# EFFECTS OF A STATE SUBSIDY PROGRAMME IN THE SMALL BUSINESS SECTOR: THE CASE OF THE EMERGING MARKET

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# **Abstract**

This paper examines the effects of the state subsidy programme on the beneficiary's firm operating status in the small business sector. The state subsidy is a matching grant-funded programme to black small businesses in South Africa to improve their competitiveness within the mainstream economy. A cross-sectional time-series secondary dataset of 945 beneficiary firms from 2012 to 2016 was utilised in the study. Data were analysed using a descriptive, multiple comparison Scheffé test and binary logistic regression technique estimated at 95% confidence intervals level of significance. The findings revealed that the state subsidy programme is a pivotal contributor to the black firm's operating status; firms in the services and construction sectors show significant improvement in their operating status and had about twice the odds of being in operation compared to firms in the manufacturing and agricultural sectors. This study will assist state programme administrators and policymakers to realise the importance of the services sector, which emerged as a major driver of innovation in the growth of local economies (Kazekami, 2017). Neglecting the sector might be counterproductive in case of a similar programme in the future. This study is limited by scope as only one state subsidy programme in South Africa was studied which may not be enough to make an inference.

**Keywords:** State Subsidy, Operating Status, Performance, Small Business, Services Sector

**Authors' individual contribution:** Conceptualization — T.O.A.; Methodology — T.O.A.; Formal Analysis — T.O.A.; Investigation — T.O.A.; Writing — Review & Editing — T.O.A.; Supervision — N.B.; Funding Acquisition — N.B.

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### 1. INTRODUCTION

In post-apartheid South Africa, the government introduced various initiatives and policy programmes to support start-up and existing small businesses on improving their performance and sustainability (Rogerson, 2004; Mason & Brown, 2013; Spigel, 2017). The support initiative instruments hinge on widely recognised theoretical and empirical

studies and acknowledge the role that small businesses play in equitable and inclusive socio-economic development through self-employment and job creation (Jili, Masuku, & Selepe, 2017; Bartik & Erickcek, 2014). For example, in South Africa, the fiscal policy achieves an appreciable level as an effective tool for poverty and inequality reduction (Inchauste et al., 2017). Rungani and Potgieter (2018) indicate that the small business sector in South

Africa accounts for approximately 60% of total employment in the country and contributes about 42% to the country's gross national output. Government initiatives include a statutory and strategic policy that guides the institutionalisation of small business support processes, systems, and procedures within and among the programme management, administrations, and the targeted beneficiary (Koens & Thomas, 2016).

Nevertheless, government support for the development and growth of small businesses has been controversial and inconsistent due to various challenges affecting their operating status post-1994 (du Plessis, 2014). Some of the challenges include programme design, implementation, and utilisation. For example, a great deal of funding has been invested where there have been direct contributions improving small business growth sustainability. The debate on the current issue is deeply problematic and mainly focuses on the outcome but ignores the programme implementation process (Muthathi, Kawonga, & Rispel, 2021). Some of the South African governments initiated programmes for small businesses, which shows that small businesses remain at the forefront of the policy. However, most programmes are controversial or have not been tested or successful due to their structural and functional approach (Peters & Naicker, 2013). One such programme is the Black Business Suppliers Development Programme (BBSDP). The BBSDP was established in 2002 by the South Africa government as intervention assets financing programme for black small businesses to grow and participate in the mainstream economy. The BBSDP provides grants funding to a maximum of one million rands (ZAR) in a cost-sharing arrangement subsidy between the state and beneficiary firms. Beneficiaries of the grant consist of formal small businesses in operation for a year or more with their shareholding held by the black majority.

However, no study provided evidence to show that the BBSDP is fulfilling its mandate or that the programme is effective. Consequently, this study examined the effects of a state-subsidy programme in the small business sector in terms of allocation and utilisation of the funded programme using firm cross-sectional time-series data from 2012 to 2016.

The structure of this paper is as follows. Section 2 reviews the relevant literature. Section 3 analyses the methodology that has been used to conduct the empirical research. Section 4 presents the results and discussion and Section 5 presents the conclusion, implication of the study, and the needs for future research.

### 2. CONCEPTUAL FRAMEWORK

According to Ayandibu and Houghton (2017), small business contributes to the country's economic growth and promote competitiveness in functioning markets. Their performances are regarded as the cornerstone of the country's progress towards inclusive growth and development (Molefe, Meyer, & de Jongh, 2018). Small business performance is defined as the analysis of the work habits of firms conduct at specific points that evaluate the magnitude to which business goals have been achieved (Al Mamun, Ibrahim, Yusoff, & Fazal, 2018).

This study aims to measure the extent to which the objectives of a resources base intervention programme are being achieved, whether at output, outcome, or impact levels (Kusters, 2011). According to Mandl, Dierx, and Ilzkovitz (2008), the level of effects of state subsidy programmes for small business shows the relationship among the inputs, the outputs, and the outcomes. This is a process of productivity designed to attain certain set goals which represents the process through which resources inputs are transformed into produced outputs (Mihaiu, Opreana, & Cristescu, 2010; Roghanian, Rasli, & Gheysari, 2012). Sutanto, Sigiols, and Putih (2018), using the resource-based view theory, identify the constructs of small business access to resources as a dimension that positively influences business performance. Chen, Michel, and Lin (2021) suggest that the resource-based view theory is a key input and determining factor of the performance by using aptly firm's internal organisational capabilities and available resources to produce the desired outputs and results (Al Mamun et al., 2018). Therefore, the resourcebased view theory recognises firms as a central element of the strategic management process which involves managing heterogeneous resources to sustain a firm's competitive advantage (Gerald, Obianuju, & Chukwunonso, 2020). Heterogeneity of resources remains a fundamental central feature in the relationship between small business and resources required to pursue and create a sustainable competitive strategies opportunity that exists in an emerging market (Akpan, Udoh, & Adebisi, 2020).

Recognising the relationship between small business failure and the business sector, Adobor (2020), Neely and Bourne (2000), and Barbosa (2016) proposed a conceptual model of small business performance. The model suggests that performance outcomes are a function of many variables, including institutional support, access to capital, access to market, the matching of investment and financing, and ownership structure. Furthermore, in the annual surveys aimed at examining small business status in South Africa and conducted among a small business panel of 300 businesses over four years between 2007 and 2010, Ligthelm (2011) identified human factors in small businesses and specifically, entrepreneurial actions and business management skills as the strongest predictors of small business survival.

The South African economy is rooted in the primary economy, focusing on mineral resources and agriculture; however, the last two decades have shown that the country has been driven mainly by the tertiary sector, including the wholesale and retail trade, tourism, and communications (Swatuk, 2010). Interestingly, there are various business players in the sectors contributing to economic growth. For example, the key economic sectors' performance 2019 in South Africa indicates that during the agriculture sector had added around 1.88% to the GDP. Other sectors such as the manufacturing and services sectors contributed 26% and 61% of the total GDP value in the same year (Statista, 2021). Growth in the services sector has been remarkable and consistent over the last decade. The sector contributed the most to employment in South Africa and primarily operated among small businesses. Sectors such as agriculture, at the time, could still be

described as essential, although manufacturing and construction-related activities had already become quite remarkable as well.

Kazekami (2017), examining Japanese microdata on manufacturing sectors within the local economy, demonstrated that service sectors improve non-tradable activity productivity, thereby increasing employment. The service sector activities are determined by the size of the local economy, which, in turn, is determined by the manufacturing sectors (Kazekami, 2017). The study further found that the significant demand for the service sector encourages competition and brings about productivity efficiency among firms in the manufacturing sectors, which adds value to service sectors as employment increases (Kazekami, 2017).

In a study conducted in Australia, McMahon (2001) suggests that greater dependence upon external finance is associated with better business growth. He utilised an approach to examining the effect of public funding, considering potential biases using Danish firms' data from 1998 to 2005. The study found strong evidence of complementary effects of a 1% increase in public funding yielding 0.08% to 0.11% increase in private research and development, primarily for firms in the services sector (Bloch & Graversen, 2012; Un & Montoro-Sanchez, 2010).

Brown, Foster, Norton, and Naschold (2001, p. 46), in their study for the Centre for Aid and Public Expenditure United Kingdom (UK), explore why a sector-wide approach provided an increased opportunity to address sector-wide problems at macro and sector levels. The study found that the agricultural sector did not perform as well as the social sector. Many problems stem from the more limited, more contested, and shrinking state's role in the agricultural sector. It was also argued that sector programmes had worked best where the critical constraints on sector development are the responsibility of a single ministry. In contrast, agricultural development requires coordinated interventions across sectors.

Kristiansen, Furuhold, and Wahid (2003) indicated that financial flexibility significantly correlated to business success in Indonesia. In Brazil, for example, Barbosa (2016) suggested in his study on the determinants of small business survival in the manufacturing sector, the effect of working capital perfectly mirrors the classical curves of economic order quantity and economic production quantity. This suggests that the costs of investing in working capital affect the probability of small business survival in the manufacturing sector. Though, small businesses that took advantage of family and third-party investment experienced a higher level of success (Kleinert, Volkmann, & Grünhagen, 2020; Kimando, Sakwa, & Njogu, 2012; Blowfield & Dolan, 2014; Un & Montoro-Sanchez, 2010). Prior studies on the services sector indicate that one of the most important determinants of a firm's sustainability in the services sector is funding, and the role is to foster economic growth but, no conclusive findings regarding its effects on firms' innovative behaviour (Binelli & Maffioli, 2007). An important issue in services sector policy is whether public intervention activities are a substitute or a complement to privately supported activities.

In a case study, Grimes (2010) distinguished social entrepreneurs according to their importance by tracking and measuring their performance and found that firms within the social sector employed performance measurement not just as a means of accountability but also as a tool for making sense of social entrepreneurship status within the social sector of operation. In an in-depth qualitative survey interview, Chapman, Crow, and Brown (2007) explored potential barriers to developing the social enterprises' sector and found that key stakeholders in the public sector assume that there is a value continuum between the voluntary and public sectors. The study concludes that the closer a firm is to the voluntary and public sector, the more likely it will be driven by its social values, which supports the view that social enterprises are both "value-led" and "market-driven" (Chapman et al., 2007).

# 3. RESEARCH METHODOLOGY

Data used in the study was extracted from the BBSDP database over the sample financial period from 2012 to 2016. The total number of firms on which data was collected was 945 firms. Firm operating status was the binary response variable (not operating = 0; operating = 1) while the sector was the categorical covariate (services = 1; manufacturing = 2; construction = 3) in the model. Frequencies, descriptive statistics, binary logistic regression analysis were conducted in the analysis. The Stata 12 was used to perform statistical analysis.

# 3.1. Descriptive statistics

Descriptive statistics which include minimum, maximum, sum, mean, standard, and deviation were computed for the purpose of determining the degree to which access to a state subsidy programme by firms influences their operating status. Also, a multiple comparison Scheffé test for sectorial grant coverage was conducted to determine the differences between sectors performance of the beneficiary firms of the programme.

### 3.2. Binary logistic regression

The binary logistic regression through the origin for the overall model, cross-sectional logistic regression analysis through the origin at a sectoral level was analysed to determine the effects distinct exploratory variables had on the sector performance of the firm operating status. The binary logistic regression analysis was applied to estimate odds ratios with 95% confidence intervals based on the function:

$$\pi = Pr(Y_i = 1 | X_i = x_i) = \frac{exp(\beta_0 + \beta_1 x_i)}{1 + exp(\beta_0 + \beta_1 x_i)}$$
 (1)

$$logit(\pi_i) = log(\frac{\pi_i}{1 - \pi_i}) = \beta_0 + \beta_1 x_i$$
 (2)

where, Y is the binary response variable (such that  $Y_i = 1$  denotes being in operation, and  $Y_i = 0$  denotes not being in operation), and  $X_i$  represents a set of covariates (such that  $X_i$  = services sector,

 $X_2$  = manufacturing sector, and  $X_3$  = construction sector; for which  $x_i$  is the observed value of the covariate for the given observation  $\hat{y}$ .

A comparison was made between the log-likelihood values of the two nested models, the base model and the model with a predictor to determine whether adding the covariate could fit the model better. Log-likelihood values are typically negative, and improvement in the log-likelihood to a smaller negative number shows that adding predictors fit the given data better. Model fit was evaluated based on the likelihood ratio test calculated as:

$$G^{2} = -2ln(\frac{L_{0}}{L_{1}}) = (-2lnL_{0}) - (-2lnL_{1})$$
(3)

where, -2ln2LLK signifies the likelihood for the base model with only a constant, and -2lnL represents the model with the predictor. The pseudo R-squared  $(G^2)$  measured the proportion of observed variation in firm operating status accounted for by the categorical predictor sector. The classification summary statistics were calculated to assess the sensitivity and specificity of the model. Since classification is sensitive to each constituent group's comparative sizes and constantly favours classification into the larger group, classification statistics were computed to measure the overall rate of correct classification. Sensitivity is the portion of observed positive outcome cases that are properly classified, and specificity refers to the fraction of observed negative outcome cases correctly classified. The area under the nonparametric receiver operating characteristic (ROC) curve was produced to examine the model's predictive power.

Alternative statistical estimation method can also further be applied to estimate the hypothesis developed in this study, such method is the logbinomial regression model, which is a generalised linear model with binomial family and log link. Similar to logistic regression, the log-binomial model is a special case of a generalised linear model which applies a log link function to binomial outcome data, in which the model takes the functional form shown by the equation below:

$$\log \pi = a + \beta_1 X_1 + \dots + \beta_P X_P \tag{4}$$

where,  $\pi$  denotes P[Y = 1] for some realised binary outcome.

These special cases of a generalised linear model owe their naming to the fact that the outcome is binomial and a link function is a natural logarithm; hence log-binomial. The classical estimation procedure for the generalised linear models becomes anchored on maximum likelihood estimation. In that generalised linear model, the outcomes Y emerge from distribution within an exponential binomial distribution, and the mean  $\mu$ , of the distribution, is on a set of variables X, such that:

$$E(Y) = \mu = g^{-1}(X\beta) \tag{5}$$

where, E(Y) is the expected value of Y,  $X\beta$  signifies the linear predictor, g denotes the link function. Therefore, theoretical and empirical research on growth activities in the beneficiary firms needs to be expanded.

# 4. RESULTS AND DISCUSSION

This section presents results obtained from statistical data analysis computed in order to address the research objectives of this study. The results are presented in the following sections: subsection 4.1 presents descriptive statistics of outcomes of frequency responses of beneficiary firms sectors relating to their coverage and small business performance. Subsection 4.2 presents results on binary logistic regression estimates and the area under the nonparametric ROC curve that examine the model's predictive power.

# 4.1. Descriptive analysis

This section provides descriptive statistics of variables under each construct. The specific descriptive statistics presented include the arithmetic means, standard errors of the means, standard deviations and the mode statistics. The computed arithmetic means show the average sector frequency under the BBSDP programme while the standard deviations of means show the degrees of reliability of arithmetic means. Furthermore, the standard deviations measure the magnitudes at which each sector responses are dispersed from the average (arithmetic mean) responses, the mode shows the most frequent or common responses by each sector of the programme. Descriptive statistics results are given in Tables 1 and 2.

Table 1. Sector and frequency under the grant programme between 2012 and 2016

Sector	Year					Total	Payaout and fundament	
	2012	2013	2014	2015	2016	างเลเ	Percentage frequency	
Services	66	96	166	203	107	638	67.5	
Retail	4	0	0	0	0	4	0.4	
Manufacturing	9	28	22	24	31	114	13	
Construction	31	63	23	0	71	188	19	
Agriculture	1	0	0	0	0	1	0.1	
Total	111	187	211	227	209	945	100	

Source: Authors' elaboration.

Firms in the state subsidy programme are more into the service and construction sector with 67.5% and 19% representation, respectively. With these statistics, it can be concluded that the state subsidy programme contributed to the performance and growth of the service and construction sectors of the beneficiaries' firm. The manufacturing sector

has 114 firms (13%), while the retail and agricultural sectors were less represented with as little as 0.4% and 0.1% of the total sample. The result is consistency with Statista (2021) reports, that growth in the services sector has been remarkable and consistent, and contributed the most to employment creation in South Africa over the last decade.

**Table 2.** Multiple comparison Scheffé test for sectorial grant coverage

Sector (I)	Sector (J)	Mean difference (I-J)	Standard error	P-value
	Manufacturing	-12.000	4.320	0.090
Agriculture	Services	-27.400*	4.320	0.000
	Construction	-51.000*	4.320	0.000
	Agriculture	12.000	4.320	0.090
Manufacturing	Services	-15.400*	4.320	0.022
	Construction	-39.000*	4.320	0.000
	Agriculture	27.400*	4.320	0.000
Services	Manufacturing	15.400*	4.320	0.022
	Construction	-23.600*	4.320	0.001
	Agriculture	51.000*	4.320	0.000
Construction	Manufacturing	39.000*	4.320	0.000
	Services	23.600*	4.320	0.001

Note: \* The mean difference is significant at the 0.05 level.

Source: Authors' elaboration.

A multiple comparison Scheffé test for sectorial grant coverage carried out for the state-subsidy programme shows significant differences between the agricultural, service and construction sectors; manufacturing sector, service and construction sector; agricultural and the service sectors and between the service sector and construction sector.

# 4.2. Binary logistic regression estimates

In this section, the binary logistic regression estimates with 95% confidence intervals

the classification summary statistics the calculated estimate that test the sensitivity and specificity of the model were presented. The results of the case-processing summary, sector of firm's operating status and odds ratios for operating status were also presented.

Based on the table below, 945 firms were included in the cross-sectional logistic regression analysis.

**Table 3.** Case processing summary

	Cases					
	Valid		Missing		Total	
	N Percent		N	Percent	N	Percent
Sector of firm operating status	945	100.0%	0	0.0%	945	100.0%

Source: Authors' elaboration.

**Table 4.** Sector of firm operating status cross tabulation

			Firm opera	Total	
			Not operating	Operating	10141
Services		Count	194	474	668
	services	% of total	20.5%	50.2%	70.7%
Sector	Manufacturing	Count	36	83	119
		% of total	3.8%	8.8%	12.6%
	Construction	Count	48	110	158
	Construction	% of total	5.1%	11.6%	16.7%
Total		Count	278	667	945
		% of total	29.4%	70.6%	100.0%

Source: Authors' elaboration.

Results presented in Table 4 reveal that from 29% (n = 2) of firms that were no longer operating relative to the total 945 firms in the study, the relative lowest proportion of firms in the manufacturing sector (4%, n = 36) were no longer operating at the period the data was collected. The manufacturing sector had the lowest proportion of firms operating relative to the total number of firms in the entire sample. The most significant and largest proportion of firms (about 71%, n = 668) from the total 945 firms were in the services sector, followed by about 17% (n = 158) of firms in the construction sector and 13% (n = 119) of firms in the manufacturing sector.

**Table 5.** Odds ratios for operating status\*

Logistic regression					No. of obs. = 945			
					$LR Chi^2(3) = 132.84$			
Log-likelihood = -581.99179				Prob. > Chi2:	= 0.0000			
Sector	Odds ratio	S. E.	Z	P > IzI	[95% Con	f. interval]		
Services	2.443299	0.208	10.48	0.000	2.067415	2.887523		
Construction	2.291667	0.396	4.79	0.000	1.632696	3.216604		

Note: \* Manufacturing sector was used as the reference category.

Source: Authors' elaboration.

The odds ratios (Table 5) are all statistically significant at the 5% level and lie within the respective 95% confidence intervals. Results indicate that firms in the services and construction sectors had about twice the odds of operating than firms in

the manufacturing sector. The LR Chi-square statistic (132.84) indicates the significance of the full model with a predictor. At the same time, significant variation in firms' operating status was accounted for by the sector in which a given firm operates.

Table 6. Classification summary statistics for the model

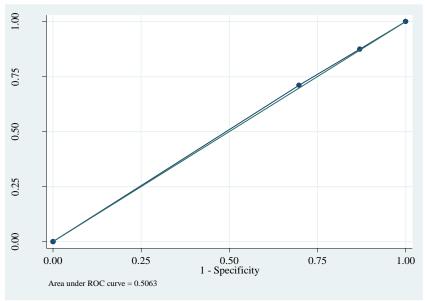
Classified		Total				
	D	~ D	Total			
+	667	278	945			
-	0	0	0			
Total	667	278	945			
Classified + if predicted Pr (D) $\geq$ 0.5						
True D defined as grant scheme! = 0						
Sensitivity		Pr (+I D)	100.00%			
Specificity		Pr (-I ~D)	0.00%			
Positive predictive va	lue	Pr (D +)	70.58%			
Negative predictive v	alue	Pr (~DI-)	=			
Correctly classified		_	70.58%			

Source: Authors' elaboration.

Results on model sensitivity indicate that 100% (667/667) of the firms in operation were correctly classified. Similarly, the result on specificity indicates that zero percent of the firms surveyed no longer operating were correctly classified. The model

yielded predicted  $p \ge 0.05$  for 945 firms, from which 667 firms (the computed positive predicted value = 70.58% (667/945)) were operating. Overall, the model correct classification rate was 70.58%.

Figure 1. Area under the receiver operating characteristic (ROC) curve\*



*Note:* \* *Null hypothesis: true area = 0.5.* 

Source: Authors' elaboration.

To evaluate the predictive power of the model, the area under the ROC curve was computed. Since the model with no predictive power would be a 45-degree line with an area exactly equal to 0.5, the calculated area (0.5063) under the curve (Figure 1) indicates that the model contained some marginal predictive power.

# 5. CONCLUSION

Arising from the study's findings, the results support earlier arguments that show that state funding is a key contributor to the firm's operating status and growth in each sector (du Plessis, 2014). Still, the state funding programme must be supplemented with other funding sources, such as foreign, private organisations, and domestic companies (Bloch & Graversen, 2012). This study's

objective has provided some clarifications and empirical evidence of state subsidy programme effects in the small business sector on black-owned firms in South Africa from 2012 to 2016. The approach has been to investigate the sector effects of the programme post-subsidy disbursement. Results presented reveal that the relatively lowest proportion of firms in the manufacturing sector was no longer operating when the data was collected. This makes the sector the lowest proportion of firms operating relative to the total number of firms in the entire sample. For example, from the total number of 945 firms sampled in the study, 67.5% of the firms are in the service sector, while the construction sector had a representation of 19%. Although the manufacturing sector also has 13% (which translates to 114 firms), The retail and agriculture sectors are less represented, with as little

as 0.4% and 0.1% of the total sample. The cross-sectional logistic regression analysis shows that 29% of the sample firms were no longer operating, out of which 4% were in the manufacturing sector. The most significant proportion of about 71% of firms in the services sector is still in operation, followed by about 17% of firms in the construction sector and 13% of firms in the manufacturing sector at the time of data collection.

Findings from the study have implications for theory and practices. First, the literature in the study on the importance of firms in the services sector provides the idea that the services sector benefited significantly (Bloch & Graversen, 2012; Un & Montoro-Sanchez, 2010) from the state subsidy programme compared to the manufacturing and construction sectors. Support from state funding is critical; it enables firms to invest in formal research and development (R&D) and hire qualified employees for efficacy output and cannot be substituted for private financing on innovation (Ligthelm, 2011). The service sector's significant role in servicing every local economic activity, be it manufacturing or construction, cannot be understated. The service sector is valued as the driving force for the local economy (Kazekami, 2017). The sector encourages competition, improves productivity and efficiency, and the spillover effect heightens the productivity performance of the manufacturing sectors (Barbosa, 2016). However, firms must seek other sources of financing for their operations (Chen et al., 2021; Akpan et al., 2020).

Secondly, the paper has implications for state programme administrators and policymakers, such that neglecting the importance of the services sector, which have emerged today as drivers of innovation, might have great effects on the growth of local economies. The analysis indicates that the sector plays a stop-gap role among other sectors,

which shows more significant public support than the manufacturing and construction sectors (Bloch & Graversen, 2012). Therefore, it is important to look at a subsidised programme tailored towards improving the activities of the services sectors. Besides, the employment creation of the services sector is enormous, and the sector could solve many unemployment issues, especially among the youth. According to the findings, the state subsidy programme is a key driver of firms operating sustainability status. Research on the state-subsidy programme policies designed to foster sectoral financial sustainability in firms should be considered while theoretical and descriptive analyses are done.

This study estimated the effects of a state subsidy programme on the beneficiary's firm operating status in the small business sector in South Africa. The study used secondary data and no first-hand surveys or interviews were done with stakeholders within the beneficiary's firms of the programme. This would have given more insight into the environment in which the black small businesses are operating. Unfortunately, due to COVID-19 lockdown and restrictions, it was not possible to use primary data. The fact that only one programme was studied, an expansion of this study on a similar programme would preferably, which can provide a different conclusion. Also, other possible measurements effects can be explored for future research, such as the development of an impact measurements framework for state-funded programmes, basing the impact on a programme designed or business models, etc. Furthermore, future research may also focus on what programmes can be offered for firms to make them more sustainable and better adapted to growth requirements.

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