associate Professor of Economics at Ilia State University in Tbilisi, Georgia. He holds an MA degree from the University of Chicago. Giorgi's academic work is supported by CERGE-EI Career Integration Fellowship. He also actively consults several institutions within the government of Georgia and international organizations in designing, implementing, and evaluating various public policy instruments.