



The impact of the EXIST Business Start-up Grant on corporate growth: A group comparison for Dresden (GER)

Introduction

The EXIST Business Start-up Grant (BSG) is one of the most important governmental programs in Germany to support founders by turning their business idea into action. This paper investigates the start-ups' corporate development using a peer group comparison on longitudinal data.

Research Question

Do BSG-funded start-ups outperform non-funded industry peers in terms of:

- (i) Risk of cessation
- (ii) Survival time
- (iii) Employment (FTE) development
- (iv) Revenue development

Keywords

- corporate growth, governmental start-up assistance, innovation policy, longitudinal analysis, peer group comparison

Conference pillars mainly addressed

- Leading edge concepts, tools and methods to assess impact of R&I policy
- Effects of and policy learning from impact evaluation

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- Cornelia Ernst, Dresden University of Technology
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Methods

Data set

The self-collected dataset was created by conducting desk research and field research (online survey) due to a lack of reliable and publicly accessible longitudinal micro-level data at the time (2017).

Cross-sectional

- **Treatment group (TBSG):** limited liability corporations (Ltds.) in Dresden (GER) funded by the BSG (n=21) [provided by dresden | exists, the local authority responsible for the BSG]
- **Control group (CBSG):** non-funded peers (n=18) which would have been eligible for a BSG funding. The eligibility criteria were assessed on information related to the Ltds.' time of incorporation, e.g. its registered object, in retrospect by two independent experts (four-eyes principle). Two independent datasets were merged, one provided by Dresden Chamber of Commerce and one retrieved from the database Amadeus.

Longitudinal

- Period of incorporation: 2008 - 2011
- Observation period: First five post-incorporation years [data on corporate development obtained from the two independent datasets and an online survey]

Measurement	(i) Risk of cessation	(ii) Survival time	(iii) Employment development	(iv) Revenue development
Method	Analysis of Differences			
	Cox proportional hazards regression	Survival time analysis	Two-way Analysis of variance	Cumulative odds ordinal logistic regression
Variables	Survival time by Treatment	Survival time by Treatment	Treatment and Year on FTE, Treatment and Industry on FTE	Revenue by Treatment, Industry, and Year
Specification	<ul style="list-style-type: none"> • Log-rank test • Scaled Schoenfeld residuals 	<ul style="list-style-type: none"> • Kaplan-Meier survival curves 	<ul style="list-style-type: none"> • Type III sums of squares • Bonferroni adjustment 	<ul style="list-style-type: none"> • Proportional odds • Post-estimation: discrete and marginal change

Results

(i) Risk of cessation

- Visual inspection of proportional risk of cessation (Figure 1) is inconclusive because the curves cross each other but lie in the same range overall. However, the result of a performed log-rank test ($p = .820$) provides evidence that the survival distributions of the two groups are not statistically different. This is supported by a test based on Schoenfeld residuals ($p = .397$).

(ii) Survival time

- Is almost equal (Table 1) between the two groups which blends into the result of almost equal risk of cessation.

(iii) Employment development

- Related to employment overall, Wilcoxon's two-sample rank sum test (Table 1) provides evidence to negate an overperformance by funded Ltds., which is displayed in Figure 2. On the contrary, groups' means indicate higher employment for the funded Ltds. (Table 1).
- For employment development, the results of Analyses of Variance are ambiguous and highly effected by outliers which is depicted in Figure 2. Over or underperformance of funded Ltds. depends on the industry sector.

(iv) Revenue development

- Related to revenue overall, independent t-test (Table 1) provides evidence to negate an overperformance by funded Ltds. Groups' medians indicate the same (Figure 3).
- Moreover, there are higher probabilities of generating higher revenue for control peers.

Figure 1: Kaplan-Meier survival curves.

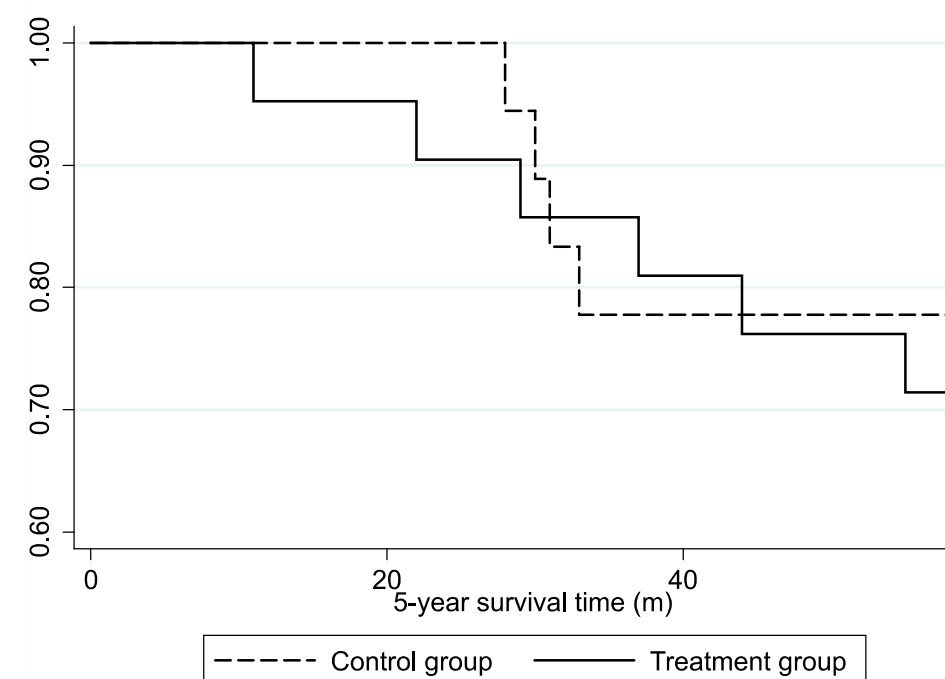


Table 1: Results analysis of differences for Survival time, Employment and Revenue by Treatment.

		n	M	Mdn	t-test	Wilcox.	r ²	M-W stat.
(ii) Survival time (5 years)	Total	39	52.8	60		.901	.000	.509
	Treatment	21	52.3	60				
	Control	18	53.3	60				
(iii) Employment	Total	72	8.9	3		.032**	.072 ^a	.654
	Treatment	47	9.6	2				
	Control	25	7.3	6				
(iv) Revenue (e.v.n.a.)	Total	76	4.2	4		.082*	.040 ^a	
	Treatment	46	3.8	3.5				
	Control	30	4.7	4				

n represents the amount of observations for Ltd. i in point of time j.

*, **, ***. Denote significance at 10%, 5%, and 1%, respectively (two-tailed test).

^a, ^b, and ^c. Denote effect sizes: small (^a): .01 ≤ r² < .09, medium (^b): .09 ≤ r² < .25, and large (^c): .25 ≤ r².

Figure 2: Median values of Employment by Year, n = 72.

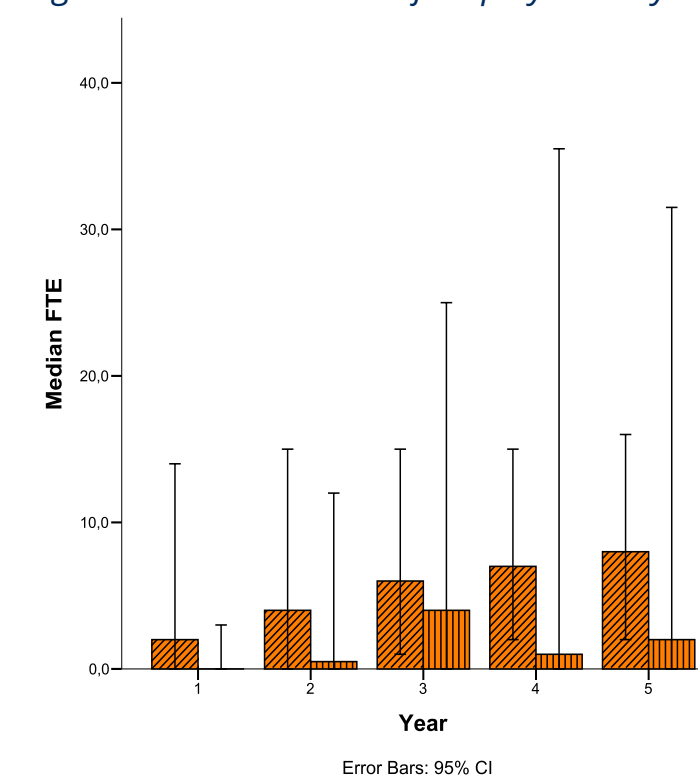
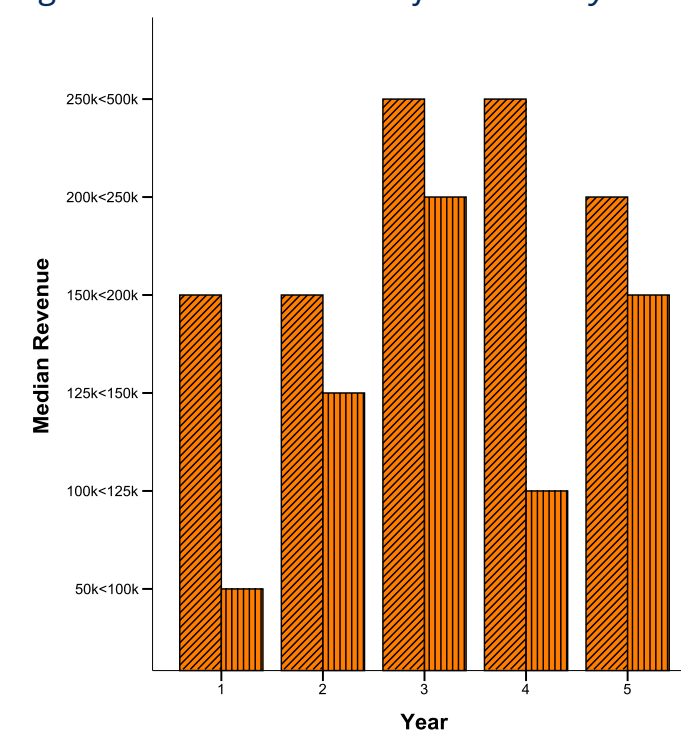


Figure 3: Medians values of Revenue by Year, n = 76.



Conclusion and Policy recommendation

- Funded Ltds. do not outperform industry peers in terms of (i) risk of cessation and (ii) survival time.
- Rather non-funded industry peers perform better than funded Ltds in terms of (iii) employment and (iv) revenue development.
- According to the online survey, for 8 out of 11 respondents it would have been unlikely or even very unlikely having founded without the BSG funding. So, treatment and control groups' Ltds. might differ in their pre-treatment willingness to incorporate.

→ The BSG in Dresden might not fund the founders ready to fly high, as intended, but helps start-up seeds to see the light of the day, which tally with the "theory of external assistance as the support option of last resort" (Juita-Elena (Wie) Yusuf 2017).

Policy recommendation

1. The start-up agents responsible for the BSG funding should increase active sourcing in order to not rely on the people who come in and apply for a BSG funding.
2. BSG funding might provide even more guided preparation during the one year funding period with regard to the "theory of outside assistance as a knowledge resource" by Chrisman and McMullan (2004).
3. Funded Ltds. should be encouraged to self-reliance by loosening university-related ties since proximity to university is not necessarily related to better performance of the start-ups (Doutriaux 1987).

Limitation and Further research

- Group sizes of 21 and 18 companies do not meet the self-proclaimed sample size threshold of $n > 30$, with regard to Student's t-distribution and the associated t-test.
- The results are not representative for Germany and must be interpreted even for the case of Dresden with caution.

Further research

1. Replicating on a larger sample size to meet the threshold of $n=30$, at least.
2. Detecting peers with another method, e.g. text mining the companies' object, to certify judges' matching (investigator triangulation).
3. Verifying the same pre-treatment conditions for the two groups to justify the matching.
4. Conducting qualitative analysis to investigate the reasons for the corporations' development on an individual basis.
5. Taking advantage of variables from the self-collected dataset, which are not considered in this paper already, e.g. Year of incorporation.

Chrisman, J. J., & McMullan, W. E. (2004). Outsider Assistance as a Knowledge Re-source for New Venture Survival. *Journal of Small Business Management*, 42(3), 229-244.
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Juita-Elena (Wie) Yusuf. (2017). The effectiveness of entrepreneurial start-up assistance programs: Evidence from the U.S. Panel study of entrepreneurial dynamics. In *Preventing Ageing Unequally* (pp. 1-9). OECD Publishing.