

**THE EFFECT OF CREDIT POLICY ON PROFITABILITY OF
MANUFACTURING SMALL AND MEDIUM SIZED ENTERPRISES IN
NAIROBI COUNTY, KENYA**

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DECLARATION

I declare that this is my original work and has not been presented in any other institution or University for the award of a degree or any other qualification.

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This project has been submitted for examination with my approval and advice as the university supervisor

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Dr. Sifunjo Kisaka

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DEDICATION

To my wife parents, for your love, encouragement and support that you have given that has brought me this far.

ABSTRACT

It is to be appreciated that SMEs and mostly manufacturing SMEs that deal with value addition are very important in terms of employment, wealth creation, and solving many other social problems which come with unemployment and slower economic growth. However many problems encounter SMEs and as a result most SMEs fail before three years after their start. Given this high failure rate, it becomes vital to study the impact of credit policy on financial returns of manufacturing SMEs. This is to gather more insights that can ensure that SME survive, grow and play their expected role in economic growth and development. Therefore, this study sought to determine the effect of credit policy on profitability of manufacturing SMEs in Nairobi County.

The study adopted a descriptive research design. The target population was all the manufacturing in Nairobi County from which 50 SMEs were sampled. The study used secondary data which was obtained from SMEs financial statement for five years from 2009 to 2013. Multiple regression analysis was used to analyze data. The significance of the results was tested using using t-test, z tests and the ANOVA.

The study found that credit policy is positively related to manufacturing SMEs profitability with a coefficient of correlation of 0.83 and coefficient of determination of 0.69. Credit policy was also found to have strong positive relationship with growth in sales as shown by coefficient of correlation of 0.896 and R square of 0.804.

The study recommended that SMEs should adopt liberal credit policy and carry out thorough credit appraisal to ensure reduced costs of bad debts and debt administration costs. The government and policy formulators should come up with ways of reducing cost of financing to ensure that manufacturing SMEs are able to finance receivables since the lower the cost of financing, the higher the credit sales hence increase in sales and profitability.

LIST OF ABBREVIATION

RoK Republic of Kenya

SME Small and Medium Sized Enterprises

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Trade credit, the main reflection of company credit policy is an arrangement between a buyer and seller by which the seller allows delayed payment for its products instead of cash payment (Mian and Smith, 1992). It is part of a joint commodity and financial transaction in which a firm sells goods or services and simultaneously extends credit for the purchase to the customer (Lee and Stowe, 1993). The granting of trade credit is a powerful selling aid, and is a fundamental foundation upon which all trading relationships are built. Both seller and buyer gain advantage from credit facilities, but the risk of slow or non payment is borne by the seller – risk in the form of non payment, and cost in the form of the interest expense incurred from the date of the sale to receipt of the funds (Mian and Smith, 1992).

Credit policy is the set of guidelines adopted by the company to guide what amount, number of days and to whom trade credit is extended and forms a part of overall firm's policy. It refers to a sound operating procedure meant to cope with the need for continuous increase in the sales volumes; need to reduce capital to fund the waiting time (between sale and cash receipt) with a worthwhile return on the investment; and regulation and enforcement, informally or by law, of credit agreements (Diogo, 2013). There have been several number of explanations put forward to explain why companies sell on credit irrespective of the risk of bad debts that come with selling on credit,

investment in receivables and the costs of debt collection (Dong and Su, 2010). The financial motive (Emery, 1984; Mian and Smith, 1992; Schwartz, 1974) argues that firms able to obtain funds at a low cost will offer more trade credit than firms with high financing costs. The operational motive (Emery, 1987) stresses the role of trade credit in smoothing demand and reducing cash uncertainty in the payments (Ferris, 1981). According to the commercial motive, trade credit improves product marketability (Nadiri, 1969) by making it easier for firms to sell. Finally, according to the product quality motive (Smith, 1987), firms extend trade credit to guarantee product quality, by alleviating information asymmetry between buyers and sellers.

Credit policy is taken to be an important component of firms' financial decision process, occupying a major portion of managers' time and resources (Silva, 2012). It is aimed at maintaining an optimal balance of receivables that minimizes costs of bad debts, foregone income due to tied up capital and collection costs and hence positively affects firm's performance (Filbeck & Krueger, 2005). A well established goal for many companies is to have as low debtor balance as possible and some well known companies pursue zero receivable strategies (Maness & Zietlow, 2005). Firm's credit policy connects its short-term financial management with firms' strategic decisions affecting firm's profitability, risk, and suggests the existence of a linear relation between credit management policy and firms' profitability (Gitman, 1974). Thus, firms can maximize profitability and minimize associated risks through an efficient management of accounts receivables (Gitman & Sachdeva, 1982).

Recent study on the relationship between credit policy in place and profitability, (Silva, 2012), point to a non-linear relationship, indicating that there is an credit balance that minimizes the costs of advancing credit as well as maximizing profitability, which indicates that both high and low credit levels are associated with a lower profitability. Such relationship between credit policy and profitability, behaves positively for low levels of investment in working capital and negatively for high levels of investment in working capital, showing the greater profitability effect but also the greater risk effect for firms with low levels of working capital (Banos-Caballero, et al., 2012).

Younger firms extend less credit to their customers while old firms extend more credit to customers since they have other sources of finance as consequence of their credit capacity and reputation (Garcia and Martinez, 2010). The cost of funds used to invest in current assets decreases with firm size, as smaller firms have greater information asymmetry, greater informational opacity and are less followed by analysts (Kieschnick, LaPlante, Moussawi, and Baranchuk, 2006). Moreover they have a higher likelihood of bankruptcy, as larger firms are more diversified failing less often (Diogo, 2013). This might affect the trade credit granted, because, according to Petersen and Rajan, (1997) firms with better access to capital markets extend more trade credit. Fazzari and Petersen, (1993) showed that small firms also face greater financial constraints, which also decreases trade credit extended to customers, using this form of credit when other forms are unavailable or have been exhausted. In addition, Nakamura & Palombini, (2009), found a negative relation between size and accounts receivables, suggesting a greater

market power from large firms or that small firms provide more trade credit to guarantee product quality.

1.1.1 Theoretical Background

Efficient receivables management is fundamental for maximizing profitability (Deloof, 2003). Whereas maximizing profit is the main objective for firms, firms need at the same time to focus on liquidity to prevent insolvency (Raheman and Nasr, 2007). Insolvency occurs when accounts receivables are not converted into cash at the same moment in time or with the same cash flow magnitude as the payables (Richard and Laughlin, 1980).

Small firms are mostly affected by insolvency issues and hence credit policy is particularly important for such firms since the firms have limited access to long-term capital markets (Diogo, 2013). Previous studies with respect to the impact of credit management policy over firm's value do not provide clear evidence on whether firms actually do maximize their value through their credit management choices (Kieschnick, et. al, 2006). Small firms manage their cash flow by having shorter net trade cycles, experience higher operating cash flows and are more valuable (Shin and Soenen, 1998).

Having an optimal credit policy reduces costs to a reasonable minimum level that create value for the firm and lead to increased profitability (Shin and Soenen, 1998). An efficient credit management is crucial since over-investment in accounts receivables result on firm's inability to meet obligations due to inadequate cash flows (as a result of cash flows tied up in accounts receivables), whereas under-investment in accounts

receivables may imply reduced sales (Kieschnick, et al., 2006, Diogo, 2013). Thus, firms within the optimal level of accounts receivables experience lower risk, are more prepared for uncertainty and have a cash reserve that can be used during difficult times (Autukaite and Molay, 2011).

There exists a negative relationship between value and credit management, an increase investment in accounts receivables and working capital at large is associated with a reduction in firm value (Diogo, 2013). The factors determining the accounts receivables position adopted by SMEs depends on size and future sales growth capital (Kieschnick, et al., 2006). Hawawini, Viallet, & Vora, (1986), found strong evidence of substantial industry effects on working capital policies, as well as the existence of benchmarks to which firms adhere when implementing working capital policies.

Generally, granting trade credit enhances firm's sales, and consequently may result in higher profitability. Meltzer (1960) states that a primary function of trade credit is to mitigate customers' financial frictions, thus facilitating increased sales and market share growth (Nadiri, 1969). In addition to resolving financing frictions, trade credit can boost sales by alleviating informational asymmetry between suppliers and buyers in terms of product quality ((Long, Malitz, and Ravid, 1993; Smith, 1987). In this sense, the seller's investment in trade credit facilitates exchange by reducing uncertainty about product quality. However, the provision of trade credit entails negative effects such as default risk or late payment, which may damage firm profitability. Moreover, extending supplier financing involves administrative costs associated with the granting and monitoring

process, as well as transaction costs for converting receivables into cash (Emery 1984). Further, carrying receivables on the balance sheet implies direct financing and opportunity costs, so reducing funds available for expansion projects. Theoretical models argue that there is an optimal trade credit policy (Nadiri, 1969; Emery, 1984), where the optimal level of accounts receivable occurs when the marginal revenue of trade credit is equal to the marginal cost (Emery, 1984).

Lewellen, McConnell and Scott (1980) demonstrated that trade credit can be used to increase firm value when financial markets are imperfect. Consequently, one might expect a quadratic relationship between trade credit and firm value or profitability determined by a trade off between costs and benefits of supplying trade credit, where there is a level of trade credit granted which maximizes firm value or profitability. Moreover, these theoretical models do not find empirical support. Actually, Hill et al. (2010) find a lineal relationship between trade credit and firm value, where the benefits of granting trade credit surpass the costs. This effect may be even greater in the case of SMEs. Cheng and Pike (2003) find that firms operating in competitive markets are forced to offer industry credit terms. In effect, SMEs are forced to grant trade credit despite the costs associated to it, because not granting trade credit would lose sales, and profitability would decrease. We therefore expect a linear relationship between the investment in trade credit and profitability (Diogo, 2013).

1.1.2 Contextual Background

The small and medium enterprises (SMEs) are businesses in both formal and informal sectors, employing 1-50 workers (Ngugi and Bwisa, 2013). Firms employing between 5 and 49 workers are referred to as small scale enterprises while those with 50-99 full-time employees are medium enterprises, those with over 100 full time workers are large enterprises (RoK, Sessional Paper 2, 2005). Three out of five businesses fail within their first three years of operation (Kenya National Bureau of Statistics 2007) out of various causes. One of the most significant causes of failure is lack of adequate financing (Amyx, 2005) which can be addressed by adopting an optimal credit policy. Despite the high rate of SMEs failures, their contribution to the economy growth cannot be ignored (Bowen, Morara, and Muriithi, 2009). In Kenya, the SMEs play an important role in employment and wealth creation, income distribution, accumulation of technological capabilities and spreading the available resources among a large number of efficient and dynamic small and medium size enterprises (IDRC, 1993). Among the challenges in the Kenya that limit SMEs growth includes the lack of access to credit, management skills, communication and infrastructure (Mbogo, 2011).

Credit investment involves a trade-off between SMEs profitability, risk and demands the understanding that decisions which enhance profitability usually do not boost the chances of adequate levels of liquidity and, conversely, decisions that focuses entirely on maximize liquidity decreases profitability (Smith, 1980). The management of this trade-off depends on working capital policies adopted, distinguished as conservative or aggressive policies (Diogo, 2013). The conservative working capital policy implies a

higher investment in working capital accounts, such as higher levels of trade credit, inventory and reducing supplier's financing, resulting in a lower profitability and lower risk (Diogo, 2013). However, according to some authors findings, conservative working capital policy positively affect profitability due to higher sales (Petersen & Rajan, 1997); higher levels of inventories that prevents interruptions in operating cycle process and a reduction of supply costs, reducing both the risk of price fluctuation among business cycles and the risk of losing customers due to product scarcity (Blinder & Maccini, 1991; Fazzari, & Petersen, 1994).

SMEs adopting conservative working capital policies may increase profitability because extend trade credit helps to ensure that the contracted services have been carried out, allowing customers to check if purchased products and services are as agreed in quality and quantity terms prior to payment, leading to repeated sales (Diogo, 2013; Long, et al., 1993). Extending trade credit to customers, also reduces asymmetric information between the buyer and seller (Smith, 1987), strengthening long-term supplier-customer relationships, increases sales in periods of low demand and reduces transaction costs (Emery, 1987). Reduction on supplier's financing, allows customers to take advantage of prompt payment discounts due to early payments, as well as, reduction of the costs of external financing (Wilner, 2000; Baños-Caballero, et al., 2010).

To the contrary, aggressive working capital policy implies lower investments in working capital accounts, through lower levels of investment in inventories, shortening trade credit to customers and postponing payments to suppliers, resulting in an increase of

profitability and risk for firms (Diogo, 2013). SMEs that keep lower investment in accounts receivables tend to be more profitable, that is achieved by minimizing the cost of holding unproductive assets, such as accounts receivables and cash (Hager, 1976). Further these results fit better to large firms, being the relationship sensitive to industry factors. A negative relationship between credit management and profitability has been identified by some studies showing that a reduction in working capital accounts, namely accounts receivables and inventories, to reasonable levels increases profitability, arguing that less profitable firms need more time to pay their bills (Shin & Soenen, 1998) and Deloof, 2003). This policy leads to a reduction in costs due to the low levels of inventories and account receivables (Diogo, 2013). The risks taken are low, because of the low levels of accounts receivables. Therefore, SMEs can create value by reducing working capital accounts to a reasonable minimum due to the observed negative relation (Dong & Su, 2010).

Sales growth affects trade credit granted and received, as well as investment in inventories (Nunn, 1981). Firms with fast growing sales pay more attention to credit levels (Chiou, Cheng, and Wu, 2006). According to Chiou, et al., (2006) there is a negative but not significant relationship between growth and accounts receivables requirements. Furthermore, Nakamura and Palombini (2009), found negative relationship between growth and cash conversion cycle.

1.2 Statement of the Problem

The importance of small and medium enterprises has been emphasized in all development plans in Kenya since independence in 1963 (Ngugi and Bwisa, 2013). The SME manufacturing sector whose major component is value adding has been identified by the vision 2030 development plan 2008-2012 as a key driver for economic growth and development because of its immense potential for wealth and employment creation as well as poverty alleviation (ROK, 2007). Credit management efficiency is vital especially for manufacturing SMEs, where a major part of assets is composed of current assets (Horne and Wachowitz, 2000) and their ability to access financing is hard (Banos-Caballero, et al., 2010). SME can adopt either a conservative or aggressive credit policy (Diogo, 2013). The conservative working capital policy implies a higher investment in accounts receivables and hence expected to result in a lower profitability and lower risk (Diogo, 2013). However, according to some studies, conservative credit policy positively affects profitability due to higher sales (Petersen & Rajan, 1997). The question emerging therefore is; what is the effect of credit policy on SME financial profitability considering the conflicting empirical findings by various researchers?

Previous studies have focused on explaining the determinants of trade credit with literature focusing on large firms. Mogaka and Jagongo (2013) using NSE listed manufacturing and construction firms found a significant effect of debtor's management on profitability. Gatuhu (2013) studied the effect of credit management on the financial performance of microfinance institutions in Kenya and established that there was strong relationship between financial performance of microfinance institution performance and

credit risk control and collection policy. Nyawera (2013) studied the effect of credit policy on the financial performance of deposit taking microfinance institutions in Kenya and found that credit had affect on the financial performance of deposit taking micro finance. The studies reviewed only focused on large firms; however, trade credit is particularly important in the case of small and medium-sized companies since trade debtors are the main asset on most of their firms' balance sheets (Garcia, & Martinez, 2010). From the findings on these previous findings, there is still the unanswered question; what is the effect of credit policy on SMEs financial profitability and not the large firms?

This study therefore sought to shed more light by determining the effect of credit policy adopted by manufacturing SMEs on profitability. It also sought to bridge the gap in literature that exists on the credit policy and SMEs financial profitability in Kenya. It sought to answer the question, what is the effect of credit policy on profitability of SMEs in Nairobi County?

1.3 Objective of the Study

To determine the effect of credit policy adopted by manufacturing SMEs in Nairobi County on profitability

1.4 Importance of the Study

The SME sector plays a critical role in the social-economic development in Kenya including employment creation, poverty eradication and industrialization. This requires

that the sector remains capable of delivering the expected results. It is imperative that the various constraints to the sector's ability especially financing are effectively addressed if the sector is to remain relevant to economic development as envisioned. Considering the importance of SMEs in economies across the globe and especially developing countries, every study aimed at addressing the challenges facing the sector and promotes their profitability and growth will be important. Specifically, this study is beneficial to various stakeholders who include the government, SME owners, employees, researchers and the general public.

To the government, employees, general public and SME owners, the study has addressed the financing challenges facing SMEs by demonstrating how credit policy can be formulated and consequently finances the firms. This will lead to profitability and growth of SMEs and consequently economic growth. To the researchers, the study has contributed to the area of knowledge by offering the solution on the credit policy and SMEs financial profitability. It has explained what constitutes to an optimal financial policy that maximizes profits for SMEs in Nairobi County and Kenya at large.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter has discussed in details the theoretical and empirical literature, review of the local literature and ends by a chapter summary. The chapter starts with section 2.2 that has reviewed the theoretical literature available on credit policy and SMEs financial profitability and is followed by section 2.3 that has dealt with empirical literature on the area of study and section 2.4 that has detailed the existing literature from Kenya on study subject. The chapter ends with section 2.5 on summary of key literature on SMEs credit policy and financial profitability.

2.2 Theoretical Literature

Trade credit and credit policy debate has been in existence for decades with various researchers trying to determine what constitutes to an optimal credit level; that is, the one that maximizes firm's financial profitability. Trade is one of the oldest forms of corporate financing and it continues to be very important at present; it refers to the financing provided by a seller to the client (Wei and Zee, 1997). Depending on the type of credit policy, payment can be made at different times. It can occur before delivery, on delivery or after delivery. In the last case, the seller may or may not offer discounts for prompt payment, depending on trade arrangements. When payment does not occur before or on delivery, trade credit is being extended and the seller assumes the credit risk. Otherwise, trade credit is not being offered and the buyer assumes the risk that the product may be of

low quality. Although trade credit is a very useful source of resources for different kinds of firms, there is no clear explanation of it yet, as pointed out by Long et al. (1993). In the last three decades, several theories and models have appeared to explain trade credit policy and will act as the guide to the study. These theories include:

2.2.1 Motive theory of credit

This theory was proposed by Schwartz (1974) and views trade credit from supplier firm's motives for offering trade credit which is classified as financial, operational and commercial. Schwartz (1974) developed the financial motive for the use of trade credit. He suggests that when credit is tight, financially stable firms will increasingly offer more trade credit to maintain their relations with smaller customers, who are “rationed” from direct credit market participation (Emery, 1984).

The seller firm acts as a financial intermediary to customers with limited access to capital markets, financing their customers' growth. Petersen and Rajan (1997) find empirical evidence that firms with better access to capital markets offer more trade credit. Larger firms are thought to be better known and have better access to capital markets than smaller firms, in terms of availability and cost, and should therefore face fewer constraints when raising capital to finance their investments (Faulkender and Wang, 2006). Financial motive predicts a positive connection between extending trade credit and firm size according to which, creditworthy firms should extend trade credit to less creditworthy firms (Emery, 1984; Mian and Smith, 1992; Schwartz, 1974). According to the financial motive of trade credit, we expect a greater effect of trade credit on firm profitability for the subsample of larger firms (Mian & Smith, 1992).

Emery (1984) argues that suppliers may extend credit if the implicit rate of return earned on receivables exceeds that of other investments. Petersen and Rajan (1994) and Atanasova (2007) show that implicit returns earned from trade credit are typically large, relative to feasible opportunity costs. The Emery model (1984) suggests that more liquid firms will extend trade credit as an alternative to investing in marketable securities. In the same vein, Ng et al. (1999) argue that trade credit is given from firms with high liquidity to firms with low liquidity. Consequently, we expect that more liquid firms secure a higher return on investment in trade credit. The financial motive for trade credit implies that larger, more financially secure producers will offer trade credit to their smaller customers.

Large firms extend trade credit to their customers in order to secure repeat sales and to build long-term relationships. However, from the standpoint of commercial motive, smaller firms that have worse reputations need to use more trade credit in order to guarantee their products (Long et al., 1993), which contradicts the predictions of financial motive for trade credit. From this perspective, a higher effect of trade credit on firm profitability for smaller firms might be expected. Emery (1987) focuses on trade credit as an operational tool, addressing the role of uncertain product demand in a firm's operating decisions. As demand fluctuates, sellers face two alternatives: either they can allow the selling price to fluctuate so that the market always clears, or they can vary production to match demand. Either option is quite costly. If price varies, potential buyers face extremely high costs of information search. If production varies, sellers face extremely high production costs. Trade credit could help to smooth irregular demand through

stimulating sales by relaxing trade credit terms in slack demand periods (Emery 1984, 1988; Nadiri, 1969). The operational motive predicts that firms with variable demand extend significantly more trade credit than firms with stable demand. Long et al. (1993) find empirical evidence that is consistent with this view.

From a commercial perspective, Nadiri (1969) argues that availability of alternative payment terms can expand the firm's market share by increasing product demand. According to the commercial motive, trade credit improves product marketability by facilitating firm's sales. So, for firms with less market share (less market power) trade credit should prove more beneficial, as these firms have stronger incentives to increase sales (Hill et al., 2010). Hill et al. (2010) find that the profitability of receivables is a decreasing function of market share. However, market pressures might force small business with no market power to offer normal industry credit terms, regardless of its possible negative impact on profitability.

2.2.2 Tax theory

The theory was proposed by Nadiri (1969) and urges that decision whether or not to accept a trade credit depends on the ability to access other sources of funds (Nadiri, 1969). Brick and Fung (1984) suggest that the tax effect is usually a consideration in order to compare the cost of having trade credit with the cost of other financing alternatives. The costs of advancing credit include the bad debts, tied up capital and collection fees.

The knowledge behind this theory is that if buyers and sellers are in different tax brackets, they have different borrowing costs, since interests are tax deductible. Firms in a high tax bracket tend to offer more trade credit than those in low tax brackets. Consequently, only buyers in a lower tax bracket than the seller will accept credit, since those in a higher tax bracket could borrow more cheaply directly from a financial institution (Nadiri, 1969). The theory concludes that firms allocated to a given industry and placed in a tax bracket below the industry average cannot profit from offering trade credit (Brick and Fung, 1984).

2.2.3 Transactions costs theory

The theory was first suggested by Schwartz (1974) and argues that suppliers may have an advantage in checking the credit worthiness of their clients. Suppliers also have a better ability to monitor and force repayment of the credit. All these superiorities may give suppliers a cost advantage when compared with financial institutions. Three sources of cost advantage are information acquisition, controlling the buyer and salvaging value from existing assets (Petersen and Rajan, 1997). The first source of cost advantage can be explained by the fact that sellers can get information about buyers faster and at lower cost because it is obtained in the normal course of business. That is, the frequency and the amount of the buyer's orders give suppliers an idea of the client's situation; the buyer's rejection of discounts for early payment may serve to alert the supplier of a weakening in the credit-worthiness of the buyer, and sellers usually visit customers more often than financial institutions do (Petersen and Rajan, 1997).

In his model, Smith (1987) concludes that in two-part credit terms with a high interest rate, those buyers that do not choose to take advantage of the discount can be identified as high risks, because they may be having financial difficulties. Recently, Burkart and Ellingsen (2004) argued that the suppliers' monitoring advantage applies exclusively to input transactions. They posit that the source of suppliers' advantage is the input transaction itself. According to the authors, an input supplier does not incur in monitoring costs to know that an input transaction has been completed, but other lenders do. The second source of cost advantage arises from the power of the seller to threaten buyers. In some cases there are only a few alternative suppliers for the product needed and, consequently, buyers have very restricted choice. In this case, suppliers can threaten to cut off future supplies if they note a reduction in the chances of repayment. Compared with suppliers, financial institutions do not have the same threatening power. This advantage can become stronger when either the buyers represent only a small part of the supplier's sales or the supplier is part of a network and future community sanctions can be made by a group, which makes this threat much stronger (Kandori, 1992).

2.2.4 Liquidity Theory

The theory was first suggested by Emery (1984) and proposes that firms with financing challenges give advances less credit and has a stringent credit policy. The central point of this idea is that when a firm is financially constrained the offer of more credit is constrained since the firm has no resources to invest in neither receivables nor the cash to pay for the collection costs. In accordance with this view, those firms presenting good liquidity or better access to capital markets can finance advance more credit unlike those that are financially constrained. Several approaches have tried to obtain empirical

evidence in order to support this assumption. Nielsen (2002), using small firms as a proxy for credit rationed firms, finds that when there is a monetary contraction, small firms react by increasing the amount of trade credit accepted but reduces on the credit advanced to their customers by adopting a more stringent credit policy so as to reduce cost of bad debts and to release funds for investment. Petersen & Rajan (1997) found that financially unconstrained firms are less likely to demand trade credit and usually offer more credit.

2.3 Empirical Literature

Various studies have been done to determine the relationship between credit management or working capital on firms' profitability. Akoto, Awunyo-Vitor and Angmor (2013) analyzed the relationship between working capital management practices and profitability of listed manufacturing firms in Ghana. Using panel data methodology and regression analysis, the study found a significant negative relationship between profitability and accounts receivable days. However, the firms' cash conversion cycle, current asset ratio, size, and current asset turnover significantly positively influence profitability. The credit policy adopted by the firms was observed to be the main working capital determinant affecting profitability due to its effect on bad debt level, cash flow tie up in receivables, collection and administration costs as well as decline in sales as a result of restrained defaulting customer relationship.

Oladipupo and Okafor (2013) examined the implications of a firm's working capital management practice on its profitability and dividend payout ratio. While the level of leverage had negative significant impact on corporate profitability, the impacts of working capital management on corporate profitability appeared to be statistically

insignificant at 5% confidence level. Almazari (2013) investigated the relationship between the working capital management and the firms' profitability for the Saudi cement manufacturing companies. The study results showed that Saudi cement industry's current ratio was the most important liquidity measure which effected profitability; therefore, the cement firms must set a trade-off between these two objectives so that, neither the liquidity nor profitability suffers. It was also found, as the size of a firm increases, profitability increased. Besides, when the debt financing increased, profitability declined. Linear regression tests confirmed a high degree of association between the working capital management and profitability.

Gul, Khan, Rehman, Khan, Khan and Khan (2013) investigated the influence of working capital management on performance of small medium enterprises (SMEs) in Pakistan. The dependent variable of the study was Return on Assets (ROA) which was used as a proxy for profitability. Independent variables were Number of Days Account Receivable (ACP), Number of Day's Inventory (INV), Cash Conversion Cycle (CCC) and Number of Days Account Payable (APP). In addition to these variables some other variables were used which included Firm Size (SIZE), Debit Ratio (DR) and Growth (GROWTH). Regression analysis was used to determine the relationship between working capital management and performance of SMEs in Pakistan. The results suggested that APP, GROWTH and SIZE have positive association with Profitability whereas ACP, INV, CCC and DR have inverse relation with profitability.

Sharma and Kumar (2011) examined the effect of working capital on profitability of Indian firms. The results revealed that working capital management and profitability is positively correlated in Indian companies. Raheman, Afza, Qayyum and Bodla (2010) analyzed the impact of working capital management on firm's performance in Pakistan for the period 1998 to 2007.

The results indicated that the cash conversion cycle, net trade cycle and inventory turnover in days are significantly affecting the performance of the firms. They concluded that manufacturing firms were in general facing problems with their collection and payment policies. Moreover, financial leverage, sales growth and firm size also had significant effect on the firm's profitability. Mathuva (2010) in his study on the influence of working capital management on corporate profitability found that there exists a highly significant negative relationship between the time it takes for firms to collect cash from their customers and profitability. He explained that the more profitable firms take the shortest time to collect cash from the customers. The studies available reveal that there is little of empirical evidence on the credit management policy and its impact on the SMEs financial profitability and specifically on manufacturing SMEs in Nairobi.

2.4 Local Literature review

Various studies have been identified which have focused on working capital management and the listed companies in Kenya. Considering the importance of working capital management as a whole, the researchers in Kenya have focused on analysing relationship between working capital management and profitability relationship.

Gatuhu (2013) examined the effect of credit management on the financial performance of microfinance institutions in Kenya. The study found that formulation of collection policies was a challenge in credit management with recovery loans advanced being expensive. Further, the study found that stringent credit policy was more effective in debt recovery than a lenient policy with regular reviews being done on credit policies so as to improve state of credit management. The study concluded that there existed a strong relationship between financial performance of microfinance institutions, credit risk control and credit policy. The study recognized the existence of an optimal credit policy that maximizes profitability while at the same time minimising costs of advancing credit.

Nyawera, (2013) studied the effect of credit policy on the financial performance of deposit taking microfinance institutions in Kenya. The study found that there was a relationship between credit policy variables and financial performance but the effect was very minimal. Empirical evidence from the study indicated that there was a negative relationship between credit terms and conditions and collection efforts which increased the financial performance of the deposit taking micro finance organization and also reduced the collection efforts which in turn led to decreasing default rate of the organization hence increasing the financial performance of the deposit taking micro finance institutions. The study also found that the other variables which included credit standards had a positive effect on financial performance of the deposit taking micro finance organization. The conclusion was that implementation of a good credit policy in an organization led to increased financial performance.

Omesa, Maniagi, Musiega and Makori (2013) studied the relationships between Working Capital Management and Corporate Performance of manufacturing firms listed on the Nairobi securities exchange using a sample of 20 companies with five years data. For analysis Principal components analysis (PCA) was used due to its simplicity and its capacity of extracting relevant information from confusing data sets. From the results using PCA and multiple regression, working capital proxies Cash Conversion Cycle (CCC), Average Collection Period (ACP) and control variables Current Liabilities (CLTA), Net Working Capital Turnover Ratio (NSCA) and Fixed Financial Ratio (FATA) were significant at 95% confidence (p values are < 0.05) to performance as measured by Return on Equity (ROE). Further, ACP was found to be negatively related to ROE while CCC, CLATA, NSCA and FATA.

Gakure, Onyango, Cheluget, and Keraro (2012) studied the relationship between working capital management and performance of 15 manufacturing firms listed at the Nairobi NSE from 2006 to 2010. Using a regression model, they found that there was a strong negative relationship between firm's performance and liquidity of the firm. However the effects of the independent variables except the average payment period were not statistically significant though the overall model was statistically significant.

2.5 Summary

Trade credit policy is a very important source of financing for companies. Although it is an old practice, it is not completely understood. Numerous theories have been proposed to explain its existence and use, but none of them can provide a complete explanation of the topic. While some of the models are more consistent in the case of certain industries

or categories of products others work better in a financially constrained environment. Four types of explanation can be enumerated as follows: a model based on transactions costs arguments was proposed by Schwartz (1974); financial models were first suggested by Emery (1984); a tax based model was suggested by Brick and Fung (1984); and an asymmetric information model was suggested by Smith (1987).some of the models are more consistent with the case of certain industries or categories of products, others work better in a financially constrained environment.

Ferris (1981) suggests that trade credit is an operational tool and exists to minimize transactions costs, as a reduction in the level of trade credit used would be expected since many improvements in transaction technologies have taken place. However, this reduction has not been observed in recent years. The liquidity theory supposes that credit constrained firms use more trade credit than those with easier access to financial intermediaries. This may be an explanation, but once more, it does not seem to be enough since it does not explain why financially unconstrained firms also use trade credit. The product quality theory argues that trade credit is offered to allow clients to check the real quality of the goods before payment, but it does not explain why firms selling some products and services do not offer credit at all; some firms even require clients to pay in advance.

SMEs in Kenya are the drivers of the economy and their growth is constrained by lack of financing. Managing the firm's trade credit can probably solve the financing problem. However, so few studies in Kenya have been done to explain more on this area of credit management and policy on SMEs which are much affected by the financing issues.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter contains a discussion of the research methods and procedures that were employed by the study to achieve the research objectives. The chapter has section 3.2 which covers the research design, section 3.3 on the target population and sample frame, section 3.4 on data collection methodology and instruments and section 3.5 covering the data analysis techniques applied, the conceptual and analytical model.

3.2 Research Design

Research design is a roadmap of how one goes about answering the research questions (Bryman and Bell, 2007). Research design is a framework or blue print for the research (Mugenda and Mugenda, 2003). Orodho (2003) define the research design as a framework for the collection and analysis of data that is suited to the research question.

The study adopted a descriptive survey design. A descriptive research design determines and reports the way things are (Mugenda & Mugenda, 2003). A descriptive research design is used when data is collected to describe persons, organizations, settings or phenomena (Creswell, 2003).

3.3 Population Target and Sample

Target population in statistics is the specific population about which information is desired. A population is a well defined or set of people, services, elements, events, group of things or households that are being investigated (Ngechu, 2004). Population studies are more representative because everyone has an equal chance to be included in the final sample that is drawn (Mugenda & Mugenda, 2003).

In Nairobi, as at 2011 as per ministry of Trade and Ministry of Industrialization, there were 2500 SMEs in Manufacturing, 1500 SMEs Trading and 560 SMEs in the service industry (RoK, 2012). The study target population was the 2500 manufacturing SMEs in Nairobi as per the details released by ministry of trade and industrialization in Nairobi County.

The sampling frame explains the list of all population units from which the sample was selected (Cooper & Schindler, 2003). It is a physical representation of the target population and comprises all the units that are potential members of a sample (Kothari, 2008). A sample size of 2% of the target population is large enough so long as it allows for reliable data analysis and allows testing for significance of differences between estimates (Kerlinger, 1986). Therefore a sample of 50 manufacturing SMEs was chosen from the list obtained from the Trade and Industrialization ministry; every 50th SME was chosen and hence all the SMEs stood the same chance of being selected.

3.4 Data Collection and Research Instruments

The study made use of secondary data sources which included mainly the review of SMEs financial records and statements for the last 5 years from 2009 to 2013 in collecting the required data. To ensure this is done successfully, the target SMEs management were assured of the confidentiality of the information collected. The obtained data was recorded in per SMEs with no indication of the name of the SME to ensure highest confidentiality of the information. The data collected related to annual sales, debtors, cost of financing, 5 years profits as measured by return on assets (ROA) and assets.

3.5 Data Analysis

Data analysis was quantitative in nature. Quantitative analysis was done using descriptive statistics like frequency counts, percentages, graphs to describe distributions, pie charts to show differences in frequencies and bar charts to display nominal or ordinal data, while the mode was used to show the category or observation that appear most frequently in the distribution or the category containing the largest number of responses (Mugenda & Mugenda, 2003). Statistical Package for Social Sciences (SPSS) version 21 was used to analyze data. Statistical inference was done using t-tests, z-tests, ANOVA and F-tests to determine the significant on the models observed before making conclusions. Cronbach's Alpha was used to test the reliability of the data obtained before starting data analysis.

3.5.1 Conceptual Model

A conceptual model consistent with previous that applied by Garcia & Martinez, (2010) was applied. The firm's financial return was modelled as a function of the four core Credit Policy measures. The impact of credit policy on the firm's financial profitability was modelled using the following function:

$$ROA_{it} = f(ACP, CR, GFC, SIZE) \quad (1)$$

3.5.2 Analytical Model

In order to check for a linear relationship between credit policy variables and SMEs profitability as measured by Return on Assets (ROA), the following estimate model was to be used;

$$ROA_{it} = \beta_0 + \beta_1 ACP_{it} + \beta_3 CR_{it} + \beta_4 GFC_{it} + \beta_5 SIZE_{it} + \varepsilon \quad (2)$$

Where;

ROA denotes the return on assets as a measure of profitability

ACP is the average collection period

CR is the current ratio,

GFC is the growth in financing costs per year

SIZE is the SME size as measured by a weighted factor of total assets and turnover

Subscripts it denote firms (cross-section dimensions) ranging from 1 to 250, t denotes years (time-series dimensions) ranging from 1 to 5 years.

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$, are the Regression model coefficients

ε is the error term

A more precise model will also be regressed to determine the relationship and its significance determined between SME profitability and credit policy which took the format in equation 3 below. The likelihood of non-linear relationship was determined using scatter diagram and the model determined.

$$ROA_{it} = \beta_0 + \beta_1 ACP_{it} + \varepsilon \quad (3)$$

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATIONS

4.1 Introduction

This chapter presents data analysis, presentation and findings, within the framework of the research questions and objectives of the study. Descriptive and inferential statistics were used to discuss the findings of the study which were in line with the objective of the study which was to determine the effect of credit policy adopted by manufacturing SMEs in Nairobi County on profitability. The chapter consists of section 4.2 on summary of statistics, 4.3 on regression analysis, section 4.4 on discussion and 4.5 on summary of the findings.

4.2 Summary of the Statistics

4.2.1 Response Rate

From the data collected, out of the 50 sampled manufacturing SMEs, data relating to the firms was obtained representing 100% response rate. Mugenda & Mugenda (2003) observed that a 50% response rate is adequate, 60% good, while 70% and above is very good. This implies that based on this assertion, the response rate in this case of 100% was very good. The high response rate could be attributed to anonymity in collection of the study data where no identification of data obtained to specific SMEs and the assurance of SMEs management on confidentiality of information provided.

4.2.2 Reliability Analysis

Reliability can be seen from two sides: reliability (the extent of accuracy) and unreliability (the extent of inaccuracy). Reliability explains the extent to which data obtained by the various study constructs can be used in analysis and for consistency of study results. The most common reliability coefficient is the Cronbach's alpha which estimates internal consistency by determining how all items on a test relate to all other items and to the total test. The reliability is expressed as a coefficient between 0 and 1.00. The higher the coefficient, the more reliable is the test. In this study to ensure the reliability of the instrument Cronbach's Alpha was used.

Cronbach Alpha was used to test the reliability of the proposed constructs. As shown in Table 4.1 below, average collection period had a Cronbach alpha of 0.623; cost of financing 0.710, current ratio 0.953 and SMEs size 0.839. All constructs depicted that the value of Cronbach's Alpha were above the suggested value of 0.5 thus the study constructs were reliable. A construct with alpha of more than 0.5 was concluded to be reliable while those with alpha of less than 0.5 were unreliable.

Table 4.1: Reliability of the constructs

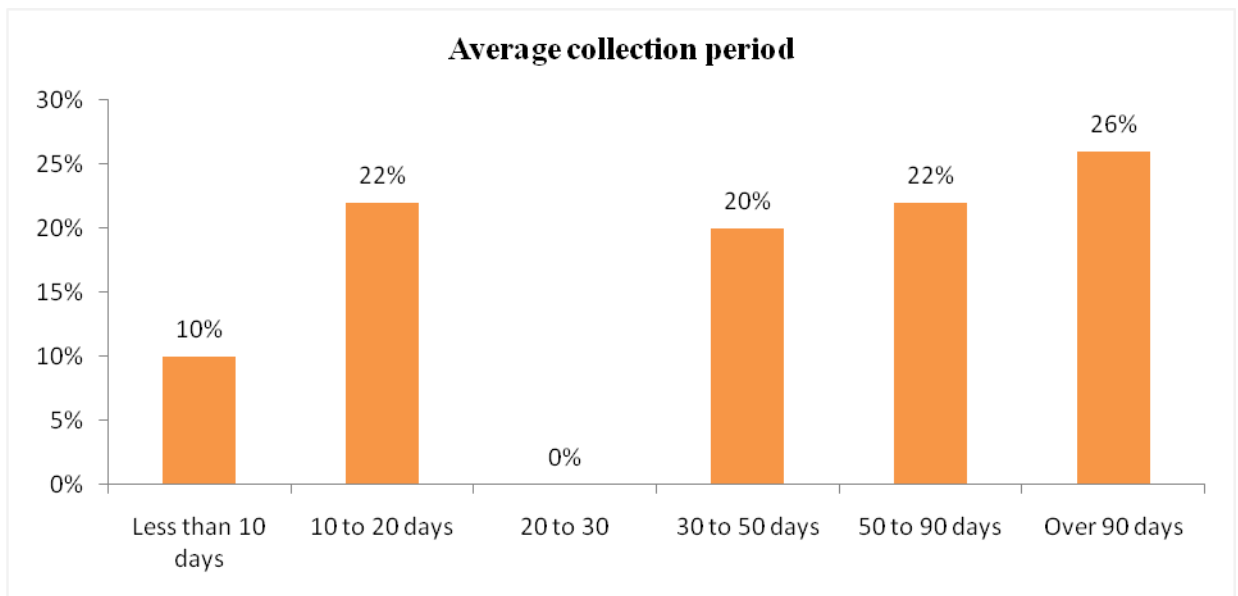
Study Variables	Cronbach's Alpha	Conclusion
Average collection period	0.623	Reliable
Financing Costs	0.710	Reliable
Current Ratio	0.953	Reliable
SMEs Size	0.839	Reliable

Source: Study Findings

4.2.3 Debtors Collection Period

The nature of credit policy adopted by SMEs was determined by the average collection period which was determined as $(365 \times \text{Average debtors}) / \text{Annual credit sales}$. As shown in figure 4.1 below, 26% (13) of the SMEs had average debtors collection period of over 90 days, 22% (11) 10 to 20 days and 30 to 50 days, 20% (10) 30 to 50 days and 0% 20 to 30 days.

Figure 4.1: Debtors Collection Period

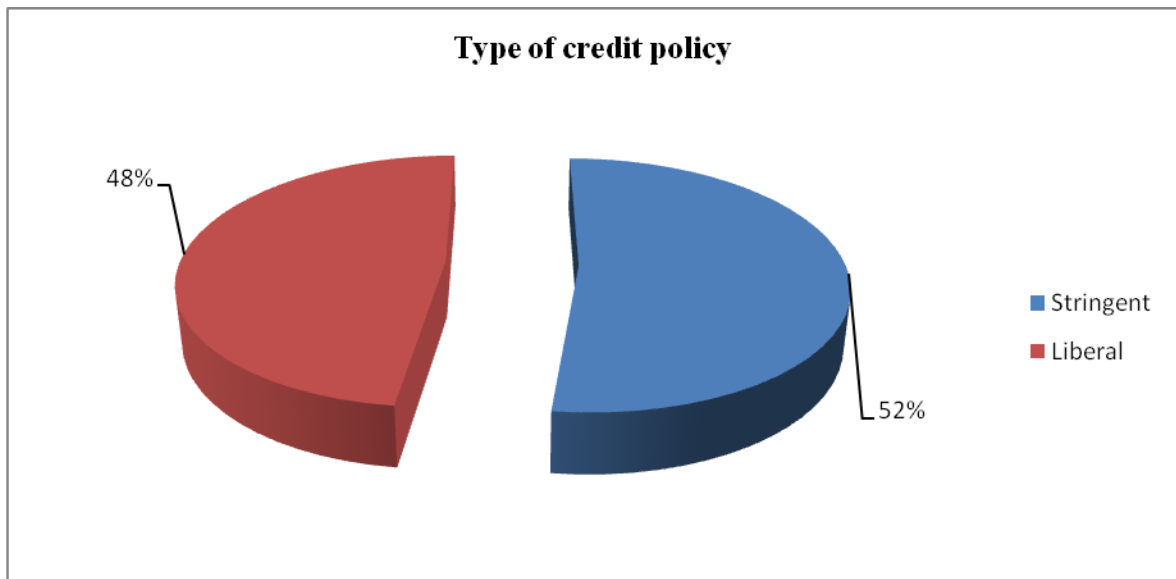


Source: Study Findings

An SME may follow a lenient or a stringent credit policy. The firm following a lenient credit policy tends to sell on credit to customers on a very liberal terms and credit is granted for a longer period. An SME following a stringent credit policy on the other hand sell on credit on a highly selective basis only to those customers who have proven credit worthiness and who are financially strong. A lenient credit policy will result in increased sales and therefore increased contribution margin.

Based on debtors' collection period, classification of SMEs type of credit policy is shown in figure 4.2 below. SMEs having a credit policy of 50 days and below were classified as stringent while those having over 50 days classified as liberal. As shown in figure 4.2 below, 52% (26) of the SMEs have adopted stringent credit policy while 48% (24) of the SMEs have adopted liberal credit policy. The adoption of stringent credit policy by manufacturing SMEs could be explained by the cash flow constraints and the high working capital required to be invested in raw materials, work in progress and finished goods.

Figure 4.2: SMEs type of credit policy adopted



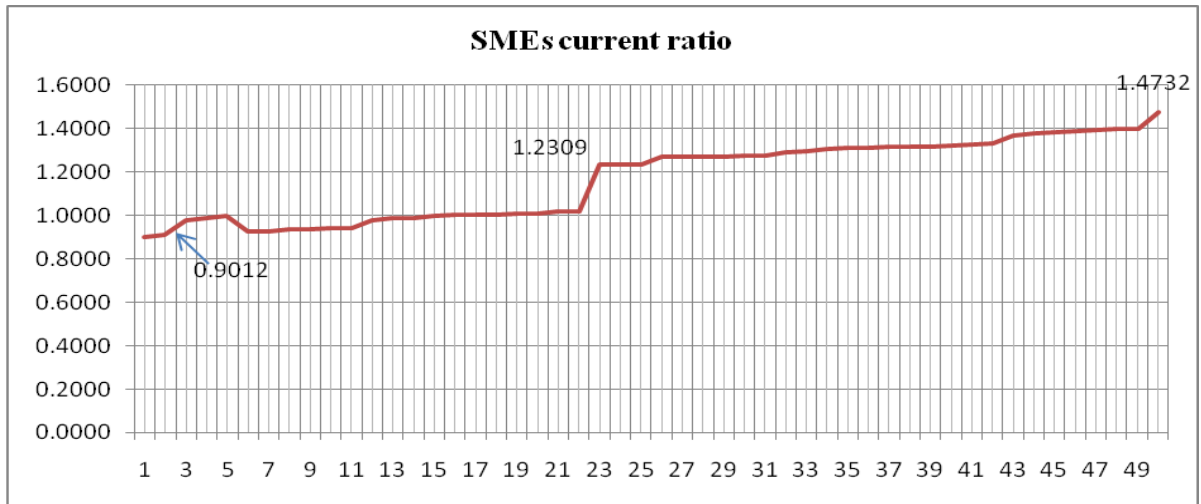
Source: Research Findings

4.2.4 Liquidity of SMEs

Liquidity is an indicator of working capital management adopted by the firm. In this study, liquidity, a key indicator of SMEs credit policy was measured by current ratio obtained by dividing total current assets by total current liabilities. As shown in figure 4.3

below, average five years current ratio for the SMEs ranged between 1.4 and 0.9 indicating the liquidity challenge facing SMEs.

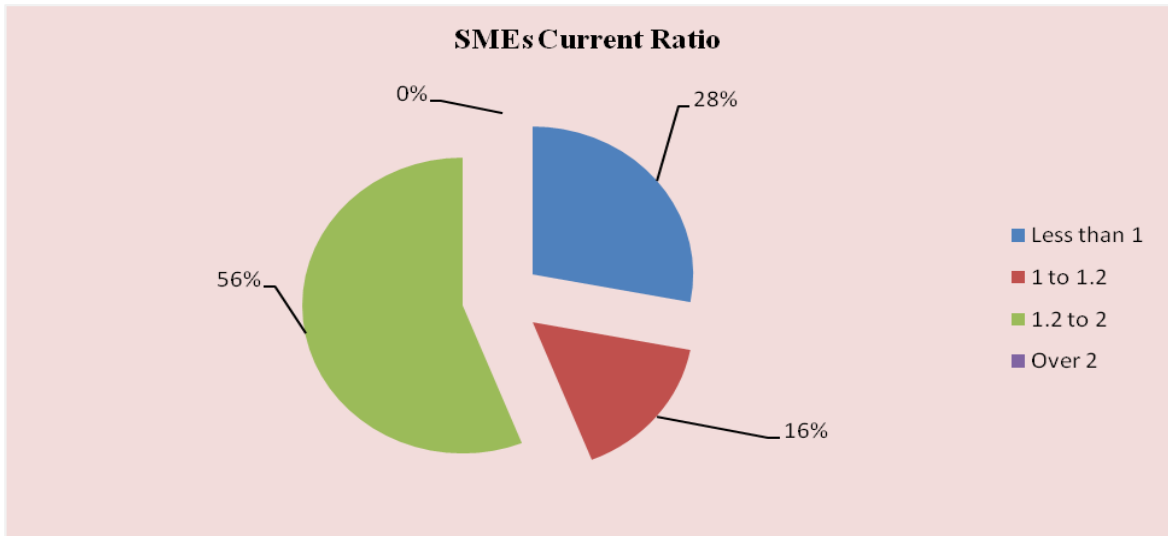
Figure 4.3: SMEs Liquidity as measured by the current ratio



Source: Research Findings

As shown in figure 4.4 below, 56% of the SMEs had a current ratio of 1.2 and 2, 28 a current ratio of less than 1 and 16% a current ratio of 1 to 1.2. Overall, 72% of the SMEs had a current ratio of more than 1.

Figure 4.4: SMEs Current Ratio



Source: Research Findings

4.3 Effect of Credit Policy on Profitability

4.3.1 Effect of Financing Costs on Credit Policy

As shown in Table 4.2 below, cost of financing is negatively related to credit policy adopted by the firm as shown by coefficient of correlation of -0.3662. The coefficient of determination implies that financing costs only account for a small percentage of credit policy. This implies that credit policy adopted may be a result of other factors like competition and need to stimulate demand.

Table 4.2: Relationship between cost of financing and credit policy

R	R Square	Adjusted R Square	Std. Error of the Estimate
-0.3662	0.1341	0.1161	0.0977

Source: Research Findings

The model between cost of financing and credit policy adopted was also found to be significant as shown by the p value of 0.0089 at 5% significance level.

Table 4.3: Estimated Model of the Relationship between Cost of Financing and Credit Policy

	Sum of Squares	df	Mean Square	F	Sig.
Regression	7888.2001	1	7888.2001	7.4333	0.0089
Residual	50937.4137	48	1061.19612		
Total	58825.6138	49			

Source: Research Findings

The coefficients of the model between cost of financing and credit policy is shown in Table 4.4 below. The table shows that both coefficients obtained are significant and can be used for prediction of credit policy to be adopted by the firm if the cost of credit is known. From the coefficient on cost of finance (-10.8675), it can be seen that an increase in financing costs leads to reduced debtors' days. Hence, increase in financing costs leads to adoption of stringent credit policy.

Table 4.4: Estimated Model of the Relationship between cost of financing and credit policy

Model	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
Constant	61.3887	5.9466		10.3233	0.0000
Cost of financing	-10.8675	3.9860	-0.3662	-2.7264	0.0089

Source: Research Findings

4.3.2 Effect of Credit Policy on Sales

Table 4.5 below shows a strong positive relationship between credit policy and growth in sales as shown by coefficient of correlation of 0.896. R square of 0.804 indicates that 80.4% of changes in sales volumes could be explained by changes in credit policy. Therefore, adoption of liberal credit policy leads to increase in sales.

Table 4.5: Relationship between Credit Policy and Sales

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.8968	0.8042	0.8001	0.2491

Source: Research Findings

As shown in table 4.6 below, the model developed is significant since the p value is 0 which is less than 5%.

Table 4.6: Estimated Model of the Relationship between Credit Policy and Sales

	Sum of Squares	df	Mean Square	F	Sig.
Regression	12.2258	1	12.226	197.102	0.000
Residual	2.9773	48	0.062		
Total	15.2032	49			

Source: Research Findings

The model coefficients as shown in Table 4.7 below indicates that a change in credit policy as measured by average debtors collection period leads to 1.44% change in sales growth.

Table 4.7: Estimated Model Coefficients on credit policy and sales

Model	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
Constant	0.8201	0.0632		12.9706	0.0000
Credit Policy	0.0144	0.0010	0.8968	14.0393	0.0000

Source: Research Findings

4.3.3 Effect of SME Size on Credit Policy

As shown in Table 4.8 below, SMEs size has positive effect on credit policy adopted by the firm as shown by R of 0.43.

Table 4.8: Relationship between SME Size and Credit Policy

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.4290	0.1840	0.1670	31.6233

Source: Research Findings

The relationship between size of SMEs and credit policy was found to be significant with a p value of 0.0019 which is less than 5% significant level. The results are presented in Table 4.9 below.

Table 4.9: Estimated Model on SME Size and Credit Policy

	Sum of Squares	df	Mean Square	F	Sig.
Regression	10824.15	1	10824.1507	10.8238	0.0019
Residual	48001.46	48	1000.0305		
Total	58825.61	49			

Source: Research Findings

As shown in Table 4.10 below, change in sales leads to a change in credit policy as indicated by debtors' period.

Table 4.10: Relationship between Size of SME and Credit Policy

	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
Constant	58.2199	4.9634		11.7299	0.0000
Size	0.0001	0.0000	-0.4290	-3.2900	0.0019

Source: Research Findings

4.3.4 Effect of Credit Policy on Profitability

As shown in Table 4.11 below, credit policy has a positive strong relationship on profitability as shown by coefficient of correlation (R) of 0.83 and coefficient of determination of 0.69. This implies that increase in debtors collection period leads to higher profitability; adoption of liberal credit policy leads to higher profitability.

Table 4.11: Model summary on credit policy and profitability

R	R Square	Adjusted Square	R Std. Error of the Estimate
0.8333	0.6944	0.6880	0.0799

Source: Research Findings

As shown in Table 4.12 below, the relationship between profitability and credit policy is significant since the p value will be 0 which is less than 5% significance level.

Table 4.12: Model ANOVA on credit policy and profitability

	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.6956	1	0.6956	109.0625	0.0000
Residual	0.3061	48	0.0064		
Total	1.0017	49			

Source: Research Findings

The model coefficients are shown in Table 1.13 below. The coefficients imply that an increase in debtors' collection period by 1 leads to 0.34% increase in return on assets.

Table 4.13: Relationship between Credit Policy and Profitability

Model	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
Constant	0.1967	0.0203		9.7024	0.0000
Credit Policy	0.0034	0.0003	0.8333	10.4433	0.0000

Source: Research Findings

4.3.5 Multiple Regression Analysis

To achieve the general objective of the study which was to determine the effect of credit policy adopted by manufacturing SMEs in Nairobi County on profitability, multiple regressions as discussed in chapter three was used. The coefficient of determination R^2 and correlation coefficient (r) shows the degree of association between independent variables and profitability of manufacturing SMES in Nairobi. The results of the linear regression indicate that R^2 of 0.88 and R of 0.94 indicating that there is a strong relationship between credit policy, liquidity, cost of financing, SMEs size and profitability of manufacturing SMEs in Nairobi County. The results are shown in Table 4.14 below.

Table 4.14: Results of Model Goodness of Fit Test

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.9418	0.8869	0.8769	0.0502

Source: Research Findings

The relationship between independent and dependent variables was found to be significant with a p value of 0.0000 which is less than 5% significance level.

Table 4.15: Results of ANOVA

Model	Sum of Squares	df	Mean F	Sig.
Regression	0.8885	4	0.2221 88.2503	0.0000
Residual	0.1133	45	0.0025	
Total	1.0017	49		

Source: Research Findings

As shown in Table 4.16 below, cost of financing was observed to have the highest effect on profitability followed by credit policy. All the coefficients were found to have a significant positive relationship with profitability.

Table 4.16: Results of Estimated Multiple Regression Model

	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
Constant	0.0344	0.0928		-3.6032	0.0008
Credit Policy	0.2008	0.0005	0.2002	-1.5139	0.0014
Liquidity	0.1465	0.0337	0.5707	4.3492	0.0001
Cost of Financing	-0.4499	0.1037	0.5672	4.3395	0.0001
Size	0.0039	0.0071	0.0315	-0.5461	0.0059

Source: Research Findings

The model developed by study is; $ROA=0.0344+0.2008ACP+0.1465CR-0.4499CR + 0.0039SIZE$; where ACP is average credit period representing credit policy, CR is current ratio which is a measure of liquidity, GFC is the growth in financing costs per year, and SIZE is the SMEs size.

4.4 Discussion

The study sought to determine the effect of credit policy adopted by manufacturing SMEs in Nairobi County. The study found that credit policy has positive strong relationship on profitability as shown by coefficient of correlation (R) of 0.83 and coefficient of determination of 0.69. This implies that increase in debtors collection period leads to

higher profitability; adoption of liberal credit policy leads to higher profitability. The relationship between profitability and credit policy was found to be significant with p value of 0 which is less than 5% significance level. The findings agree with those of Sharma and Kumar (2011) who found that working capital management and profitability were positively related with debtors days increase leading to increase in profitability. Also, Raheman, *et al.*, (2010) found that working capital management had positive effect on firm's performance in Pakistan for the period 1998 to 2007.

The study found that cost of financing is negatively related to credit policy adopted by the firm as shown by coefficient of correlation of -0.3662. However, the relationship was not strong indicating that credit policy and not greatly depends on cost of financing but other factors. The findings are in line with the argument of the financial motive theory as discussed by Emery (1984), Mian & Smith, 1992 and Schwartz (1974) who argues that firms able to obtain funds at a low cost will offer more trade credit than firms with high financing costs. SMEs liquidity was observed to be low with current ratio ranging between 1.4 and 0.9 indicating the liquidity challenge facing SMEs.

Strong positive relationship between credit policy and growth in sales as was found with coefficient of correlation of 0.896. R square of 0.804 indicates that 80.4% of changes in sales volumes could be explained by changes in credit policy. Therefore, adoption of liberal credit policy leads to increase in sales. The findings are in line with those of Meltzer (1960) who found that trade credit mitigates customers' financial frictions, thus facilitating increased sales and market share growth. Smith (1987) also found that trade credit boosted sales by alleviating informational asymmetry between suppliers and buyers in terms of product quality by reducing uncertainty about product quality.

SMEs size was found to have positive effect on credit policy adopted by the firm as shown by R of 0.43. The findings are in line with those of Kieschnick et al, (2006) who that the cost of funds used to invest in current assets decreases with firm size, as smaller firms have greater information asymmetry, greater informational opacity and are less followed by analysts and hence smaller firms have more stringent credit policy. Also Diogo (2013) found that smaller firms have adopt stringent credit policy since they have a higher likelihood of bankruptcy, as larger firms are more diversified failing less often.

4.5 Summary

Cronbach Alpha was used to test the reliability of the proposed constructs where alpha of more than 0.5 meant that the variable was relevant. Average collection period had a Cronbach alpha of 0.623; cost of financing 0.710, current ratio 0.953 and SMEs size 0.839. All constructs depicted that the value of Cronbach's Alpha were above the suggested value of 0.5 thus the study constructs were reliable. A construct with alpha of more than 0.5 was concluded to be reliable while those with alpha of less than 0.5 were unreliable.

The nature of credit policy adopted by SMEs was determined by the average collection period which was determined as $(365 \times \text{Average debtors}) / \text{Annual credit sales}$. 26% (13) of the SMEs had average debtors collection period of over 90 days, 22% (11) 10 to 20 days and 30 to 50 days, 20% (10) 30 to 50 days and 0% 20 to 30 days. SMEs having a credit policy of 50 days and below were classified as stringent while those having over 50 days classified as liberal. On this basis, 52% (26) of the SMEs had adopted stringent credit policy while 48% (24) of the SMEs have adopted liberal credit policy. The

adoption of stringent credit policy by manufacturing SMEs could be explained by the cash flow constraints and the high working capital required to be invested in raw materials, work in progress and finished goods.

SME studied were found to be facing liquidity challenges with current ratios ranging from 1.4 and 0.9. Also, cost of financing was found to be negatively related to credit policy adopted by the firm as shown by coefficient of correlation of -0.3662. Strong positive relationship between credit policy and sales was found as shown by coefficient of correlation of 0.896. SMEs size was also found to have positive effect on credit policy adopted by the firm as shown by R of 0.43. Credit policy was found to have a positive strong relationship on profitability as shown by coefficient of correlation (R) of 0.83 and coefficient of determination of 0.69. This implied that increase in debtors collection period leads to higher profitability; adoption of liberal credit policy leads to higher profitability. The model developed was $ROA=0.0344+0.2008ACP+0.1465CR-0.4499CR + 0.0039SIZE$; where ACP is average credit period representing credit policy, CR is current ratio which is a measure of liquidity, GFC is the growth in financing costs per year, and SIZE is the SMEs size.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives the summary, conclusion and recommendation of the whole study. From the findings the researcher was able to come up with the summary, conclusion and recommendation. The chapter summarizes the findings of the study done with specific to the objectives and research questions which were used as units of analysis. Data was interpreted and the results of the findings were correlated with both empirical and theoretical literature available. The conclusion relates directly to the specific objectives/research questions. The chapter has sections 5.2 on summary, section 5.3 on conclusion, section 5.4 on recommendations for policy, section 5.5 on limitations of the study and section 5.6 on recommendation for further research.

5.2 Summary of the Study

The study sought to investigate the effect the effect of credit policy adopted by manufacturing SMEs in Nairobi County on profitability. Specifically, the study investigated the effect of credit policy, liquidity, size, and cost of finance on SMEs profitability. The study found that credit policy is positively related to manufacturing SMEs profitability with a coefficient of correlation of 0.83 and coefficient of determination of 0.69. Credit policy was also found to have strong positive relationship with growth in sales as shown by coefficient of correlation of 0.896 and R square of

0.804 indicating that 80.4% of changes in sales volumes could be explained by changes in credit policy.

SMEs size was also found to have positive effect on credit policy adopted by the firm as with a coefficient of determination of 0.43. The results also indicates a strong linear regression relationship between credit policy, liquidity, cost of financing, SMEs size and profitability of manufacturing SMEs in Nairobi County as indicated by coefficient of determination of 0.88 and coefficient of correlation of 0.94.

Cost of financing was found to be negatively related to credit policy adopted by the firm as shown by coefficient of correlation of 0.3662. On type of credit policy adopted by SMEs, 52% of the manufacturing SMEs had adopted stringent credit policy while 48% of the SMEs have adopted liberal credit policy. The adoption of stringent credit policy by manufacturing SMEs was explained by the cash flow constraints and the high working capital required to be invested in raw materials, work in progress and finished goods. Manufacturing SMEs studied were found to be faced by liquidity challenges with their current ratio ranging between 1.4 and 0.9. 56% of the SMEs had a current ratio of 1.2 and 2, 28 a current ratio of less than 1 and 16% a current ratio of 1 to 1.2.

5.4 Conclusions

The aim of this study was to explore the effect of credit policy on profitability of manufacturing SMEs in Nairobi County. Based on the study findings, the study concludes that credit policy has effect on profitability of manufacturing SMEs in Nairobi County. Adoption of liberal credit policy leads to higher profitability and vice versa. Having longer debtors' collection days leads to higher manufacturing SMEs profitability.

The study also concludes that size of the SMEs affects the credit policy adopted by the firm. Smaller SMEs are more likely to adopt stringent credit policy. Credit policy adopted by the SMEs is also determined by the cost of funds available to fund credit sales. Low cost of financing leads to higher credit sales and hence SMEs adopts a liberal credit policy. The study finally concludes that most SMEs in Nairobi County are faced with liquidity challenges where most of them have current ratio of less than the recommended ratio of two.

5.4 Policy Recommendations

The findings on the effects of a credit policy on financial performance can be used in formulating credit policy which will ensure that firm's profitability is maximized. Since type of credit policy adopted by the SMEs affects profitability, firms ought to adopt credit policy that will maximize profitability.

Based on the study findings, the study recommends the following: First, SMEs need to adopt liberal credit policy and carry out thorough credit vetting to ensure reduced costs of bad debts and debt administration costs. Secondly, the government and policy formulators need to come up with ways of reducing cost of financing to ensure that manufacturing SMEs are able to finance receivables since the lower the cost of financing, the higher the credit advanced leading to increased sales and profitability. Establishment and facilitation of growth of SMEs need to be emphasized since big firms are able to advance more credit and consequently achieve higher profitability.

5.5 Limitations of the Research

This study used only secondary data in analysis and making conclusions which raises completeness and reliability issues of the data used. Relying on the secondary data means that any error in the source will also be reflected in the research, that is, errors and assumptions not disclosed in the source documents will also reoccur in the research. The study only considered debtors period as a measure of type of credit policy in coming up with the findings and conclusions. Credit standards, credit terms and conditions and collection efforts also affect nature of credit policy and costs of credit management which need to be looked into in details.

5.6 Recommendations for Further Research

Further research should be done on the relationship between credit policy and financial performance of other SMEs sectors apart from manufacturing SMEs in Nairobi County. Further research needs to be done on how to implement credit policies so as to ensure the highest profitability on SMEs.

This study only studied SMEs and hence the findings may not have been representative. Therefore, further study need to be done to determine the effect of credit policy on profitability of big firms. Large firms and small firms are very different and hence effect of credit policy is also expected to affect profitability differently. Similar study is also recommended but using both primary and secondary data to ensure that information not captured in secondary data is captured in primary data.

REFERENCES

- Akoto, K., Awunyo, D., & Angmor, L., (2013). Working capital management and profitability: Evidence from Ghanaian listed manufacturing firms. *Journal of Economics and International Finance*, 5(9), 373-379
- Almazari, A., (2013). The Relationship between Working Capital Management and Profitability: Evidence from Saudi Cement Companies. *British Journal of Economics, Management & Trade*, 4(1).
- Amyx, C., (2005). The Perception Problem: Size Doesn't Matter. *Washington Business Journal*.
- Autukaite, R., & Molay, E., (2011). Cash Holdings, Working Capital and Firm Value: Evidence From France. *International Conference of the French Finance Association (AFFI)*, pp. 1-34.
- Baños-Caballero, S., García-Teruel, P. & Martínez-Solano, P., 2012. How does working capital management affect the profitability of Spanish SME's?. *Small Business Economics*, Volume 39, pp. 517-529.
- Baños-Caballero, S., García-Teruel, P., & Martínez-Solano, P., (2010). Working capital management in SMEs. *Accounting and Finance*, Volume 50, pp. 511-527.
- Blinder, S., & Maccini, J., (1991). The Resurgence of Inventory Research: What Have We Learned? *Journal of Economic Survey*, Volume 5, pp. 291-328.
- Bowen, M., Morara, M., & Muriithi, S. (2009). Management of Business Challenges Among Small and Micro Enterprises in Nairobi, Kenya. *KCA Journal of Business Management* , 2 (1).
- Brennan J., Maksimovic V., & Zechner J., (1988). Vendor Financing. *Journal of Finance* 43, 1127-1141.

- Bryman, A., and Cramer, G., (1997), *Quantitative data analysis with SPSS for windows*.
Routledge, London.
- Chiou, R., Cheng, L., & Wu, W., (2006). The determinants of working capital management.
Journal of American Academy of Business, Volume 10, pp. 149-155.
- Cooper, R., and Schinder, S., (2008). *Business research methods*. 10th Ed. New York: Mc Graw
Hill.
- Deloof, M., (2003). Does Working Capital Management Affect Profitability of Belgian Firms?
Journal of Business, Finance and Accounting, Volume 30; No.3, pp. 573-587.
- Diogo, F., (2013). How does working capital management affect firms' profitability? Evidence
from Portugal. *Lisboa School of Management and Economics*.
- Dong, P., & Su, J., (2010). The Relationship between Working Capital Management and
Profitability: A Vietnam Case. *International Research Journal of Finance and Economics*,
Volume 49, pp. 59-67.
- Emery, W., (1984). Measuring Short-Term Liquidity. *Journal of Cash Management*, Volume 4,
pp. 25-32.
- Fazzari, M., & Petersen, B., (1993). Working Capital and Fixed Investment: New Evidence on
Financing Constraints. *Rand Journal of Economics*, Volume 24; No.3, pp. 328-342.
- Ferris S., (1981). A transactions theory of trade credit use, *Quarterly Journal of Economics* 96,
243-270.
- Gakure, R., Cheluget, J., Onyango, A., & Keraro, V., (2012). Working capital management and
profitability of manufacturing firms listed at the Nairobi stock exchange. *Prime Journal
of Business Administration and Management (BAM)*, 2(9), 680-686.

- García-Teruel, P. & Martínez-Solano, P., 2010. Determinants of Trade Credit: A Comparative Study of European SMEs. *International Small Business Journal*, Volume 28, No.3, pp. 215-233.
- Gatuhu, R., (2013). The effect of credit management on the financial performance of microfinance institutions in Kenya. University of Nairobi, MBA.
- Gitman, L., & Sachdeva, K., (1982). A Framework for Estimating and Analyzing the Required Working Capital Investment. *Review of Business and Economic Research*, Volume 17, No.3, pp. 36-44.
- Gitman, L., (1974). Corporate Liquidity Requirements: A Simplified Approach. *The Financial Review*, Volume 9, pp. 79-88.
- Gul, S., Khan, B., Raheman, U., Khan, T., Khan, M., & Khan, W. (2013). Working capital management and performance of SME sector. *European Journal of Business and management*, 5(1), 60-68.
- Hager, C., (1976). Cash Management and the Cash Conversion Cycle. *Management Accounting*, Volume 57(9), pp. 19-21.
- Hawawini, G., Viallet, C., & Vora, A., (1986). Industry Influence on Corporate Working Capital Decisions. *Sloan Management Review*, Volume 24, No.4, pp. 15-24.
- Horne, C., & Wachowicz M., (2000). *Fundamentals of Financial Management*. New York, NY: Prentice Hall Publishers.
- IDRC, D., (1993). *Small Enterprises Development and International*. Ottawa, Ontario: IDRC.
- Kerlinger, F., (1986). *Foundations of behavior research* (3rd ed.). New York: Holt, Rinehart, and Winston.

- Kieschnick, R., LaPlante, M., Moussawi, R., & Baranchuk, N., (2006). Corporate Working Capital Management: Determinants and Consequences. Working Paper. University of Texas: Dallas, pp. 1-33.
- Lee W., Stowe, D., (1993). Product risk, asymmetric information, and trade credit. *Journal of Financial and Quantitative analysis* 28, 285-300.
- Long, S., Malitz, B., & Ravid, A., (1993). Trade Credit, Quality Guarantees and Product Marketability. *Financial Management*, Volume 22; No.4, pp. 117-127.
- Mathuva, M., (2010). Influence of working capital management components on corporate profitability: A survey on Kenyan listed firms. *Research Journal of Business Management* 3 (1),
- Mbogo, M., (2011). Influence of Managerial Accounting Skills on SME's on the Success and Growth of Small and Medium Enterprises in Kenya. *Journal of Language, Technology & Entrepreneurship in Africa* Vol. 3 No. 1
- Mian S, Smith C., (1992). Accounts receivable management policy: theory and evidence. *Journal of Finance* 47, 167–200.
- Mogaka, D., and Jagongo, A., (2013). Working Capital Management and Firm Profitability: Empirical Evidence from Manufacturing and Construction Firms Listed on Nairobi Securities Exchange, Kenya, *International Journal of Accounting and Taxation*, Vol. 1 No. 1, December 2013
- Mugenda, A., & Mugenda, O., (2003). Research methods; quantitative and qualitative approaches. Africa Center for Technology (ACTS), Nairobi Kenya
- Nadiri I., (1969). The determinants of trade credit terms in the U.S. total manufacturing sector. *Econometrica* 37, 408-423.

- Nakamura, W., & Palombini, N., (2009). *The Determinant Factors of Working Capital Management in the Brazilian Market*, São Paulo, Brazil: Universidade Presbiteriana Mackenzie.
- Ngugi, J., and Bwisa, H., (2013). Factors influencing growth of group owned small and medium enterprises: a case of one village one product enterprises international journal of education and research vol. 1 no. 8 august 2013
- Nunn, K., (1981). *The Strategic Determinants of Working Capital: A Product-Line Perspective*. *Journal of Financial Research*, Volume 4, pp. 207-219.
- Nyabwanga, N., Ojera, P., Lumumba, M., Odondo, J., & Otieno, S., (2012). Effect of working capital management practices on financial performance: A study of small scale enterprises in Kisii South District, Kenya. *African Journal of Business Management*, 6 (18) 5807-5817.
- Nyawera, K., (2013). *The effect of credit policy on the financial performance of deposit taking microfinance institutions in Kenya*. University of Nairobi, MBA.
- Oladipupo, O., & Okafor, A., (2013). Relative contribution of working capital management to corporate profitability and dividend payout ratio: Evidence from Nigeria. *International Journal of Business and Finance Research*, 3(2), 11-20.
- Omesa, W., Maniagi, M., Musiega, D., & Makori, A., (2013). Working capital management and corporate performance: Special reference to manufacturing firms on Nairobi Securities Exchange. *International Journal of Innovative Research and Development*, 2(9), 177-183.
- Orodho, J., (2003) *Essentials of Educational and Social Science Research methods: Qualitative and Quantitative Approaches*. Nairobi Acts Press.

- Petersen, A., & Rajan, G., (1997). Trade Credit: Theories and Evidence. *Review of Financial Studies*, Volume 10; No.3, pp. 661-691.
- Raheman, A., Afza, T., Qayyum, A., & Bodla, M.A. (2010). Working Capital Management and Corporate Performance of Manufacturing Sector in Pakistan. *International Research Journal of*
- Richard, V. & Laughlin, E., 1980. A Cash Conversion Cycle Approach to Liquidity Analysis. *Financial Management*, pp. 32-38.
- Republic of Kenya, (2012). Economic Survey. Nairobi Kenya: Government Printers.
- Republic of Kenya (2007). Kenya Bureau of Statistics. Nairobi: Government Printer.
- Republic of Kenya, (1989-1994). National Development Plan. Nairobi: Government printer.
- Republic of Kenya. (2005). Sessional Paper No.2. Nairobi: Government printer.
- Republic of Kenya. (2009). Economic Survey. Nairobi: Government Printer.
- Saunders, (2003). *Research methods for business students (3rd edition)* New York – Prentice Hall
- Schwartz RA, 1974. An economic model of trade credit. *Journal of Financial and Quantitative Analysis* 9, 643-657.
- Sekaran, U., (2010) *Research Methods for business :A skill Building Approach (5th Edition .)* USA: John wiley & Sons Publisher
- Sharma, A.K., & Kumar, S. (2011). Effect of working capital management on firm profitability: Empirical evidence from India. *Global Business Review*, 12 (1) 159-173.
- Shin, H., & Soenen, L., (1998). Efficiency of Working Capital and Corporate Profitability. *Financial Practice and Education*, Volume 8, pp. 37-45.
- Silva, S., (2012). Effects of Working Capital Management on the Profitability of Portuguese

Smith, K., (1987). Trade Credit and Informational Asymmetry. *Journal of Finance*, Volume 42, pp. 863-872.

Smith, K., (1980). Profitability versus Liquidity Tradeoffs in Working Capital Management. In: K. Smith, ed. Smith, K.V. ed. St Paul, MN: West Publishing Company: Readings on the Management of Working Capital, pp. 549-562.

Wilner, S., (2000). The Exploitation of Relationships in Financial Distress: The Case of Trade Credit. *Journal of Finance*, Volume 55, pp. 153-178.

APPENDIX I: RESEARCH DATA

	Average collection period	sales growth	SMEs current ratio	growth in financing costs	SMEs	Profitability
1	7.27492	0.191666667	0.9012	6.577747	889380	0.085515
2	7.28427	0.439852445	0.9124	5.000664	837062.04	0.102955
3	7.2845	0.439491805	0.9771	-0.09992	836976.24	0.112118
4	7.29195	0.458867143	0.9886	-0.08633	823210	0.119998
5	7.29925	0.459249075	1.0004	-0.35598	821420	0.124907
6	13.7223	1.13392238	0.9262	3.257976	37307.4	0.195563
7	13.5652	1.134503287	0.9267	3.015871	37298.26	-0.195812
8	13.51	1.161400956	0.9357	1.834085	37254	0.204221
9	13.5493	1.161904456	0.9381	1.421052	37240.42	0.204222
10	12.4144	1.168644508	0.9397	0.909969	37230.34	0.203155
11	12.3954	1.179902241	0.9434	0.898879	37194.47	0.204724
12	12.3264	1.183821608	0.9753	0.899273	37182	0.252106
13	12.3104	1.184255861	0.9858	0.824828	37088.42	0.262535
14	34.9729	1.21610623	0.9886	0.774606	37034.94	0.26427
15	35.5069	1.216277381	0.9990	0.786935	36777.86	-0.01584
16	35.4796	1.249013743	1.0023	0.791705	36628.68	0.01801
17	35.7365	1.247934839	1.0040	0.792113	36614.2	0.001253
18	35.728	1.282685703	1.0055	0.749045	36554.32	0.001775
19	35.6941	1.283355049	1.0085	0.74776	36523.3	0.01826
20	36.5229	1.294733525	1.0099	0.726056	36499.4	0.07714
21	36.307	1.294873548	1.0161	0.727792	36332.36	0.2997
22	12.1803	1.307383931	1.0184	0.727408	36308.52	0.2439
23	12.1878	1.305268936	1.2309	0.694116	36282	0.044678
24	12.2151	1.313778835	1.2306	0.67854	36275.04	0.443698
25	44.2439	1.313947488	1.2323	0.684935	36104.64	0.442538
26	44.1719	1.916446222	1.2682	0.59254	35650.44	0.445814
27	56.595	1.954513932	1.2671	0.589508	35599	0.445125
28	56.6655	1.955512484	1.2693	0.580322	35579	0.043634
29	56.657	1.955179679	1.2702	0.58141	35500	0.440726
30	56.8613	1.953187423	1.2726	0.57789	35393	0.438721
31	57.0437	1.998320611	1.2720	0.576394	35376.94	0.438984
32	58.0583	2.003933642	1.2870	0.576056	35345.18	0.448673
33	89.1526	1.996847985	1.2944	0.577359	35278.12	0.0060116
34	89.6399	1.997172138	1.3030	0.575171	35274.1	0.0065776
35	89.598	2.001327866	1.3075	0.576019	35218.98	0.063977

36	89.7975	2.01836054	1.3113	0.579098	35124.5	0.469405
37	89.9405	2.019965354	1.3133	0.579101	35102.95	0.4698
38	90.3056	2.036384694	1.3146	0.574431	35098.1	-0.009757
39	90.3913	2.036684223	1.3169	0.574307	35023.46	0.465862
40	91.9339	2.059252784	1.3222	0.561752	35011.12	0.47252
41	92.2284	2.096394028	1.3232	0.562197	35000	0.4714
42	92.6804	2.09723984	1.3296	0.560646	35000	0.47653
43	93.4835	2.105860301	1.3679	0.550474	34844	0.03556
44	93.6945	2.105353309	1.3761	0.551551	34814.88	0.012149
45	93.9178	2.106451753	1.3800	0.552557	34775.36	0.014369
46	93.9594	2.127493249	1.3845	0.552281	34759.76	-0.019978
47	94.4304	2.142853952	1.3895	0.552213	34750.46	0.004629
48	94.8906	2.141891542	1.3981	0.551919	34726.7	-0.06676
49	95.3017	2.141550831	1.3987	0.551924	34721.41	0.036442
50	98.4583	2.275710799	1.4732	0.529433	34496.08	-0.049147