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Abstract
Governments attempt to stimulate entrepreneurship and innovation in various ways and with different results. In 2015 the Romanian government began to subsidize the creation of start-ups, following a general policy of the European Union. We evaluate the effects of the Romania Start-up Program, which offered subsidies for hundreds of entrepreneurs in a large variety of economic sectors. We statistically compare subsidized and unsubsidized start-ups, by calculating the Kaplan-Meier estimators of survival rates in both groups over a 5-year period. We show that subsidized start-ups have a significantly lower survival rate than non-subsidized start-ups after 4 to 5 years. Moreover, the level of employment in subsidized start-ups decreased drastically compared to their non-subsidized counterparts. Examining the survival rates of subsidized start-ups created with and without additional private investment, we find that start-ups with "skin in the game" have a higher survival rate, although we cannot draw statistically significant conclusions.

Key words: start-ups, entrepreneurship, state aid, firm subsidies, public grants.
JEL Classification: H25, L26, M13.

Introduction

Policymakers around the world often take for granted that government support for start-ups fuels innovation and entrepreneurship and ultimately increases economic growth and employment. An extensive literature on market failures serves as the intellectual basis of governments implementing a broad set of measures in order to remove barriers to entry into entrepreneurial activities. They include tax incentives, increased access to finance, entrepreneurial education, business incubators and other measures to create an ecosystem conducive to entrepreneurship. Specific policies differ in their approaches and targeted groups: some are dedicated to unemployed persons, others to innovative high-tech entrepreneurs.

A decades-long body of research on the merits of start-up support programs has delivered mixed results. The effects of these interventions seem to depend a lot on the circumstances under which they were implemented and on the specific methods used to promote business creation and development.

Our paper contributes to the discussion of start-up policies by analyzing a case of start-up subsidization policy in Romania. It is the first attempt to assess the effects of business creation measures implemented by the Romanian government, within the framework of the European Union support for start-ups and especially youth entrepreneurship. We use a large database of firms and check their survival rates over the short to medium term of up to five years. Our results show the necessity of reconsidering entrepreneurship grant schemes in Romania and the importance of a prudent policy at the level of the European Union to avoid adverse effects.

The paper is organized as follows. The next section reviews the research conducted on public financial support for start-ups. Section 3 describes the 2015 *Romania Start-up* Program to support entrepreneurship. Section 4 presents the research methods and the data used in our analysis. In Section 5 we discuss the results and their policy implications. The last section concludes.

Literature review

The research conducted on the impact of public grants on business survival and performance has delivered mixed results: the anticipated positive effects of state aid sometimes occur and sometimes do not. The insightful work of Amezcua et al. (2013), which examinates the population data of all US university incubators between 1955-2007, points out that generosity of public and private aid ("resource munificence") is not necessarily correlated with survival rates of young firms. The viability and performance of young firms depends on a variety of firm-level and environmental factors: the entrepreneurial abilities of their founders, the intensity of competition, the quality of institutions, the business culture, the degree to which they adopt new technologies etc. This has prompted some authors (Santarelle and Vivarelli, 2002) to question even the importance of entry subsidies.

However, many studies have highlighted a positive correlation between government funding and start-up performance, and some of them have analyzed specifically the survival rate

of newborn businesses receiving public help. For example, Pellegrini and Muccigrosso (2017) analyses the effects of a major incentive scheme of the Italian government which provided over 2.3 billion euros to 44,000 businesses during 1996-2007. The authors focus only on the new-born companies (21% of beneficiaries) and they use the Kaplan Meier estimator to show that subsidized firms have a higher survival probability than non-subsidized firms at 5, 10 and 14 years. It is worth mentioning that only manufacturing and extractive firms were eligible in the program, and the first criterion used by the government to rank eligible projects was the share of owners' funds of the total investment. Kersten et al. (2017) meta-analysis of the SME finance literature concludes that public programs have a positive effect on firm performance, but no significant impact on economic development. This review refers to government programs with a large variety of financial instruments - not only capital injections - and explicitly excludes micro-enterprises, which represent most of the existing start-ups. Similarly, Dvoulety et al. (2021) show that most studies report positive effects of public grant schemes on firm-survival, employment, fixed assets, and sales. Their review focuses on policies supporting small and medium-sized enterprises in general, not only on subsidies for start-ups. Srhoj et al. (2021) investigate the effects of small public grants on young micro and small firms in Croatia and they find a positive effect on survival. The Croatian program did not target startups in particular, and it intended to support mainly skill development and small capital investment, like purchase of IT equipment; salaries were not eligible expenses. Bartlett III and Morse (2020) test the effectiveness of the Paycheck Protection Program during COVID pandemic in US and conclude that small businesses which received subsidies had a 20.5% greater survival rate beyond six months. This positive effect occurs only in the case of self-employers and microbusinesses with less than five employees. Almus (2004) finds that financial support for start-ups improves the average employment growth rate in Germany, but his study focuses on financial support *via* bank loans, not government subsidies. Duhautois, Redor and Desiage (2015) who evaluate a program for incentivizing unemployed people to become entrepreneurs in France show that "subsidized start-ups are more likely to survive than non-subsidized firms after their first two years of existence" (p. 12). Butler et al. (2016) discovered a significant beneficial impact of government grants on business creation, survival rates and employment. The program that they evaluate (*Buenos Aires Emprende*) concentrates on promoting innovative ideas and provides government subsidies representing only up to 40% of the initial investment. Similarly, Fuertes-Callen et al. (2024) argues that subsidies are likely to improve business survival. Their study includes all subsidies received by the high-tech and knowledge-intensive service start-ups in Spain over a decade (2008-2017) and finds a moderate positive relation between subsidies and survival.

There is also a significant literature documenting the weaknesses or lack of results of government aid. Pfeiffer and Reize (2000) study start-ups initiated by unemployed people in Germany and do not identify a significant impact of subsidies on employment growth. They find a negative impact on firm survival. Battistin et al. (2001) refer to a popular scheme for promoting youth entrepreneurship in Italy and question the merits of subsidization. Following a law issued by the Italian Parliament in 1986, thousands of young entrepreneurs participated in a business plan

contest to obtain a generous government grant (1.7 mil. euro on average). Earlier assessments of this program showed that subsidized firms survived longer than non-subsidized firms, but the paper cited above focuses on what happens 30 months after the subsidy is recorded: from that moment on (and 75 months later) most of the difference in the survival rate between subsidized and non-subsidized firms disappears. The authors conclude that "subsidized firms live longer than spontaneous ones just because they are subsidized" (p. 174). Also, Monte and Scalera (2001) scrutinize the same Italian program and, besides dismissing the idea that subsidized start-ups live longer than non-subsidized start-ups, they discover that the program created an unusual distortion: a negative relation between firms' size and duration, due to the fact that the magnitude of the state aid was proportional with the size of the investment projects. Kösters (2009) analyzes survey data from Germany and concludes that start up subsidization has been a failure, having no effect on employment and the firms' survival rates. Boyer et. al (2014) come to a similar conclusion in a comprehensive study of French micro-enterprises. Caliendo et al. (2015) also investigate the effects of start-up subsidization in Germany and discover that subsidized start-ups have a higher 19-months survival rate, but lower business growth than non-subsidized start-ups. The authors noticed that subsidized businesses were created mostly by necessity-driven entrepreneurs. According to Dubard et al. (2017), who study the impact of government start-up support programs in OECD countries, start-up subsidization has no significant effect on the entrepreneurship rate or on the unemployment rate. Although it stimulated the *necessity* entrepreneurship rate, it failed to improve the *opportunity* entrepreneurship rate – a valuable dichotomy because opportunity entrepreneurship is particularly associated with serious, growth-oriented businesses (Fairlie and Fossen, 2020). This conclusion is similar to Shane's (2009, p. 142), who argued that "[t]he vast majority of people founding new businesses are not entrepreneurs in the sense of people building companies that grow, generating both jobs and wealth. Rather, they are founding wage-substitution businesses."

Based on the existing evidence, we can assert that subsidies may not always positively affect survival rates or the performance of young firms. This is pointed out by OECD (2023), which reviews 50 studies in the field of entrepreneurship policies and states that future entrepreneurship policies need to be systematically assessed in order to have more conclusive findings. This recent study echoed to a certain extent the findings of Eurofound (2016), a comprehensive review carried out by the European Union on the effects of start-up support measures adopted previously in various member countries, which draw the following conclusions:

- "The review of the selected evaluations shows that the specific policy rationale of the interventions tends to be unclear or underspecified" (p. 6);
- "the majority of evaluations found that the measure had positive or mixed impacts" (p. 59);
- "Although evaluations of general start-up support incentives using robust statistical methods show some positive results", there is "limited evidence of policy impact of start-up support measures specifically addressing young people" (p. 64);
- "the more sophisticated the evaluation approach, the lower the identified impact of the programme being evaluated" (p. 2).

Thus, when the *Romania Start-up* program that we focus on was conceived and implemented, there were a number of theoretical and empirical works circumscribing the debate for/against government subsidization of young businesses, and several reasons for decisionmakers to be prudent in designing supporting mechanisms for start-ups. More precisely, it was not clear that subsidies always improve the overall performance of start-ups and lead to more successful entrepreneurship (particularly among the youth), reduce unemployment or achieve other desirable social objectives.

So far, a single research study addressed the effects of state aid for young companies in Romania. Busu et al. (2021) analyzed a government subsidization program dedicated not only to start-ups, but also to medium-sized companies not older than 2 years. Their study could not assess survival rates, and instead focused on financial performance. In contrast, the present paper assesses survival rates for firms funded under *Romania Start-up* which is a program that specifically targets business creation in various economic sectors in Romania.

Program description

The *Romania Start-up* program was an initiative financed by the European Union from its cohesion and structural funds. The objective of this program was to promote entrepreneurial culture, to develop managerial abilities and to support the creation of new businesses. The initiative was implemented in 2015. In the following years, the Romanian government has cloned this scheme and came up with its own (nationally-funded) program called *Start-up Nation* in 2017, 2018, and 2022. The reader may be tempted to think that it is precisely the success of the 2015 program which paved the way for the subsequent iterations of the national program, but in fact neither the *Romania Start-up*, nor the *Start-up Nation* measures were examined carefully in order to check the medium-term results and to proof the merit of these state-aid schemes.

The general objective of *Romania Start-up* was to increase national employment by subsidizing the creation of new firms. The overall budget of this scheme was 75 million euros, 94%-98% of this amount being covered by the European Social Fund. The program was implemented through various "Applicants", i.e. intermediaries: companies, educational institutions, trade unions and employers organizations, local authorities (municipalities), professional associations, chambers of commerce, and non-governmental organizations. The Applicants were asked to "promote the entrepreneurial culture" by organizing various activities such as: information campaigns about the merit of entrepreneurship, activities focused on entrepreneurship education, business planning, training and support for people willing to start a business.

The first tactical goal of this program was to enhance the managerial and entrepreneurial abilities of Romanian adults. Thousands of people participated in entrepreneurship courses where they learnt how to write business plans, presented and discussed their ideas. The second goal was to provide financial support for business creation. Thus, potential entrepreneurs had to submit their proposals and, following a business plan contest, they could receive up to EUR 25,000, an amount

equivalent to 5 annual average salaries in 2015. According to program requirements, at least 50% of subsidized business plans were initiated by students.

To be eligible for state aid, the entrepreneurs were not required to make their own financial contribution (the state aid covered 100% of eligible investment). They were allowed to open a business in a wide number of areas: tourism, textiles, furniture, automobile manufacturing, creative industries, IT&C, food & beverage, health & pharma, bio-economy, energy and environmental management. Also, according to the program, the following types of expenditures were considered eligible under the state aid scheme: capital investment (constructions, technological equipment, machinery, transportation vehicles, IT equipment furniture), raw materials, wages, utilities, accounting services, rent, operating lease payments, taxes and fees etc.

The newly created start-ups had one important obligation: to create at least 2 jobs and maintain these jobs for a period of six months. The companies were required to maintain their investment for at least 3 years, meaning that it was illegal to dissolve or terminate the firm earlier than 2018; however, this was a lenient condition, because it did not imply any costs for the entrepreneurs.

To apply for this program Romanian entrepreneurs had to submit their proposal to a business plan competition, open to the public at large. The plans were judged by a selection committee in a transparent and non-discriminatory procedure consistent with European state aid regulations.

The *Romania Start-up* program instructed thousands of potential entrepreneurs and led to the establishment of hundreds of businesses throughout the country. Initially, decision-makers estimated that 3000 entrepreneurs could be incentivized to start a new business through the program. At least from this perspective, the program was far from successful, despite the apparently tempting financial conditions – a consistent public grant which required zero mandatory shareholder contribution. Only 990 people decided to enroll in the program and start a business, so less than a quarter of the overall budget was actually spent directly for business formation. No serious attempt has been made to assess the economic consequences of this attempt to subsidize start-ups. The following analysis aims to fill this gap at least in part and provide a comparative analysis of the survival rates of subsidized and non-subsidized start-ups.

Data and research methods

We compare government-subsidized and fully private start-ups. For the first category, we use the list of firms set up with public funding in the "DMI 3.1 – Apel 176 România start-up" program of the Romanian government. This list consists of 810 start-ups (limited liability companies) created in 2015 as a result of the government scheme. For the second category, we use the list of all firms set up in 2015 for which information is provided by the Ministry of Finance, from which we have excluded the beneficiaries of state aid. This database consists of 11341 limited liability companies created without government subsidy. The list of firms established in 2015 has been provided by

Creditreform, one of the major credit rating agencies in Europe, and it collects public data from the Ministry of Finance.

We compare the survival rates of start-ups within both groups. According to Eurostat (2021), *survival occurs if an enterprise is active in terms of employment and/or turnover in the year of birth and the following year(s)… An enterprise born in year xx is considered to have survived in year xx+1 if it is active in terms of turnover and/or employment in any part of year xx+1 (= survival without changes).*

Based on that definition, Table 1 provides the number of firms that survived each year from 2015 to 2020 for both groups, subsidized and non-subsidized start-ups founded in 2015. The survival rates in Table 1 are calculated on the basis of the observed data, interpreting missing values as a sign of non-survival. We can see that subsidized firms have a higher survival rate from 2015 to 2018. Then, however, their survival rate drops below that of non-subsidized start-ups. In 2020 subsidized start-ups have a survival rate that lies 10 percentage points below that of non-subsidized start-ups. This result suggests that subsidizing start-ups have not led to a sustained improvement in market dynamism and competitiveness. Subsidized start-ups underperform and have a higher dropout rate three years after the initiation of the program. However, these descriptive results must be taken with a grain of salt.

Table 1: Survival rates of firms created with and without government subsidy

Year	Subsidized start-ups		Non-subsidized start-ups	
	number	%	number	%
2015	710	100	10985	100
2016	693	97.6	10499	95.6
2017	639	90.0	9769	88.9
2018	593	83.5	9118	83.0
2019	520	73.2	8486	77.3
2020	405	57.0	7455	67.9

Survival rate in year X: ratio of the number of firms active in year X divided by the number of firms active at the end of 2015 (missing values being interpreted as a sign of non-survival).

Interpreting missing values as a sign of non-survival can potentially cause a bias, because a significant number of observations in both groups are right-censored, that is, they are missing because of drop-out from surveys or loss to follow-up. We therefore proceed by calculating the Kaplan-Meier estimator and the corresponding 95%-confidence bands, specifying for which start-ups survival or death has actually been observed and for which start-ups observations were truncated. The advantage of this estimator is its ability to cope with incomplete data and avoid biases (Kaplan and Meier 1958). It is commonly used in medical research, such as comparative studies of cancer treatments (Kuhnle, Israel and Menges 2019), where losses to follow-up occur regularly when patients refuse further treatment or stop collaborating for other reasons. The Kaplan-Meier estimator is the most commonly used estimator in survival analysis.

The target of the Kaplan-Meier estimator is the survival function $S(t)$ which gives the probability that survival lasts longer than time t. The survival function is thus formally defined as a probability function $S(t) = P(T > t)$, where T is the survival time. The Kaplan-Meier estimator of the survival function is calculated in the following way:

$$\hat{S}(t) = \prod_{t_i<t} \left(1 - \frac{d_i}{n_i}\right),$$

where t_i refers to distinct time points when at least one event, i.e. death or in our case business failure, occurs. In our case, the distinct time points refer to years between 2015 and 2020. The variable d_i refers to the number of observed deaths (business failures) that happened during the year t_i, and n_i refers to the number of subjects, i.e. start-ups, known to have survived until right before t_i, that is, the number of start-ups that have not yet died or have not yet been right-censored (dropped out of the sample) up to time t_i. The estimator thus does not interpret right-censored observations as business failures. It simply looks at the number of observed business failures (d_i) relative to the number of businesses that are known to have survived (n_i). By construction, the estimated survival function is going to be a downward-sloping step function with steps occurring at every distinct time point t_i, i.e. year, where at least one start-up is observed to fail.

The standard error of the Kaplan-Meier estimator at time t is commonly estimated by Greenwood's formula:

$$\hat{\sigma}\left(\hat{S}(t)\right) = \hat{S}(t)\sqrt{\sum_{t_i<t} \frac{d_i}{n_i(n_i - d_i)}}.$$

Given the estimated standard error one can construct confidence bands around the estimator using the normal distribution approximation. For the 95%-confidence band, the critical value from the standard normal distribution is 1.96 and the confidence band is estimated by:

$$\hat{S}(t) \pm 1.96 * \hat{\sigma}\left(\hat{S}(t)\right)$$

To ensure that the confidence band remains within the bounds of the survival function, that is between 0 and 1, one commonly applies the log-log transformation and obtains:

$$\log\left(-\log\left(\hat{S}(t)\right)\right) \pm 1.96 * \frac{\hat{\sigma}\left(\hat{S}(t)\right)}{\hat{S}(t)\log\left(\hat{S}(t)\right)}$$

Then, by exponentiating back one obtains the lower and upper confidence limits that will always remain within the desired range:

$$\hat{S}(t)_{lower} = \exp\left(-\exp\left(\log\left(-\log\left(\hat{S}(t)\right)\right) - 1.96 * \frac{\hat{\sigma}\left(\hat{S}(t)\right)}{\hat{S}(t)\log\left(\hat{S}(t)\right)}\right)\right),$$

and

$$\hat{S}(t)_{lower} = \exp\left(-\exp\left(\log\left(-\log\left(\hat{S}(t)\right)\right) + 1.96 * \frac{\hat{\sigma}\left(\hat{S}(t)\right)}{\hat{S}(t)\log\left(\hat{S}(t)\right)}\right)\right).$$

As we compare survival within two groups of firms, i.e. subsidized versus non-subsidized start-ups, we can calculate hazard ratios as relative measures of risk. Hazard ratios are based on the hazard function as opposed to the survival function. The hazard function describes the risk of an event, i.e. a business failure, occurring at time t given that the subject, i.e. the start-up, has survived until right before t. In a continuous time setting, the hazard function is formally defined as:

$$h(t) = \lim_{\Delta t \to 0} \frac{P(t \leq T < t + \Delta t | T \geq t)}{\Delta t}.$$

In our discrete case with annual data, the hazard function can be estimated simply by computing the following ratio for each year t:

$$\hat{h}(t) = \frac{d_t}{n_t},$$

with d_t being the number of observed business failures and n_t being the number of firms known to have survived until year t.

Defining the dummy variable X being equal to 1 if a start-up was subsidized and 0 if it was not subsidized, the hazard ratio at time t of subsidized over non-subsidized firms is defined as:

$$HR = \frac{h(t|X = 1)}{h(t|X = 0)}.$$

A simple way of estimating the hazard ratio is based on the Cox model (Cox, 1972) which assumes a constant hazard ratio over time, such that the hazard ratio between the two groups of firms can be expressed as:

$$h(t|X = 1) = h(t|X = 0)\exp(\beta X),$$

where β is the regression coefficient and $\exp(\beta)$ represents the estimated hazard ratio. The hazard ratio is a relative measure of risk. A value above 1 would indicate that there is a higher risk of failure in the treatment group (subsidized start-ups) as compared to the control group (non-subsidized start-ups) over the entire observation period.

Results and Discussion

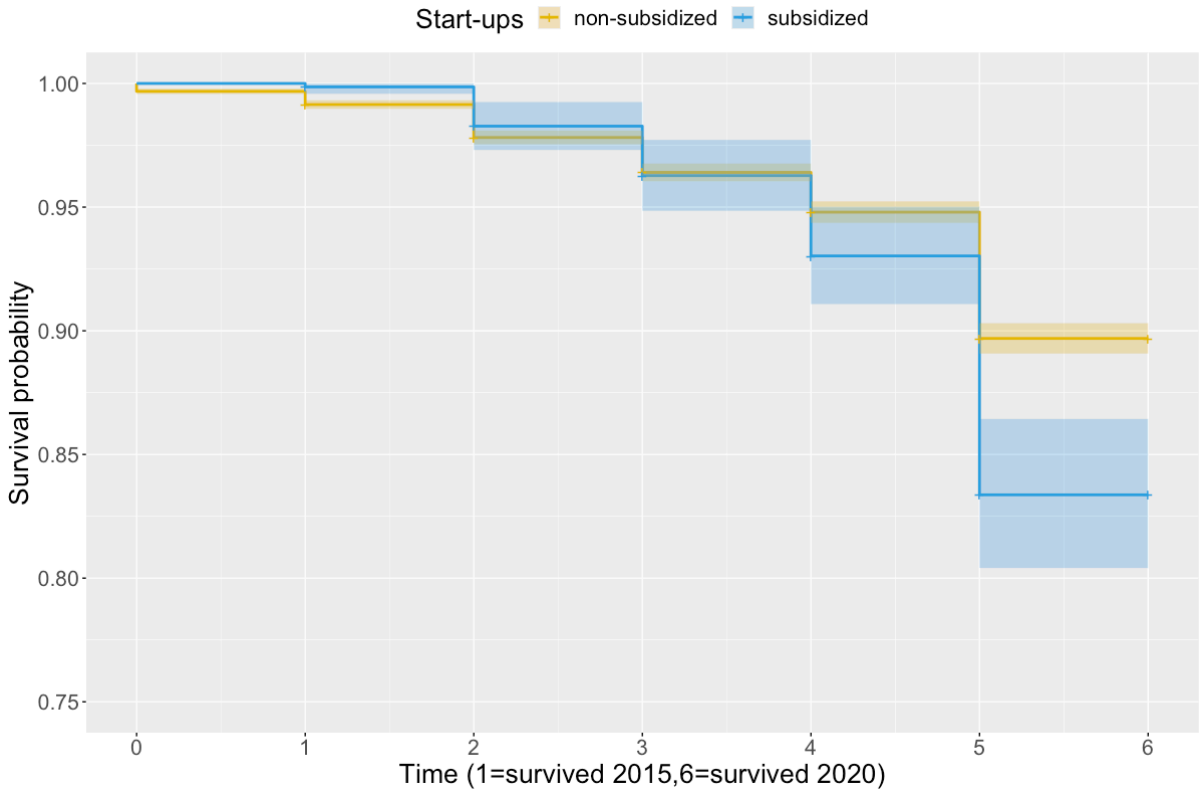
Survival rates

Figure 1 presents the Kaplan-Meier survival probabilities. They are substantially higher than in Table 1 for both groups as the estimator considers the possibility that some of the truncated observations have actually survived. The overall pattern remains the same. Subsidized start-ups

have a significantly higher survival probability during the first year. The difference in survival probabilities then turns statistically insignificant. After 5 years subsidized start-ups have a significantly lower estimated survival probability (80.4%) than their non-subsidized counterparts (89.7%).

The asymmetric evolution of survival probabilities suggests that many of the government-funded start-ups were kept alive artificially in the first 2 years, only to meet the requirement of the grant scheme, which prevented companies from employing less than two people for more than six months. They would thus survive according to our definition even with no turnover. Instead of fostering long-term economic growth through the subsidy program, incentives were created to exploit the scheme by merely fulfilling the formal requirements without engaging in productive entrepreneurship.

Figure 1: Kaplan-Meier survival probabilities for subsidized and non-subsidized start-ups with 95%-confidence bands



A log-rank test over the entire follow-up time leads to a rejection of the null hypothesis of equal distributions at any common significance level (p-value < 0.001). The hazard ratio estimated from a Cox regression model as defined above is also significantly higher than 1 (1.61 with the 95%-confidence band between 1.31 and 1.98), indicating that subsidized start-ups have a significantly higher risk of non-survival over the entire observation period. There risk of failure is estimated to be 61% higher.

Employment growth

The market process implies an economic natural selection (Alchian, 1950), as a result of which fitter firms survive and develop. Not all start-ups survive, and not all surviving firms manage to become market leaders. Many will remain an example of subsistence entrepreneurship and only a minority will become transformational enterprises (Schoar, 2010). Thus, the impressive net job creation achieved by small and young firms (Acs and Audretsch, 1989) is mostly due to this minority of elite start-ups which, by their disproportionate contribution to employment, more than offset the number of jobs destroyed by unsuccessful or dead enterprises (Calvino et. al. 2015).

Given that employment is a standard metric for assessing a firms' success (Siepel and Dejardin 2020) and was also a principal target of the *Romania Start-up* program, it is useful to observe the evolution of employment in the sector of subsidized start-ups relative to the group of non-subsidized firms. The striking difference between the two groups is illustrated by Figure 2. While the total number of jobs created by the group of unsubsidized firms grew, as expected, employment in the class of subsidized businesses declined year after year. As we have noted, in the second half of 2016, the obligation to maintain at least two jobs expired, and the effect can be seen in 2017, when total employment in the class of subsidized start-ups falls sharply.

Figure 2: Aggregate employment of subsidized and non-subsidized start-ups from 2015 to 2020

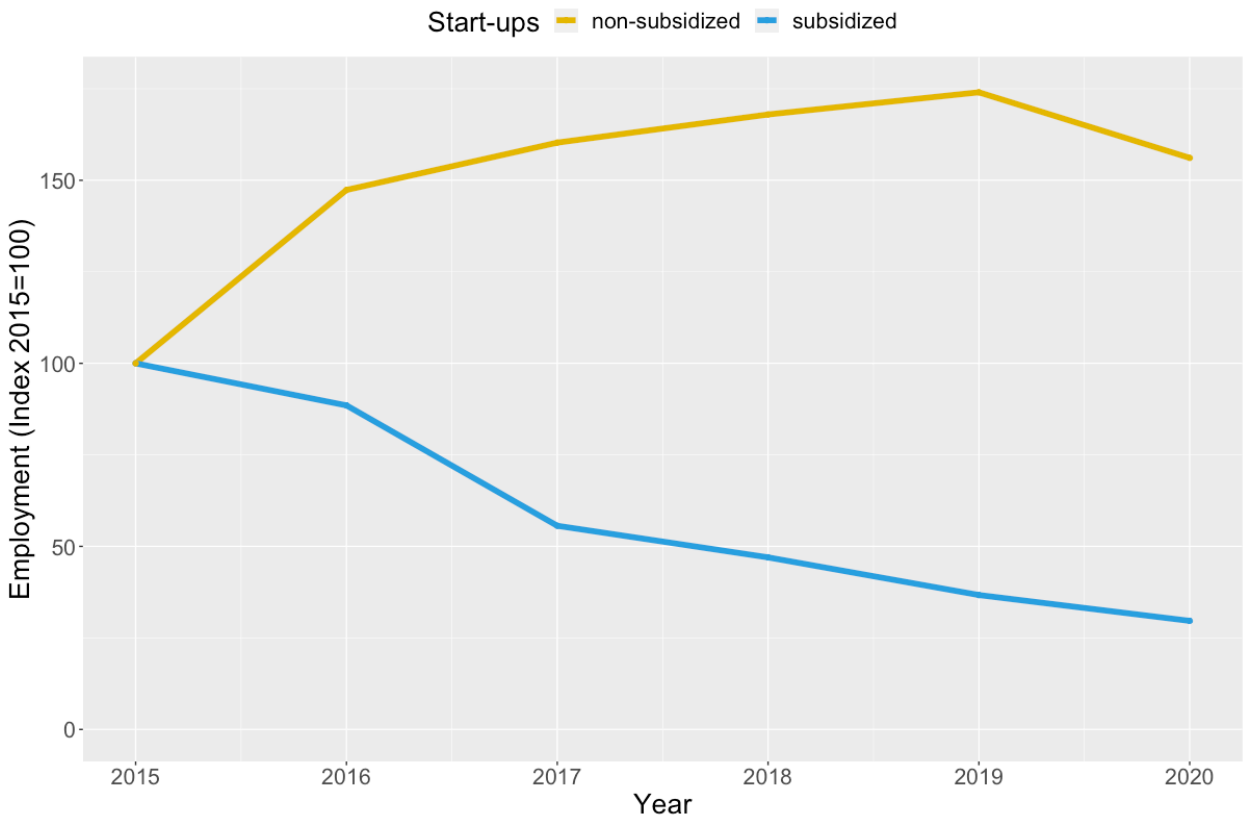


Table 2: Aggregate number of employees in subsidized and non-subsidized start-ups from 2015 to 2020

Start-ups	2015	2016	2017	2018	2019	2020
subsidized	1332	1179	741	626	489	395
non-subsidized	15308	22558	24537	25715	26642	23900

The employment recorded by the subsidized start-ups has followed a clear downward trend. At the end of our study period, the number of people employed by the subsidized start-ups was practically equal to the number of still active firms (405): from the initial number of 1332 jobs created in 2015, only 395 were still recorded five years later, meaning more than 70% were lost. By contrast, in the group of non-subsidized start-ups, employment has increased steadily, except for the last year (the pandemic year), and the total number of jobs was 56% higher in 2020 than in 2015.

Figure 2 and Table 2 summarize the results. It has to be noted again, however, that a substantial part of observations is right-censored. The loss in employment in subsidized start-ups is thus exaggerated. For the same reason, the gain in overall employment in non-subsidized start-ups is underestimated. The relative evolution of employment in both groups is nonetheless well depicted, if there are no structural differences in the distribution of unobserved survivors between subsidized and non-subsidized start-ups.

Thus, while non-subsidized start-ups were net job creators, confirming the general experience and the insights of the standard economic literature, subsidized startups became net job destroyers. The *Romania Start-up* program has turned out to be a self-employment subsidization scheme, and a very costly one, with about 5 times the annual average salary being paid upfront by the government for each job created.

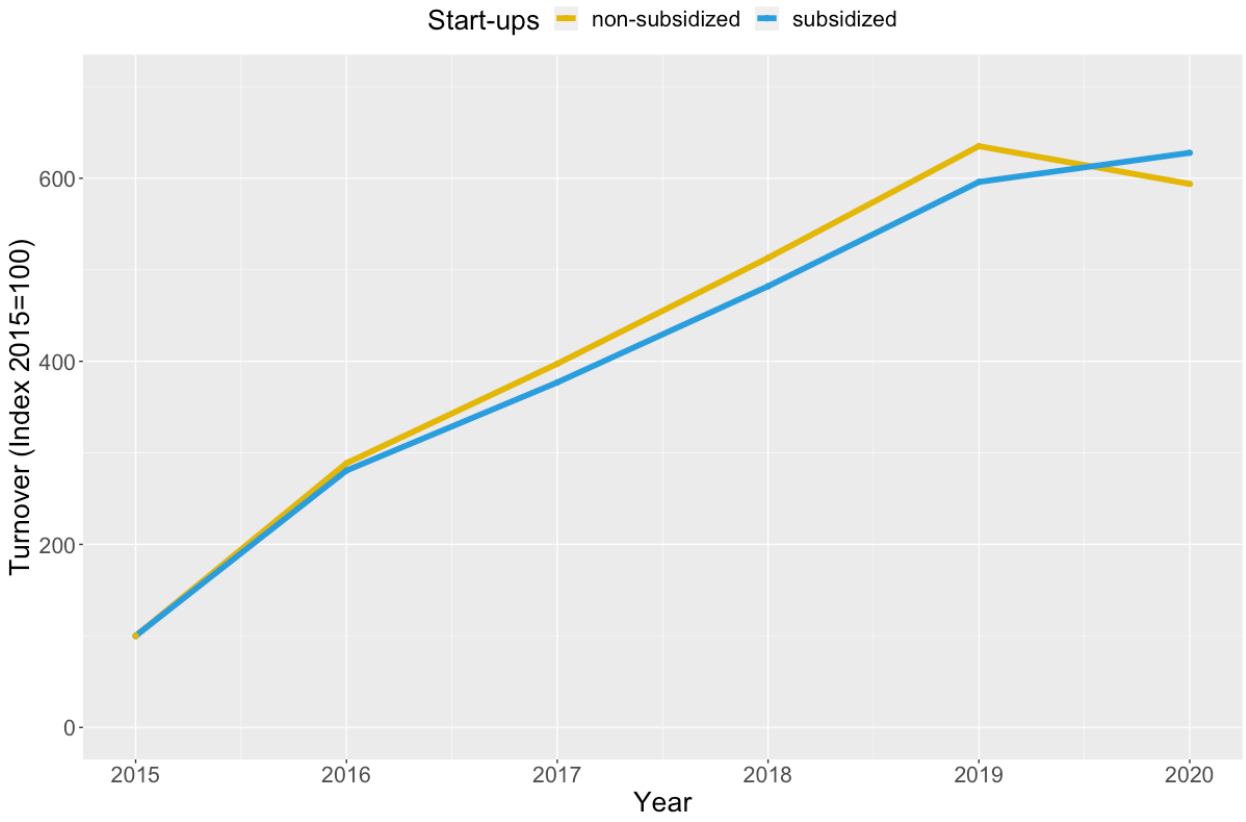
The sharp decline in employment that characterizes subsidized start-ups reflects another unfortunate outcome of the *Romania start-up* program. The subsidized entrepreneurs have a very low probability of developing their businesses and becoming transformational entrepreneurs. We can illustrate the start-ups' post-entry growth by looking at the share of firms with at least 10 employees at the end of the period. Put differently, we look at how many *micro* enterprises (with fewer than 10 employees) turn into *small* enterprises (10-49 employees) or into *medium-sized* enterprises (50-249 employees), according to OECD definitions. Among the subsidized start-ups that survived, there is only one firm with at least 10 employees. This corresponds to a rate of 0.15%. By contrast, in the non-subsidized group there are 340 small to medium-sized firms, that is, a rate of 3,1%. Thus, non-subsidized micro enterprises are 21 times more likely to evolve into small to medium-sized enterprises (SMEs).

The European Union uses a slightly different definition of SMEs, according to which a firm is considered small or medium-sized if it fulfills two conditions: it has (1) a staff of at least 10 persons and (2) either a turnover or a balance sheet total of at least 10 million euros. Using this definition, we have identified 61 firms (0.56%) in 2018 and 75 (0.68%) in 2020 in the group of non-subsidized start-ups. In contrast, there are none in the group of subsidized start-ups. According to that definition all surviving subsidized start-ups remained micro enterprises.

Turnover

While none of the subsidized start-ups turned into a SME according to the EU definition, the evolution of their aggregated turnover during the 5-year follow-up period is close to that of non-subsidized start-ups. Figure 3 shows both time series as indices. Aggregate turnovers for subsidized and non-subsidized start-ups have both increased by a factor of about 6. In the pandemic year of 2020, subsidized start-ups have performed better than non-subsidized start-ups. The latter's turnover dropped by 6.5%, whereas subsidized start-ups could even increase their aggregate turnover by 5.3%.

Figure 3: Aggregate turnover of subsidized and non-subsidized start-ups from 2015 to 2020



This suggests that subsidized start-ups have been more resilient to the disruption of the pandemic and have overall performed equally well or even better when it comes to turnover at least on the aggregate level. However, this result needs to be qualified, because subsidized start-ups started from a very low bar of an average turnover of only 18,039 lei in 2015. Non-subsidized start-ups had an average turnover of 101,857 lei in 2015, more than five times that of subsidized start-ups. As the low-performing subsidized start-ups drop out over time, they do not lead to

significant declines in aggregate turnover for the entire group. The remaining better-performing firms can still increase aggregate turnover.

The skin-in-the-game hypothesis

When a start-up is subsidized by taxpayer money, one might ask what the proportion of the subsidy is relative to the overall capital invested in the start-up and how this proportion affects the start-up's performance. In other words, one might ask whether skin in the game matters. Does it make a significant difference if a certain amount of private capital is invested in the business in addition to the subsidy? Basic economic considerations suggest that private capital invested, i.e., skin in the game, tends to improve the performance as private risk borne by the investors is directly linked to the amount of private capital invested (Taleb, 2018). The potential private cost of business failure increases with private capital invested. We refer to this idea as the skin-in-the-game hypothesis. Our results so far confirm the hypothesis as the group of private start-ups tends to perform better. But it is worth looking closer into the group of subsidized start-ups to see whether a similar effect can be identified on a subtler level.

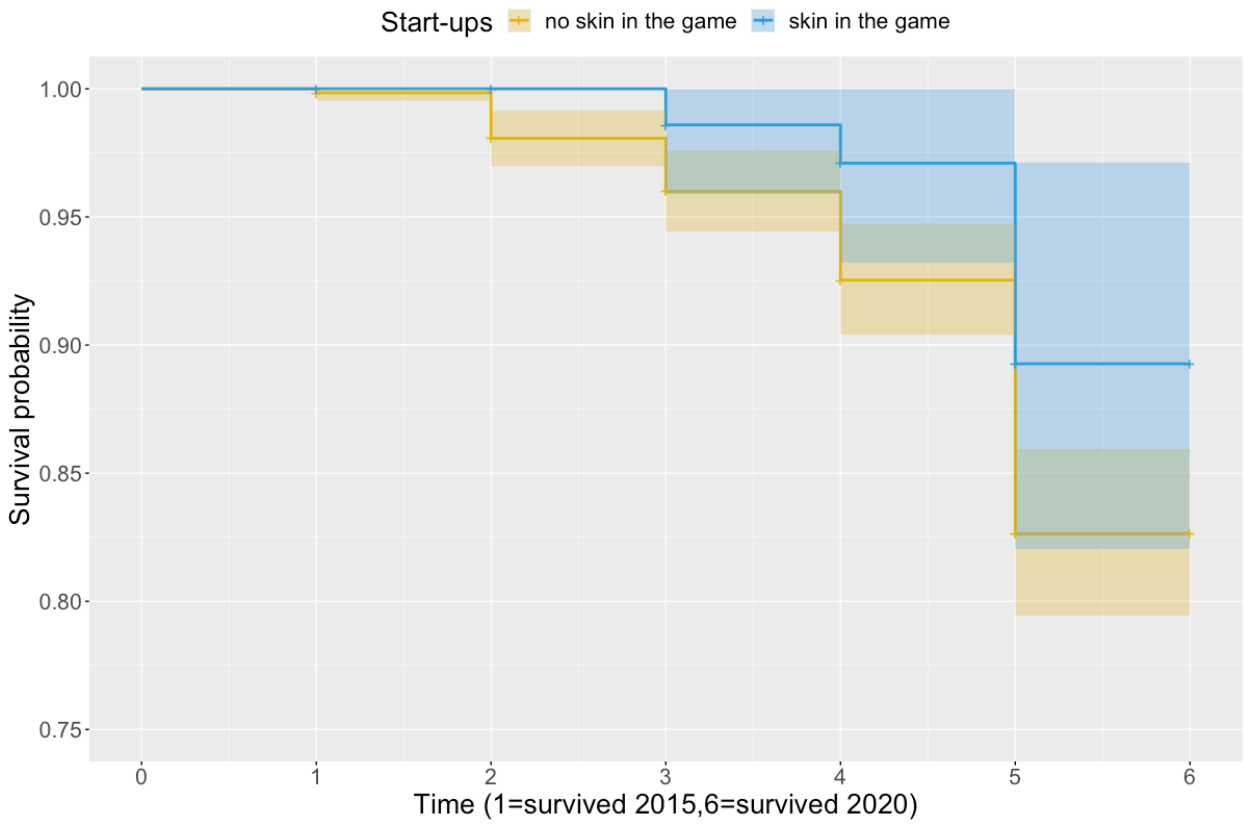
We are, unfortunately, limited in our ability to identify the subsidized start-ups' amount of private capital invested. Our data basis contains information about their fixed and circulating assets, as well as their prepaid expenses. This allows us to calculate the amount of total assets for each start-up as the sum of fixed assets, circulating assets and prepaid expenses. Knowing that the maximum amount for the subsidy per start-up is 111,125 lei, we can infer that any start-up with total assets of more than 111,125 lei in 2015 must have been financed additionally by private capital. This does not provide an exact demarcation line as some start-ups with total assets below 111,125 lei might also be financed partly by private capital, but we cannot know for sure. Given the data limitations this approach provides a good proxy. It allows us to divide the group of subsidized start-ups into two subgroups, those who definitely have skin in the game and those who are likely to have little or no skin in the game.

The subgroup of subsidized start-ups with skin in the game contains 75 firms. The other subgroup is significantly bigger and contains 635 firms. If we interpret missing values as sign of non-survival, we can see that survival rates are higher for start-ups with skin in the game. After 5 years there is a difference of almost 10 percentage points as shown in Table 3. But as before we need to be careful because of right-censored data. The Kaplan-Meier estimator does not lead to a statistically significant difference between the two subgroups as can be seen in Figure 4 by the overlapping confidence bands. The relatively small number of observations for start-ups with skin in the game might be a problem here.

Table 3: Survival rates of subsidized start-ups with no skin in the game and subsidized start-ups with skin in the game

Year	No skin in the game		Skin in the game	
	number	%	number	%
2015	635	100	75	100
2016	619	97.4	74	98.6
2017	568	89.4	71	94.7
2018	527	82.9	66	88.0
2019	458	72.1	62	82.7
2020	355	55.9	50	66.7

Survival rate in year X: ratio of the number of firms active in year X divided by the number of firms active at the end of 2015 (missing values being interpreted as non-active). Start-ups with kin in the game are identified as those start-ups with larger total assets in 2015 than the maximum amount of the subsidy per start-up (€111.125)



The evidence is only suggestive. A log-rank test over the entire follow-up time would not lead to a rejection of the null hypothesis of equal distributions at any common significance level. Only at a significance level of 20% or above would we reject the null hypothesis.

These results need to be put into perspective. The difference observed could be due to other reasons like size. Maybe the start-ups with skin in the game are performing better because they are bigger. A similar analysis for the group of private start-ups, however, suggests that it is not purely

the size of the firms that brings about the different results. The very same distinction between firms with total assets above and below 111,125 lei in 2015 in the group of private start-ups leads to less obvious differences in the estimated survival rates. The null hypothesis of a log-rank test would here be rejected only at a significance level of 50% or more. So, skin in the game seems to matter. Although we cannot draw statistically significant conclusions based on the data at our disposal.

Policy implications

Our analysis shows that the state-aid scheme failed to fulfill its objective, namely, "to support entrepreneurial initiatives in order to stimulate employment" (Romanian Government 2014, p. 3). Despite the seeming lack of success, the start-up subsidization measure was reintroduced a couple of years later, almost in the same form, although in more generous financial terms. Thus, the *Romania Start-up Plus* program increased the potential subsidy to €40,000. A twin program, *Start-up Nation*, financed from the national budget but observing the same European regulations, increased the potential subsidy even further to €50,000. These schemes subsidized tens of thousands of businesses. A public scandal emerged when the public discovered that many of the business projects approved by the government were subsequently put on sale on a major online marketplace.

The poor results of *Romania Start-up* are likely to arise from several causes:

1. First, the magnitude of the financial help (5 times the annual wage) and its main requirement (creating two jobs for six months) encouraged opportunistic behavior; some applicants became unproductive entrepreneurs or rent-seekers (Baumol, 1990), using the grants to cover salary costs (including their own wage), without a proper concern for the future of their company. It incentivized people to set up new businesses artificially, only to get the financial aid, and close their business as soon as possible afterwards. A similar phenomenon has been noticed by Pfeiffer and Reize (2000) in eastern Germany.
2. Secondly, the program financed a disproportionately large number of young and inexperienced entrepreneurs: half of the business plans funded with public money were initiated by students.
3. Thirdly, the government program did not manage to attract a high number of applicants, so the subsidies were awarded on a de facto automatic procedure, not on a consistent competitive basis. As Colombo et al. (2011) showed, discussing the case of policy measures to support high-tech start-ups, only subsidies provided on a real selective procedure have a significant positive impact.
4. Fourthly, and perhaps the most important factor, the program covered 100% of all eligible expenses and the mandatory private contribution was zero. The subsidized entrepreneurs had mostly no skin in the game. Therefore, they had little interest in working hard to develop "their" business.

The OECD's (2023) framework recommends having clear and measurable objectives for impact evaluations: business survival, sales growth, and employment growth in supported enterprises. Also, governments should assess the outcomes and use cost-benefit analysis to

calibrate their interventions. Following this advice, using the existing international evidence (good examples and bad examples) and acknowledging the weaknesses of the programs legislated so far are essential for an optimal design of policies that can indeed enhance entrepreneurship in Romania and elsewhere.

Conclusions

This paper investigates the difference between subsidized and non-subsidized start-ups in Romania, Using the list of firms set up with public grants offered by the *Romania Start-up* program in 2015 and the data set of non-subsidized firms initiated in the same year. Our research shows that this specific program failed to enhance entrepreneurship.

More precisely, we have shown that the survival rates of subsidized start-ups decreased after the first two years and became significantly lower than the survival rates of non-subsidized companies at the end of the 5-year follow-up period. Also, employment in subsidized firms decreased drastically, while it increased in non-subsidized start-ups.

Given the specificities of the *Romania Start-up* program, in particular the requirement that subsidized firms set up at least two jobs and preserve them at least six months, our results suggest that both the survival and employment of subsidized start-ups were heavily influenced in the short run (2015 and 2016) by legal rather than economic factors. After these requirements expired, the genuine viability of start-ups became manifest as the survival rate and employment tumbled for subsidized start-ups compared to the performance of non-subsidized start-ups.

Retrospectively, the *Romania Start-up* program was poorly designed to promote entrepreneurship. The applicants used the subsidies and the scheme features to become non-employers and to delay exit. Our conclusions are relevant on the European level, because the Romanian program was conceived within the framework of EU legislation on state aid and was funded by the EU's structural funds allocated to Romania. Future attempts to support entrepreneurship should mitigate the risks of moral hazard, adverse selection, and displacement of private funding with public subsidies.

References

Acs, Z. J. & Audretsch, D. B. (1989). "Job creation and firm size in the US and West Germany", International Small Business Journal, 7, 4, 9–22. DOI: 10.1177/026624268900700401.

Acs, Z., Åstebro, T., Audretsch, D., Robinson, D. T. (2016). "Public policy to promote entrepreneurship: a call to arms". Small Business Economics 47, 35–51. DOI: 10.1007/s11187-016-9712-2.

Alchian, A. (1950). "Uncertainty, evolution and economic theory." Journal of Political Economy 58(3): 211–221. DOI: 10.1086/256940.

Almus, M. (2004). "Job creation through public start-up assistance?" Applied Economics 36: 2015-2024. DOI: 10.1080/0003684042000201802.

Amezcua, Al., Grimes, M., Bradley, S., Wiklund, J. (2013). Organizational Sponsorship and Founding Environments: A Contingency View on the Survival of Business Incubated Firms, 1994-2007. The Academy of Management Journal. 56. 1628-1654. 10.5465/amj.2011.0652.

Bartlett, R. P., & Morse, A. (2021). Small-Business Survival Capabilities and Fiscal Programs: Evidence from Oakland. Journal of Financial and Quantitative Analysis, 56(7), 2500–2544. doi:10.1017/S0022109021000478

Battistin, E., Gavosto, A., Rettore, E. (2001). Why do subsidized firms survive longer? An evaluation of a program promoting youth entrepreneurship in Italy. In M. Lechner & F. Pfeiffer (Eds.), Econometric evaluation of active labour market policies in Europe (pp. 153–181). Heidelberg: Physica

Baumol, W. (1990). Baumol W. Entrepreneurship: Productive, Unproductive, and Destructive. Journal of Political Economy, pp. 893-921. http://www.jstor.org/stable/2937617

Boyer, T., Blazy, R. (2014). "Born to be alive? The survival of innovative and non-innovative French micro-start-ups." Small Business Economics 42: 669–683. DOI: 10.1007/s11187-013-9522-8

Butler, I., Galassi, G. & Ruffo, H. (2016). "Public funding for startups in Argentina: an impact evaluation." Small Business Economics 46: 295–309. DOI: 10.1007/s11187-015-9684-7.

Busu, M., Caraiani, P., Hadad, S., Incze, C. B. & Vargas, M. V. (2021). "The performance of publicly funded startups in Romania." Economic Systems 45(3): 100908,

Caliendo, M., Hogenacker, J., Künn, S., and Wießner, F. (2015): "Subsidized start-ups out of unemployment: a comparison to regular business start-ups." Small Business Economics 45: 165-190. DOI: 10.1007/s11187-015-9646-0.

Calvino, F., Criscuolo, C. and Menon, C. (2015), "Cross-country evidence on start-up dynamics", OECD Science, Technology and Industry Working Papers 2015/06, OECD Publishing, Paris.

Colombo, M. G., Grilli, L., Murtinu, S. (2011). "R&D subsidies and the performance of high-tech start-ups." Economics Letters 112(1): 97-99. https://doi.org/10.1016/j.econlet.2011.03.007.

Cox, D. R. (1972). "Regression Models and Life-Tables", Journal of the Royal Statistical Society, Series B. 34 (2): 187–220. DOI: 10.1111/j.2517-6161.1972.tb00899.x.

Dubard B., Laffineur, C. & Fayolle, A. (2017). "Public funding for business start-up programmes, a worthy investment?". Entreprendre & Innover 34: 50-56. DOI: 10.3917/entin.034.0050.

Duhautois, R., Redor, D., Desiage, L. (2015), "Long Term Effect of Public Subsidies on Start-up Survival and Economic Performance: An Empirical Study with French Data", Revue d'économie industrielle 149: 11-41. DOI: 10.4000/rei.6063.

Dvoulety, O., Srhoj, S. & Pantea, S. (2021). "Public SME Grants and Firm Performance in European Union: A Systematic Review of Empirical Evidence". Small Business Economics 57: 243-263. DOI: 10.1007/s11187-019-00306-x.

Eurofound (2016). Start-up support for young people in the EU: From implementation to evaluation, Publications. Office of the European Union, Luxembourg.

Eurostat. 2021. Business demography: metadata.
https://ec.europa.eu/eurostat/cache/metadata/en/bd_esms.htm

Fairlie, R.W. and Fossen, F.M. (2020). "Defining Opportunity versus Necessity Entrepreneurship: Two Components of Business Creation", in Polachek, S.W. and Tatsiramos, K. (Eds.) Change at Home, in the Labor Market, and On the Job (Research in Labor Economics, Vol. 48), Emerald Publishing Limited, Bingley, pp. 253-289.

Fuertes-Callén, Y., Cuéllar-Fernández, B., & Serrano-Magdalena, A. (2024). The impact of startup subsidies on survival, growth, and stakeholder value. Journal of Small Business Management, 1–29. https://doi.org/10.1080/00472778.2024.2387601

Kaplan, E. L.; Meier, P. (1958). "Nonparametric estimation from incomplete observations". Journal of the American Statistical Association 53 (282): 457–481. DOI: 10.2307/2281868

Kersten, R., Harms, J., Liket, K., Maas, K. (2017). "Small Firms, large Impact? A systematic review of the SME Finance Literature." World Development 97: 330-348. DOI: 10.1016/j.worlddev.2017.04.012.

Kösters, S. (2010). "Subsidizing Start-Ups: Policy Targeting and Policy Effectiveness." Journal of Industry, Competition and Trade 10: 199–225. DOI: 10.1007/s10842-010-0083-0.

Kuhnle, P., Israel, K.-F., Menges, M. (2019). "Real-life data on improvement of survival after perioperative chemotherapy versus surgery alone on resectable adenocarcinoma of the stomach–a single-center study." Zeitschrift für Gastroenterologie 57 (5): 606-610. DOI: 10.1055/a-0841-3513

Monte, A. D., & Scalera, D. (2001). The Life Duration of Small Firms Born Within a Start-up Programme: Evidence from Italy. Regional Studies, 35(1), 11–21. https://doi.org/10.1080/00343400120025646

OECD (2023). Framework for the Evaluation of SME and Entrepreneurship Policies and Programmes 2023. OECD Studies on SMEs and Entrepreneurship. OECD Publishing, Paris, https://doi.org/10.1787/a4c818d1-en.

Pellegrini, G. and T. Muccigrosso (2017). "Do subsidized new firms survive longer? Evidence from a counterfactual approach", Regional Studies, Vol. 51/10, https://doi.org/10.1080/00343404.2016.1190814.

Pfeiffer, F. and Reize, F. (2000). "Business start-ups by the unemployed – an econometric analysis based on firm data." Labour Economics 7: 629-663. DOI: 10.1016/S0927-5371(00)00016-6.

Reid, G.C., Smith, J.A. (2000). "What Makes a New Business Start-Up Successful?" Small Business Economics 14: 165–182. DOI: 10.1023/A:1008168226739.

Romanian Government (Ministry of European Funds). 2014. Schemă de ajutor de minimis. „Sprijin pentru antreprenori". https://www.fonduri-structurale.ro/Document_Files//resurseumane/00000030/yfx0w_ajdeminimis.pdf

National Business Capital and Services. "2019 Small Business Failure Rate: Startup Statistics by Industry." https://www.nationalbusinesscapital.com/blog/2019-small-business-failure-rate-startup-statistics-industry/

Santarelli, E., Vivarelli, M. (2002). Is subsidizing entry an optimal policy?. Industrial and Corporate Change 11(1)Ș 39–52, https://doi.org/10.1093/icc/11.1.39.

Schoar, A. (2010). "The divide between subsistence and transformational entrepreneurship". Innovation Policy and the Economy 10(1): 57-81. DOI: 10.1086/605853.

Shane, S. (2009). "Why encouraging more people to become entrepreneurs is bad public policy." Small Business Economics 33: 141–149. DOI: 10.1007/s11187-009-9215-5.

Siepel, J., Dejardin, M. (2020). "How do we measure firm performance? A review of issues facing entrepreneurship researchers." In Saridakis, G. and Cowling, M. (eds.) Handbook of Quantitative Research Methods in Entrepreneurship. Cheltenham: Edward Elgar.

Srhoj, S., Škrinjarić, B., & Radas, S. (2021). "Bidding against the odds? The impact evaluation of

grants for young micro and small firms during the recession". Small Business Economics, *56*(1): 83-103. https://doi.org/10.1007/s11187-019-00200-6.
Taleb, N. N. (2018). Skin in the Game: Hidden Asymmetries in Daily Life. London: Penguin.
U.S. Bureau of Labor Statistics. Business Employment Dynamics. https://www.bls.gov/bdm/us_age_naics_00_table7.txt
U.S. Small Business Administration. (2012). "Do economic or industry factors affect business survival?" https://www.sba.gov/sites/default/files/Business-Survival.pdf