

**THE RELATIONSHIP BETWEEN FINANCIAL RISK
MANAGEMENT AND EFFICIENCY OF MANUFACTURING
FIRMS IN KENYA**

BY

KORIR, GEOFFREY KIPKIRUI

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

NOVEMBER 2010

DECLARATION

This management research project is my original work and has not been presented for examination in any other university.

Signed.....

Date.....

GEOFFREY KIPKIRUI KORIR

D61/70244/2008

This management research project has been submitted for examination with my approval as university supervisor.

Signed.....

Date.....

MR. HERRICK ONDIGO

Lecturer,

School of Business

University of Nairobi

ACKNOWLEDGEMENTS

I would like to acknowledge the following persons whose contributions facilitated the completion of this project.

First and foremost, I thank the Almighty God for the gift of life and for giving me the skills, knowledge and energy to be able to complete this paper and the postgraduate degree of Master of Business Administration.

Second, I give special thanks to my supervisor Mr. Ondigo, for providing unlimited, invaluable and active guidance throughout the study. His immense command and knowledge of the subject matter enabled me to shape this research project to the product it is now.

Third, I thank all the manufacturing firms in Kenya that agreed to take part in this study. Also my gratitude go to the Nairobi Stock Exchange for availing data and documents which made this research a success for the listed manufacturing firms.

Finally, I owe my gratitude to a great pool of people who in one way or another contributed towards completion of this project. To all of you, I say a big THANK YOU!

DEDICATION

To the lovers of knowledge

ABSTRACT

A number of studies have been done in various firms viewing the problem of risk management as the need to control risks which make up most, if not all, of their risk exposure. Studies in Kenya have only focused on risk management practices of firms in general without being specific on the financial risk management practices of manufacturing industry. This study sought to establish the relationship between financial risk management and efficiency of manufacturing firms in Kenya.

The researcher used descriptive design. The population was 50 manufacturing firms. A sample of 40 firms was selected and 36 took part in the final survey. Both primary and secondary data were collected. The primary data was collected using questionnaires while secondary data was collected from the annual statements. Data was analysed using descriptive analysis and regression analysis. The results are presented in tables.

The study found that the most managed financial risk in the manufacturing sector was foreign currency risk (mean score = 4.22) while the least managed financial risk was commodity price risk (mean score = 1.78). The study also revealed that currency risk, interest rate risk, and commodity price risk management practices had insignificant negative influences on firm efficiency ($R = -0.121, -0.126$ and -0.116 respectively). The study concludes that financial risk management is negatively related with efficiency of manufacturing firms in Kenya. The policy makers need to put up more stringent policies for the manufacturing firms to better manage financial risks. The study recommends need for manufacturing to entrench more measures to manage financial risks as the level of use of instruments to manage such risks is still low.

TABLE OF CONTENTS

DECLARATION.....	i
ACKNOWLEDGEMENTS	ii
DEDICATION.....	iii
ABSTRACT.....	iv
TABLE OF CONTENTS	v
LIST OF TABLES	vii
CHAPTER ONE	1
1.0 INTRODUCTION.....	1
1.1 Background of the Study.....	1
1.2 Statement of the Problem	3
1.3 Objective of the Study.....	4
1.4 Significance of the Study	4
CHAPTER TWO	5
2.0 LITERATURE REVIEW	5
2.1 Introduction	5
2.2 Financial Risk Management Theories.....	5
2.2.1 MM Model.....	5
2.2.2 Portfolio Theory.....	6
2.3 Financial Risk Management.....	7
2.4 Firm Efficiency	9
2.5 Empirical Studies	10
2.6 Summary of Literature Review	12
CHAPTER THREE	13
3.0 RESEARCH METHODOLOGY	13
3.1 Introduction	13
3.2 Research Design.....	13
3.3 Target Population.....	13

3.4	Sample.....	13
3.5	Data Collection.....	13
3.6	Data Analysis	14
CHAPTER FOUR.....		15
4.0	DATA ANALYSIS, RESULTS AND DISCUSSION.....	15
4.1	Introduction.....	15
4.2	Characteristics of Respondents	15
4.3	Financial Risk Management Practices	17
4.4	Financial Risk Management Practice and Efficiency of Firms.....	20
4.5	Discussion of Findings.....	21
CHAPTER FIVE		22
5.0	SUMMARY, CONCLUSION AND RECOMMENDATIONS	22
5.1	Introduction.....	22
5.2	Summary of Research Findings	22
5.3	Conclusion.....	22
5.4	Recommendations for Policy and Practice.....	23
5.5	Limitations of the study.....	23
5.6	Suggestions for further research.....	23
REFERENCES.....		24
APPENDICES.....		28
Appendix 1:	Research Questionnaire	28
Appendix 2:	Research Population	32

LIST OF TABLES

Table 1: Gender	15
Table 2: Age.....	16
Table 3: Length of service	16
Table 4: Experience in current positions	17
Table 5: Financial risks.....	18
Table 6: Management of currency risks	18
Table 7: Management of interest rate risks.....	19
Table 8: Management of commodity price risks	19
Table 9: Influence of financial risk on efficiency.....	20
Table 10: Pearson correlations	21

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

Financial risk management is one of the fastest growing service industries in the business world. According to the Global Association of Risk Professionals (GARP), one of the leading trade associations in the field, there are currently more than 74,000 financial risk managers in financial institutions (GARP, 2008). Dozens of academic and professional institutions award degrees and diplomas in financial risk management and these qualifications are gaining recognition by regulators and international certification bodies. At the heart of this body of knowledge and practices (virtually nonexistent less than thirty years ago) is a set of financial economic theories, employing a variety of statistical models to assess and calculate the risks associated with a plethora of financial assets and contracts.

Financial risk management is the practice of creating economic value in a firm by using financial instruments to manage exposure to risk, particularly credit risk and market risk. Other types include Foreign exchange, Shape, Volatility, Sector, Liquidity, Inflation risks, etc. Similar to general risk management, financial risk management requires identifying its sources, measuring it, and plans to address them. Financial risk management can be qualitative and quantitative. As a specialization of risk management, financial risk management focuses on when and how to hedge using financial instruments to manage costly exposures to risk (Tapiero, 2004).

Corporate financial risk management (CFRM) concerns the management of financial price risks in corporate entities, namely interest rates, exchange rates and the prices of commodities. Since its first implementation in the 80s, CFRM has evolved in three main steps. In the first step, banks designed new structured products, exploiting their deep knowledge of financial engineering. Secondly, practitioners have developed best practices concerning the correct use of derivatives in corporate entities, focusing on the organization and the reporting of the process of CFRM. The third step is now under way. In this step the main change concerns the regulatory and accounting context of CFRM. Up to now, the new regulatory context has deeply influenced the operations of corporate entities. A first very evident impact concerns the less frequent use of complicated

structured derivative products. Moreover, new protagonists of the process of CFRM have developed rapidly. Accounting managers have been obliged to thoroughly understand the economics of derivatives, while the Board, the auditors and external financial analysts have become more deeply involved in the process of CFRM (Mauri and Conti, 2007).

According to Teal (2000), manufacturing industries are the chief wealth producing sectors of an economy. These industries use various technologies and methods widely known as manufacturing process management. Manufacturing industries are broadly categorized into engineering industries, construction industries, electronics industries, chemical industries, energy industries, textile industries, food and beverage industries, metalworking industries, plastic industries, transport and telecommunication industries.

Measuring an organisation's efficiency is about the relationship between the outputs it produces and the inputs it uses. An efficient organisation would be one that produces the maximum possible outputs given its inputs, or one that produces a certain level of output with the minimum amount of inputs. The process of trying to measure an organisation's efficiency can therefore be broken down into three steps. First, its inputs and outputs need to be defined and measured. Secondly, it is necessary to define what is feasible – in other words, what outputs could be achieved for any given set of inputs. Finally, the organisation's actual inputs and outputs are compared with the set of feasible inputs and outputs (Kuo et al., 2008).

The rising levels of poverty coupled with the general slowdown of the economy has continued to inhibit growth in the demand of locally manufactured goods, as effective demand continues to shift more in favour of relatively cheaper imported manufactured items. In addition, the high cost of inputs as a result of poor infrastructure has led to high prices of locally manufactured products thereby limiting their competitiveness in the regional markets and hampering the sector's capacity utilization. However, the recent introduction of the EAC Customs Union provides Kenya's manufacturing sector, the most developed within the region, a greater opportunity for growth by taking advantage of the enlarged market size, economies of scale, and increased intraregional trade (Teal, 2000).

Traditional efficiency measures, based on the consideration of outputs and inputs, are usually a good instrument of analysis of the performance of firms; however, it is

sometimes necessary to consider other factors. In the case of banking, one of the most important of these is risk, as it is desirable not only that a banking firm should be efficient, but also that it should be secure. This is certainly not exclusive to the banking sector, but it is of greater importance than in other sectors, given the potential economic repercussions of banking failures. However, despite its importance, the relationship between risk and efficiency has hardly been studied in the literature. Only the studies by Berg et al. (1992), Hughes et al. (1993 and 1996) and Mester (1994a, 1994b) have attempted to obtain risk-adjusted efficiency measures.

1.2 Statement of the Problem

Financial risk management is the practice of creating economic value in a firm by using financial instruments to manage exposure to risk, particularly credit risk and market risk. Other types include Foreign exchange, Shape, Volatility, Sector, Liquidity, Inflation risks, etc. Similar to general risk management, financial risk management requires identifying its sources, measuring it, and plans to address them. Despite innovation in the manufacturing sector, finance risk is still the major single cause of firm failures. The reason is that more than 80% of a firm's balance sheet generally relates to this aspect of risk management (Gruening and Bratanovic, 1999).

A number of studies have been done in various firms viewing the problem of risk management as the need to control risks which make up most, if not all, of their risk exposure. According to Bessis (2005) risk management is important to bank management because banks are 'risk machines' they take risks; they transform them and embed them in banking products and services. Risks are uncertainties resulting in adverse variations of profitability or in losses. Various risks faced by commercial firms include; credit risk, market risks, interest rates risk, liquidity risk and operational risk (Shubhasis, 2005). Studies in Kenya have only focused on risk management practices of firms in general without being specific on the financial risk management practices of manufacturing industry. A search on studied on risk management in Kenya yielded studies done on credit risk management (Njiru, 2003; Kioko, 2008; Ngare, 2008; Simiyu, 2008; and Wambugu, 2008), information systems risk management (Weru, 2008) and foreign exchange risk management (Kipchirchir, 2008). While the above research outcome

provides valuable insights on risk management, they have not induced clear relationship between financial risk management and efficiency of manufacturing firms. Given the gaps poised by the above empirical studies, this study posed the research question: “what is the relationship between financial risk management and efficiency of manufacturing firms?”

1.3 Objective of the Study

To establish the relationship between financial risk management and efficiency of manufacturing firms in Kenya.

1.4 Significance of the Study

Management

The management, especially the top level management of manufacturing firms will use the study to understand the relationship between financial risk management and efficiency of their organizations.

Employees

The employees of manufacturing companies will use the study to find out different ways of implementing financial risk management in order to cut out operational costs.

Other Manufacturing Firms

They will use the study to understand the significance of competition in order to increase the market of the organization.

Other researchers

Researchers will use the study to get information about financial risk management and use the information on other projects.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter deals with various concepts in regard to the relationship between financial risk management and efficiency of manufacturing firms. In addition, the researcher will discuss various empirical studies done in the same field, theories of financial risk management and summary conclusion of the literature review.

2.2 Financial Risk Management Theories

The theories presented in this section are Modigliani-Miller model and Portfolio theory.

2.2.1 Modigliani-Miller Model

There is a broad literature on risk management decisions for firms in general, beginning with Modigliani and Miller (1959): Their famous theorem states that in a world of perfect and complete markets, financial decisions are irrelevant as they do not alter the value of the shareholder's stake in the firm. The only way to increase shareholder's wealth is to increase value of the firm's assets. Neither the capital structure nor the risk management decisions have an impact on shareholder's wealth.

Some important deviations from the perfect capital markets in the Modigliani Miller setting have been identified, giving motivations for firms to care about risk management, such as taxes, bankruptcy costs, agency costs and others (Gossy, 2008). When these reasons for risk management are incorporated into the firm's objective function, one finds the following basic result: When all risks are perfectly tradeable the firm maximizes shareholder value by hedging completely (Gossy, 2008; Mozumdar, 2001).

Modigliani and Miller (1959) state that under the restrictive neoclassical assumptions, corporate financial decisions do not influence the value of the firm. These decisions simply redistribute the income stream among different investors. As long as investors can act in the capital markets at the same terms and conditions as the firm itself, the only way to impact firm value is by influencing the expected level of firm cash flows (Gossy, 2008).

Since risk management is part of an overall financing policy, the MM findings directly have important implications for the risk management strategy of the firm. Under the MM model, any investor's wealth position is unaffected by corporate risk management activities on the part of the firm (Gossy, 2008). Following this argument, a MM disciple would argue against doing any risk management at all since it is a purely financial transaction (Gossy, 2008). The immense importance of the MM-framework for corporate risk management, however, becomes apparent when it is used as a starting point for identifying conditions under which corporate risk management makes economic sense. Such a positive theory of corporate risk management can be derived by relaxing the neoclassical assumptions of the MM-framework.

2.2.2 Portfolio Theory

The concept of risk is closely related to the insights of portfolio theory. The most important paradigm of risk is part of a set of results known in the financial economics literature as the Capital Asset Pricing Model (CAPM) developed by Sharp (1964) and Lintner (1965) and later refined by Black (1972). It represents an extension and simplification of the model by Markowitz (1952). The Markowitz model was the first theorizing a relationship between risk and return. In his model, there are as many efficient portfolios as there are investor risk preferences. All efficient portfolios must lie on the mean-variance investment frontiers where investors can get a higher return only by accepting a higher level of risk (Gossy, 2008). The CAPM extends this theory to a situation of equilibrium. The CAPM argues that all investors will hold the same efficient portfolio (the market portfolio) regardless of their individual risk preferences. Thereby, the CAPM is capable of determining the market price for risk and an appropriate risk measure for a single asset (Gossy, 2008).

There have been numerous anomalies of the CAPM that have been discovered by finance researchers. This has initiated a discussion of the usefulness of the CAPM for the field of strategic management starting with the contribution by Bettis (1983). He detects a conundrum regarding the role of risk in strategic management context and states the main points of controversy between finance and strategy (Vicente-Lorente, 2001). In particular, he seriously questions the implications of the CAPM for strategic management but especially corporate risk management. The author identifies an implied recommendation

in the CAPM to corporate management not to be concerned at all about firm-specific risks. Bettis (1983) argued that business risks are associated with firm specific resources and competencies and are strongly related to the firm-environment interface.

Modern Portfolio Theory (MPT) is a theory of investment which tries to maximize return and minimize risk by carefully choosing different assets (Markowitz, 1952). MPT is a mathematical formulation of the concept of diversification in investing, with the aim of selecting a collection of investment assets that has collectively lower risk than any individual asset. This is possible, in theory, because different types of assets often change in value in opposite ways. For example, when the prices in the stock market fall, the prices in the bond market often increase, and vice versa. A collection of both types of assets can therefore have lower overall risk than either individually (Mandelbrot, and Hudson, 2004). The Primary principle upon which Modern Portfolio Theory is based (MPT) is the random walk hypothesis which states that the movement of asset prices follows an Unpredictable path: the path as a trend that is based on the long-run nominal growth of corporate earnings per share, but fluctuations around the trend are random (Chandra, Siddharth and Shadel, 2007).

2.3 Financial Risk Management

According to Kroszner (2002), financial risk management leads to availability of loans especially when cost is contained for example, non-performing loans are closely associated with financial crises. The insurance efficiency literature has a variety of discussions on market structures (market share of an insurance firm, Rai 1996, Choi and Weiss 2005), organizational forms (mutual vs. stocks insurers, Rubio-Misas, and Zi 2004), regulation set-up in different countries (Cummins and Rubio-Misas 2006), and corporate activities in mergers and acquisitions (Cummins, Tennyson and Weiss 1999), whereas it is lack of a rigorous investigation on the efficiency level that is attributed to risk management. Cummins et al. (1998) have investigated the reason that an insurance firm would participate in one risk management mechanism— the usage of derivatives, but not explore the effect on cost efficiency.

Cummins et al. (2006) assume that the risk management variables are predetermined based on the assumption of the minimization of the total cost of an insurance firm. However, this predetermined risk management decision violates the practices in the

insurance industry. The decision of the risk management in underwriting and financial activities results from the joint determination with capital and investment levels (Wen Lin, and Born 2007, Froot 2007), and thereby the degree of risk management on the derivative transactions in managing financial risks and the usage of reinsurance in managing underwriting risks becomes an jointly-determined policy by financial management, capital management, and risk management and the management's discretion.

Another important strand of the banking literature emphasizes the importance of including nontraditional outputs such as off-balance sheet (OBS) activities as well as controls for risk in estimating bank efficiency (e.g., Mester, 1996; Stiroh, 2000; Hughes, et al., 2001; Clark and Siems, 2002; Girardone, Molyneux, and Gardener, 2004; Casu and Girardone, 2005; Pastor and Serrano, 2005). These studies show that failing to account for non-traditional outputs and for risk can lead to misleading efficiency estimates and thus reinforce the argument for controlling for such factors in the present study.

Berger and De Young (1997) and Kwan and Eisenbeis (1997) posit that it is crucial to recognise explicitly the concept of bank efficiency in empirical models analyzing the determinants of banks' risk.¹⁰ Berger and De Young (1997) employ Granger-causality methods to assess the inter-temporal relationships among problem loans, cost efficiency, and capital for a sample of US banks from 1985 to 1994. Kwan and Eisenbeis (1997) use a simultaneous equation framework to test hypotheses about the interrelationships between bank risk, capitalization, and operating efficiency. Both papers provide evidence that both efficiency and capital are relevant determinants of bank risk.

Berger and De Young (1997) show that declines in cost efficiency precede increases in problem loans (particularly at thinly capitalized banks). They also show that problem loans result in reductions in cost efficiency. Kwan and Eisenbeis (1997) also found that poorly performing banks are more vulnerable to risk-taking. They also find that that highly capitalised banks are more efficient than less capitalized institutions.

Williams (2004) and Altunbas et al., (2007) have replicated both papers in a European banking setting. Similar to Berger and De Young (1997), Williams (2004) uses Granger-causality techniques to assess the inter-temporal relationships among problem loans, cost

efficiency, and financial capital. His sample includes European savings banks over the period 1990-1998 and finds that poorly managed banks tend to make more poor quality loans.

Altunbas et al., (2007) follow an approach similar to Kwan and Eisenbeis (1997) and use a static simultaneous equation framework to investigate the relationship between capital, loan provisions and cost efficiency for a sample of European banks over the period 1992-2000. In stark contrast to Williams (2004), Altunbas et al., (2007) do not find a positive relationship between inefficiency and bank risk-taking. Inefficient European banks appear to hold more capital and take on less risk. Overall, the European studies yield contradictory findings as to the relationships between operating efficiency, capital and bank risk.

2.4 Firm Efficiency

Most of the previous literature on measuring efficiency is drawn from the banking industry. This is the direction followed by the present study too. This literature can be divided into financial ratios methods and production frontier methods. The production frontier method includes parametric and nonparametric methods (Kuo et al., 2008). Parametric method usually applies a stochastic frontier; while a nonparametric method usually applies data envelopment analysis (DEA). For the measurement of bank efficiency, financial ratios methods only take into account a single-input/output. Banking industries characterized by multiple-input/output properties may have problems with the objectivity of weights. However, when there is more than one input and output, then a method for aggregating these inputs and outputs into a single index to obtain a ratio for the construction of efficiency measures is required. The parametric method makes assumptions on production functions and cost functions; it also assumes that the probability distribution of error terms is normal distribution. The difference in functions may end with different results.

Loan services of banks play an important role in the operation of a bank, especially in traditional banking services operations. As mentioned before, non-performing loans are a part of banking that needs to be proactively addressed. In recent DEA studies, scholars still see problem loans as exogenous variables in the measurement of banking efficiency (e.g., Berger and Humphrey, 1997); to address this however, adopt the data as a DEA

input variable, as a trend (Mester, 1996; Berger and DeYoung, 1997; Altunbas et al. 2000; Drake and Hall, 2003); this is another reason why this study adopted credit risk into its input variables. Based on the characteristics of bank management, we included interest rate risks and liquidity risks into our considerations.

Additionally, in terms of empirical studies, Kao et al. (2001) suggested that foreign banks in Taiwan are more efficient than domestic banks in Taiwan, and that banks established after the financial deregulations are more efficient than banks established before financial deregulations. Hasan and Marton (2003) analyzed the lower inefficiency of foreign banks, or foreign funded banks, in the Hungarian transitional economy, where fierce competition in the banking industry changed in operational scale or evolved into bank holding companies, which significantly influenced scale efficiency (Berger and Humphrey, 1991; McAllister and McManus, 1993; Stiroh, 2000). Canhoto and Dermine (2003) also found new banks to be more efficient than old banks in Portugal.

2.5 Empirical Studies

Several studies have analyzed the risk management-performance relationship for non-financial firms. For example, Allayannis and Weston (2001) analyze the use of foreign currency derivatives (FCDs) by nonfinancials and find a positive relationship between firm value and the use of FCDs. Nelson, Moffitt, and Affleck-Graves (2005) find that nonfinancial firms that hedge using derivatives outperform non-hedgers but that the effect is primarily due to the use of FCDs by relatively large firms. Finally, Jin and Jorion (2006) find that risk management has no effect on oil industry firms' market value, and Dionne and Triki (2006) verify that risk management in the gold mining industry increases returns on assets.

Cummins et al. (2006) and Ren (2007) examine the effects of risk management on insurance efficiency based on the respective econometric and nonparametric model, namely stochastic frontier analysis and data enveloped analysis (DEA) model, respectively. Stochastic frontier approaches are set in a parametric framework and are able to depict the causality relations between the variables in a defined function (Lin and Lin; 2006 and 2007).

Lin and Wen (2008) used the Property-Liability insurance companies as a research sample to investigate the relation between the enhancement of cost efficiency and the

usage of reinsurance and financial derivatives as risk management tools. The stochastic frontier approach was applied to consider not only the mean of cost efficiency, but also its variance. The sample included both organizational forms of insurers, namely, stock and mutual insurers. Empirical results showed that the use of financial derivatives to manage investment risks contributed to the enhancement of the mean of the cost efficiency, while the use of reinsurance to manage underwriting risks did not. That is, the more a firm used derivatives to hedge, the higher was the cost efficiency. On the other hand, while both mechanisms of risk management did not show their influences on the volatility of cost (in) efficiency, the ratio surplus to regulatory required risk-based capital (RBC) was a factor driving the variance of cost (in) efficiency of insurance firms.

Fiodelisi et al., (2010) analyzed the impact of efficiency on bank risk. The study also considered whether bank capital has an effect on this relationship. The authors modeled the inter-temporal relationships among efficiency, capital and risk for a large sample of commercial banks operating in the European Union. The study found that reductions in cost and revenue efficiencies increase banks' future risks thus supporting the bad management and efficiency version of the moral hazard hypotheses. In contrast, bank efficiency improvements contributed to shore up bank capital levels. The findings suggest that banks lagging behind in their efficiency levels might expect higher risk and subdued capital positions in the near future.

Niringiye et al., (2010) sought to establish the relationship between firm size and technical efficiency in East African manufacturing firms. This study used a two-step methodology to examine the relationships between technical efficiency and firm size in East African manufacturing firms. In the first step, technical efficiency measures were calculated using DEA approach. Secondly, using GLS technique, a technical efficiency equation was estimated to investigate whether technical efficiency is increasing in firm size. Contrary to our expectation, the results showed a negative association between firm size and technical efficiency in both Ugandan and Tanzanian manufacturing firms. The existence of a positive association between size squared and technical efficiency and a negative association between firm size and technical efficiency in Ugandan and Tanzanian manufacturing firms suggests an inverted U- relationship between firm size and technical efficiency in these countries.

2.6 Summary of Literature Review

The literature has tackled the concepts of financial risk management as well as efficiency of firms. An empirical review has been provided with studies on risk-performance being evaluated. As it can be noted, the debate on the relationship is not yet settled. Further, most of these studies were done in different environments which cannot be generalized to developing countries especially Kenya. Hence, the present study seeks to bridge the gap.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter involves the methods that were used by the researcher to collect data. These methods included research design, target population, sampling design, data collection instruments, data collection procedures and data analysis procedures.

3.2 Research Design

According to Mugenda and Mugenda (1999), research design is the outline plan or scheme that is used to generate answers to the research problems. It is basically the structure and plan of investigation. The researcher used descriptive design. Descriptive research seeks to establish factors associated with certain occurrences, outcomes, conditions or types of behavior.

3.3 Target Population

A target population is one that the researcher wants to generalize the result of the study. There were 50 manufacturing firms in Kenya. These formed the target population.

3.4 Sample

The sample was drawn using stratified random sampling technique. This method is recommended when the researcher is dealing with a population, which is heterogeneous. The study covered 40 manufacturing firms in Kenya which were in operation as at 31st December 2009 for data consistency.

3.5 Data Collection

Both primary and secondary data were used to collect data. The primary data were collected using questionnaires. These contained questions that helped in establishing the financial risk management practices of the firms. Secondary data were collected from the company financial statements. The secondary data were the financial information especially the asset values, the revenues and the costs.

3.6 Data Analysis

The data collected were edited, coded, tabulated and interpreted in relation to the research objectives. The data collected from the questionnaires were analyzed using SPSS (statistical package for social Scientists). The tools used were regression analysis and descriptive analysis. The regression was performed using Pearson correlations while the descriptive analysis used mean scores, standard deviations, and frequencies. The firm efficiency was estimated as follows:

$$\text{Total cost} = \text{cost of inputs} + \text{cost of outputs}$$

The regression analysis was performed using the following model.

$$\text{EFFICIENCY} = \beta_0 + \beta_1(\text{FOREIGN}) + \beta_2(\text{INTEREST}) + \beta_3(\text{COMMODITY}) + \beta_4$$

Where

$\beta_0, \beta_1, \beta_2, \beta_3,$ and β_4 are constants

EFFICIENCY is measured by total cost ratio

FOREIGN is the mean score on foreign currency risk management

INTEREST is the mean score on interest rate risk management

COMMODITY is the mean score on commodity price risk management

CHAPTER FOUR

4.0 DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results of the study. The study targeted 40 firms. Thus, a total of 40 questionnaires were distributed to the respondents in the 40 firms. Of these, 36 questionnaires were successfully completed and returned to the researcher by respondents, giving a response rate of 90%, a figure considered substantially sufficient for the study. The chapter is organised as follows: first, the chapter presents the results on the profiles of respondents. This is followed by results on financial risk management practices. Lastly, a presentation on the relationship between financial risk management practices and efficiency of firms is shown.

4.2 Characteristics of Respondents

This section presents the results of the profile of the respondents in terms of their gender, age, duration of stay in the organisations as well as the experience in their current positions. The results are shown in terms of frequencies and percentages. The questions relating to these analyses are in section A of the questionnaire.

An analysis of the gender of employees was performed with a view of presenting the composition of respondents in terms of their sexes. The results are shown in Table 1.

Table 1: Gender

	Frequency	Percent
Male	24	67
Female	12	33
Total	36	100

Source: Research Data

The study found that 67% of the respondents were male while 33% were female. These results show that most of the managers in these firms were male. This mirrors the composition of managers in manufacturing firms based on gender.

The ages of the respondents was also analysed in order to establish the composition of workforce in the organisations in terms of their age. These results are shown in Table 2.

Table 2: Age

	Frequency	Percent
26-30 years	3	8
31-35 years	5	14
36-40 years	10	28
41-45 years	12	33
46-50 years	6	17
Total	36	100

Source: Research Data

The study found that 8% were aged 26-30 years, 14% were aged 31-35 years, 28% were aged 36-40 years, 33% were aged 41-45 years, and 17% were aged 46-50 years. These results indicate that most of the managers were in their forties. This shows that the workforce was young and vibrant.

The results on the analysis of how long the managers had been working in the firms are shown in Table 3.

Table 3: Length of service

	Frequency	Percent
0 to 2 years	4	11
3 to 5 years	12	33
6 to 10 years	4	11
Over 10 years	16	44
Total	36	100

Source: Research Data

The study found that 11% of the managers had been working in the firms for up to 2 years, 33% for a period of 3 to 5 years, 11% for 6 to 10 years and 44% for over 10 years. The results show that most of the managers had over 10 years experience in the firms. This shows that they had been working long enough to understand the dynamics of their respective organisations.

The experience of the managers in their current roles was also analyzed and the results are shown in Table 4.

Table 4: Experience in current positions

	Frequency	Percent
0 to 2 years	6	17
3 to 5 years	13	36
6 to 10 years	17	47
Total	36	100

Source: Research Data

The study found that 17% had up to 2 years experience, 36% had 3 to 5 years experience while 47% had 6 to 10 years experience. The results show that most of the managers had a 6-10 year experience in their present management positions. Since most of them were human resource managers, it means that they had vast knowledge of human resource practice in their organisations.

4.3 Financial Risk Management Practices

This section presents the results on financial risk management practices of manufacturing firms in Kenya. The questions relating to this analysis are in section B of the questionnaire. The responses were made on a five-point likert scale. The results are interpreted in terms of mean scores and standard deviations. Mean scores of more than 3 shows that the method was commonly used or managed but the mean score below 3 shows that the method was least used or managed. Table 5 shows the analysis on the extent to which financial risks are managed in manufacturing firms in Kenya.

Table 5: Financial risks

	Mean	Std. Dev
Foreign currency risk	4.2222	.79682
Interest rate risk	4.1111	1.00791
Commodity price risk	1.7778	.79682
Equity price risk	3.4444	1.36161

Source: Research Data

The study found that the most managed financial risk in the manufacturing sector was foreign currency risk (4.22). This is followed by interest rate risk (4.11) and equity price risk (3.44). The least managed risk was commodity price risk (1.78).

The respondents were asked to state the extent to which the firms used various instruments to manage currency risks. The results are shown in Table 6.

Table 6: Management of currency risks

	Mean	Std. Deviation
Structured derivatives	3.1111	1.11555
Over-the-counter currency option	2.0000	.95618
Stock exchange currency option	2.6667	1.17108
Currency swap	3.6667	1.26491
Currency futures	2.4444	1.36161
Currency forward	3.3333	1.58565

Source: Research Data

The study found that currency risk management tools were currency swaps (3.67), currency forwards (3.33) and structured derivatives (3.11). The least used method was over-the-counter currency option (2.00).

The results in Table 7 show the extent to which the manufacturing firms used various instruments to manage interest rate risks.

Table 7: Management of interest rate risks

	Mean	Std. Deviation
Structured derivatives	4.2222	.79682
Over-the-counter currency option	2.1111	1.38930
Stock exchange currency option	2.6667	1.26491
Currency swap	1.2222	.42164
Currency futures	2.0000	.82808
Currency forward	3.2222	1.24467

Source: Research Data

The study found that the most used instruments to manage interest rate risks were structured derivatives (4.22) and currency forward (3.22). The least used methods were currency swaps (1.22) and currency futures (2.00).

The respondents were asked to state the extent to which the firms used various instruments to manage commodity price risks. The results are shown in Table 8.

Table 8: Management of commodity price risks

	Mean	Std. Deviation
Structured derivatives	4.2222	.79682
Over-the-counter currency option	2.1111	1.38930
Stock exchange currency option	2.6667	1.26491
Currency swap	1.2222	.42164
Currency futures	2.0000	.82808
Currency forward	3.2222	1.24467

Source: Research Data

The results revealed that the most used methods to manage commodity price risks were structured derivatives (4.22) and currency forward (3.22). The least used method was currency swap (1.22).

The respondents were asked to state the extent to which they thought financial risk management practices of manufacturing firms influences efficiency. The results are shown in Table 9.

Table 9: Influence of financial risk on efficiency

	Frequency	Percent
Low extent	8	22
Large extent	12	33
Very large extent	16	44
Total	36	100

Source: Research Data

The study found that 22% of the respondents cited that financial risks had a low influence on efficiency, 33% thought it had large influence while 44% cited that it had very large influence.

4.4 Financial Risk Management Practice and Efficiency of Firms

This section presents the results on the relationship between financial risk management practice and efficiency of firms. The questions relating to this analysis are in Section B and Section C of the questionnaire. The Pearson correlation analysis was used to perform the analysis on the relationship. The results are presented and interpreted in terms of Pearson correlation coefficient, R, coefficient of determination, R², and p-values. The results are shown in Table 10.

Table 10: Pearson correlations

		Efficiency
Currency risk	R	-.121
	P-value	.481
Interest rate risk	R	-.126
	P-value	.500
Commodity price risk	R	-.116
	P-value	.500

Source: Research Data

As shown in Table 10, currency risk management practice had a negative influence on efficiency ($R = -0.121$) and the influence was not significant ($p > 0.05$). Interest rate risk and commodity price risk management practices were also negatively correlated with firm efficiency ($R = -0.126$ and -0.116 respectively). These relationships were also not statistically significant because the p-values exceeded 0.05.

4.5 Discussion of Findings

On the level of financial risk management among commercial banks in Kenya, the study noted that indeed the management of financial risks was moderate. This confirms the previous studies in Kenya on risk management especially Kioko (2008) and Kipchirchir (2008) on the on risk management in commercial banks in Kenya. This high practice is attributed to the growing regulatory framework in Kenya on risk management of financial institutions.

The study also noted a low negative correlation between financial risk management practices and efficiency. These results are inconsistent with prior studies such as Niringiye et al. (2010) and Fiodelisi et al. (2010) who established that better financial risk management are associated with higher efficiencies.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of research findings, conclusion of the study, recommendations for policy and practice, limitations of the study, and suggestions for further research.

5.2 Summary of Research Findings

The study sought to establish the relationship between financial risk management and efficiency of manufacturing firms in Kenya. The results showed that most of the managers in the firms were male (67%). The study noted that most of the managers were in their forties (33%). The study found most of the managers (44%) had over 10 years experience in the firms. The study revealed that most of the managers had a 6-10 year experience in their present management positions (47%).

The study found that the most managed financial risk in the manufacturing sector was foreign currency risk (4.22) while the least managed financial risk was commodity price risk (1.78). The study found that currency risk management tools was currency swaps (3.67), the most used instruments to manage interest rate risks was structured derivatives (4.22) and the most used methods to manage commodity price risks was structured derivatives (4.22). The study found that financial risks had large influence on efficiency (77%).

The study revealed that currency risk, interest rate risk, and commodity price risk management practices had negative influences on efficiency ($R = -0.121, -0.126$ and -0.116 respectively). None of these relationships were statistically significant because the p-values exceeded 0.05.

5.3 Conclusion

The study noted that the most managed financial risk was foreign currency risk. This suggests that the companies manufacture for sale not only in the local market but also in the foreign markets where the companies deal in foreign currencies hence the need to manage the foreign currency risk. The study concludes that financial risk management is

negatively related with efficiency of manufacturing firms in Kenya. This might be attributed to the fact that efficiency of manufacturing firms in Kenya is very low hence the negative relationship.

5.4 Recommendations for Policy and Practice

The policy makers need to put up more stringent policies for the manufacturing firms to better manage financial risks. At the moment, pressure to manage risks is on the financial sector and the other sectors, especially the manufacturing sector, have been left out. Better management of financial risks would be possible with such policies in place.

The study recommends need for manufacturing firms to entrench more measures to manage financial risks as the level of use of instruments to manage such risks is still low. This will help in ensuring that such risks are better managed for their gains to be realised.

The study also recommends that the manufacturing firms should also work on enhancing their efficiencies in terms of their cost of inputs as well as their cost of outputs. This can also be enhanced by putting into place better financial risk management practices.

5.5 Limitations of the study

There were a number of limitations that affected the outcome of the study. For instance, data was collected from only 36 firms out of the total number of 50 firms. This is because most of the firms were not willing to give out the information regarding their activities. The other limitation was time factor as it was not possible to cover all the 50 commercial firms within the time given to carry out the research. These issues may limit the applicability of the research findings to the manufacturing firms.

5.6 Suggestions for further research

There is need to replicate these results to other sectors to establish whether significant contribution of financial risk management on efficiency can be found. Also, there is need for future studies to increase the sample firms. It would be prudent to cover at least the 50 firms in future studies.

REFERENCES

- Al-Tamimi, H. (2002), Risk management practices: an empirical analysis of the UAE commercial banks, *Finance India*, Vol. 16 No. 3, pp. 1045-57
- Al-Tamini, H. and Al-Mazrooei, F. (2007) Banks' risk management: a comparison study of UAE national and foreign banks, *The Journal of Risk Finance*, Vol. 8 No. 4, pp. 394-409
- Beasley, M.S., Clune, R. and Dana, R. (2005) Enterprise risk management: an empirical analysis of factors associated with the extent of implementation, *Journal of Accounting and Public Policy*, Volume 24, Issue 6, Pages 521-531
- Bettis, R. (1983). Modern financial theory, corporate strategy and public policy: Three conundrums. *Academy of Management Review*, 8, 406-414.
- Black, F. (1972) Capital Market Equilibrium with Restricted Borrowing, *The Journal of Business*, Vol. 45, No. 3, pp. 444-455
- Chandra, Siddharth; Shadel, William G. (2007) Crossing disciplinary boundaries: Applying financial portfolio theory to model the organization of the self-concept. *Journal of Research in Personality* 41 (2): 346–373
- COSO (2004) Enterprise Risk Management —Integrated Framework: Executive Summary, [Online] available <http://www.coso.org>
- Dorfman, M.S. (2007) *Introduction to Risk Management and Insurance*, (9 ed.). Englewood Cliffs, N.J: Prentice Hall
- Gordon, L.A., Loeb, M.P. and Tseng, C.Y. (2009) Enterprise risk management and firm performance: A contingency perspective, *Journal of Accounting and Public Policy*, Volume 28, Issue 4, pages 301-327
- Gossy, G. (2008) *A Stakeholder Rationale for Risk Management: Implications for Corporate Finance Decisions*, Google Books

- Khambata, D. and Bagdi, R.R. (2003), Off-balance-sheet credit risk of the top 20 Japanese banks, *Journal of International Banking Regulation*, Vol. 5 No. 1, pp. 57-71
- Kioko, K.T. (2008) A Survey Of Credit Risk Management Techniques Of Unsecured Bank Loans Of Commercial Banks In Kenya, *Unpublished MBA Project*, University of Nairobi
- Kipchirchir, D.T. (2008) Foreign Exchange Risk Management Practices: A Survey Of Motor Vehicle Industry In Kenya, *Unpublished MBA Project*, University of Nairobi
- Liebenberg, A.P. and Hoyt, R.E. (2003) The Determinants of Enterprise Risk Management: Evidence from the Appointment of Chief Risk Officers. *Risk Management & Insurance Review*, Vol. 6, pp. 37-52, Available at <http://ssrn.com/abstract=416197>
- Linbo Fan, L. (2004), Efficiency versus risk in large domestic US, *Managerial Finance*, Vol. 30 No.9, pp.1-19
- Lintner, J. (1965) The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets, *The Review of Economics and Statistics*, Vol. 47, pp. 13-37
- Mandelbrot, B., and Hudson, R. L. (2004) *The (Mis)Behaviour of Markets: A Fractal View of Risk, Ruin, and Reward*. London: Profile Books.
- Markowitz, H.M. (1952) Portfolio Selection, *The Journal of Finance*, Vol. 7, No. 1, pp. 77-91
- Medanoglu, M. (2005) Underlying Risk Dimensions in the Restaurant Industry: A Strategic Finance Approach, *PhD Thesis*, Virginia Polytechnic Institute and State University [Online] <http://scholar.lib.vt.edu/theses/available>
- Merton, R.C. (1995), A functional perspective of financial intermediation, *Financial Management*, Vol. 24 No. 2, pp. 23-41

- Modigliani, F. and Miller, M.H. (1959) The Cost of Capital, Corporate Finance and the Theory of Investment, *American Economic Survey*, Vol. 48, pp. 261-297
- Ngare, E.M. (2008) A Survey Of Credit Risk Management Practices By Commercial Banks In Kenya, *Unpublished MBA Project*, University of Nairobi
- Niinimaki, J.P. (2004), The effects of competition on banks' risk taking, *Journal of Economics*, Vol. 81 No. 3, pp. 199-222
- Njiru G.M. (2003) Credit Risk Management by Coffee Co-operatives In Embu District, *Unpublished MBA Project*, University of Nairobi
- Nocco, B.W., and Stulz, R.M. (2006) Enterprise Risk Management: Theory and Practice. *Journal of Applied Corporate Finance*, Vol. 18, No. 4, pp. 8-20, Available at SSRN: <http://ssrn.com/abstract=963398>
- Oldfield, G.S. and Santomero, A.M. (1997), Risk management in financial institutions, *Sloan Management Review*, Vol. 39 No. 1, pp. 33-46
- Pagach, D.P. and Warr, R.S. (2007) *An Empirical Investigation of the Characteristics of Firms Adopting Enterprise Risk Management*, retrieved on 03/08/2010 from SSRN website <http://ssrn.com/abstract=1010200>
- Pagach, D.P. and Warr, R.S., (2008) *The Effects of Enterprise Risk Management on Firm Performance*. Available at SSRN: <http://ssrn.com/abstract=1155218>
- Salas, V. and Saurina, J. (2002), Credit risk in two institutional regimes: Spanish commercial and savings banks, *The Journal of Financial Services Research*, Vol. 22 No. 3, pp. 203-16
- Sensarma, R. and Jayadev, M. (2009) Are bank stocks sensitive to risk management?, *The Journal of Risk Finance*, Vol. 10 No. 1, pp. 7-22
- Sharp, W.F. (1964) Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk, *The Journal of Finance*, Vol. 19, No. 3, pp. 425-442
- Simiyu, R.S. (2008) A Survey of Techniques of Credit Risk Management in Micro-Finance Institutions In Kenya, *Unpublished MBA Project*, University of Nairobi

- Sobel, P.J and Reding, K.F. (2004) Aligning corporate governance with enterprise risk management, *Management Accounting Quarterly*, Winter [Online] available at http://findarticles.com/p/articles/mi_m00OL/is_2_5/ai_n6118711/
- Wambugu, S.M. (2008) A Survey of Credit Risk Management Practices By Micro-Finance Institutions In Kenya, *Unpublished MBA Project*, University of Nairobi
- Wang, A.T. and Sheng-Yung, Y. (2004), Foreign exchange risk, world diversification and Taiwanese ADRs, *Applied Economics Letters*, Vol. 11 No. 12, pp. 755-8
- Weru, S.G. (2008) An Assessment of Information Systems Risk Management Practices: A Case of Practical Action (International), *Unpublished MBA Project*, University of Nairobi

APPENDICES

Appendix 1: Research Questionnaire

Section A: General Information

1. What is your gender?

Male []

Female []

2. What is your age?

18-25 years []

26-30 years []

31-35 years []

36-40 years []

41-45 years []

46-50 years []

51 or above []

3. How long have you been working in the company?

0 to 2 years []

3 to 5 years []

6-10 years []

Over 10 years []

4. What is your position in the company?

.....

5. How long have you been working in the present capacity?

0 to 2 years []

3 to 5 years []

6-10 years []

Over 10 years []

6. What sector does your company belong?

.....

Section B: Financial Risk Management Practices

7. To what extent are the following financial risks managed in the company?

Key

[1] Very low extent

[2] Low extent

[3] Moderate

[4] Large extent

[5] Very large extent

	1	2	3	4	5
Foreign currency risk					
Interest rate risk					
Commodity price risk					
Equity price risk					

8. To what extent does your company use the following instruments to manage currency risks?

Key

[1] Very low extent

[2] Low extent

[3] Moderate

[4] Large extent

[5] Very large extent

	1	2	3	4	5
Structured derivatives					
Over-the-counter currency option					
Stock exchange currency option					
Currency swap					
Currency futures					
Currency forward					

9. What is the extent to which the following instruments' are used to manage interest-rate risks in the company?

Key

[1] Very low extent

- [2] Low extent
- [3] Moderate
- [4] Large extent
- [5] Very large extent

	1	2	3	4	5
Structured derivatives					
Over-the-counter currency option					
Stock exchange currency option					
Currency swap					
Currency futures					
Currency forward					

10. What is the extent to which the following instruments are used to manage commodity price risks in the company?

Key

- [1] Very low extent
- [2] Low extent
- [3] Moderate
- [4] Large extent
- [5] Very large extent

	1	2	3	4	5
Structured derivatives					
Over-the-counter currency option					
Stock exchange currency option					
Currency swap					
Currency futures					
Currency forward					

Section C: Efficiency of Firms

11. Kindly insert the values for the following measures for the company in the respective years.

Measure	2006	2007	2008	2009
Inputs:				
Cost of raw materials				

Fixed assets at the beginning of the year				
Labor costs				
Outputs:				
Cost of goods sold				
Sales revenue				

12. In your opinion, to what extent do you think that financial risk management influences efficiency of your firm?

Very large extent []

Large extent []

Low extent []

Very low extent []

Not at all []

End of Questionnaire

Appendix 2: Research Population

1. 3M
2. Alliance One Tobacco Kenya Ltd
3. Astra Zenica
4. Bata shoe Company
5. Bidco Oil Refineries Ltd
6. Baumann Ltd
7. British American Tobacco Kenya Ltd
8. Brookside Dairy Limited
9. Cadbury Kenya LTtd
10. Capwell Industries Ltd
11. Carlton Products (EA) Ltd
12. Coca-Cola East Africa Ltd
13. Colgate Palmolive
14. Cussons Ltd
15. Del Monte Kenya Ltd
16. E & A Industries Ltd
17. East Africa Cables
18. East African Sea Food Ltd
19. Eastern Produce Kenya Ltd
20. East Africa Hides Ltd
21. Eveready East Africa
22. General Electric East Africa
23. GlaxoSmithkline Ltd
24. Kapa Oil refineries
25. Karirana Estate Ltd
26. Kenafric Industries Limited
27. Kenol Kobil
28. East Africa Breweries Ltd
29. Kenya Nut Company Ltd
30. Master Mind tobacco
31. Nation Media group
32. Nesfood Industries Ltd
33. Toyota East Africa

34. Nestle Foods Kenya Ltd
35. Norvatis
36. Premier Food Industries Limited
37. Proctor & Allan (E.A.) Ltd
38. Rafiki Millers Ltd
39. Reckit Benkiser
40. Razco ltd
41. Sameer Industries
42. Samsung Electronics
43. Sanofi Avenis Ltd
44. Spin Knit Dairy Ltd
45. Sunny Processors Ltd
46. Super Bakery Ltd
47. Tetrapak
48. Total Ltd
49. Trufoods Ltd
50. Wrigley Company (E.A.) Ltd