THE EFFECT OF INTEREST RATE VOLATILITYON FINANCIAL PERFORMANCE OF CLASS "A" ROAD CONSTRUCTION COMPANIES IN NAIROBI COUNTY

BY

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D61/63976/2010

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A DEGREE OF MASTER OF BUSINESS ADMINISTRATION UNIVERSITY OF NAIROBI

OCTOBER 2013

DECLARATION

I declare that this research project is my original work and has not been submitted to any other university for an award of a degree.

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This research project is submitted for examination with my approval as the university supervisor

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DEDICATION

For my dad and mum, their support was the greatest

ACKNOWLEDGEMENT

I take this opportunity to acknowledge each of the following people and organizations that contributed to making this project a success. First, the staff of the Jomo Kenyatta Library of the University of Nairobi provided to me the opportunity to use the library facilities especially in the MBA and the Electronic Library section.

Secondly, I wish to recognize the help and direction of my supervisor, Mr. Ondigo Herick. The advice on what to do at each stage of this research right from the generation of the research idea, to its conceptualization, to the drafting of the research proposal, to the analysis of samples and preparation of the final report is highly valued.

Thirdly, the data of analysis was got from respondents companies and the Central Bank of Kenya. It would not have been possible to conduct an analysis and extract out the relevant finding if the data was not provided in the first place.

Finally, I appreciate the people who worked on the materials cited in this study: those in the wider scholarly world and those in the business school. I also wish to thank my family that provided me with encouragement throughout the period I was conducting this research.

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ABSTRACT

The return of any firm is a product of the interaction of various factors with different contribution towards the returns. This study was designed with the aim of establishing the determinants on financial performance in Class "A" construction companies in Nairobi County. The study was a descriptive study on 16 of 48 registered companies using time series data for the five years from 2008 to 2012.

A regression model was used to determine the relationship between returns of the companies and four factors, namely, interest volatility, working capital, growth and age. However, due to the nature of the data, age was regressed with return on assets of each company on a cross-section basis, unlike the other variables which were done on time series basis per company. The level of accuracy of the regression analysis was at 95% confidence level. The significance of the constant terms and the coefficient from the regression was tested using the t-test; the significance of the regression model was done using the F-test; correlation was tested using the Pearson's correlation coefficient, while the coefficient of determination was used to determine how much variation in return was explained by variation in the independent variables.

The results show that age of the companies had a significant and positive effect on return. However, the regression analyses per company showed no statistically significant relationship between return and interest volatility, working capital and growth. The study consequently

recommends putting in place policies to make these companies competitive irrespective of their age in order to make the road construction business competitively cheaper without compromising quality.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Monetary policy operating procedures vary from one country to another. In particular, thereare major differences regarding the target interest rate used to formulate monetary policy. Somecentral banks have as operational target a short-term market interest rate while others use therate they chargefinancial institutions for the provision of short-term funds typically a reporate. Since short-term interest rates in a given currency tend to move closely in line with eachother during normal times, these differences have attracted little attention in the literature.Inthefinancial crisis of 2007/08, however, the level and volatility of interest rate spreads increaseddramatically, raising the issue of how alternative monetary policy procedures impact on theeconomy (Patra & Barabara, 2010).

Availability of information on interest rates is important not only for practitioners,but also for monetary authorities. The estimation of the volatility of interestrates is equally important as it allows gauging uncertainty surrounding market'sexpectations, notably as regards the future path of the monetary policy rate. Measuring and analyzing volatility of interest rates is an important element of any financial market analysis. For instance central banks, analyzing the volatility of interest rates are of paramount importance, since monetary policy is usually implemented by steering short-term interest rates and by shaping the market expectations of the future values of those short rates (Vincent & Allain, 2013).

Interest rates volatility has a number of implications to business organizations that depend on other financial institutions to raise money for projects. According to Hillebrand & Koray (2008) variations in interest rates are the major reason why financiers turn resources to less riskier investments such as government securities. When financiers opt to divert resources to government securities, the money available to other sectors especially the private sector is limited. This makes it difficult for private sector companies to access credit facilities for their projects. Construction companies undertake projects that require enormous resources and are more likely to suffer the most due to interest rate volatility.

1.1.1 Interest Rates Volatility

The term volatility of interest rates refers to the variability of interest rates over periods that correspond to the length of the typical business cycle. The variability of short-term and long-term interest rates is a prominent feature of the economy. Interest rates change in response to a variety of economic events, such as changes in Fed policy, crises in domestic and international financial markets, and changes in the prospects for long-term economic growth and inflation. However, economic events such as these tend to be irregular. There is a more regular variability of interest rates associated with the business cycle, the expansions and contractions that the economy experiences over time. For example, short-term interest rates rise in expansions and fall in recessions. Long-term interest rates do not appear to co-vary much with the level of economic output (Sill, 1996).

The variability of interest rates affects decisions about how to save and invest. Investors differ in their willingness to hold risky assets such as stocks and bonds. When the returns to holding stocks and bonds are highly volatile, investors who rely on these assets to provide for their consumption face a relatively large chance of having low consumption at any given time. Just as individuals care about managing risk in their investment portfolios, so do firms. To manage risk, firms must pay attention to interest rate volatility and the composition of their portfolios. Many business firms hold portfolios containing large numbers of assets and, thus, are interested in quantifying the risk of losing large sums of money(Chatterjee and Satyajit, 1995). As risks in the economy change, the expected gains and losses from the investment portfolio change. Measuring this risk involves knowing how volatile prices of and returns on assets are, as well as how the returns on different assets change together over time. The volatility of interest rates is likely to be an important component in quantifying risk and guiding the investment decisions of these institutions. Interest rate volatility also has implications for how the prices of certain types of assets are determined. Options are assets that give investors the right, but not the obligation, to buy (call options) or sell (put options) other assets (such as stocks or bonds) at a pre-specified price at or before some pre-specified time in the future. For options purchased on interest-bearing securities, modern finance theory demonstrates that the option price depends on the volatility of returns on the underlying asset. The volatility of interest rates is related to the volatility of returns on these assets (Chatterjee and Satyajit, 1995).

Interest rates and their volatility have important implications for how both individuals and firms make investment decisions. These investment decisions are part of the process whereby resources are allocated in the economy. To begin, we'll briefly discuss how bond prices, interest

rates, and maturities of bonds are related and how interest rates can be determined from bond prices (Sill, 1996).

1.1.2 Financial Performance

According to Brealey, Myers and Marcus (2009) financial performance is a way of determining how well a firm uses its assets from its core operations and generates revenues within a given financial period. This measure is compared to some given industrial average standard of similar firms in the same industry. There are several measures that organizations can use to determine their financial performance. These include: profitability, liquidity, solvency, financial efficiency and repayment capacity. Profitability is the measures of the profit generated by a firm through the use of its productive assets; liquidity measures the ability of a firm to meet its obligations when they fall due; solvency measures a firm ability to pay all its financial obligations if all of its assets are sold (Brealey et al., 2009).

According to Yacuzzi (2005) performance measures used by most organizations over a long period of time have largely been financial in nature. However, with time there have been concerns on the inadequacy of financial measures to capture many other areas of concern to performance of an organization. One such concern claims that financial reporting does not have the ability to support investment in new technologies and markets, andthis investment is required for enterprise advancement. Corporate balances measurehistorical issues, but they do not indicate potential yield of future technological andcommercial opportunities. Yacuzzi (2005) further asserts that when financial measures were developed, corporate markets andproducts were much simpler than today's. Finally, financial measures tend to focus on theshort term: the

short length of employment of top executives and the practice to manipulateaccounting figures do strengthen short term expectations.

For any organization to attain or achieve the desired or projected financial performance in line with the strategic objectives there is need to promote transparency and accountability in all the operations of the organizations (Kaplan,2001). Kaplan also agrees that using financial performance to measure the performance of an organization may be inadequate since it has some limitations. Financial reports measure past performancebut communicate little about long-term value creation. The inadequacy of the financial performance to accurately measure the performance of an organization led to the introduction of the Balanced Score Card by Kaplan and Norton (1996). The balanced Score Card is meant to measure the performance of the entire organization using other variables such as customer, the internal process, and learning and growth in addition to financial measurements.

1.1.3 Effect of Interest Rates on Financial Performance

There are a number of theories that attempt to explain interest rates and financial performance of an organization. The first theory that explains interest rates is the time preference theory that suggests that people prefer current capital investments than future ones even if both investments are given with certainty. There is also the traditional interest rate parity theory which posits that the market determines exchange rates in such a way that high interest rates are compensated for by an expectation of currency depreciation, and vice versa (Gorder, 2012).

The time preference theory also asserts that permanent income gained from capital goods. People value present satisfactions over future satisfactions, so there is a discounting process that takes place between the two. The other theory of interest rate and financial performance is that of the liquidity preference theory. The theory suggests that economic units have a preference for liquidity over investing. This theory is better applied in explaining the premium offered in forward rates in comparison to expected future spot rates (Gorder, 2012).

1.1.4Road Construction Companies in Nairobi County

Nairobi County is the biggest in terms of population density since it holds close to 4 million people. The County also serves as the administration hub of most of the organizations that operate in the country. Most of the road construction companies in Kenya have their administrative offices in Nairobi. Therefore the contractors found in Nairobi county can be classified into 6 main categories i.e. Those involved in the construction of International Trunk roads (class A), Those involved in the construction of National roads (class B), those who qualify to construct Primary roads (class C), contractors who undertake construction of Secondary roads (class D); those involved in the construction of Minor roads (class E) and Special Purpose roads. Class A roads are large road construction projects that are handled by big companiesreferred to as class 'A' road construction companies (Kenya roads board, 2012).Out of the 160,886 km of Kenya's public roads, 2,772km are international trunk roads which are classified as class 'A' roads (Kenya roads board, 2012).

Roads on urban spaces such as Nairobi County are fundamental means of communication and transaction. Thus the roads need to be well-functioning and efficient to serve the demand. For

better management of urban road construction, there is need for proper planning and implementation of urban road construction projects. The Kenya Urban Roads Authority (KURA), a state Corporation under the Ministry of Roads established by the Kenya Roads Act, 2007 has the core mandate of management development, rehabilitation and maintenance of all public roads in the Cities and Municipalities in Kenya except where those roads are national Roads. The national and international roads are managed by the Ministry of roads (Kenya roads board, 2012).The Class 'A' road construction projects are normally undertaken by class 'A' construction companies that have the ability in terms of resources and expertise to handle such projects. Most of these companies are based in Nairobi for effective administration purposes(Kenya roads board, 2012).

1.2 Research Problem

The variability of interest rates has a very significant relationship with inflation and prices of various products within any given economy. When interest rates are low most business establishments are able to access cheap credit from banks or through open market operations in order to finance their projects. This is likely to impact on the revenue and profitability of such companies. On the other hand, high interest rates may lead to high cost of credit thus denying business enterprises the opportunity to venture into projects that require employment of enormous financial resources. In Kenya, there is evidence of high interest volatility that mainly results from changes in monetary policy. This volatility may have different levels of effects on the financial performance of firms including construction companies since they rely on the financial sector to raise funds for construction projects.

The county of Nairobi is one of the largest counties in the country. In recent times, the county has experienced the construction of major roads that rated as International trunk roads. These roads are large projects that require longer periods of time to complete. The frequent changes in interest rates may lead to unstable prices and expensive credit facilities which are likely to impact on the performance of these companies.

Studies conducted on interest rate volatility indicate that it has adverse effects on various aspects of business. For instance a study carried out by Thakor, Hong & Greenbaum (1981) on Bank loan commitments and interest rate volatility confirms that volatility of interest rates play a very significant role in determining whether customers will remain commited to repaying their loans. Pierrre Roberts and Christopher (2009) also conducted a study on the possibility of extracting interest rate volatility from the cross section of bond yields. The study established that short rate volatility cannot be extracted from the cross-section of bond prices since short rate volatility and convexity are only weakly correlated. Gruber and Vigfusson (2012) also carried out an investigation on iinterest rates and the volatility and correlation of commodity prices. The study confirmed that price volatility attributable to transitory shocks declines with interest rates, while, for many commodity pairs, price correlation increases as interest rates decline. Olweny (2011) carried out a study on modelling interest rate volatility in Kenya. The study established that there exists a link between the level of short-term interest rates and volatility of interest rates in Kenya. Maana, Mwita and Odhiambo (2010) also conducted a study on modeling the volatility of exchange rates in the Kenyan market. The findings from the study revealed that exchange rates are leptokurtic and slightly positively skewed. This implies that the

exchange rate depreciation was preferred during the period, probably to ensurethat Kenya's exports remained competitive.

There is evidence of research on interest rate volatility but it is mainly concentrated or tilted towards its effects on the macroeconomic aspects. There is little research that focuses on the effect of interest rate volatility on the particular sectors of an economy such as the construction sector that may largely depend on external sources of finance to undertake some of the huge construction projects. Interest rate volatility may affect the price of credit and this is likely to affect the financial performance of these companies. This study will seek to bridge this gap by establishing the effect of interest rate volatility on the financial performance of Class 'A' construction Companies in Nairobi. The study sought to answer this question: What is the effect of interest rate volatility on the financial performance of Class 'A' construction companies in Nairobi?

1.3 Research Objective

To establish the effect of interest rate volatility onfinancial performance of class A road construction companies in Nairobi.

1.4 Value of the Study

The findings of this study will assist in providing knowledge on how interest rates volatility affects the financial performance of other sectors of the economy especially those firms in the private sector. It will be a significant contribution to the already known literature on interest rate volatility.

The study will also enable the policy makers in road construction companies in Kenya to gain a better understanding of interest rate volatility and its effect on the financial performance of organizations. This will assist them in coming up with appropriate policies that can cushion their companies against interest rate volatility.

The government of Kenya as the main source of monetary policy that results to variability in interest rates will also be able to know how the volatility of interest rates affects construction companies. This will enable to government to take necessary measures that can promote growth in the private sector without causing much damage to their financial performance.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this section, the study provides a review of relevant studies that have been carried out on interest rate volatility and performance of organizations. The main studies reviewed relate to interest rate volatility; financial performance; the relationship between interest rate volatility and financial performance of organizations; theoretical framework as well as empirical review.

2.2 Theoretical Review

The theories of interest rate volatility have been developed by numerous authors. These theories attempt to explain the changes in interest rates and the reasons why interest rates are pain. Some of these theories include: the interest rate parity theory; the time preference theory; the productivity theory of interest and the liquidity preference theory of interest. Each of these theories is discussed next in brief.

2.2.1Interest Rate Parity Theory

The Traditional interest rate parity theory posits that the market determines exchange rates in such a way that high interest rates are compensated for by an expectation of currency depreciation, and vice versa. In this case, there would be no opportunity to profit from interest differentials, and hence no incentive to borrow in a low-interest currency in order to invest the

proceeds in a high-interest currency. Neither is this traditional theory borne out by the facts. Inpractice, high-interest currencies often experience prolonged periods of sharp appreciation spurred by capital inflows. Lured by interest differentials, short-term private capital flows can be highly destabilizing (UNCTAD, 2010). The interest rate parity theory is significant in this study since it helps to explain the reason why business organizations may not achieve high financial performance because of servicing loans that were acquired at high interest rates. Organizations may also not have much incentive to borrow at high interest rates and this is likely to affect the magnitude of projects undertaken and the financial performance attained.

2.2.2 Time Preference Theory

The theory explains the permanent income gained from capital goods. People value present satisfactions over future satisfactions, so there is a discounting process that takes place between the two. This discount manifests itself in the valuation of capital goods, which produces a difference in the value of the capital good and the products sold. The realized value of the products tends to be greater than what entrepreneurs were willing to pay, even after arbitraging away any pure profit. The theory further suggests that when people exchange money across time, they are actually using money to compare two satisfactions at different points in time (Fetter, 1983). This implies that people have already done the relevant time value comparison and have taken into account whenthey place their actions in time. This comparison assists people to make temporal exchange. Comparing the two satisfactions to money has eliminated this issue, effectively isolating the time discount. The time discount manifests itself as the now isolated premium of the present satisfaction over the future satisfaction (Murray, 2004). This theory is very important in explaining the reasons behind the reasons of business

organizations willing to borrow money to undertake various projects. Money acquired now may assist carry out significant activities than it would do a number of years later. This is the reason why construction companies may opt to borrow and pay interest in order to meet current obligations.

2.2.3 Productivity Theory of Interest

According to Kiran (2012) interest is the reward for the use of capital in production. Interest is paid, they say, because capital is productive. The labour assisted by capital can produce more things than what they can do without it. For instance, a man with the help of a machine can sew more clothes than without it. It is but Just and proper therefore that a part of the pool of wealth which the capital has producedshould go to the lender of the Capital. Interest is, thus, a payment for the productivity of capital. The critics of the theory assert that the theory does explain as to why the interest is paid but it throws no light as to how the rate of interest is determined; interest is paid because capital is productive. This means that pure interest should vary in proportion to the productiveness of the capital; pure interest tends to be the same in money market during the same period of time; the theory only emphasizes as to why interest is demanded but it totally neglects the supply side of the capital and the theory fails to explain as to how interest is paid for the loan borrowed for consumption purposes. This theory also explains why construction companies may opt to pay interest rates for consumption purposes more especially in the short run. Even though funds borrowed by the companies may be used for construction activities, part of it may be utilized for consumption.

2.2.4 Liquidity Preference Theory of Interest

The Liquidity preference theory holds that economic units have a preference for liquidity over investing. This theory is better applied in explaining the premium offered in forward rates in comparison to expected future spot rates. This forward rate is used as payment for the use of scarce liquid resources. The preference for liquidity can be accounted for by the fact that economic units need to hold certain levels of liquid assets for purchase of goods and services and the fact that these near term future expenditures can be difficult to predict. The liquidity preference theory is mainly focused on the short term interest rate determination. Therefore, the theory is limited by its short-term nature, the assumptions that income remains stable, and, like classical theory, only supply and demand for money are considered (Gorder, 2012). This theory assists to explain why construction companies may prefer to borrow in order to enhance their liquidity. Construction companies make payments frequently because of the nature of the industry. The interest rates may therefore be a very important determinant on the liquidity of construction companies.

2. 3 Determinants of InterestRate Volatility

There are two main types of determinants of interest rate volatility. The first type of determinants market-specific determinants which include lack of adequate competition in the banking sector and consequent market power of commercial banks, the degree of development of the banking sector, and explicit and implicit taxation - such as profit taxes, reserve requirements,the efficiency of the legal system, contract enforcement, and decreased levels of corruption, which are all critical elements of the basic infrastructure needed to support efficient banking. According to Barajas et al, (2000) when commercial banks have greater market power

the interest rate volatility tends to be higher and the reverse is also true. He further argues that when the reserve requirements are also high, then the chances of experiencing high interest rate volatility are very high. Demirguc-Kunt and Huizinga (1998) also assert that inefficiency of the legal system and high corruption are potential determinants of interest rate volatility.

The second type of determinant of interest rate volatility is macroeconomic factors. Macroeconomicfactors are among the most influential sources for variations in interest rate volatility. Macroeconomic instability and the policy environment have important impacts on the pricing behaviour of commercial banks (Chirwa and Mlachila, 2004). They further assert that the macroeconomic variables typically thought to be determinants of interest rate volatility include inflation, growth of output, and money market real interest rates. Brock and Franken (2002) includeinterest rate uncertainty and volatility, and Randall (1998)also includes the share of commercial bank public sector loans, in her list of determinants of interest rate volatility.

Tennant (2006) also confirms that that macro-policy variables, such as public sector domestic borrowing, discount rates and Treasury Bill rates, are commonly perceived to impact on interest rate volatility. However there are other additional macro-policy variables included by Crowley (2007) in his study of English-speaking African countries such as broad money growth, and the fiscal balance. The macroeconomic variables which have been empirically shown to increase interest rate volatility include: high and variable inflation and real interest rates (Demirguc-Kunt and Huizinga, 1998); interest rate uncertainty (Brock and Franken, 2002); broad money growth (Crowley, 2007); increased

fiscal deficits (Crowley, 2007); and a high share of commercial bank public sector loans (Randall, 1998).

2.4 Determinants of Financial Performance

2.4.1 Marketing Expenditure

The financial performance of an organization is influenced by the amount of resources the company allocates to its marketing activities. When a company embarks on marketing, it is able to create brands that act as barriers to entry to its competitors hence providing a competitive advantage that leads to higher profitability of the firm. Marketing expenses can also be important in enabling companies to protect the market share that has already been developed. This protection is very essential in ensuring that the company retains a sustainable financial performance over long periods. Marketing expenses therefore have a positive correlation with the financial performance of an organization (Kakani et al., 2000).

2.4.2 Working Capital Ratio

This refers to the solvency position of a business enterprise and it usually indicates the the amount of liquid assets that a company has to enable it build its business, fund its growth strategies and produce value for its stakeholders. The main components of the working capital ratio (inventory, receivables and payables) have two important dimensions of time and money. If a firm can get money to be able to perform transactions faster and manage to reduce the

amount of money tied up in the business, the outcome will be generation of more cash which will translate to more profitability and sound financial performance. If the working capital of an organization goes too low, there is a risk of that firm running into liquidity problems and may not be able to carry out business transactions with ease (Martin et al., 1991).

2.4.3 Risk and Growth

Risk and growth are two other important factors influencing a firm's financial performance. Since market value is conditioned by the company's results, the level of risk exposure can cause changes in its market value. Economic growth is another component that helps to achieve a better position on the financial markets, because market value also takes into consideration expected future profits

2.4.4 Size of the Company

The size of the company can have a positive effect on financial performance because larger firms can use this advantage to get some financial benefits in business relations. Large companies have easier access to the most important factors of production, including human resources. Also, large organizations often get cheaper funding. In the classical theory, capital structure is irrelevant for measuring company performance, considering that in a perfectly competitive world performance is influenced only by real factors. Recent studies contradict this theory, arguing thatcapital structure play an important role in determining corporate performance. Barton & Gordon (1988) suggest that entities with higher profit rates will remain low leveraged because of their ability to finance their own sources. On the other hand, a high

degree of leverage increases the risk of bankruptcy of companies. Total assets are considered to positively influence the company's financial performance, assets greater meaning less risk.

2.4.5 The Age of the Company

According to Sorensen and Stuart (1999) the age of an organization is a very important determinant of its financial performance. They assert that older organizations that have been in existence over a long period are usually inflexible and more resistance to change. This inflexibility gives advantage to newer and smaller firms that are more robust and flexible to changes in the operating environment. The smaller companies are therefore able to take away a reasonable share of the market that is controlled by older organizations. This in turn impacts negatively on the financial performance of the older firms due to reduced profitability.

2.5 Empirical Review

Garner (1986) carried out a study to establish whether interest rate volatility can affect demand for money in the United States of America. The aim of the study was to confirm whether high interest rate volatility is the main reason behind higher average interest rates that discourage business investment decisions and consumer purchases of durable goods. The study also sought to establish whether high interest rate volatility may depress capital spending through increment of the risks that are associated with investment decisions. The findings from the study confirmed that there is no significant relationship between interest rate volatility and demand for money.The study recommended that policy makers should consider the effects of their procedures on interest rate volatility since it may affect real economic variables such as business investment spending and bond prices.

Piere & Leslaw (2001) also conducted astudy on the volatility clustering in real interest rates. The study featured 10 countries: Australia, Canada, France, Germany, Italy, Japan, New Zealand, Switzerland, United Kingdom and United States of America. The main aim of the study was to establish how the behavior of real interest rates might have been influenced by the introduction of inflation targets. The evidence suggests that, even if we control for the stage of the business cycle, the introduction of inflation targets reduces the volatility of real borrowing or lending rates in Australia and New Zealand. In addition, real borrowing rates are higher under inflation targeting in New Zealand and the UK but lower in Australia. However, real lendingrate levels appear to be un- affected by inflation targeting. The impact of inflation targets is more significant still if we omit the recession indicator proxies.

A study was also carried out by Henry, Olekalns & Suardi (2005) on level effects and asymmetric dynamics of equity return and short-term interest rate volatility in Australia. The main purpose of the study was to investigate the relationship between equity returns and short-term interest rates. Evidence from the findings confirm that that short-term interest rate volatility peaks with the level of short rates, while equity volatility responds asymmetrically to positive and negative shocks. The study also established that there is strong evidence of a level effect and asymmetric response in the relationship between index returns and 3-month US Treasury Bills. However the conditional covariance depends on the level of the short rate which has implications for hedging equity returns against short term interest rate movements.

Another area that has been linked to interest rate volatility is the mortgage financing sector. Duarte (2006) carried out a study to find out the empirical evidence and theoretical implications of the causal effect of mortgage re-financing on interest-rate volatility. An empirical

examination by the study suggests that the inclusion of information about mortgage backed securities considerably improves model performance in pricing interest-rate options andin forecasting future interest-rate volatility. The empirical findings from the results showed consistent with the hypothesis that mortgage backed securities hedging affects both the interest-rate volatility implied by options and the actual interest-rate volatility. The results also indicate that theinclusion of information about the mortgage backed securities universe may result in models that better describe the price of fixed-income securities.

Maana et al., (2010) carried out a study on modeling the volatility of exchange rates in the Kenyan market. The main purpose of the study was to consider the application of the generalized autoregressive conditional heteroscedasticity process in the estimation of volatility in the Kenyan exchange rates. The findings from the study confirm that exploratory analysis showed that the exchange rates are leptokurtic and slightly positively skewed. This implies that the exchange rate depreciation was preferred during the period, probably to ensure that Kenya's exports remained competitive.

Another study was conducted by Kim and Stock (2011). The study focused on the effect of interest rate volatility on corporate yield spreads on both non-callable and callable bonds. The study held an assumption that if greater interest rate volatility increases a firm's debt volatility, the firm is more likely to reach a critical value for default, thereby leading to a higher yield spread. We find that interest rate volatility is positively related to yield spreads on non-callable bonds. The main aim of the study was to determine whether the positive effect of interest rate volatility on yield spreads is stronger or weaker for callable bonds than for non-callable bonds. The findings from the study confirmed that the positive effect of interest rate volatility on yield

spreads is weaker for callable bonds. This result indicates there is a negative relation between default spreads and call spreads. It was also established that the relationship between interest rate volatility and yield spreads is more strongly positive for junk bonds than for investment grade bonds. Investment grade bonds are unlikely to default (Kim and Stock, 2011).

Olweny (2011) also conducted a study on modeling volatility of short-term interest rates in Kenya. The main purpose of the study was to establish the link between the level of interest and the volatility of interest rates in Kenya using theTreasury bill rates from August 1991 to December 2007. The main variable for the study was the short term interest rate series. In Kenya, this is the Central Bank three month Treasury bill rate. The findings from the study revealed that there was consistency between the hypothesisthat the volatility is positively correlated with the level of the short term interest rate and the key results. The study also found out that there exists a link between the level of short-term interest rates and volatility of interest rates in Kenya.

2.6 Summary of Literature Review

Volatility of interest rates is mainly caused by the monetary policy changes that are applicable by the central bank of any government. The volatility of interest rates may have an impact on the entire economy and even greater impact to some other sectors of the economy. Volatility of interest rates for instance will affect capital investments and stability of prices in any given economy. The empirical evidence available reveals that short term interest rates in any country have a positive correlation with the volatility of interest rates. This means that when the short term interest rates are high, there are high chances of having high interest rate volatility. Theoretical literature also indicates that investors pay interest because they have engaged

capital in productive activities. However the studies reviewed have not linked the volatility of interest rates and the financial performance of various sectors in the economy. This is a research gap that requires to be filled.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

In this chapter the methodology that guided the study is discussed. Among the issues discussed include the research design to be adopted in conducting the study; The target population for the study; The sample size and sampling design; the type of data to be collected and the instruments to be used to collect the data; the techniques to be used to analyze data as well as the analytical model that was used to represent the relationship between interest rate volatility and performance of Class 'A' construction companies in Nairobi.

3.2 Research Design

The study adopted a descriptive research design in establishing the relationship between interest rate volatility and the financial performance of class 'A' construction companies in Nairobi. According to Sandelowski (2000) descriptive research is used when one desires to describe individuals or organizations or a particular event. He further notes that descriptive research design can also be used to describe the relationship between various variables. This study intended to establish the relationship between interest rate volatility and financial of Class "A" road construction companies. It was therefore be important to adopt descriptive research design.

3.3 Target Population

The target population refers to all the elements that are to be included in this study. This is where the sample size is selected from. According to the Kenya roads board, there are a total of 48 Class 'A' road construction companies based in Nairobi (Appendix I). The target population for the study was therefore all the road construction companies registered by the Kenya roads board.

3.4 Sample

The study involved 16 construction of the 48 Class "A" companies in Nairobi County. The method of sampling wasstratified sampling where from the list of companies as provided by the Kenya roads board (Appendix I), the researcher selected every third company starting from the first to the last company in the list. This gave a total of 16 companies that formed the sample size for his study. Each of the 16 companies was treated as a stratum from where data was collected.

3.5 Data Collection

The study used of secondary data. The secondary data was collected by personal visits to the finance departments of the 16 respondent companies and capturing data in excel as provided. Data on monthly average interest rates were collected from the Central Bank of Kenya. The data that used for this study covered the period 2008-2012.

3.6 Data Analysis

Since this study sought to establish the effect of interest rate volatility on financial performance of construction companies, a multiple regression was used to analyze the data. The researcher used the following model to establish the relationship between the dependent and independent variables.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Where

Y represents the financial performance of construction companies that will be measured using Return on Assets (ROA);

X_1 represents the interest rate volatility;

X_2represents working capital ratio,

X_3representsgrowth,

X_4representsthe age of the company,

e is the error term;

β_i is the sensitivity of ROA to factor X_i

The - relationship between age of the company was done cross-sectionally using the regression model below:

$$ROA = \alpha + \beta.X + e$$

Where, α is the constant term, β is the sensitivity of ROA to age of the company and e the error term.

The $t - tests$ at 95 % confidence level was used to determine the statistical significance of the constant terms, $\alpha$and the coefficient terms, β_i. The $F - tests$ was used to determine whether each of the regressions is of statistical importance at 95 % confidence level. The coefficient of determination, R^2, and the Adjusted $R^2$was used to determine how much variation in the dependent variables is explained by variation in the independent variables. The analysis was done using SPSS 17.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

In this chapter, the focus is on the presentation of data and interpretation of the findings. It presents the analysis of the data ending with the regression analysis results. The data is presented and the analyzed and compared with other similar studies done on the subject matter of this study. The regression and correlation analysis has been done according to companies studied. The analysis of ROA versus age of company was done cross-sectionally while the analysis of ROA versus interest rate volatility, working capital and growth was done longitudinally.

4.1 Findings

4.1.1 Return on Assets and Age

As shown in Table 4.1 the regression analysis indicates that the intercept term was 0.05 which was not significant, $t_{(11)} = 1.11, p > 0.05$. The coefficient of Age was 0.003 which was statistically significant, $t_{(11)} = 2.49, p < 0.05$. The regression analysis between average ROA and age of the companies was statistically significant, $F_{(1,10)} = 6.19, p < 0.05, R^2 = 0.329$.

Table 4.1: Regression results for Age and ROA

	Coefficients	Standard Error	t -Stat	P-value
Intercept	0.05	0.05	1.17	0.27
Age in Years	0.003	0.002	2.49	0.03
F (1, 10)	6.19			
P-value (F)				0.039
R-squared	0.389			
Adjusted R-squared	0.329			

Source: Research Findings

4.1.1 Returns against Interest Volatility, Working Capital and Growth

In this section the results are presented according to each of the studied companies. Table 4.2a indicates that in A. Bayusuf, there was strong positive correlation between interest volatility and returns, $r(5) = 0.77$; between Return and Growth, $r(5) = 0.88$ and between interest volatility and growth, $r(5) = 0.57$. Strong negative correlation was found between Return and Working Capital Ratio, $r(5) = -0.62$ and between Working Capital Ratio and Growth, $r(5) = -0.91$. There was weak negative correlation between interest volatility and Working Capital Ratio, $r(5) = -0.43$.

Table 4.2a: Correlation for A. Bayusuf

	Return	Interest Volatility	WCR	GROWTH
Return	1.00			
Interest Volatility	0.77	1.00		
WCR	-0.62	-0.43	1.00	
GROWTH	0.88	0.57	-0.91	1.00

Source: Research Findings

Table 4.2b indicates that, in the regression analysis, the constant term was $-\mathbf{0.024}$ which was not significant, $\boldsymbol{t_{(5)} = -2.96, p > 0.05}$. The coefficient of interest volatility was $\mathbf{0.10}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 4.93, p > 0.05}$. The coefficient of Working Capital Ratio was $\mathbf{0.0043}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 7.37, p > 0.05}$. The coefficient of Growth was $\mathbf{0.0027}$ which was not statistically, $\boldsymbol{t_{(5)} = 11.66, p > 0.05}$. The regression was not statistically significant and the variation in interest volatility, working capital ratio and Growth strongly explained the variation in Return, $\boldsymbol{F_{(3,\ 1)} = 149.07, p < 0.05, R^2 = 0.9978}$.

Table 4.2b: Regression results for A. Bayusuf

	Coefficient	Std Error	t-Statistic	p-Value
Const	-0.024	0.008	-2.96	0.21
Interest Volatility	0.10	0.021	4.93	0.13
WCR	0.0043	0.00058	7.37	0.09
GROWTH	0.0027	0.00023	11.66	0.06
F(3, 1)		149.07		
P-value(F)				0.06
R-squared		0.9978		
Adjusted R-squared		0.9911		

Source: Research Findings

Table 4.3a indicates that there was weak positive correlation between Return and interest volatility, $\boldsymbol{r(5) = 0.37}$; between interest volatility and working capital ratio, $\boldsymbol{r(5) = 0.44}$; and between interest volatility and growth, $\boldsymbol{r(5) = 0.31}$. There was weak negative correlation between Return and working capital ratio, $\boldsymbol{r(5) = -0.19}$; between working capital ratio and

growth, $\boldsymbol{r(5) = -0.06}$. There was strong negative correlation between return and growth, $\boldsymbol{r(5) = -0.56}$.

Table 4.3a: Correlation for Arshad Sazeh Tools Kenya Limited

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.37	1.00		
WCR	-0.19	0.44	1.00	
GROWTH	-0.56	0.31	-0.06	1.00

Source: Research Findings

Table 4.3b presents the regression results for Arshad Sazeh Tools and as indicated, the constant term was $\boldsymbol{0.09}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 3.75,\ p > 0.05}$. The coefficient of interest volatility was $\boldsymbol{0.50}$ which was not significant, $\boldsymbol{t_{(5)} = 5.67,\ p > 0.05}$. The coefficient of working capital ratio was $\boldsymbol{-0.02}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -4.22, p > 0.05}$. The coefficient of growth was $\boldsymbol{-0.01}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -6.00,\ p > 0.05}$. The regression was statisticallysignificant and the variation in return was strongly explained by the variation in interest volatility, working capital ratio and growth,$\boldsymbol{F_{(3,\ 1)} = 17.19, p > 0.05, R^2 = 0.9810}$.

Table 4.3b: Regression results for Arshad Sazeh Tools Kenya Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	0.09	0.02	3.75	0.17
Interest Volatility	0.50	0.09	5.67	0.11
WCR	-0.02	0.003	-4.22	0.15
GROWTH	-0.01	0.001	-6.00	0.10
F(3, 1)		17.19		
P-value(F)				0.18
R-squared		0.9810		
Adjusted R-squared		0.9239		

Source: Research Findings

Table 4.4a and 4.4b present the analysis of Bridgestone Construction Company. As shown in Table 4.4a, there was strong positive correlation between return and growth, $\boldsymbol{r(5) = 0.91}$. There was weak positive correlation between return and interest volatility, $\boldsymbol{r(5) = 0.00}$; between interest volatility and growth, $\boldsymbol{r(5) = 0.08}$. Weak negative correlation was recorded between return and working capital ratio, $\boldsymbol{r(5) = -0.49}$; between interest volatility and working capital ratio, $\boldsymbol{r(5) = -0.01}$ and between working capital ratio and growth, $\boldsymbol{r(5) = -0.19}$.

Table 4.4a: Correlation Bridgestone Construction Company Limited

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.00	1.00		
WCR	-0.49	-0.01	1.00	
GROWTH	0.91	0.08	-0.19	1.00

Source: Research Findings

The regression results in Table 4.4b indicate that the coefficient term was $-\mathbf{0.01}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -0.16, p} > 0.05$. the coefficient of interest volatility was $-\mathbf{0.05}$ which was statistically significant, $\boldsymbol{t_{(5)} = -0.30, p} > 0.05$. The coefficient of working capital ratio was $-\mathbf{0.01}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -1.30, p} > 0.05$. The regression was not statistically significant but the variation in interest volatility, working capital ratio and growth strongly explained the variation in return, $\boldsymbol{F_{(3,\ 1)} = 5.23,\ p} > 0.05, \boldsymbol{R^2 = 0.9401}$.

Table 4.4b: Regression results for Bridgestone Construction Company Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	-0.01	0.06	-0.16	0.90
Interest Volatility	-0.05	0.16	-0.30	0.82
WCR	-0.01	0.01	-1.30	0.42
GROWTH	0.01	0.002	3.43	0.18
F(3, 1)		5.23		
P-value(F)				0.31
R-squared		0.9401		
Adjusted R-squared		0.7603		

Source: Research Findings

Table 4.5a and 4.5b present an analysis of COVEC. As shown in Table 4.5a, there was strong positive correlation between return and interest volatility, $\boldsymbol{r(5) = 0.65}$ and between working capital ratio and growth, $\boldsymbol{r(5) = 0.82}$. There was weak positive relationship between return and working capital ratio, $\boldsymbol{r(5) = 0.03}$. Weak negative correlation was recorded between return and growth, $\boldsymbol{r(5) = -0.29}$; between interest volatility and working capital ratio, $\boldsymbol{r(5) = -0.13}$; and between interest volatility and growth, $\boldsymbol{r(5) = -0.23}$

4.5a: Correlation COVEC

	ROA	Interest Volatility	WCR	GROWTH
ROA	1			
Interest Volatility	0.65	1		
WCR	0.03	-0.13	1	
GROWTH	-0.29	-0.23	0.82	1

Source: Research Findings

As shown in Table 4.5b the regression results indicate that the constant term was $\mathbf{0.01}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.17, p} > 0.05$. The coefficient of interest volatility was $\mathbf{0.22}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.86, p} > 0.05$. The coefficient of working capital ratio was 0.01 which was not statistically significant, $\boldsymbol{t_{(5)} = 0.61, p} > 0.05$. The coefficient of growth was -0.0014 which was not statistically significant, $\boldsymbol{t_{(5)} = -0.62, p} > 0.05$. The regression was not statistically significant but the variation in interest volatility, working capital ratio and growth strongly explained the variation in return, $\boldsymbol{F_{(3,1)} = 0.48, p} > 0.05, \boldsymbol{R^2 = 0.5879}$.

Table 4.5b: Regression results for Corporation (COVEC) Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	0.01	0.08	0.17	0.89
Interest Volatility	0.22	0.26	0.86	0.55
WCR	0.01	0.01	0.61	0.65
GROWTH	-0.0014	0.002	-0.62	0.65
F(3, 1)		0.48		
P-value(F)				0.76
R-squared		0.5879		
Adjusted R-squared		-0.6483		

Source: Research Findings

In China Wu Yi, whose results are presented in Table 4.6a and Table 4.6b there was strong positive correlation between return and interest volatility, $\boldsymbol{r(5) = 0.59}$ and between return and working capital ratio, $\boldsymbol{r(5) = 0.53}$. There was strong negative correlation between return and growth, $\boldsymbol{r(5) = -0.73}$. Weak positive correlation was recorded between interest volatility and working capital ratio $\boldsymbol{r(5) = 0.25}$ while weak positive correlation was registered between interest volatility, $\boldsymbol{r(5) = -0.23}$ and between working capital and growth, $\boldsymbol{r(5) = -0.20}$.

Table 4.6a: Correlation for China Wu Yi

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.59	1.00		
WCR	0.53	0.25	1.00	
GROWTH	-0.73	-0.23	-0.20	1.00

Source: Research Findings

The regression analysis as shown in Table 4.6b indicates that the constant term was $\boldsymbol{0.10}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.60, p} > 0.05$. The coefficient of interest volatility was 0.40 which was not statistically significant, $\boldsymbol{t_{(5)} = 0.87, p} > 0.05$. The coefficient of working capital ratio was 0.0004 which was not statistically significant, $\boldsymbol{t_{(5)} = 0.73, p} > 0.05$. The coefficient of growth was -0.003 which was not statistically significant, $\boldsymbol{t_{(5)} = -1.34, p} > 0.41$. The regression was not statistically significant, but the variation in return was strongly explained by the variation in interest volatility, working capital and growth, $\boldsymbol{F_{(3,1)} = 1.56, p} > 0.05, \boldsymbol{R^2 = 0.8243}$.

Table 4.6b: Regression results for China Wu Yi Co. Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	0.10	0.16	0.60	0.66
Interest Volatility	0.40	0.46	0.87	0.55
WCR	0.0004	0.0006	0.73	0.60
GROWTH	-0.003	0.002	-1.34	0.41
F(3, 1)		1.56		
P-value(F)				0.52
R-squared		0.8243		
Adjusted R-squared		0.2973		

Source: Research Findings

As shown in Table 4.7a there was strong positive correlation between return and interest volatility, $\boldsymbol{r(5) = 0.54}$ and between return and growth, $\boldsymbol{r(5) = 0.51}$. Strong negative correlation was recorded between working capital and growth, $\boldsymbol{r(5) = -0.93}$. There was weak positive correlation between interest volatility and growth, $\boldsymbol{r(5) = 0.34}$. There was weak negative correlation between return and working capital $\boldsymbol{r(5) = -0.28}$ and between working capital and interest volatility, $\boldsymbol{t_{(5)} = -0.14}$.

Table 4.7a: Correlation for China Railways

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.54	1.00		
WCR	-0.28	-0.14	1.00	
GROWTH	0.51	0.34	-0.93	1.00

Source: Research Findings

The correlation analysis in Table 4.7b indicates that the constant term was $\boldsymbol{-0.07}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -0.27, p} > 0.05$. The coefficient of interest

volatility was $\mathbf{0.10}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.23, p} > 0.05$. The coefficient of working capital was $\mathbf{0.06}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.59, p} > 0.05$. the coefficient of growth was $\mathbf{0.09}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.72, p} > 0.05$. The regression was not statistically significant but the variation in interest volatility, working capital and growth strongly explained the variation in returns, $\boldsymbol{F_{(3,1)} = 0.09, p} > 0.05, \boldsymbol{R^2 = 0.5649}$.

Table 4.7b: Regression results for China Railways Seventh Group 1Co.Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	-0.07	0.25	-0.27	0.83
Interest Volatility	0.10	0.44	0.23	0.85
WCR	0.06	0.10	0.59	0.66
GROWTH	0.009	0.01	0.72	0.60
F(3, 1)		0.43		
P-value(F)				0.77
R-squared		0.5649		
Adjusted R-squared		-0.7405		

Source: Research Findings

Table 4.8a and 4.8b show the analysis of Dhanjal Bros. As shown in Table 4.8a there was strong positive correlation between return and interest volatility $\boldsymbol{r(5) = 0.80}$. Strong negative correlation was registered between return and growth, $\boldsymbol{r(5) = -0.60}$. There was weak positive correlation between return and working capital, $\boldsymbol{r(5) = 0.35}$. There was weak negative correlation between interest volatility and working capital, $\boldsymbol{r(5) = -0.02}$, between interest volatility and growth, $\boldsymbol{r(5) = -0.11}$.

Table 4.8a: Correlation for Dhanjal Bros

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.80	1.00		
WCR	0.35	-0.02	1.00	
GROWTH	-0.60	-0.11	-0.18	1.00

Source: Research Findings

As shown in Table 4.8b the regression analysis revealed that the coefficient term is $\mathbf{0.05}$ which is not statistically significant, $\boldsymbol{t_{(5)} = 2.91, p} > 0.05$. The coefficient of interest volatility was $\mathbf{0.24}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 4.84, p} > 0.13$. The coefficient of working capital was 0.001 which was not statistically significant, $\boldsymbol{t_{(5)} = 1.80, p} > 0.05$. The coefficient of growth was $\mathbf{-0.0009}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -2.97, p} > 0.05$. The regression was not statistically significant and the variation in interest volatility, working capital and growth did not strongly explain the variation in returns, $\boldsymbol{F_{(3,\ 1)} = 13.70, p} > 0.05, \boldsymbol{R^2 = 0.9762}$.

Table 4.8b: Regression results for Dhanjal Bros Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	0.05	0.02	2.91	0.21
Interest Volatility	0.24	0.05	4.84	0.13
WCR	0.001	0.0006	1.80	0.32
GROWTH	-0.0009	0.0003	-2.97	0.21
F(3, 1)		13.70		
P-value(F)				0.20
R-squared		0.9762		
Adjusted R-squared		0.9050		

Source: Research Findings

Tables 4.9a and 4.9b present the analysis of Sinohydro. As shown in Table 4.9a there was strong positive correlation between returns and interest volatility, $\boldsymbol{r(5) = 0.66}$. There was weak positive correlation between working capital and growth, $\boldsymbol{r(5) = 0.33}$. There was strong negative correlation between interest volatility and growth, $\boldsymbol{r(5) = -0.95}$. There was weak negative correlation between returns and working capital, $\boldsymbol{t(5) = -0.44}$; between return and growth, $\boldsymbol{r(5) = -0.46}$ and between interest volatility and working capital, $\boldsymbol{r(5) = -0.38}$.

Table 4.9a: Correlation for Sinohydro

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.66	1.00		
WCR	-0.44	-0.38	1.00	
GROWTH	-0.46	-0.95	0.33	1.00

Source: Research Findings

The constant term of the regression was $\boldsymbol{-3.55}$ which was not statistically significantly, $\boldsymbol{t_{(5)} = -1.25, p} > 0.05$. The coefficient of interest volatility was $\boldsymbol{12.15}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 1.40, p} > 0.05$. The coefficient of working capital was $\boldsymbol{-0.04}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -0.27, p} > 0.05$. The coefficient of growth was $\boldsymbol{0.06}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 1.10, p} > 0.05$. The regression was not statistically significant and the variation in returns was not strongly explained by the variation in interest volatility, working capital and growth, $\boldsymbol{F_{(3,1)} = 1.08, p} > 0.05, \boldsymbol{R^2 = 0.7642}$.

Table 4.9b: Regression results for Sinohydro CorporationLimited

	Coefficient	Std Error	t-Statistic	p-Value
Const	-3.55	2.83	-1.25	0.43
Interest Volatility	12.15	8.67	1.40	0.40
WCR	-0.04	0.13	-0.27	0.82
GROWTH	0.06	0.06	1.10	0.47
F(3, 1)		1.08		
P-value(F)				0.59
R-squared		0.7642		
Adjusted R-squared		0.0570		

Source: Research Findings

As shown in Table 4.10a in H. Young there was strong positive correlation between working capital and growth, $\boldsymbol{r(5) = 0.93}$. Weak positive correlation was found between return and interest volatility, $\boldsymbol{r(5) = 0.19}$. Strong negative correlation was found between return and working capital, $\boldsymbol{r(5) = -0.88}$; between return and growth, $\boldsymbol{r(5) = -0.90}$; between interest volatility and working capital, $\boldsymbol{r(5) = -0.50}$. Weak negative correlation was found between interest volatility and growth, $\boldsymbol{r(5) = -0.36}$.

Table 4.10a: Correlation for H. Young

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.19	1.00		
WCR	-0.88	-0.50	1.00	
GROWTH	-0.90	-0.36	0.93	1.00

Source: Research Findings

The regression results presented in Table 4.10b show that the constant term was $\boldsymbol{0.21}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 3.07, p} > 0.05$. The coefficient of interest volatility was $\boldsymbol{-0.14}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -0.67, p} > 0.05$.

The coefficient of working capital was $-\mathbf{0.005}$ which was not statistically significant, $\boldsymbol{t}_{(5)} = -\mathbf{0.65}, \boldsymbol{p} > 0.05$. The coefficient of growth was $-\mathbf{0.0007}$ which was statistically significant, $\boldsymbol{t}_{(5)} = -\mathbf{0.40}, \boldsymbol{p} > 0.05$. The regression was not statistically significant and the variation in return was not strongly explained by the variation in interest volatility, working capital and growth, $\boldsymbol{F}_{(3,\ 1)} = \mathbf{2.50}, \boldsymbol{p} > 0.05, \boldsymbol{R^2} = \mathbf{0.8823}$.

Table 4.10b: Regression results for H.Young Co Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	0.21	0.07	3.07	0.20
Interest Volatility	-0.14	0.21	-0.67	0.62
WCR	-0.005	0.01	-0.65	0.63
GROWTH	-0.0007	0.002	-0.40	0.76
F(3, 1)				2.50
P-value(F)				0.43
R-squared				0.8823
Adjusted R-squared				0.5291

Source: Research Findings

The analysis of ICON (Kenya) is presented in Table 4.11a and Table 4.11b. The correlation results in Table 4.11a indicate strong positive correlation between return and interest volatility, $\boldsymbol{r}(\mathbf{5}) = \mathbf{0.66}$; between return and growth, $\boldsymbol{r}(\mathbf{5}) = \mathbf{0.63}$ and between working capital and growth, $\boldsymbol{r}(\mathbf{5}) = \mathbf{0.71}$. Weak positive correlation was found between interest volatility and growth, $\boldsymbol{r}(\mathbf{5}) = \mathbf{0.07}$. Weak negative correlation was found between return and working capital, $\boldsymbol{r}(\mathbf{5}) = -\mathbf{0.03}$ and between interest volatility and working capital, $\boldsymbol{r}(\mathbf{5}) = -\mathbf{47}$.

Table 4.11 a: Correlation for ICON (Kenya) Limited

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.66	1.00		
WCR	-0.03	-0.47	1.00	
GROWTH	0.63	0.07	0.71	1.00

Source: Research Findings

The regression results show that the constant term was $-\mathbf{0.04}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -0.34, p} > 0.05$. The coefficient of interest volatility was $\mathbf{0.272}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.54, p} > 0.05$. The coefficient of working capital was $-\mathbf{0.02}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -0.91, p} > 0.05$. The coefficient of growth was $\mathbf{0.007}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 1.68, p} > 0.05$. The regression was not statistically significant and the variation in return was not strongly explained by variation in interest volatility, working capital and growth, $\boldsymbol{F_{(3,\ 1)} = 2.43, p} > 0.05, \boldsymbol{R^2 = 0.8796}$.

Table 4.3b: Regression results for ICON (Kenya) Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	-0.04	0.12	-0.34	0.79
Interest Volatility	0.272	0.50	0.54	0.69
WCR	-0.02	0.03	-0.91	0.53
GROWTH	0.007	0.004	1.68	0.34
F(3, 1)		2.43		
P-value(F)				0.43
R-squared		0.8796		
Adjusted R-squared		0.5183		

Source: Research Findings

According the analysis of Kay Construction in Tables 4.12a and 4.12b there was strong positive correlation between return and interest volatility, $\boldsymbol{r(5) = 0.64}$ and between interest volatility and growth, $\boldsymbol{r(5) = 0.52}$. There was weak positive correlation between return and working capital, $\boldsymbol{r(5) = 0.10}$. There was weak negative correlation between return and growth, $\boldsymbol{r(5) = -0.27}$; between interest volatility and working capital, $\boldsymbol{r(5) = -0.46}$ and between working capital and growth, $\boldsymbol{r(5) = -0.38}$.

Table 4.4a: Correlation for Kay Construction Company Limited

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.64	1.00		
WCR	0.10	-0.46	1.00	
GROWTH	-0.27	0.52	-0.38	1.00

Source: Research Findings

As shown in Table 4.12b the regression results indicate that the constant term was $\boldsymbol{-0.05}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -3.44, p} > 0.05$. The coefficient of interest volatility was $\boldsymbol{0.82}$ which was statistically significant, $\boldsymbol{t_{(5)} = 15.28, p} < 0.05$. The coefficient of working capital was $\boldsymbol{0.01}$ which was statistically significant, $\boldsymbol{t_{(5)} = 4.86, p} > 0.05$. The coefficient of growth was $\boldsymbol{-0.003}$ which was not ststistically significant, $\boldsymbol{t_{(5)} = -10.05, p} > 0.05$. The regression was not statistically significant, but the variation in interest volatility, working capital and growth strongly explained variation in return , $\boldsymbol{F_{(3,1)} = 83.81, p} > 0.05, \boldsymbol{R^2 = 0.9960}$.

Table 4.125b:Regression results for Kay Construction Company Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	-0.05	0.01	-3.44	0.18
Interest Volatility	0.82	0.05	15.28	0.04
WCR	0.01	0.002	4.86	0.13
GROWTH	-0.003	0.0003	-10.05	0.06
F(3, 1)		83.81		
P-value(F)				0.08
R-squared		0.9960		
Adjusted R-squared		0.9842		

Source: Research Findings

Table 4.13a and Table 4.13b provide the analysis of Kundan Singh Constructions. As shown in Table 4.17a, there was strong positive correlation between return and interest volatility, $\boldsymbol{r(5) = 0.64}$. There was weak positive correlation between return and growth, $\boldsymbol{r(5) = 0.30}$ and between working capital and growth, $\boldsymbol{r(5) = 0.02}$. Strong negative correlation was recorded between return and interest volatility, $\boldsymbol{r(5) = -0.64}$. Weak negative correlation was recorded between interest volatility and working capital, $\boldsymbol{r(5) = -0.45}$ and between interest volatility and growth, $\boldsymbol{r(5) = -0.05}$.

Table 4.13a: Correlation for Kundan Singh Construction Limited

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.64	1.00		
WCR	-0.64	-0.45	1.00	
GROWTH	0.30	-0.05	0.02	1.00

Source: Research Findings

Table 4.13 shows that the constant term was $\mathbf{0.04}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.25, p} > 0.85$. The coefficient of interest volatility was $\mathbf{0.04}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.72, p} > 0.05$. The coefficient of working capital was $\mathbf{-0.03}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -0.68, p} > 0.05$. The coefficient of growth was $\mathbf{0.002}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.59, p} > 0.05$. The whole regression was not statistically significant but the variation in return was fairly explained by the variation in interest volatility, working capital and growth, $\boldsymbol{F_{(3,1)} = 0.69, p} > 0.05$, $\boldsymbol{R^2 = 0.6757}$.

Table 4.13b:Regression results for Kundan Singh Construction Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	0.04	0.18	0.25	0.85
Interest Volatility	0.41	0.57	0.72	0.60
WCR	-0.03	0.05	-0.68	0.62
GROWTH	0.002	0.004	0.59	0.66
F(3, 1)		0.69		
P-value(F)				0.68
R-squared		0.6757		
Adjusted R-squared		-0.2972		

Source: Research Findings

The correlation matrix for MRZ Construction shown in Table 4.14a indicates that there was strong positive correlation between return and interest volatility, $\boldsymbol{r(5) = 0.64}$. There was weak positive correlation between return and growth $\boldsymbol{r(5) = 0.30}$, and between working capital and growth, $\boldsymbol{r(5) = 0.02}$. Strong negative correlation was found between return and working capital $\boldsymbol{r(5) = -0.64}$. Weak negative correlation was found between interest volatility and growth $\boldsymbol{r(5) = 0.05}$.

Table 4.14a: Correlation for MRZ Construction Co. Limited

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.64	1.00		
WCR	-0.64	-0.45	1.00	
GROWTH	0.30	-0.05	0.02	1.00

Source: Research Findings

The regression analysis in Table 4.14b shows that the constant term was $\mathbf{0.11}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 2.29, p} > 0.05$. The coefficient of interest volatility was $\mathbf{0.53}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 3.73, p} > 0.05$. The coefficient of working capital was $\mathbf{-0.12}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -6.31, p} > 0.05$. The coefficient of growth was 0.0005 which was not statistically significant, $\boldsymbol{t_{(5)} = 1.34, p} > 0.05$. The whole regression was not statistically significant, $\boldsymbol{F_{(3,\ 1)} = 37.32, p} > 0.05$, $\boldsymbol{R^2 = 0.9911}$.

Table 4.14 b:Regression results for MRZ Construction Co. Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	0.11	0.05	2.29	0.26
Interest Volatility	0.53	0.14	3.73	0.17
WCR	-0.12	0.02	-6.31	0.10
GROWTH	0.0005	0.0004	1.34	0.41
F(3, 1)		37.32		
P-value(F)				0.12
R-squared		0.9911		
Adjusted R-squared		0.9646		

Source: Research Findings

Table 4.15a presents the correlation analysis of Progressive Constructions Private. There was strong positive correlation between return and working capital, $\boldsymbol{r(5) =}$

$\mathbf{0.75}$;between return and growth, $\boldsymbol{r(5) = 0.57}$ and between interest volatility and growth, $\boldsymbol{r(5) = 0.87}$. There was weak positive correlation between return and interest volatility, $\boldsymbol{r(5) = 0.17}$ and between working capital and growth, $\boldsymbol{r(5) = 0.10}$. Weak negative correlation was between interest volatility and working capital, $\boldsymbol{r(5) = -0.23}$.

Table 4.15 a: Correlation for Progressive Constructions Private Limited

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.17	1.00		
WCR	0.75	-0.23	1.00	
GROWTH	0.57	0.87	0.10	1.00

Source: Research Findings

The regression analysis of Progressive Constructions Private presented in Table 4.15b indicates that the constant term was $\mathbf{0.11}$ which was not significant, $\boldsymbol{t_{(5)} = 0.92, p} > 0.05$. The coefficient of interest volatility was $\mathbf{-0.47}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -0.78, p} > 0.05$. The coefficient of working capital was $\mathbf{0.023}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 1.08, p} > 0.05$. The coefficient of growth was $\mathbf{0.005}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 1.29, p} > 0.05$. The whole regression was not statistically significant but the variation in interest volatility, working capital and growth strongly explained the variation in return, $\boldsymbol{F_{(3,\ 1)} = 2.55, p} > 0.05$, $\boldsymbol{R^2 = 0.8842}$.

Table 4.15b:Regression results for Progressive Constructions Private Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	0.11	0.12	0.92	0.53
Interest Volatility	-0.47	0.61	-0.78	0.58
WCR	0.023	0.02	1.08	0.47
GROWTH	0.005	0.004	1.29	0.42
F(3, 1)		2.55		
P-value(F)				0.42
R-squared		0.8842		

Adjusted R-squared	0.5370

Source: Research Findings

The correlation analysis of SPENCON Kenya is presented in Table 4.16a. There was strong positive correlation between return and interest volatility, $\boldsymbol{r(5) = 0.68}$; between return and working capital, $\boldsymbol{r(5) = 0.73}$; between return and growth, $\boldsymbol{r(5) = 0.84}$; between interest volatility and working capital, $\boldsymbol{r(5) = 0.83}$ and between interest volatility and growth, $\boldsymbol{r(5) = 0.55}$. There was weak positive correlation between working capital and growth, $\boldsymbol{r(5) = 0.38}$.

Table 4.16 a: Correlation for SPENCON Kenya Limited

	ROA	**Interest Volatility**	**WCR**	**GROWTH**
ROA	1.00			
Interest Volatility	0.68	1.00		
WCR	0.73	0.83	1.00	
GROWTH	0.84	0.55	0.38	1.00

Source: Research Findings

The regression results of SPENCON Kenya shown in Table 4.16b indicate that the constant term was $\boldsymbol{0.068}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 1.06, p} > 0.05$. The coefficient of interest volatility was $\boldsymbol{-0.12}$ which was not significant, $\boldsymbol{t_{(5)} = -0.53}$, $\boldsymbol{p} > 0.05$. The coefficient of working capital was $\boldsymbol{0.013}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 1.34}$, $\boldsymbol{p} > 0.05$. The coefficient of growth was $\boldsymbol{0.0028}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 2.11}$, $\boldsymbol{p} > 0.05$. The regression was not significant but the variation in return was strongly explained by the variation in interest volatility, working capital and growth, $\boldsymbol{F_{(3,\ 1)} = 3.72}$, $\boldsymbol{p} > 0.05$, $\boldsymbol{R^2 = 0.9178}$.

Table 4.16b: Regression results for SPENCON Kenya Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	0.068	0.064	1.06	0.48
Interest Volatility	-0.12	0.23	-0.53	0.69
WCR	0.013	0.009	1.34	0.41
GROWTH	0.0028	0.0013	2.11	0.28
F(3, 1)		3.72		
P-value(F)				0.36
R-squared		0.9178		
Adjusted R-squared		0.6710		

Source: Research Findings

The analysis of Glencarrick Construction is presented in Table 4.17a and Table 4.17b. There was strongpositive correlation between working capital and growth, $\boldsymbol{r(5) = 0.90}$. There was weak positive correlation between return and interest volatility, $\boldsymbol{r(5) = 0.40}$. There was weak negative correlation between return and working capital, $\boldsymbol{r(5) = -0.43}$; between return and growth, $\boldsymbol{r(5) = -0.30}$; between interest volatility and working capital, $\boldsymbol{r(5) = -0.47}$ and between interest volatility and growth, $\boldsymbol{r(5) = -0.44}$.

Table 4.17a: Correlation for Glencarrick Construction (Kenya) Limited

	ROA	Interest Volatility	WCR	GROWTH
ROA	1.00			
Interest Volatility	0.40	1.00		
WCR	-0.43	-0.47	1.00	
GROWTH	-0.30	-0.44	0.90	1.00

Source: Research Findings

As shown in Table 4.17b the regression analysis indicates that the constant term was $\mathbf{0.11}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.40, p} > 0.05$. The coefficient of interest volatility was $\mathbf{0.21}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.27}$, $\boldsymbol{p} > 0.05$. The coefficient of working capital was $\mathbf{-0.03}$ which was not statistically significant, $\boldsymbol{t_{(5)} = -0.36}$, $\boldsymbol{p} > 0.05$. The coefficient of growth was $\mathbf{0.0013}$ which was not statistically significant, $\boldsymbol{t_{(5)} = 0.23}$, $\boldsymbol{p} > 0.05$. The whole regression was not statistically significant and the variation in return was not strongly explained by variation in interest volatility, working capital and growth, $\boldsymbol{F_{(3,\ 1)} = 0.12}$, $\boldsymbol{p} > 0.05$, $\boldsymbol{R^2 = 0.2724}$.

Table 4.17b: Regression results for Glencarrick Construction (Kenya) Limited

	Coefficient	Std Error	t-Statistic	p-Value
Const	0.11	0.27	0.40	0.76
Interest Volatility	0.21	0.78	0.27	0.83
WCR	-0.03	0.09	-0.36	0.78
GROWTH	0.0013	0.0056	0.23	0.86
F(3, 1)		0.12		
P-value(F)				0.93
R-squared		0.2724		
Adjusted R-squared		-1.9105		

Source: Research Findings

4.2 Interpretation of Findings

The analysis of the data from the 16 companies reveals that the relation between return and age of the companies was strong and positive. However, the variation in age of the companies did not strongly explain the variation in return indicating there are other key determinants of return not captured by the regression of age of companies and return. The indication is that older companies generate higher returns that the younger companies. The findings are similar to those of Sorensen and Stuart (1999) who found that the age of an organization is a very important determinant of its financial performance and profitability.

The company based regressions have shown that there is a weak relationship between return and interest rate volatility. This indicates that the variation in interest rates did not have an effect on the returns of the companies in construction. The findings agree with those of Ongore and Okoth (2013) who found that interest rate variation affected the performance of organizations especially in the financial sector in Kenya. The findings seem to agree with those of Owolabi and Obida (2012) who found that though interest rate affected profitability, the effect was reduced to null with proper liquidity management.

The study has also found a weak relationship between working capital and return. This suggests that the variation in working capital did not have a strong impact on the returns of the companies in this study. The findings agree with those of Atieno (2012) who found that working capital ratio did not have any significant effect on the profitability of firms on the Nairobi Securities Exchange. The finding of this research are, however, in disagreement with those of Garcia (2011) who found that working capital management had a strong effect on the performance of non - financial companies listed in 11 European Stock Exchanges for a period of 12 years: 1998 – 2009.

This study found a weak relationship between company growth and return. The findings are drawn from the statistically insignificant coefficient of growth variable in the regression analysis of all the sixteen companies. The findings are in disagreement with those of Kouser (2012) who found that profitability had strong positive relationship with growth of the firm, but size had less significant and negative impact on profitability. The study by Kouser (2012) was done on 70 non-financial companies listed at Karachi Stock Exchange of Pakistan. The finding of this study support those of Davidsson, Achtenhagen and Naldi (2012) who found that growth direction of firms did not necessarily depend on profitability or vice versa.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

Theoretical positions by studies like Sorensen and Stuart (1999) and Garner (1986) indicate that the age of a firm, interest rate volatility, growth, and working capital are closely related to the profitability of a firm. However, other studies like Atieno (2012) and Davidsson, Achtenhagen and Naldi (2012) provide disagreeing positions showing that working capital and growth did not have strong bearing on the profitability of companies especially those in the non-finance sectors.

This study set out to investigate the relationship between profitability as the dependent variable and Interest Volatility, working capital, Growth and age of the company as the independent variables. The study was done on 16 randomly selected companies out of 48 registered Class "A" construction companies in Nairobi with data covering five years ending December 2012. The relationship between return and age was done using ordinary least squares and was done separate from the regression analysis relating return on the other independent factors, namely, Interest Volatility, working capital and Growth.

The study established that there was a strong and positive relationship between the age of the companies and their return. This indicates that older companies were likely to generate higher returns as opposed to their younger peer companies. The study also found that the relationship between interest volatility, working capital and growth and return was weak and statistically insignificant for all the 16 companies in the sample. This, indicates that interest volatility, working capital and growth did not have a strong influence on the returns of the companies in the Class "A" construction business located in Nairobi.

5.2 Conclusions

Based on the findings of this study, the following conclusions hold. First, age of the company strongly affects the return of the Class "A" registered construction companies. The effect is positive which means that older companies are likely to make higher returns than the newer companies.

Secondly, there is weak relationship between interest volatility and return of the companies. This arises from the statistical insignificance of the coefficient of interest volatility across the 16 companies. This leads to the conclusion that variability in the lending rates of bank seem not to affect the returns of the construction companies. The returns of construction companies seem to be insulated against interest rate risk.

The statistical significance of the relationship between working capital and return was weak across the 16 companies. This indicated that for each of the companies, working capital was not a strong driver of profitability. This leads to the third conclusion of this research that working capital did not have a strong effect on the profitability of the Class "A" registered companies.

The final conclusion is that there is no significant relationship between growth and return among the Class "A" construction companies in Nairobi. This conclusion is drawn from the finding that the coefficient of growth variable in the analyses of the 16 companies was, all through, not statistically significant.

5.3 Recommendations for Policy

This study finds that age of companies seems to be a strong issue determining returns of companies in the Class "A" construction business. This could indicate that the older companies secure more construction contracts or get the more lucrative contracts as compared to the older contractors. This situation is unfavourable for the new firms which

might have the capacity to provide better jobs that the older ones. This study recommends putting in place policies to make these companies competitive in order to make the road construction competitively cheaper without compromising quality.

The policies put in place to hedge these construction companies against the effects of interest rate risk should be discovered and investigated. Such policies can be used by industries in other sectors to avoid losses caused by interest rate volatility.

5.4 Limitations of the Study

This study has the following three limitations. First, the sample was done on a small section of the construction companies in Kenya. The findings might not be usefully applied to the whole construction industry in Kenya. The sample of the study is itself a limitation of this study.

Secondly, the analysis has been done with the assumption that the relationship between return on one side and interest volatility, working capital and growth on the other side is linear. There has been no theoretical basis for this assumption, though no other theory exists to provide alternative positions. However, the indication is that the nature of the relationship has not been established to be linear or otherwise.

Thirdly, the study has used historical data to conduct the analysis yet issues that will drive the profitability of a firm are current and context based. The findings may, therefore, no reflect the situation as it currently is in the construction industry.

5.5 Suggestion for Further Research

The findings of this study can be improved based on the following recommendations for further study. This study has not established the causality relationship between returns and each of the independent variables interest volatility, working capital, growth and

age.A study should be done to establish whether there is a causality relationship between these variables and establish the nature of the causality.

A study can be done covering the whole construction industry in Kenya to make the findings richer and provide more room for generalizablity. This is because the findings of this study are focused on few companies in a small sub-sector of the construction industry and for a short period of study. A study with a wider population will be more informing and will give more generalizable results.

A study can be done to include industries outside Kenya but in the East African Region. The current trend in East Africa is to unify into one trading and political bloc. Basing studies on this bloc will be beneficial in providing researched input that will help in decision making and policy designing.

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APPENDICES

Appendix I: Registered Class "A" Contractors in Nairobi

S/NO	NAME OF CONTRACTOR
1	A. A BAYUSUF & SONS LTD
2	AEGIS CONSTRUCTION LTD
3	ARAB CONTRACTORS LIMITED
4	ARSHAD SAZEH TOOLS KENYA LIMITED
5	ASSOCIATED CONSTRUCTION COMPANY LIMITED
6	ASSOCIATED ELECTRICALS & HARDWARE SUPPLIERS LIMITED
7	BRIDGESTONE CONSTUCTION COMPANY LIMITED
8	CHINA DALIAN INTERNATIONAL
9	CHINA NATIONAL OVERSEAS ENGINEERING
10	CORPORATION (COVEC) LTD
11	CHINA SICHUAN INTERNATIONAL COOPERATION COMPANY LTD
13	CHINA ROAD AND BRIDGE
13	CHINA WU YI CO, LIMITED
14	CHINA JIANGXI INTERNATIONAL KENYA LIMITED
15	CHINA RAILWAY NUMBER FIVE ENGINEERING GROUP CO (K) LTD
16	CHINA RAILWAYS SEVENTH GORUP 1COMPANY LTD
17	C & M CONSTRUCTION (K) LIMITED
18	CRESCENT CONSTRUCTION COMPANY LIMITED
19	DHANJAL BROS LIMITED
20	EVEN AMI LIMITED
21	ETERNAL FOUNDATION CONSTRUCTION COMPANY LTD
22	GLENCARRICK CONSTRUCTION (KENYA) LIMITED
23	G.ISSAIAS & CO. (K) LIMITED
24	GOGNI RAJOPE CONSTRUCTION CO. LTD
25	H.YOUNG CO LIMITED
26	GOWHARRUD CONSTRUCTION AFRICA LIMITED
27	HAYER BISHAN SINGH & SONS LTD
28	ICON KENYA LIMITED
29	INTEX CONSTRUCTION LIMITED
30	KABUITO CONTRACTORS LIMITED
31	KAY CONSTRUCTION COMPANY LIMITED
32	KIMILILI HAULIERS LIMITED
33	KIRINYAGA CONSTRUCTION (K) LIMITED
34	KUNDAN SINGH CONSTRUCTION LTD
35	LANDMARK HOLDINGS LIMITED
36	MATTAN CONTRACTORS LIMITED
37	MRZ CONSTRUCTION CO LIMITED
38	MULJI DEVRAJ & BROTHERS LIMITED
39	POWER CONSTRUCTION EAST AFRICA LIMITED
40	PROGRESSIVE CONSTRUCTIONS PRIVATE LIMITED
41	PUT SARAJEVO ENG. CO.
42	SHENGLI ENGINEERING CONSTRUCTION (GROUP) COMPANY LTD

43	SPENCON KENYA LIMITED
44	S.S. MEHTA & SONS LIMITED
45	SBI INTERNATIONAL HOLDINGS AG
46	SINOHYDRO CORPORATION LTD
47	TM-AM CONSTRUCTION GROUP (AFRICA)
48	TRANSTECH CONSTRUCTION COMPANY LIMITED

Source: Kenya Roads Board, 2013

Appendix II: Returns on Assets

	2008	2009	2010	2011	2012
A. A BAYUSUF & SONS LTD	0.06	0.04	0.03	0.13	0.06
ARSHAD SAZEH TOOLS KENYA LIMITED	0.06	0.09	0.06	0.10	0.20
BRIDGESTONE CONSTUCTION COMPANY	0.05	0.06	0.07	0.05	0.22
CORPORATION (COVEC) LTD	0.05	0.06	0.07	0.16	0.07
CHINA WU YI CO, LIMITED	0.04	0.25	0.01	0.12	0.27
CHINA RAILWAYS SEVENTH GORUP 1	0.21	0.19	0.07	0.14	0.21
DHANJAL BROS LIMITED	0.07	0.14	0.05	0.11	0.10
SINOHYDRO CORPORATION LTD	-0.06	0.06	0.08	1.40	0.20
H.YOUNG CO LIMITED	0.07	0.05	0.13	0.17	0.18
ICON (KENYA) LIMITED	0.08	0.11	0.09	0.33	0.07
KAY CONSTRUCTION COMPANY LIMITED	0.05	0.23	0.07	0.17	0.08
KUNDAN SINGH CONSTRUCTION LTD	0.06	0.25	0.15	0.31	0.13
MRZ CONSTRUCTION CO LIMITED	0.03	0.06	0.07	0.42	0.08
PROGRESSIVE CONSTRUCTIONS PRIVATE	0.23	0.22	0.08	0.11	0.07
SPENCON KENYA LIMITED	0.07	0.15	0.07	0.15	0.06
GLENCARRICK CONSTRUCTION (KENYA)	0.14	0.30	0.10	0.16	0.07

Source: Research Findings

Appendix III: Company Growth (%)

	2007	2008	2009	2010	2011
A. A BAYUSUF & SONS LTD	6.56	-22.27	-14.26	32.11	15.07
ARSHAD SAZEH TOOLS KENYA LIMITED	17.00	11.16	15.36	28.05	4.63
BRIDGESTONE CONSTUCTION COMPANY	18.41	14.96	11.87	11.43	32.76
CORPORATION (COVEC) LTD	29.81	29.38	18.45	5.01	-23.49
CHINA WU YI CO, LIMITED	24.15	21.29	54.30	50.61	-2.71
CHINA RAILWAYS SEVENTH GORUP 1 LTD	16.27	7.44	7.07	17.94	34.83
DHANJAL BROS LIMITED	19.51	-15.09	26.04	32.73	28.95
SINOHYDRO CORPORATION LTD	4.30	0.82	37.66	-6.85	1.78
H.YOUNG CO LIMITED	42.50	57.85	43.69	9.89	-13.08
ICON (KENYA) LIMITED	21.35	15.07	22.19	33.01	-9.12
KAY CONSTRUCTION COMPANY LIMITED	30.94	6.76	-5.87	22.52	36.04
KUNDAN SINGH CONSTRUCTION LTD	10.32	-4.45	24.16	32.92	-1.64
MRZ CONSTRUCTION CO LIMITED	149.69	20.85	3.89	-16.11	57.26
PROGRESSIVE CONSTRUCTIONS PRIVATE	28.44	36.76	0.08	42.43	12.66
SPENCON KENYA LIMITED	21.04	29.31	24.39	45.61	14.12
GLENCARRICK CONSTRUCTION (KENYA)	82.60	9.85	29.56	1.71	25.70

Source: Research Findings

Appendix IV: Working Capital as Percentage of Assets

	2008	2009	2010	2011	2012
A. A BAYUSUF & SONS LTD	8.03	20.48	18.06	5.42	2.30
ARSHAD SAZEH TOOLS KENYA LIMITED	3.78	4.99	-0.93	1.23	0.65
BRIDGESTONE CONSTUCTION COMPANY	5.09	5.74	0.50	-0.50	-0.47
CORPORATION (COVEC) LTD	2.13	6.82	5.22	3.42	-2.67
CHINA WU YI CO, LIMITED	0.01	195.52	0.66	0.47	1.09
CHINA RAILWAYS SEVENTH GORUP 1	0.78	2.83	1.64	0.67	-0.85
DHANJAL BROS LIMITED	-19.17	2.83	3.38	-1.40	-1.47

SINOHYDRO CORPORATION LTD	1.66	1.11	0.59	-1.92	-4.20
H.YOUNG CO LIMITED	12.64	9.08	9.06	-0.35	-3.86
ICON (KENYA) LIMITED	1.53	2.25	3.71	0.21	-3.86
KAY CONSTRUCTION COMPANY LIMITED	0.76	3.03	0.94	-3.49	-0.05
KUNDAN SINGH CONSTRUCTION LTD	2.26	-0.07	0.48	-0.76	-1.09
MRZ CONSTRUCTION CO LIMITED	2.28	1.80	0.81	-0.77	1.99
PROGRESSIVE CONSTRUCTIONS PRIVATE	4.63	1.86	1.30	0.57	1.09
SPENCON KENYA LIMITED	-2.97	2.11	-3.76	0.73	0.02
GLENCARRICK CONSTRUCTION (KENYA)	4.90	-0.52	2.43	0.99	0.61

Source: Research Findings

AppendixV: Age of Companies

Source: Company Websites

	Years of Inception	Age (Years)
A. A BAYUSUF & SONS LTD	1993	20
ARSHAD SAZEH TOOLS KENYA LIMITED	1999	14
BRIDGESTONE CONSTUCTION COMPANY	1988	25
CORPORATION (COVEC) LTD	1984	29
CHINA WU YI CO, LIMITED	1994	19
CHINA RAILWAYS SEVENTH GORUP 1	1998	15
DHANJAL BROS LIMITED	*	*
SINOHYDRO CORPORATION LTD	1953	60
H.YOUNG CO LIMITED	1963	50
ICON (KENYA) LIMITED	*	*
KAY CONSTRUCTION COMPANY LIMITED	*	*
KUNDAN SINGH CONSTRUCTION LTD	1974	39
MRZ CONSTRUCTION CO LIMITED	1993	20
PROGRESSIVE CONSTRUCTIONS PRIVATE	1966	47
SPENCON KENYA LIMITED	1983	30
GLENCARRICK CONSTRUCTION (KENYA)	*	*

****Missing information***

Appendix VI: Lending Rates of Banks and Interest Volatility

Source: Central Bank of Kenya

YEAR	MONTH	RATE (%)	STD DEV
2008	JAN	13.78	0.25
	FEB	13.64	
	MAR	13.56	
	APR	13.33	
	MAY	13.38	
	JUN	13.14	
	JUL	13.29	
	AUG	13.04	
	SEP	12.87	
	OCT	13.24	
	NOV	13.39	
	DEC	13.32	
2009	JAN	13.78	0.33
	FEB	13.84	
	MAR	14.06	
	APR	13.91	
	MAY	14.01	
	JUN	14.06	
	JUL	13.90	
	AUG	13.66	
	SEP	13.66	
	OCT	14.12	
	NOV	14.33	

	DEC	14.87	
2010	JAN	14.78	0.11
	FEB	14.67	
	MAR	14.87	
	APR	14.71	
	MAY	14.85	
	JUN	15.09	
	JUL	14.79	
	AUG	14.76	
	SEP	14.74	
	OCT	14.78	
	NOV	14.85	
	DEC	14.76	

YEAR	MONTH	RATE (%)	STD DEV
2011	JAN	14.98	0.41
	FEB	14.98	
	MAR	14.80	
	APR	14.58	
	MAY	14.46	
	JUN	14.39	
	JUL	14.29	
	AUG	14.18	
	SEP	13.98	
	OCT	13.85	
	NOV	13.95	
	DEC	13.87	
2012	JAN	14.03	0.30
	FEB	13.92	
	MAR	13.92	
	APR	13.92	
	MAY	13.88	
	JUN	13.91	
	JULY	14.14	
	AUG	14.32	
	SEP	14.79	