

**THE EFFECT OF VENTURE CAPITAL FINANCING ON INVESTMENT IN  
KENYA**

**BY  
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REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN  
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## **DECLARATION**

I hereby declare that this research project contains my original work and to the best of my knowledge and skills. It contains no material previously published by another person nor does it contain materials which have been accepted for the award of any other degree in the university except where due acknowledgement has been made in text.

Signed.....Date.....

**Valerie Kizito**

**D63/10705/2018**

This research project has been present for review with my approval as the university supervisor.

Signed.....Date.....

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## **DEDICATION**

To my dad James Kizito, my mum Gladys Kizito, my brother and sisters I would not have done this without you. Thank you for your encouragement, support and understanding throughout my studies.

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## LIST OF ABBREVIATION

<b>GDP</b>	Gross Domestic Product
<b>LM</b>	Lagrange Multiplier
<b>TFP</b>	Total Factor Productivity
<b>VAR</b>	Vector Autoregressive
<b>VC</b>	Venture Capital
<b>VEC</b>	Vector Error Correction

## ABSTRACT

The objective of the study was to establish the effect of venture capital financing on investment in Kenya. To achieve this objective venture capital was disaggregated into two variables, namely, the number of firms financed and the total amount of financing. Other variables were also included in the analysis to act as control variables; these were interest rate and GDP per capita. The study used 10 years' data spanning from 2009 to 2018. Descriptive analysis namely, measures of dispersion and central tendencies were applied to the data. Additionally, empirical analysis and regression were applied to the data to make the results inferable. From the regression results. The coefficient of determination of the model was 0.9165, these results indicate the model is a good fit. The F statistics of the model is 13.72 and the P-value is 0.006, showing that the model is suitable in predicting the population parameter. The coefficient for the number of financed firms was 0.5813, while that for the total amount of financing was 0.1367. The partial slope coefficient for interest rate was -0.1810 and that for GDP per capita was 0.6410. All these variables were significant at 1 percent level. The study concludes that venture capital financing has a positive effect on aggregate investment levels in Kenya. The study recommends that the government should come up with ways of financing small and medium enterprises, this will boost their productive capacities thus leading to more investment in the country and more generation of income.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

In a country, the government of the day is entrusted with steering economic growth. Previously, governments employed economic measures which were expected to have a positive impact on the population but in the long run it failed to improve the lives of majority of the population. Large industries were set up to provide employment and improve the living standards of its employees, little change was affected (White Paper on International Development, 2000). Consequently, the governments had to turn their attention to other emerging sectors such as small-scale enterprises in hopes of spurring economic growth. Small and Medium Enterprises (SMEs) promote competition, innovation, and enhance culture necessary for private sector development and industrialization (Memba, 2015).

Unfortunately, SMEs lack access to credit which hinders their emergence and growth. Poor access to formal finance is majorly because of the high risk of default among SMEs and inadequate financial facilities (Kauffmann, 2005). Without proper finance, SMEs can neither expand to compete globally nor can they acquire technology or meet their fixed and working capital requirements (Wanjohi&Mugure, 2008). Venture capital emerged to fill the void by providing equity capital to SMEs in order to enhance growth. The venture capital industry embraces opportunities that create value based on rational partnerships with a less formal control mechanism and a limited track record.

### **1.1.1 Venture Capital Financing**

Venture capital is defined as equity or equity-linked investments in new, privately held companies, where the investor is a financier who is typically active as a director, a manager and an advisor of the firm (Kortum and Lerner, 2000). According to, Gompers and Lerner (2001), venture capital is an independent, professionally managed, dedicated pool of capital that focus on equity or equity linked investments in privately held, high growth companies. It is an investment in a growing SME or start-up with high growth prospects that is facilitated by a Venture Capitalist who manage funds raised from public and private investors. When an entrepreneur is unable to acquire bank financing because of the businesses' high-risk venture capital financing is sort after as an alternative. Venture capital financing provides equity to promising small businesses in exchange for equity stake in the business.

Notably, venture capital investment is a non-bank financial option which is prevalent in developed financial markets for start-up or small firms (Keuschnigg 1998). SMEs emergence and eventual growth is hampered by the difficulty in accessing financing, therefore, restricting their options to debt financing or equity. Because of their small size, high risk of default and poor financial structures these companies are unable to qualify for loans from financial institutions.

Venture capital also helps investors to access equity capital as a source for finance in cases of expansion of the business while still maintaining control. In line with the venture capital financing agreement, the investor firm will provide funds to enable an enterprise to operate and in return it gets an ownership stake in the enterprise (Boateng, 2010). Normally,

venture capitalists look for features such as, competitive edge, growth potential, competent management and other intangible factors (Smart, Megginson &Gitman, 2004).

Fairchild (2009), reported that an entrepreneur prefers choosing a venture capitalist because of their preference to financiers with value-creating abilities. The extensive relationship and expertise of the venture capitalist not only adds value to the business but it also increases customer credibility. In return, the enterprise gain access to the venture capitalist knowledge in budgeting, accounting, back-office operations and computer systems (Amissah, 2009).

### **1.1.2 Investment**

According to Hassett (2019), investment is production of goods that will be used to produce other goods. Investment can also be defined as the disbursement of money with the expectation and objective of receiving an increased amount of money return at some future date (Rutterford& Davison, 2007). Fixed capital formation growth is the precondition for increased economic growth due to its crowding in effect of output and hence disposable income (Langat, 2007).

In Kenya, investment together with its determinants were seriously affected by the external shocks experienced in the country throughout the 1970's to 1990's. Determinants of investment have diversified over the years to include expectation, public policy, technological changes, capacity utilization and the stock of capital.

Expectation of the investor on the return on investment determines plans to change capital stock. A change in capital stock changes expectation of reduced profitability, future production capacity, reduces investment while expectation of increase in return on investment increases it. Technological changes required by most small and medium

enterprises increases the demand for capital (Megginson and Weiss, 1991; Jain and Kini, 1995); Hellmann and Puri, 2000). The stock of capital as a determinant of investment affects the level of investment both positively and negatively. A business needs more investment to replace capital after depreciation, therefore, a greater capital stock is likely to lead to more investment. One negative effect of a greater capital stock's is that it tends to reduce investment because investment occurs to adjust the stock of capital to its desired level. However, when the current capital stock is high the amount of investment needed to reach the said desired level will be lower (Rutterford & Davison, 2007). Public policy can have major implications on the demand for capital by affecting the cost of capital to firms.

### **1.1.3 Venture Capital Financing and Investment**

Venture capital investment has been demonstrated to contribute to the graduation of many enterprises from small, to medium and finally to macro enterprises, as well as, increased productivity of the beneficiary firms. The great achievement of venture capitalist has been primarily linked to their role in connecting a set of entities such as investment banks, government agencies, universities, and large corporations. The intricate set of an overlapping network allows them to gain access to market information including risks related to enterprise development, this ensures the elimination of information asymmetry and consequently, survival of new businesses. Baeyens and Manigart (2003) assert that venture capitalists screen potential investments by collecting information about business on its market approach, management team or entrepreneur, to increase investment while reducing the initial information asymmetry and potential problems with entrepreneurs.

Venture capital are responsible for raising funds and investing those funds in an investment process owned by an entrepreneur. Furthermore, venture capital investors participate in

management of their investment applying their vast knowledge in business to ensure growth. Silvola (2008) reports that venture capital investors have great power over several areas of business, including strategic decisions, business development and management control. Also, venture capital investment has the responsibility of stimulating further venture capital investment through co-investment with corporations. According to Peneder (2010), individual investors organize into fund management groups to share research and pool their investment capital to invest into entrepreneurial financing. Therefore, entrepreneurial financing acts as a substitute for domestic investment in countries where domestic investors are not well established or afraid to take risks (Megginson, 2001).

#### **1.1.4 Venture Capital Financing and Investment in Kenya**

Kenya has positioned itself as the economic hub of the East African region; this has mainly been attributed to its relatively stable regulatory frameworks, sophisticated business environment, a functional electronic banking system, large and enlightened human capital, and a dominant private sector-led economy. Consequently, Kenya has attracted numerous equity investors and venture capital investors in the last decade, making it the third country, after South Africa and Nigeria regarding capital venture and private equity transactions in Sub Saharan Africa. Between 2013 and 2015 alone more than \$750 million venture capital fund have been invested across 60 percent of early stage enterprises businesses in Kenya (Divakran, McGinnis & Schneiderrking, 2018).

In Kenya, primary sources of capital for venture capital investors are foreign development finance institutions (DFIs), high net worth individuals (HNWs) and foreign institutional investors. DFIs strong participation in the market is because of their longstanding participation as investors to emerging markets. Further, they provide governance, social



and environmental best practices while serving as training ground for the human capital (Divakran, McGinnis & Schneiderrking, 2018). IFC and CDC are the most active DFIs in the East Africa region each having made both direct investment and fund investment as part of their overall investment. DFIs can act as a source of co-investment capital for venture capital fund because of their significantly more sources of stock capital. In Kenya DFIs that invest directly to companies include IFC, CDC, Proparco, DEG Norfund and FMO. (Divakran, McGinnis & Schneiderrking, 2018). Family offices are High net worth individuals that represent important source of potential investment for venture capital. In Kenya, foreign HNWs outnumber Kenyan families, although the minimum investment of US\$1 million usually required by private equity funds limits the addressable market in the country.

Also, there has been some investment by institutional investors and sovereign wealth funds (SWF) although their most of their capital is directed toward Pan African and not regional or national funds. Recent reports have suggested that large SWFs that are active in private equity such as the Singapore's GIC and Abu Dhabi Investment Authority (ADIA) have included Africa in their investment plans. Kenyan private equity firms, such as Catalyst, report receiving investment from US-based funds of funds.

In Kenya, DFIs and international investors have been the most crucial LPs and perhaps the most consistent source of venture capital and private equity funds for entrepreneurs. However, venture capital and private equity should be sourced from local domestic institutional investors because of their fundraising potential that can play a major catalytic role. Notable examples of institutional investors in local funds include Ascent Capital which raised more than \$80 million for its inaugural Ascent Rift Valley Fund, Nation

Media Group Pension Fund and Kenya Power Pension Fund contributed a combined sum of \$5 million. Institutional investors are a fundamental cog to the growth of venture capital and private equity sector in Kenya. Even though most local institutions in the emerging market regions trail foreign investors in the private equity fund sector they can evolve into core investors in the assets class. Local institutional investors are critical to creating a domestic market for fundraising because of their size and need to generate long-term returns.

## **1.2 Research Problem**

Entrepreneurial scholars, policymakers and economists have widely shared the optimism of the vital role of venture capital investment in the growth of early-stage enterprises (Bygave&Timmons, 1986; Amit, Brander &Zott, 1988; Florida &Kenny, 1998). Venture capital investment has been demonstrated to contribute to the graduation of many enterprises from small, to medium and finally to macro enterprises, as well as, increased productivity of the beneficiary firms. The great achievement of venture capitalist has been primarily linked to their role in connecting a set of entities such as investment banks, government agencies, universities, and large corporations (Hellman&Puri, 2002). The intricate set of an overlapping network allows them to gain access to market information including risks related to enterprise development; this ensures the elimination of information asymmetry and consequently, survival of new businesses (Bertoni& Colombo, 2005).

Kenya has positioned itself as the economic hub of the East African region; this has mainly been attributed to its relatively stable regulatory frameworks, sophisticated business environment, a functional electronic banking system, large and enlightened human capital,

and a dominant private sector-led economy. Consequently, Kenya has attracted numerous equity investors and venture capital investors in the last decade, making it the third country, after South Africa and Nigeria regarding capital venture and private equity transactions in Sub Saharan Africa. Between 2013 and 2015 alone more than \$750 million venture capital fund have been invested across 60 percent of early stage enterprises businesses in Kenya (Divakran, McGinnis & Schneiderrking, 2018). Despite the increased, venture capital financing on Kenya firms, Kenya is still underperforming in the growth of private investment compared to its East African Community counterparts (World Bank, 2018).

Empirical studies have tried to establish a link between venture capital financing and survival of early enterprise, (Lerner, 2002; Dessí, 2009; Dessí&Yin, 2010; Haeussler, Harhoff& Müller, 2009). However, little is known on whether venture capital financing has any impact on private investment in a country. Additionally, literature has pointed out venture capital financed firms have demonstrated better financial performance than non-venture capital funded firms (Megginson&Weiss, 1991; Jain & Kini, 1995); Hellmann &Puri,2000); Kaplan & Lerner, 2010). It is worth noting however, that the process of selecting firms for venture capital financing is vigorous and very competitive that only best funds are selected and funded. In essence, these firms are smaller in number compared to the ones that are left out.

Locally, studies have also concentrated on venture capital and performance of firms and no research has been conducted on venture capital financing and aggregate investment nexus despite the fact that the existence of such as a study may be crucial for designing best policies for investment. Notable among the studies conducted include: (Njoroge, 2003; Momba; 2015; Kiprotich, 2017; &Njumbi, 2018). It is against this background therefore

that this study sought to answer the question, what is the effect of venture capital financing on investment in Kenya?

### **1.3 Research Objective**

The objective of the study was to establish the effect of venture capital financing on investment in Kenya

### **1.4 Value of the Study**

The findings of the study will be useful to the government as it will highlight the gaps in policies which will enable the government to make sound economic policies in relation to venture capital financing and investment in Kenya. The study will guide the government in designing policies that promote venture capital financing through providing an enabling environment for them.

There are scarce literatures that have linked venture capital financing and investment nexus. This study will therefore form a good foundation to be replicated by similar studies in the future. It will therefore add on to the body of knowledge in the relationship between venture capital financing and investment. The study will form a foundation of empirical literature that will be used in future studies as a guide. The study will also provide recommendation for future studies in the field of venture capital financing and investment. Finally, the study is useful to venture capitalist firms. It will enable them identify the progress they have made so far in contributing to investment in Kenya. This will provide a basis for the areas that need improvement or areas that need to be strengthened. The study will provide recommendation on the areas that they can improve on and the area that they can place more emphasis on.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

In this chapter, the literature highlights various theories and studies that exist that form the foundation of this study. Further, empirical literature is reviewed and the conceptual framework analyzed.

#### **2.2 Theoretical Literature**

The section gives a review of theories that relate to venture capital that apply to investment. This study will be based on agency theory.

##### **2.2.1 Agency Theory**

Agency model is considered as one of the oldest theories in the literature of the management and economics (Daily, Dalton, & Rajagopalan, 2003; Wasserman, 2006). Ross (1973) and Mitnick (1975) have had the most notable influence in shaping the theory of agency. Though the central idea behind each of their theories remained similar, they each had a different regard to the agency problem. Ross (1973), saw it as an incentives problem while Mitnick (1975), considered that the problem is caused by institutional structure. Hence, the theory attempts to solve the agency problem which occurs when the goals of the principal (Venture Capitalist) and agent (entrepreneur) are different, and when it is difficult for the principal to know what the agent is actually doing. Sapienza and Gupta (1994), described a situation where entrepreneurs and investors disagree on the ways to achieving their objectives and termed this type of agency problem as good faith disagreements.

Mitnick(1975), explains that the institutional approach plays a part in developing the core agency theory and it is designed to understand the behaviour of the real world. His theory posits that institutions are built around agency and grow to reconcile with the agency. As a result, institutional venture capitalists are easier to locate, more visible and have more resources to invest in entrepreneurs. Typically, entrepreneurs start businesses with an innovative base with the expectation that the firm will become a long-term success. The new enterprise obtains some venture capital financing to aid its development (Mason & Harrison, 1996).

According to Eisenhardt (1989), agent theory assumes that both the agent (entrepreneur) and principal (venture capitalist) are self-interested and have bounded rationality. The bounded rationality by each actor (venture capitalist and entrepreneur) gives rise to information asymmetry between the parties (Amit et al., 1990). Information asymmetry occurs when one party of a contract is privy to relevant information not available to the other party of the contact (Panwar, 2005). Note, when the goals of the Venture Capitalist and entrepreneur are aligned, there is no agency problem (Eisenhardt, 1989).

Interestingly, recent research has failed to find much relevance of agency theory in explaining the venture capitalist and entrepreneur relationship (Kelly & Hay, 2001). In cases where there is an agency problem then there is goal incongruence between the two parties meaning their goals have not been aligned (Arthurs & Busenitz, 2003). Note, to reduce chances of agency problem agents (entrepreneurs) need to ensure a change in opportunity behavior and avoid tensions with their principle (Venture Capitalist). In entrepreneurship literature agency theory has emerged as the dominant theory in explaining the venture capital and entrepreneur relationship (Amit et al., 1990). The theory has for

years been the dominant theoretical perspective applied to the venture capitalists and entrepreneur relationship.

### **2.2.2 Resource Dependency Theory**

Pfeffer and Salancik (1978), formulated the resource dependency theory which posits that organisations which have resource scarcity because of their smaller organizational size are more inclined to formally collaborate. Organizations with a larger resource base indicated by their huge annual budget size are less inclined to formally collaborate. The theory implies that to understand organizational behavior, one ought to understand how organizations and other social actors in the environment relate. Often, organizations either comply with the demands of others, or they manage dependencies that create limitation on organizational actions. An entrepreneur with scarce resources would look to collaborate with a more established organization or individual (venture capitalist).

According to Davis & Cobb, (2010), scholars investigating power in organisations are very likely to draw on the resource dependency theory. Organisations form alliances with each other for longevity, knowledge and resource sharing. These alliances are guided by agreements among organisations to explore joint objectives through sharing of resources or knowledge and coordination of activities (Scott and Davis, 2007). Typically, businesses need resources to survive hence they need to interact with other businesses that control these resources. Eisenhardt (2009), posits that there is a renewed interest in the resource dependence theory and offers suggestions on where it might be heading.

Nonetheless, there are a number of opposing opinions to the basic tenets put forth by the theory. In opposing the theory, Subramanian et al., (2009), through his comparative study of literacy and immigration established that correlation at the group level does not need to

apply at the individual level. In a study of entrepreneurial ventures in US technology-based industries, Katila et al (2008), examines the conditions under which entrepreneurs are likely to be part of a corporate investment relationship. The entrepreneur's fundamental tension underlying the decision to take up venture capital is the tradeoff between the potential of being taken advantage of and access to resources. Entrepreneurs enter corporate investment relationships when managerial resources needed are great and when financial needs are high (Katila et al., 2008). While these works offer an excellent starting point, it seems there are numerous opportunities for scholarly contribution to resource dependences theory. In the meantime, assumptions are being tested alternative strategies are being offered and gaps in the theory are being filled (Katila et al., 2008).

## **2.3 Determinants of Investment**

### **2.3.1 Venture Capital Financing**

A number of studies have linked venture capital financing to investment. Prowse (1998), asserts that venture capital financing has played a critical role in contribution to investment activities in a country. The study attempted to explain the mechanism through which venture capital contribute to investment. Firstly, they point out that, through innovation financed firms are able to diversify into other products and increase their line of production which leads to mass scale production. Additionally, they established that, venture capitalists do not only fund an organization but also bring in their expertise in various types of management transforming risky start-ups to stable ones, thereby leading to stability of firms in the different industries. Ewing and Butler (2007) also noted that venture capital has played a pivotal role on investment in a nation, through a critical mechanism of channeling capital through the national and international markets, leading to availability of



funds and reduction of interest rates which would otherwise be higher if firms were only depending on debt financing.

### **2.3.2 Interest Rate**

There is a general consensus among monetary and economic scholars about the impact of interest rate on investment. The interest rate has been established to be the major determinant of investment as it plays a critical role in determining the cost of capital. The current interest rate is not only important in explaining the current investment but also predicting future investment through adjusting saving (Ibicioglu&Kapusuzoglu, 2012). Alvarez (2010) notes that, an increase in the rate of interest would results to the decrease in the price of bonds and a fall in interest rate would lead to an increase in binds prices. In this regard, interest rate plays a major influence on the scale of investment as it operates as an opportunity cost of investment to total investment. If investment incomes remain constant, then an increase in interest rates would result to an increase in investment cost. This would then lead low income investor to pull out from investment thus reducing demand for investment. On the other hand, a reduction in interest rate would facilitate reduction in investment cost thus stimulate investment in a country (Sax, 2010).

### **2.3.3 Gross Domestic Product Per Capita**

Literature has pointed out the importance of GDP per capita in influencing investment in a country. According to a 2016 World Bank report, GDP per capita is a key indicator for measuring the level of people's income in a nation. A rise in GDP per capita can, therefore, be interpreted as the rise in levels of income, this would provide an incentive for people to save increasing the aggregate saving in a country. Keynes (1936) pointed out that there is a savings investment nexus, and that the two variables exhibit an increasing return to scales.

An increase in income would lead to an increase in saving which would lead to an increase in investment in a country.

## **2.4 Empirical Literature**

A number of studies have been conducted in the area of venture capital and investment but with varied results and conflicting outcomes about the possible effect of venture capital on investment. According to Dobloug (2008), the provision of reliable capital and management expertise to those firms leads to shorter times-to-market through accelerated growth, and a more solid development of company structures in the areas of marketing, strategy and market positioning. The fact is that this kind of financing played no little part in the evolution and increasing market strength of technological sectors, especially in the US (Gompers & Lerner, 2001).

As technological sectors rely heavily on innovativeness to stay competitive, it is useful to investigate the particular impact of venture capital funding on investment. However, finding empirical evidence for detailed explanations of this relationship and involving factors to prove the impact on outcomes appeared to be difficult (Gompers and Lerner, 2001). Nevertheless, three studies by different researchers move to the foreground as they are considered to be important in this case. The first research to be taken into account by has been carried out by Kortum and Lerner (2000). The research covered data of three decades about companies and their accompanying patenting patterns across twenty industries and related venture capital investments on the industry level. The assumption was that venture capital investments might disproportionately affect the evolution of innovations and therefore hampering investment in the long-run. Contrary to the

assumptions however, the outcome of the study suggests a strong positive correlation between venture capital funding and investment.

Another research to be considered is the study conducted by Hellmann and Puri (2000), which covered data by a questionnaire within a small sample in Silicon Valley, included also non-venture-backed companies to present possible differences in VC-funding and their consequences. According to this, firms who follow a more innovative strategy on average achieve funding earlier in their business life cycle and have higher chances of obtaining venture capital investments. This has already been assumed earlier as VC's mainly target highly innovative companies as they use to have better economic prospects. Moreover, VC-backed companies strengthen the assumption made by Dobloug (2008) of a faster time-to-market and perceived VC-funding as an advantage, especially for companies with the focus on innovations. Although findings share partial similarities with the previous research by Kortum and Lerner (2000), concerns about the insufficiency of obtained results can here be addressed to the small sample size of less than 200 firms. Additionally, it has not been proofed in this research whether VC-funding facilitates higher investment through innovation or companies already featuring high innovativeness choose venture capital as best opportunity for financing further activities.

The third research the study focuses on is a study by Hirukawa and Udea (2006) who took the study by Kortum and Lerner (2000) as base and adapted it to a larger timeframe and used five-year averages of existing data to cover for differences in capacity utilization of variables. Additionally, they included another measure of innovational impact, namely TFP (Total Factor Productivity) and Labor Productivity Growth. As opposed to Kortum and Lerner's research, they tried to measure and explain productivity growth by the rate of

R&D intensity when determining the influence of VC-investments on TFP. However, this model did not lead to significant outcomes and could not support the assumption of a VC influence on Total Factor Productivity. Nevertheless, testing Labor Productivity growth showed more significant indications as the factor labor is subject to higher adjustability when inputs increase. Still, concerns were also addressing as it is just a partial and vulnerable measure of total productivity since an increase in labor productivity not always entails an increase in total productive efficiency. As a result of their modelling, the study established a negative correlation between venture financing and innovation.

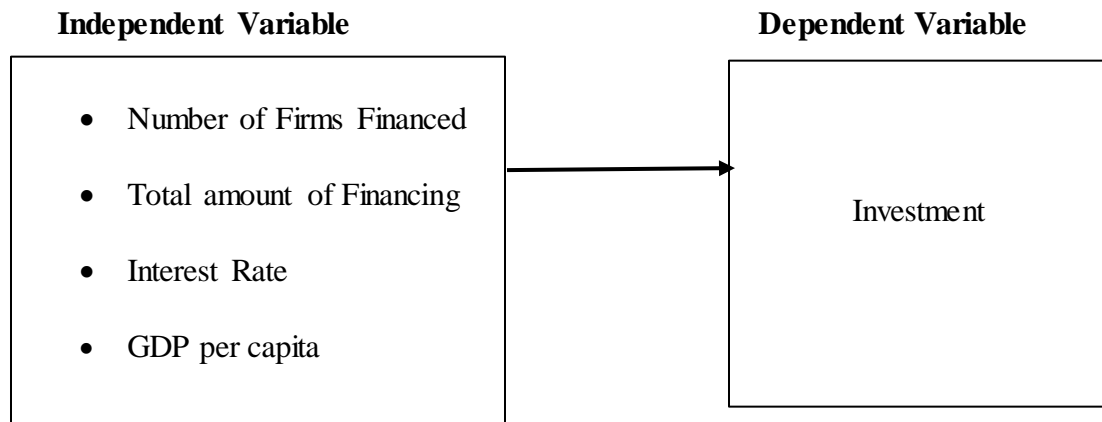
## **2.5 Research Gap**

Different models have been used by different researchers of which most lead to the outcome of a positive correlation as well as the quantification of concerns regarding misleading factors. However little research has been done that could provide evidence about how Venture capital financing affects the aggregate economy, especially, investment. This study seeks to fill this research gap by analyzing the effect of venture capital financing on investment in Kenya.

## **2.6 Conceptual Framework**

Mugenda and Mugenda (2004), define conceptual framework as a tool that can be used to show the relationship between the dependent variable and a list of independent variables in the study. The conceptual framework is presented in Figure 2.1, the right-hand side presents the dependent variable which is investment while the left-hand side represents the independent variables, they are venture capital which is split into the number of firms financed and the total amount of investment, the other independent variables are control

variables which are important determinants of investment, they are interest rate and GDP per capita.



**Figure 2.1: Conceptual Model**

**Source: Author's Construct, 2019**

## **2.7 Summary of Literature Review**

In general, the venture capital financing and aggregate investment nexus has received relatively little attention in academic literature compared with other studies on venture capital financing and performance of Small and Micro enterprises. This may partly be due to the nature of venture capital financing transaction and information about which is not always easily accessible.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter presents research design, the study population, data collection procedure, diagnostic test and data analysis.

#### **3.2 Research Design**

According to Cooper and Schindler (2014), Research design is the structuring of data collection and analysis in a way that would lead to achieving the study objectives. This study used descriptive research design to answer the study question: what is the effect of venture capital financing on investment in Kenya? The advantage of descriptive research design is that, it can accommodate different form of data and it facilitates a detailed description of the relationship of the variables under study (Kothari, 2004). Descriptive research design is also beneficial as it allows data to be analyzed using a wide range of analytical techniques, ranging from descriptive statistics to inferential statistics (Kothari, 2004).

#### **3.3 Study Population**

A population is a universal set of all the phenomenon that the researcher seeks to carry out a study on. The area of the study was Kenya. Using aggregate national data, the study covered a period of 10 years that is from 2009 to 2018. The study focused on the aggregate investment and venture capital financing in Kenya.

### 3.4 Data Collection

The study relied on secondary data. Annual data was collected from various sources covering the period 2009 to 2018. Data on venture capital financing was collected from the Capital Markets Authority as it is the one that licenses the venture capital financing and keeps the records of the all the financing, interest rate data were collected from Central Bank of Kenya, GDP per capita from Kenya National Bureau of Statistics.

### 3.5 Data Analysis

In order to find out the effect of venture capital financing on investment in Kenya the study used the ordinary Least Square framework in analysis. The dependent variable was aggregate investment, while the independent variable included two measure of venture capital financing, that is, the amount of money financed and the number of firms financed. The model also included other control variables which are essential determinants of investment that is, interest rate, and GDP per capita. The functional form of the model is:

$$AI = F (NFF, TAF, IR, GDPPC,) \dots\dots\dots 3.1$$

Shahbaz (2012) Log-log model was used so as to provide more efficient results and may eliminate or reduce heteroscedasticity. The parameters of the log-log model have an interpretation as elasticity and constant elasticity is assumed over all values of the data set.

$$\ln AI_t = \beta_0 + \beta_1 \ln NFF_t + \beta_2 \ln TAF_t + \beta_3 \ln IR_t + \beta_4 \ln GDPPC_t + \varepsilon_t \dots\dots\dots 3.2$$

**Where:**

AI=Aggregate Investment

NFF= Number of Firms Financed

TAF=Total Amount of Financing

IR=Interest Rate

GDPPC=GDP per capita

$\varepsilon$  – Error term

$\beta_0$ =Y intercept

$\beta_1, \beta_2, \beta_3, \beta_4$  and  $\beta_5$  are partial slope coefficients

### **3.6 Diagnostic Test**

#### **3.6.1 Pre-estimation Diagnostic Tests**

The study used time series data spanning 10 years. Time series data are reported to non-stationary as the mean and variance are not always constant across the period. Therefore, it was necessary to carry out test for stationarity to determine whether, unit root is present or not. The study used Augmented Dickey Fuller procedure and Philips Perron test for this purpose. The two approaches were selected for the sake of robustness. The study went ahead and carry out cointegration test to establish whether the model exhibits a long-run property. In this case Johansen cointegration test was be applied.

#### **3.6.2 Post-estimation Diagnostic Tests**

Time series analysis are mainly based on the Ordinary Least Square assumptions which if violated they are likely to lead to serious econometric problems such as biased and inconsistent estimates. The study conducted normality test to check the distribution of the data, using skewness and Kurtosis tests. The ordinary least square requires the regression model be normally and identically distributed, with a mean of zero and a constant variance. Multicollinearity test was conducted, this study will use the White general test. OLS requires that the independent variables in the model should not be correlated, an assumption that violated may result in a problem of multicollinearity that will render the inferential tests insignificant.



The study will carry out tests for heteroscedasticity and autocorrelation to check for validity of the model. Heteroscedasticity refers to an econometric situation that arises when the variance of the error term is not constant. It results in the violation of Ordinary Least Square (OLS) which requires the error term to have a constant variance, this is likely to lead to inefficient regression predictions. The study used the Breusch- Pagan test.

On the other hand, Autocorrelation is an econometric problem that arises when two successive error terms seem to be correlated, a situation also referred to as serial correlation. Ordinary least square requires that error terms in a time series be independent of each other as this would lead to biased and inconsistent estimates rendering the inferences invalid. The study used Breusch-Godfrey LM test for autocorrelation.

Linearity of the model is also an important test that needs to be conducted. However, this was done by the researcher by ensuring that all the variables are only raised to power one.

## **CHAPTER FOUR**

### **DATA ANALYSIS RESULTS AND DISCUSSION**

#### **4.1 Introduction**

This chapter presents descriptive properties that give the overall characteristic of the variables in the study in the form of mean, standard deviation, skewness, and kurtosis. These tests are deemed useful in assessing the normality property of the data. The chapter presents correlation analysis, pre-estimation diagnostic tests such as unit root test and cointegration test, the regression model and as well as the post-estimation diagnostic tests.

#### **4.2 Descriptive Statistics**

Descriptive statistics is the starting point and fundamental analysis that precedes empirical analysis. It is useful in enabling the researcher to have a feel of the data as well as detecting the presence of outliers in the data. It is beneficial as it provides a summary of the data and thereby informing the researcher about the factors that they ought to put into perspective prior to proceeding on with empirical analysis (Kothari, 2004). In this regard, measures of central tendency and dispersion were used to provide summary statistics of the variables under study. Table 4.1 shows the summary statistics of the various variables used in the study, namely aggregate investment (AI), number of firms financed (NFF), total amount of financing(TAF), interest rate (IR) and GDP per capita (GDPPC). All the variables apart from the number of firms and interest rates are measured in Kenya Shillings.

**Table 4.1: Summary Statistics**

<b>Variable</b>	<b>Observation</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>AI</b>	10	7.46e+11	1.26e+11	-0.3969	1.8418
<b>NFF</b>	10	18.6	12.86857	1.003	2.7339
<b>TAF</b>	10	2.33e+10	2.55e+10	1.000	2.4853
<b>IR</b>	10	15.71442	1.941613	0.5663	2.7650
<b>GDPPC</b>	10	96356.43	29102.28	0.2619	1.7841

**Source: Research findings, 2019**

Table 4.1 presents the summary statistics of the variables used in the study. The number of observations for the study was 10 years. The mean for Aggregate investment was Ksh746 billion. The mean for the number of firms financed in the 10-year period was 18.6, the mean for the total amount of financing was Ksh23.3 billion. The mean for interest rate was 15.7 while the mean for GDP per capita was Ksh96356.43 in the 10-year period spanning from 2009 to 2018.

The standard deviation is a measure that described the extent to which data has spread out from the mean. A larger value of standard deviation signifies a higher spread out of the data from the mean and vice versa. The standard deviation for aggregate investment was Ksh 126 billion that for number of firms financed was 12.8, the standard deviation for the total amount of financing was Ksh 25.5 billion, while that for interest rate was 15.7142, on the other hand, the standard deviation for GDP per capita was Khs 29102.28. Since all the values of standard deviation were lower than the mean it can be concluded that data was well spread out.

Skewness represents the degree of asymmetry of the data, it measures how far the mean has deviated from the median. Skewness is critical in informing the researcher about the distribution of the data, this is important in informing the choice of the test to be conducted between parametric tests and non-parametric tests. When the skewness coefficient is less than 1 in absolute terms, the data is said to be moderately skewed, while larger values signify skewed data. The skewness coefficient for aggregate investment was -0.3969, meaning that it was moderately skewed to the negative. The skewness coefficient for the number of firms is 1.003 meaning that it is moderately skewed to the positive, the coefficient for the total amount of financing was 1.00, while that for interest rate was 0.5663, on the other hand, the skewness coefficient for GDP per capita is 0.2619.

Kurtosis, on the other hand, is a measure of how heavy the tail is in comparison to normal distribution. This measure is important in detecting the presence of outliers in the data, which is always shown by heavy tails (Kothari, 2004). A coefficient of more than 3 indicates the presence of kurtosis while that with less than three shows the absence of kurtosis and thus normal distribution. The results in Table 4.1 shows that all the variables have a kurtosis coefficient of less than 3 an indication that they are all light-tailed and thereby normally distributed. In economic modeling, if the data is normally distributed, then there is a reduced probability of obtaining extreme outcomes.

### **4.3 Correlation Analysis**

Correlation refers to the relationship between two variables. It is measured using a coefficient that shows the degree of linear association between two variables. The coefficient ranges between -1 and +1, where values that tend towards 1 signify a strong and

positive correlation, those that tend towards -1 signify a strong and negative correlation. While 0 values that tend towards zero in absolute terms signify weak correlation.

**Table 4.2. Correlation Matrix**

	<b>LnAI</b>	<b>LnNFF</b>	<b>LnTAF</b>	<b>LnIR</b>	<b>LnGDPPC</b>
<b>LnAI</b>	1				
<b>LnNFF</b>	0.7077 (0.0220)	1			
<b>LnTAF</b>	0.6103 (0.0310)	0.7972 (0.0057)	1		
<b>LnIR</b>	-0.311 (0.012)	-0.5100 (0.1321)	-0.2795 (0.4341)	1	
<b>LnGDPPC</b>	0.9365 (0.0001)	0.8507 (0.0018)	0.6912 (0.0269)	-0.2250 (0.5320)	1

**Source: Research findings, 2019**

Table 4.2 shows the correlation results of the variables in the study. From the Table, the correlation coefficient between the number of financed firms and aggregate investment is 0.7077 and is statistically significant at 5 percent as shown by the P-value of 0.0220. The correlation coefficient between total amount of financing and aggregate investment is 0.6103, this indicates that the two variables have a strong and significant relationship. The coefficient for the correlation between interest rate is negative as expected, -0.0311 and is statistically significant at 5 percent as shown by the P-value of 0.012. These results indicate that the two variables have a weak and negative relationship. Finally, the coefficient for

the correlation between GDP per capita and aggregate investment is positive, 0.9365 and statistically significant at 5 percent level of significance. This is an indication that GDP per capita and the aggregate level of investment have a strong association.

## 4.4 Preestimation Diagnostic Test

### 4.4.1 Unit Root Test

Unit root testing is critical in time series modeling as it helps in avoiding the possible cases of spurious regression. This study used Phillips Peron and the Augmented Dickey-Fuller approach to test for the presence of unit root. The two approaches were used for the sake of robustness. The results for the unit root test are presented in Table 4.3.

*Table 4.3: Unit Root Test*

Variables	ADF Test Z(t)		PP test Z(t)		Order of Integration
	At level	First Difference	At level	First Difference	
<b>LnAI</b>	-1.972	-3.227 ***	-2.804	-3.321 ***	I (1)
<b>LnNFF</b>	-0.525	-3.208 ***	-0.023	-3.707 ***	I (1)
<b>LnTAF</b>	-2.148	-4.801 ***	-2.092	-6.970 ***	I (1)
<b>LnIR</b>	-1.294	-3.709 ***	-1.315	-3.706 ***	I (1)
<b>LnGDPPC</b>	-0.173	-6.569 ***	-0.137	-6.195 ***	I (1)

Note: \*\*\* denotes significant at 5 percent

**Source: Research findings, 2019**

From the results presented in Table 4.3, all the variables contain unit root, therefore they were differenced once to get rid of the unit root. The variables in the study can, therefore, be said to be integrated of order one.

## 4.5 Regression Analysis

The study employed regression analysis using the differenced data since all the variables were integrated of order one. The regression analysis results are presented in Table 4.4 and Table 4.5

**Table 4.4: Model Summary**

<b>R-squared</b>	0.9165
<b>Adj R-Squared</b>	0.8497
<b>F-statistics</b>	F (4, 5) = 13.72 Prob> F = 0.0066

**Source: Research findings, 2019**

Table 4.4 shows the summary statistics for the regression model. The coefficient of determination of the model is 0.9165 meaning that 91.65 percent of the variation in the model is explained by the included independent variables namely, number of firms financed. These results indicate the model is a good fit. The F statistics of the model is 13.72 and the P-value is 0.006, this shows that the model is suitable in predicting the population parameter.

**Table 4.5: Regression Results**

<b>Variables</b>	<b>Coefficients</b>	<b>Standard Errors</b>	<b>T-statistic</b>	<b>P-value</b>
<b>Constant</b>	19.5885	1.347554	14.54	0.000
<b>LnNFF</b>	0.5813	0.1048	5.06	0.000
<b>LnTAF</b>	0.1367	0.0199	6.88	0.000
<b>LnIR</b>	-0.1810	0.0256	-7.1	0.000
<b>LnGDPPC</b>	0.6410	0.1466634	4.37	0.005

**Source: Research findings, 2019**

Table 4.4 shows the regression results. The Y-intercept is 19.5885. The partial slope coefficient of the number of firms financed is 0.5885, the results indicate that a 10 percent increase in the number of financed firms would lead to a 5.85 percent increase in the level of aggregate investment. These results are consistent with the works of Ewing and Butler (2007) who established that the number of firms by venture capitalists has a positive effect on aggregate investment. Financed firms can afford to be more innovative and thereby increasing their line of production leading to a mass scale of production.

The partial slope coefficient for the total amount of financing is 0.1367 and it is significant at 1 percent. The result indicates that a 10 percent increase the total amount of financing would result to a 1.36 percent increase in the level of aggregate investment. These results are consistent with the works of Prowse (1998) who found that the amount of financing to be having a positive effect on aggregate investment. Venture capitalists do not only fund an organization but also bring in their expertise in various types of management



transforming risky start-ups to stable ones, thereby leading to stability of firms in the different industries.

The partial slope coefficient for the interest rate is -0.181 and this is statistically significant at 1 percent. The results show that a 10 percent increase in the interest rate would lead to a reduction in the level of investment and vice-versa. The results conform to the accelerator theory of investment as well as empirical literature. Ibicioglu and Kapusuzoglu (2012) assert that the current interest rate is not only important in explaining the current investment but also predicting future investment by adjusting saving. An increase in the rate of interest would result in a decrease in the price of bonds and a fall in interest rate would lead to an increase in bond prices. In this regard, interest rate plays a major influence on the scale of investment as it operates as an opportunity cost of investment to total investment. If investment incomes remain constant, then an increase in interest rates would result to an increase in investment cost. This would then lead low-income investor to pull out from investment thus reducing demand for investment. On the other hand, a reduction in interest rate would facilitate reduction in investment cost thus stimulate investment in a country

The partial slope coefficient for Gross Domestic Product per capita is 0.6410 and it is statistically significant at 5 percent. These results show that a 10 percent increase in Gross Domestic Product per capita would lead to a 6.41 increase in the aggregate investment in Kenya. The results are in line with Keynesian theory which postulated that a rise in GDP can be interpreted as the rise in levels of income, this would provide an incentive for people to save increasing the aggregate saving in a country. The theory further posits that out that there is a savings investment nexus, and that the two variables exhibit an increasing return

to scales. An increase in income would lead to an increase in saving which would lead to an increase in investment in a country.

#### 4.6 Post-estimation Diagnostic Tests

Post estimation tests were conducted including to ensure that the model was robust. Lagrange multiplier test for autocorrelation, and Breusch-Godfrey for heteroscedasticity. The results are displayed in Table 4.6.

*Table 4.6: Post Estimation Tests*

Test	Coefficient
<b>Breusch-Godfrey LM test for autocorrelation</b>	Chi <sup>2</sup> = 0.003 Prob> chi2= 0.9576
<b>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity</b>	Chi <sup>2</sup> =0.00 Prob> chi2=0.9863

**Source: Research findings, 2019**

Table 4.6 shows the results for post estimation diagnostic tests. Among the tests conducted was the Breusch-Godfrey LM test for autocorrelation. The null hypothesis for this test states that there is no serial correlation while the alternative hypothesis states that there is serial correlation in the error term. From the findings, the Chi-square coefficient is 0.423 and the P-value is 0.5156, meaning that it is not significant at any statistical level. We, therefore, accept the null hypothesis of no serial correlation and conclude that the model does not violate the OLS assumption of autocorrelation.

On the other hand, Breusch-Pagan/Cock-Weisberg test for heteroscedasticity. The null hypothesis for the test states that the variance of the error term is constant while the

alternative hypothesis states that the variance of the error term is not constant. The Chi-square coefficient obtained for the test is 0.000 while the P-value is 0.9470 meaning that we accept the null hypothesis and conclude that the variance of the error term in the model is constant. This model, therefore, does not violate the Ordinary Least Square assumption of constant variance.

## CHAPTER FIVE

### SUMMARY, CONCLUSION, AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter contains a summary of findings obtained using descriptive statistics as well as regression analysis. The chapter also provides the conclusion of the research based on the objectives of the study. This section presents policy recommendations, as well as suggested areas of further studies.

#### 5.2 Summary of Findings

The objective of the study was to establish the effect of venture capital financing on investment in Kenya. To achieve this objective venture capital was disaggregated into two variables, namely, the number of firms financed and the total amount of financing. Other variables were also included in the analysis to act as control variables, these were interest rate and GDP per capita. The study used 10 years' data spanning from 2009 to 2018. Descriptive analysis namely, measures of dispersion and central tendencies were applied to the data. Additionally, empirical analysis and regression were applied to the data to make the results inferable.

From the regression results. The coefficient of determination of the model was 0.9165, these results indicate the model is a good fit. The F statistics of the model is 13.72 and the P-value is 0.006, showing that the model is suitable in predicting the population parameter. The variables were also subjected to normality tests, by use of kurtosis and skewness, all the data were found to be having a normal distribution. The model was also tested for validity using Breusch-Godfrey test for autocorrelation and Breusch Pagan test for

Heteroscedasticity. The model was found to be homoscedastic and did not have serial correlation.

The coefficient for the number of financed firms was 0.5813, while that for the total amount of financing was 0.1367. The partial slope coefficient for interest rate was -0.1810 and that for GDP per capita was 0.6410. All these variables were significant at 1 percent level.

### **5.3 Conclusion**

From the analysis and discussion of findings, it is clear that the study has met the objective of the study which was to establish the effect of venture capital financing on investment in Kenya.

The study sought to find the effect of the number of firms financed on the aggregate investment in Kenya. The study established that there is a positive correlation between the number of firms financed and the aggregate investment in Kenya. The study also established that the number of firms financed by venture capitalist has a positive effect on aggregate investment in Kenya. When firms are financed they become capable of affording to innovate and diversify their products contributing to large level of investment in the economy.

The study also sought to determine the effect of the total amount of financing of firms on the aggregate investment in Kenya. The study established that the total amount of financing has a positive correlation with the aggregate investment. Additionally, the study found out that the total amount of financing by venture capitalists has a positive effect on aggregate investment in Kenya. Venture capital also plays a pivotal role in investment in a nation, through a critical mechanism of channeling capital through the national and international

markets, leading to availability of funds and reduction of interest rates which would otherwise be higher if firms were only depending on debt financing.

#### **5.4 Recommendations**

The study recommends that the government should create an enabling environment for the venture capitalists firm in Kenya, by giving them favorable tax rates and incentives as they are important in contributing to the level of investment in Kenya. Venture capitalists' firms should increase the number of firms that they finance and incubate. The government should come up with ways of financing small and medium enterprises, this will boost their productive capacities thus leading to more investment in the country and more generation of income.

#### **5.5 Suggested Areas of Future Studies**

The study focused on a 10-year period which was quite limiting, the study therefore suggest that a study should be carried out using a longer period of time to enable in measuring the long-run and short-run effects. The study used also used the general venture capital financing, future studies should focus on the various types of venture capital financing and determine which ones have more effect on aggregate investment level.

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## APPENDICES

### APPENDIX I: Data Collection Sheet

Year	Aggregate Investment	Number of firms Financed	Total amount of financing	Interest Rate	GDP per capita
2009					
2010					
2011					
2012					
2013					
2014					
2015					
2016					
2017					
2018					