

The Impact of Venture Capital Financing on SMEs Growth and Development in Ghana

Christian Biney*

Business School, University of Ghana, Legon, Ghana

Abstract

The purpose of this paper is to investigate the impact of venture capital financing on SMEs growth and development in Ghana. SMEs play a significant role in the economic development of both developed and developing countries. We applied matching methods by combining PSM-DiD estimation to compare venture backed SMEs with non-venture backed SMEs.

We found positive and significant association between venture capital financing and SMEs with regards to increased employment and sales growth. Our empirical results revealed that venture backed SMEs as compared to non-venture backed SMEs experienced increased sales and employment growth by 1.5 percent and 3.7 percent, respectively.

One limitation which arises from using PSM-DiD methods to determine the impact of venture capital financing on SMEs growth is that venture capital financing by nature is endogenous. Consequently, the PSM-DiD methods may not adequately be able to address endogeneity problems that may arise from our estimation. Thus, our impact assessment may be inconsistent due to bias selection. Another limitation is that the study only demonstrates a significant impact of venture capital funding on SMEs' growth in a cross-sectional model, while the long-term effect is not included because many of the SMEs are young. Hence, a longitudinal data analysis of our study may show different results.

The results suggest that SMEs which received VC financing experience better performance in terms of sales and employment growth as suggested. The government should therefore take a holistic approach that strengthens the venture capital market by providing enabling macroeconomic environment alongside the financial resources for SMEs entrepreneurs who chose to access venture capital funding to support the growth and development of SMEs in Ghana.

There are limited studies focused on impact of venture capital financing on SMEs performance especially in developing countries. There is no study assessing the effects of venture capital financing on SMEs growth especially in Ghana to the best of our knowledge. This paper provides an insight on the effects of adopting venture capital as funding sources for SMEs growth in Ghana. The paper also indicates the implications of SMEs accessing venture capital to finance their business operations. This paper concludes that SMEs owners should be encouraged to access venture capital financing to improve their business performance. In addition, policy makers should put in place policy measures such as giving tax incentives to Venture Capitalists in order to make venture capital funding easily available to prospective SMEs owners.

Keywords: Small and medium-sized enterprises; Venture capital financing; Accessibility; Entrepreneurs; financing

Introduction

Most governments have acknowledged the significant effect of small-sized enterprises on economic development. It has been well documented in the economic literature that SMEs are a catalyst for economic development [1]. SMEs' growth has attracted considerable interest among policymakers, development experts, entrepreneurs, financial institutions, venture capital firms, and NGOs [2]. Tambunan [3] states that SMEs perform a vital role in national development in the area of employment generation and GDP growth, in both developed and developing countries. Similarly, Qureshi and Herani [4] states that SMEs make considerable contributions toward GDP, income generation, tax contributions, fostering innovations, job creation, increasing revenue, enhancing human capital, alleviating poverty, and improving the living standards and quality of life in a nation.

However, the existing literature recognizes a gap in financial support for SMEs in Ghana. For instance, Abor and Biekpe [5] assert that obtaining finance is a significant obstacle facing Ghanaian SMEs. Furthermore, according to a study conducted by Aryeetey et al. [6] 38% of Ghanaian SMEs listed credit as a critical impediment to their

development. Aryeetey et al. [6] claim that in Ghana over half of the micro-enterprises which apply for loans are likely to be rejected and only half of the small enterprises which apply for formal finance such as loans from banks are likely to be considered. In Ghana, it has often been acknowledged that high risk linked with lending to SMEs, high-interest rates, guarantee requirements and burdensome procedures are impediments to SMEs obtaining loans from banks [7-9]. There are limited studies focusing on impact of venture capital financing on SMEs performance especially in developing countries. To the best of knowledge, there are no studies evaluating the effects of venture capital financing on SMEs growth especially in Ghana. This study

*Corresponding author: Biney C, Business School, University of Ghana, Legon, Ghana, Tel: +233302500381; E-mail: bychris2002@gmail.com

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seeks therefore, to empirically investigate the effects of venture capital financing on the growth and development of SMEs in Ghana.

Literature Review

Venture capital is defined as “as capital provided by firms who invest alongside management in young companies that are not quoted on the stock market. The objective is a high return on the investment. The young company created value in partnership with venture capitalist’s money and professional expertise” [10].

EVCA defined venture capital as professional equity that is co-invested with the entrepreneur to fund an early stage (seed and start-up) or expansion venture. Offsetting the high risk, the investor expects a higher than average return on the investment. Venture capital is a subset of private equity.

Venture Capital refers to a subset of Private Equity, which is equity investment made to support the pre-launch, launch and early-stage development phases of business [10]. Private equity investments are expended in companies during the expansion phase when the firms have established products, markets, and stable cash flows history. In contrast, venture capital investments are expended in the earlier stages of the life-cycle of a firm when the trustworthiness of its business model is still in the process of being acknowledged.

Empirical Studies on the Impact of Venture Capital Financing on SME’s Growth

Numerous studies have analysed the effect of VC investments on business growth by depending on matched pair methods or cross-sectional regression by comparing sales growth, employment or the total assets of VC-funded and Non-VC-funded businesses [11-14]. In general, a positive correlation between VC funding and growth is observed, though the results differ [15]. The authors using hand-collected data argued that VC backed companies in Europe do not grow and create jobs faster than Non-VC backed companies because of the immaturity of European venture capital. Further, they also found that VC backed companies do not generate more sales and employment than Non-VC backed companies. However, VC backed companies which perform R&D appear to increase their sales less than Non-VC backed companies [16-19].

Engel and Keilbach [12] studied some extensive records that contained almost all registered companies on the German trade register and used matching methods to compare VC-backed businesses with Non-VC backed businesses. The authors found that growth in employment of VC-backed businesses was about twofold larger than Non-VC funded counterparts. On the contrary, Bottazzi and Da Rin [15] used data from the period 1996-2000 on 511 businesses listed on the European new stock market; the authors found no evidence of effects of VC on growth in employment in three years after the IPO. Audretsch and Lehmann [20] observed significant employment growth in VC-backed companies during the year before and after the IPO compared to a control group of companies without VC backing.

Belke et al. [21] applied information on 20 advanced countries from 1986 to 1999. The authors identified that VC investment results in reduced unemployment and increased employment. The authors also found the positive effect of VC investment on growth in employment to be more dynamic and theorized that it might take time for VC investments to gain their full employment potential through feedback and spin-off effects on other businesses [22-25].

Aleman and Marti [13] conducted a study by comparing 323 companies in Spain which received VC financing from 1993-1998 plus a control group sample. However, Non-VC funded companies’ samples matched were based on the location of the company, sector or industry, size, and age in which VC funding was attained. The authors considered early and later phase funding, with the reorganization and MBOs/LBOs by computing for the average sales growth, employment and total assets after the year the investment happened to the third year after the incidence, and differentiating based on the stage of the company’s life-cycle (i.e., start-up, growth, later stage) in which VC funding was received. VC-funded companies outperformed Non-VC funded companies when VC investments occurred in the start-up or growth stage.

VC-funded companies from 1970-2000 and found out that sales increased twofold, they paid taxes about thrice, produced twofold exports and spent nearly thrice on R&D as against the average Non-VC funded companies. Bürgel et al. [26] evaluated sales growth and the staff of 500 start-ups in Germany and the UK but failed to discover any impact of VC financing. EVCA concluded that VC-funded companies recorded a high sales growth as compared to other companies. The result shows that companies that used venture capital experienced growth in sales [27-30].

Hellmann and Puri [31] revealed that once the investor invests his or her cash in the business, he/she must dedicate enough time in assisting the business to be successful, organizing internal structures and proper management of human resources. Thus, venture capitalists assist in adding value to make the firm professional. Being professional is the most significant advantage of VC funding. Hellmann and Puri [32] established that innovative businesses are more likely to receive VC funding as compared to imitator start-ups and that VC is linked to a significant reduction in the period needed to convey merchandise to the market.

Jain and Kini [14] matched 136 sampled US-listed companies that received VC funding preceding IPO with a matched sample of Non-VC funded IPO companies in the same sector that experienced IPOs of comparable size. The authors considered growth in sales from the year before and after the IPO and the subsequent three years, respectively. During the IPO time, VC-backed companies significantly surpassed the Non-VC funded matched group [33-36].

Manigart and Van Hyfte [37] investigated 187 VC-funded companies in Belgium and found a significant effect on the control group regarding superior growth in assets and cash flow, but not turnover and employment growth. The authors discovered that the growth rate of the total assets of VC-funded companies was significantly larger than the control group every year, commencing in the year in which the company received VC funding over the ensuing five years [38-41].

Engel [42] identified significant growth effects based on some broad German sampled companies offered by the country’s top credit ranking agency. The author employed propensity score matching and found that VC-funded companies attained more than twice the yearly employment growth compared to Non-VC funded companies.

Puri and Zarutskie [11] analyzed VC-backed companies by comparing matched and non-matched samples. The authors found that VC has a positive effect on sales growth. However, VC-funded companies on average are less profitable compared to non-VC-funded companies, which indicates that the massive scale of the investee matters more than the profit for VCs.

Davila et al. [43] study underpinned this finding by describing the employment patterns of VC backed firms. The authors pointed out that firms receiving VC has a signalling effect and increases employment growth after the investment. With regard to firm survival, when comparing the failure rates of firms that received VC to firms that did not receive VC, Puri and Zarutskie [11] found that the former showed a much lower rate of failure than the latter (34.1% vs. 66.3 % as of 2005).

Bertoni et al. [44] analysed whether companies with higher employment growth easily obtained VC based on a dataset of 537 Italian new technology firms. The authors found proof of significantly higher growth in employment of VC-funded companies as compared to the Non-VC funded companies, thus validating the positive impact of VC on employment growth. In contrast, the only weak evidence is exhibited in companies' growth preceding the initial VC round which leads to a greater probability of receiving VC financing. This finding supports the view that the venture capital financing and the managerial support provided by VCs resulted in the company's growth more than the ability to pick the winners (best companies) [45-48].

Peneder [49] investigated the effect of VC funding on innovation and company growth by using two-stage propensity score matching on micro-data from Austria. The author disclosed that companies with VC funding grow significantly faster than other companies and perform much better regarding innovative output.

Empirical Studies on Venture Capital Financing in Ghana

Mensah [50] stated that venture capital funding is not new in Ghana because, in 1991, US Agency for International Development (USAID) together with Common wealth Development Corporation (CDC) supported the development of a venture capital fund in Ghana. It was re-introduced into the country in 2006 as a form of financing to help in the promotion of SMEs and the development of the venture industry. Hence, only a handful of research studies have been done on the subject and researchers are more interested in other forms of financing such as bank loans, micro-finance and the stock market in Ghana [51-55].

Sam-Brew [56] investigated the effect of venture capital financing on SMEs' growth in Tema Metropolis in a single case study and found that SMEs prefer self-financing, but occasionally receive support from financial institutions. SMEs that receive venture capital financing also received technical skills, managerial expertise, access to marketing and distribution support.

Owusu-Adjei [57] examined the state of the private equity industry in Ghana and the extent to which it contributes to private sector development. Based on personal interviews and case studies on five locally based companies, the author found that, while the industry is still growing, it made a significant contribution to businesses in Ghana through the provision of capital and technical assistance.

Agyeman [58] investigated challenges facing venture capital firms in developing countries, with emphasis on Ghana, based on a semi-structured interview, documentary evidence, and direct observation. The author found that the venture industry is beset with numerous challenges such as inadequate outlet prospects due to a stable IPO environment, inadequate industry policies and rules and regulations, inadequate Research and Development support as well as poor record-keeping by SMEs [59-63].

Obeng et al. [64] appraised the venture capital activities in Ghana, based on survey questionnaires and interviews of 29 SME firms. The

authors concluded that venture capital is an emerging industry with high growth prospects as evidenced by the increasing trend of total capital under management and investment.

Poku and Frimpong [65] assessed the prospects of venture capital finance in Ghana, using a survey questionnaire and a sample of 80 small businesses in the Greater Accra region of Ghana. The authors found the majority of the small businesses see venture capital support as an answer to their financial problems, but are unwilling to partner with venture capital firms to nurture their business due to fear of losing control rights. The findings also reveal that the prospect of the venture capital industry looks promising and can be maintained if the government creates the right environment for the industry to grow.

Data and Methodology

Primary data were collected through survey questionnaire. The primary data were obtained based on a structured questionnaire personally conducted between July 2016 and September 2016. The study was conducted among SME owners-managers in Accra and Tema Metropolitan Areas of the Greater Accra Region of Ghana. The lists of respondents were obtained from the Association of Ghana Industries (AGI) database, National Board for Small Scale Industries (NBSSI) and the Venture Capital Fund Trust Secretariat. The SMEs under study were mainly from the manufacturing/Construction industry, Wholesale/Retail Trade, Agriculture/Fisheries/Poultry and Service sector.

Sampling Technique and Sample Frame

Purposive sampling technique was used for sampling the respondents. The purposive sampling method was adopted in order to solicit information from respondents who have expert knowledge and experience in the subject matter [66]. The sample size of 385 respondents was used for the study based on Cochran formulae (Appendix A). In all 400 out of 600 questionnaires distributed were collected, thus given a response rate of 67% and usable responses of 385.

Study Instrument

The instrument used for this study is a well-structured questionnaire. The questionnaires were administered through personal interview. The survey questions were closed-ended in nature to simplify the respondents' answers. The questionnaires were administered to the respondents to ascertain whether access to venture capital has had any impact on the growth of their small businesses.

Results and Discussion

We applied PSM-DiD to estimate the impact of venture capital financing on SMEs growth. In impact evaluation or policy intervention studies, two critical issues need to be addressed. These are the issue of counterfactual and selection bias. In other words, evaluating the impact of any intervention requires making an inference about what would have been the outcome for the programme participants had they not participated in the programme and vis-vis. i.e., the counterfactual. Further, selection bias may occur in a situation, where the selection of programme participants is not randomly done.

This required that we compare the outcomes of SMEs who received venture capital financing with the presumed outcomes of SMEs who did not receive venture capital financing. In most empirical studies based on non-randomised experiment, matching methods have been used to address these problems. In this study, we combined PSM-DiD estimation methods to measure the outcome of venture capital financing on SMEs growth in Ghana. This empirical strategy is adopted

not only to deal with the issue of selection bias but also to address the issue of observables and non-observables factors that may influence the outcomes.

We first computed the propensity score defined in Rosenbaum and Rubin [67] which is the probability of assignment of treatment (i.e., venture capital financing) given the pre-treatment characteristics.

$$P(x) = \Pr\{Z=1|X\} = E\{Z|X\} \tag{1}$$

In this information, $Z=(0,1)$ is the indicator of receiving the treatment and X is a vector of observed pre-treatment characteristics. Rosenbaum and Rubin [67] show that if the recipient of the treatment is randomly chosen within the cell defined by X , it is also random within the cells defined by the values of the single index variable (P_x). Therefore, each treatment case I , if the propensity score (P_x) is known, the Average effect of Treatment on the Treated (ATT) can be estimated as follows:

$$\begin{aligned} \alpha ATT &= E\{y_{1i} - y_{0i} / z_i = 1\} \\ &= E\{E(y_{1i} - y_{0i} / z_i = 1, P(x_i))\} \\ &= E\{E(y_{1i} / z_i = 1, P(x_i)) - E(y_{0i} / z_i = 0, P(x_i)) | z_i = 1\} \end{aligned} \tag{2}$$

To obtain the propensity score estimation, we first run logit model based a set of covariates selected. The covariates selected for this study were SMEs owners' socio-demographic characteristics (i.e., Age, gender, Marital status, educational background, experience, and income level) as well as firm characteristics (Firm age, Firm size, type of ownership, sector/industry) and pre-treatment outcomes (Pre-treatment sales and number of employees). The choice of covariates for estimating the propensity score is vital because we need to ensure that we select covariates that are likely to influence programme participation and outcomes simultaneously to match treatment and control groups in our logit model. Thus, the logit model was used to estimate the propensity score for participants and non-participants SMEs owners. The results of the logit model for propensity scores are reported in Appendix B.

The estimated coefficients show that four explanatory variables significantly influence the probability of participation. The coefficient for gender is negative and significant at 5%, and age is positive and significant at 5% level. Further, income and legal status are positive and significant at 1% level, respectively. The results of our propensity score estimation indicated that the p-value is significant at 1% level, log-likelihood is -115.59337, pseudo R² value 0.3387 and LR-chi-squared is 118.41 with a p-value of 0.000 at 1% significance level which means our model is well-fitted. The pseudo R² value showed how well the covariates explain the participation probability. A low pseudo R² value means that participants SMEs do not have many distinct characteristics overall, and thus finding a good match between participants and non-participants SMEs becomes easier. After matching, there should not be any systematic differences in the distribution of covariates between both treated and control groups, and hence, the Pseudo R² value should be very low [68].

On, the basis of this participation model, we then computed the distribution of the propensity score for each SME included in the treated and control groups to identify the existence of common support (Appendix C).

Before we implemented the matching of the treated groups and the control groups, we undertook three major tasks. We first and foremost estimated the predicted values of programme participation (propensity scores) for all participants and non-participants households/SMEs. Secondly, to satisfy the overlap assumption, we imposed a

common support condition on the propensity score distributions of the households/SMEs with and without programme participation (i.e., Venture capital financing). Thirdly, we rejected or discarded observations whose predicted propensity scores fall outside the range of common support region. The estimated propensity scores differ between 0.024 and 0.92 for SME participants (treated groups) and 0.025 and 0.88 for SMEs non-participants (control groups). The relevance of the propensity score estimation is to balance the distributions of significant variables in both treated groups and control groups, and not to get a precise prediction of selection into treatment. The region of common support is [0.02401465, .92121572].

The next step in our model estimation was to check the balancing of propensity score and covariates. To check the characteristics of the treatment group and the control group after the matching procedure, we conducted two types of balance tests. (Appendix D). The results of the t-test showed that the differences in all the covariates became insignificant after the matching procedure, which indicates that the characteristics of the control group were sufficiently similar after matching. Furthermore, we found that the pseudo-R-squared values reduced from 0.338 to 0.080 after the matching. The balancing tests confirmed that there was no systematic difference among the covariates used for matching between the treated group and after-matching control groups. The results demonstrate that the matching process can balance the characteristics of the treated groups and comparable control groups [69-74].

Finally, we choose different matching algorithms to estimate the average treatment effect on the treated (ATT). In other words, we applied matching algorithm methods to estimate the effects of venture capital financing on SMEs growth (outcomes). There are four different algorithm methods that can be used to estimate the ATT, namely, nearest neighbour matching method, radius matching method, kernel matching method, and stratification matching method. We choose the nearest neighbour matching and kernel matching methods to estimate the ATT. The estimates of the average treatment effect of the venture capital financing programme participation on the treated (ATT) are summarized in Tables 1 and 2 for the two outcomes using Nearest Neighbour Matching, and kernel matching routines.

The first column in Table 1 specifies the outcome variables of interest in the propensity score function and the second and third columns reports the treated and control used in the matching process. The fourth column shows the ATT for annual sales or employment by the nearest neighbour matching, while the fifth and sixth columns display the standard error and p-value respectively. As the result

Outcome Variables	Treated	Control	ATTR	Std. Err	t
Annual Sales	65	34	0.011	0.017	0.648 **
Employment	65	34	0.054	0.015	3.591***

Notes **, *** represents 5%, 1% significance level

Table 1: Estimation of Average Treatment effects on Treated (ATT) on annual sales and employment (Nearest Neighbour Matching).

Outcome Variables	Treated	Control	ATTR	Std. Err	t
Annual Sales	65	184	0.012	0.014	0.841**
Employment	65	184	0.05	0.012	4.258***

Notes **, *** represents 5%, 1% significance level

Table 2: Estimation of Average Treatment effect on Treated (ATT) annual sales and employment (Kernel Matching).

shows, VC backed SMEs participation in venture capital financing programme have a significant impact on annual sales with the nearest neighbourhood matching method ($t=0.684$) at 5% significance level. The average treatment effect on the treated (ATT) on annual sales for VC backed SMEs is 1.1 percent. This implies the average sales revenue of VC-backed SMEs increased by 1.1 percent. The VC backed SMEs participation in venture capital financing programme also have a significant impact on employment with the nearest neighborhood matching method ($t=3.591$) at 1% significant level. The average effect on the treated (ATT) on employment for VC -backed SMEs is 5.4 percent. This implies that the average number of employees of VC-backed SMEs increased by 5.4 percent.

As the following output in Table 2 shows, VC-backed SMEs participation in venture capital financing has a significant impact on SMEs annual sales with kernel matching method ($t=0.841$) at 5% significance level. As can be seen from the Table 2 Column 2 indicates the treated group (65) and column 3 indicates the control group (184). Column 4 depicts the average treated effects of treated (0.012), and column 6 indicates the t-test (0.841). The average treatment effect on the treated (ATT) on annual sales for VC-backed SMEs is 1.2 percent and statistically significant at 5 percent. This implies that the average sales revenue of VC-backed SMEs rose by 1.2 percent.

The results of VC-backed SMEs participation in the venture capital financing programme on employment with kernel matching method is ($t=4.258$) and statistically significant at 1% level. The average treatment effect on the treated (ATT) on employment for VC-backed SMEs is 5.0 percent. This also implies that the average number of employees by VC-backed SMEs increased by 5 percent.

In order to reduce any bias estimation and to control for the unobservable heterogeneities, which may impact on our results based on the PSM method, this study evaluates the impact on SMEs on SMEs growth by combining a standard difference-in-difference estimation technique based on equation 3. The standard DID use to determine the effect of venture capital on SMEs growth. The treatment variable which is venture capital financing program participation is of binary form which signifies SMEs owners' participation in the program (i.e., venture capital financing) taking on the value one if SMEs owners participated in the program, otherwise 0. The model estimated is a logarithmic function where the outcome variable is the standard logarithm of the SMEs growth measurement such as annual sales and number of employees making the approximations not sensitive to distant observations on the dependent variables [75]. Consequently, the coefficient (γ) of the treatment variable, if multiplied by 100, gauges the estimated average percentage change in the firms' outcomes (Annual sales and number of employees) concerning the treatment variable [75].

The following equation gives the standard DiD model:

$$Y_{it} = \beta_0 + \delta_0 d_{2t} + B_i P_i + \gamma M_{it} + \epsilon_{it} \quad (3)$$

Where Y_{it} is the SMEs outcome being examined (SMEs annual sales and number of employees) for SME i at period t ; d_{2t} is a time dummy variable which is equivalent to one for $t=2$ (post-treatment period) and zero for $t=1$ (pre-treatment period); dummy variable for a group is P_i and takes a value of one if SME owner i belongs to the treatment group and otherwise zero; an interaction term of the product of d_{2t} is M_{it} and P_i , which shows the participation in the programme is equal to one if SME owner i , received venture capital and the observation happens in the second period (i.e., received the venture capital funding), and zero otherwise; δ_0 represents time effect suffered by both treatment and control groups; B_i represents the possible time-invariant difference

in total means between the two groups; γ is the principal parameter of interest which measures the average programme effect on receiving venture capital financing; ϵ_{it} is the idiosyncratic error expected to be independent and identically assigned over SMEs and time, with average zero at each period.

The critical assumption of the standard DiD method, also called the common trend assumption, is that γ would be zero in the absence of the program, or $E[\epsilon_{it}|M_{it}] = 0$. Thus, the average change in the outcome variables (Y_{it}) would not have been systematically different between the VC backed group and the non-VC backed group if there were no programs [76,77]. Under this assumption, an unbiased estimation of γ can be obtained by just calculating the difference between two differences: (1) the average difference in the outcomes over the two time periods for the venture-backed group; and (2) the same differences for the non-venture backed group [76,78]. The following equation illustrates this:

$$\overline{\gamma sdd} = \Delta \overline{Y}_B - \Delta \overline{Y}_N \quad (4)$$

$$= E[Y_{it=2} - Y_{it=1} | P_i=1] - E[Y_{it=2} - Y_{it=1} | P_i=0]$$

where " Δ " denotes the change from $t=1$ to $t=2$, γsdd indicates the standard DiD estimator of γ the overbar represents the average across SMEs, B and N denote VC backed SMEs and non-VC backed SMEs, respectively. As a result of deducting the average differences in the Non-VC backed group from the average differences in the VC backed group from eqn. (4), the DiD estimation strategy ensures two types of estimation bias to be removed, namely bias from the cross-sectional comparison between the two groups in the post-program period, which could be due to permanent differences between these two groups (captured by β_i) but unconnected to the program, and bias from the comparison over the two periods for the VC backed groups [79-85]. It could be due to time trends (captured by δ_0) but unrelated to the program [75,76,78,86].

Table 3 shows the result of the impact of venture capital financing on SMEs' growth measured by the annual sales and number of employees, has dramatically improved for the VC-backed SMEs (treated group) between 2013 and 2015 (see column 3 in Table 3). For instance, the average annual sales for the VC-backed SMEs (treated group) increased by almost 8.4% over the three years and is significant at the 1% level. Likewise, the average number of employees for the VC-backed SMEs (treated group) during the same period increased by 14.7% and is significant at the 1% level. It is important to note that the significant increase in annual sales and the number of employees for the VC-backed SMEs can be attributed to a combination of time influence and impact of the venture capital injection. To separate the true programme impact on the VC-backed SMEs, the potential time trend must be controlled for.

The average changes in outcome for the Non-VC backed SMEs (control group) between the period 2013-2015 are taken to estimate the time trend suffered by the VC-backed group (column 6 in Table 3). After netting out the average increases between the treated and control group (column 7 in Table 3), the standard DiD estimates suggests that the average annual sales for VC-backed SMEs increase by 1.5% as a direct result of SMEs' participation in the programme and is positive and significant at the 5% level. Similarly, the standard DiD estimates for VC- backed SMEs on the number of employees increased by 3.7%, based on the participation in the venture capital financing programme. The impact of the programme on the VC-backed SMEs is positive and statistically significant at the 1 % level (column 7 in Table 3).

	VC-backed SMEs (N=65)			Non-VC backed SMEs (N=184)			DiD
	Year	Year	Difference	Year	Year	Difference	Impact estimator
	2013 (1)	2015 (2)	(2012-2015) (3)	2012 (4)	2015 (5)	(2012-2015) (6)	(7)
Outcome variable(Y _{it})	Y _{B,13}	Y _{B,15}	D ₁ =Y _{B,13} -Y _{B,15}	Y _{N,13}	Y _{N,15}	D ₂ =Y _{N,13} -Y _{N,15}	Y _{std} =D ₁ -D ₂
Log of annual sales	5.739	5.823	0.0841***	5.439	5.508	0.0690***	0.0150**
	-0.0767	-0.0758	0.0074	-0.0464	-0.0477	0.0036	0.0077
Log of number of employees	1.253	1.4	.1475***	1.139	1.249	1.104*, **	.0371***
	-0.0252	-0.0222	0.0092	-0.0115	-0.0102	0.0042	0.009

Notes: The figures represent the average log of annual sales and number of employees, respectively; Standard errors are numbers in parentheses; ***, **, * denotes the 1%, 5%, and 10%

Table 3: Impact of venture capital on SME's growth using standard DiD estimation.

Based on the standard DiD estimation, the impact of the venture capital financing programme on the participants' annual sales and the number of employees is positive and significant. The results show that VC-backed SMEs are likely to improve their annual sales and employment growth, and this is consistent with similar empirical studies [13,21,42,49].

The results of this study showed that SMEs which receive VC financing experience better performance in terms of sales and employment growth as suggested by Alemany and Marti [13] and Peneder [49]. This is probably because, in addition to the VC funds they also receive value added services such as technical expertise, networks and marketing/management support from venture capitalists [87].

The practical implications of this study are firstly, the findings would assist researchers to gain better understanding of the impact of VC financing on small businesses. Further, the findings indicate that potential entrepreneurs must take advantage of venture capital funding to explore innovative ideas into marketable products and services. In addition to this, policymakers should take a holistic approach that strengthens the venture capital market by providing technical and managerial support alongside the financial resources for entrepreneurs who access venture capital funding [88]. This is because most entrepreneurs not only lack the financial resources needed to run their businesses, but also the technical expertise which is greatly needed to enhance the efficiency and effectiveness of their operational activities [89].

Conclusion

This study investigates the impact of venture capital financing on SMEs growth in Ghana. We applied propensity score matching approach and difference-in-difference estimation to determine the impact of venture capital financing on SMEs growth in Ghana. Our empirical results showed that VC-backed SMEs experienced better performance in terms of sales and employment growth, partly due to SMEs owners access to venture capital funding programme. Our empirical analysis has established that venture backed SMEs as compared to non-venture backed SMEs experienced increased sales and employment growth by 1.5 percent and 3.7 percent respectively.

The results from this study shows that venture backed SMEs experience higher sales and employment growth as compared to non-venture backed SMEs. Hence, SMEs entrepreneurs should be encouraged to access venture capital financing to improve their business performance. In addition, the government should put in place policy measures that would encourage SMEs entrepreneurs to choose venture capital as alternative sources of finance by making it easily accessible by SMEs entrepreneurs. In addition, policymakers should create enabling environment such as macroeconomic stability, and protection of investor's rights to drive investment into the country's

economy. Further, policy makers should provide incentives packages for venture capital providers such as giving tax incentives to enable VC provide more venture capital funds to prospective SMEs owners.

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