THE EFFECT OF RESEARCH AND DEVELOPMENT ON THE FINANCIAL PERFORMACE OF MANUFACTURING COMPANIES LISTED AT THE NAIROBI SECURITIES EXCHANGE

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DECLARATION

This research project is my original work and has not been presented to any other university or institution of higher Learning for an academic award.

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D63/60106/2013

This research project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

This project is dedicated to my dear late father Zakaria Mugalisi, who laid the foundation of my academic world and the role he played to get me this far.
ABSTRACT

The growth of manufacturing firms is based on the exploitation of innovative products and services thus forcing them to strongly invest in research and development (R&D). If the R&D expenditures announce the strategic positioning of firms, they can also significantly decrease the financial performances in terms of net income, return and risk. To remain competitive, organizations should aim at uniqueness and superiority in all spheres of their operations such as technology, work procedures, supply chain, approaches to various management functions. This study was undertaken with the aim of assessing the effect of research and development on the financial performance of the manufacturing companies listed at the NSE. It employed a descriptive survey design studying all the 17 manufacturing firms listed on the Nairobi Stock Exchange. Secondary data was used in the study that was collected from the annual published financial statements of the listed manufacturing firms for the years 2010 to 2014. Regression and correlation analysis techniques were employed to present the relationship between the variables. The test for the significance was done at the 5% level of significance. The study results indicated that there is a strong positive correlation between the financial performance and R&D in the manufacturing companies. A strong correlation of 0.833 was found between financial performance and leverage of the manufacturing companies; 0.901 between financial performance and liquidity of the manufacturing companies and 0.847 for the correlation between financial performance of manufacturing firms and the size of the firms. A positive relationship was also found between R&D intensity, leverage, size of manufacturing firms, and liquidity and the firms’ financial performance of the manufacturing firms. The study therefore recommended that there is need for the manufacturing firms to invest more in research and development strategies towards achievement of organizational goals as well that there is need for the sector to ensure that all the firms are governed by the production policies and have strategies for R&D for them to keep in phase with consumer requirement towards achievement of performance goals.
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LIST OF ABBREVIATIONS

CVI: Content Validity Index
EAC: East African Community
EPS: Earnings per share
EU: European Union
GDP: Gross Domestic Product
IAS: International Accounting Standards
IMPs: Innovative Management Practices
KAM: Kenya Association of Manufacturers
LDC: Less Developed Countries
MDGs: Millennium Development Goals
OECD: Organization for Economic Cooperation and Development
ROA: Return on Asset
R&D: Research and Development
ROE: Return on Equity
SPSS: Statistical Package for the Social Sciences
US: United States
CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

During the last few decades, scholars have increasingly stressed the importance of research and development (R&D) in the manufacturing sector. Technology based companies in this sector put forth large expenditures for R&D in order to maintain their competitive advantage and ensure their future viability (Lee et al., 2011). The global economic architecture has changed significantly over the last four decades due to the forces of digitization, globalization, and liberalization. These global forces have intensified competition for factors of production such as the availability of skilled labor, infrastructure as well as seeking markets abroad. To stay competitive, companies have to continually invest in research and development as well as enhance their innovative capacity and competitiveness. Kasipillai et al. (2008) stated that Research and development activities are seen as the “cornerstone” of the long-term sustainability of companies in developed countries as well as in the developing world.

To remain competitive, organizations should aim at uniqueness and superiority in all spheres of their operations such as technology, work procedures, supply chain, approaches to various management functions. These changes are only possible through research and development. Organizational change can be defined as “the alteration of existing activities”. Change can also be defined as “innovation”, the basic sense of introducing something new in the organization. Organization change in the sense of “improvement” therefore refers to activities aimed at strengthening organizational performance such as new technology, work policy, procedure, product, work attitude and structural design.

1.1.1 Research and Development

According to the Organization for Economic Cooperation and Development (OECD, 2008), research and development comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications.
R&D is the basis of innovation and key to improving the core competence. Increasing R&D activity has been considered key to innovation (Cardoso & Teixeira, 2009). Research is the process by which change can be introduced in an organization. It refers to the generation of new findings and ideas. Development is the process of translating new ideas/findings into a real product, service or method of production.

There is a series of works focusing on quantitative measures of the impact of research and development on business performance. They are usually based on profitability or market share and implicitly lie on the assumption that there is a relationship between research and development success and market share or profitability. They show two major deficiencies: they cannot eliminate the effect of other factors, and they treat profitability at a given point in time as the only measure of business performance. These approaches usually cannot identify the contribution to which the research and development organization controls.

Firm performance is generally measured by accounting-based indicators. Hence, these indicators have been considered as the most important criteria to better measure firm’s performance (Sher & Yang, 2005).

1.1.2 Financial Performance

Performance is defined as the accomplishment of a given task measured against preset standards of accuracy, completeness, cost effectiveness and efficiency. In other words, it refers to the degree to which an achievement is being or has been accomplished. The recommended measures for financial analysis that determine a firm’s financial performance are grouped into five broad categories: liquidity, solvency, profitability, repayment capacity and financial efficiency (Ongore & Kusa, 2013).

Financial performance can be measured by evaluating a firm’s profitability, solvency, and liquidity. Financial performance is a subject measure of how well a company can use its assets from its primary mode of business to generate income. To establish performance one must measure what is expected to be managed and accomplished. One way of determining the performance of a firm is through the computation of ratios on its financial statements. The financial performance of a firm is its ability to
sustain its growth and sustainability. Financial performance measures are shown through monetary metrics with the common analysis being; ratio analysis, trend analysis, and cross-sectional analysis. Ratios are mathematical expressions used in expressing terms using other numerical terms (Berger, 2013). Davies (2011) noted that ratio analysis gives an objective picture of a company’s financial performance because ratios eliminate the size effect.

A firm’s profitability indicates the extent to which a firm generates profit from its factors of production. Financial performance can be measured by monitoring the firm’s profitability levels. Davies (2011) states that profitability analysis focuses on the relationship between revenues, expenses and the level of returns realizable against the firm’s size through the use of profitability ratios. The return on equity (ROE) and the return on assets (ROA) are the standard measures of profitability. By monitoring a firm’s profitability levels, one can measure its financial performance (Hinz, 2010).

Another measure of Return on debt (ROD) is defined as net income divided by total debt investment and shows the ability of an institution to compete effectively for capital in the market. ROD can be considered as the price or the cost of attracting deposits. If the bank becomes more efficient in gathering deposits and transforming them into profitable investments, the dollar value of deposits becomes more valuable. To develop an adequate metric for measuring a firm’s profitability, previous studies have combined market data with accounting data to predict growth opportunities (Kolapo, 2012). An attractive theoretical measure to capture the market valuation is Tobin’s Q, defined as a ratio of a company’s value relative to the cost of replacing its assets. When market data is used, the replacement cost is assembled as the sum of the book value of liabilities and the market value of equity. A Market valuation is predicted to be positively related to size (Wolfe, 2014).

Block (2013) Indicates that the financial performance of a firm can be measured by three principal dimensions: Solvency, Profitability, and liquidity. He further defines them as; solvency is the amount of borrowed capital used by the business relative to the amount of owners’ equity capital invested in the business. In other words, solvency is a measure of the ability to repay indebtedness if all the firm’s assets are
sold thus showing the ability of the company to withstand risk. Profitability is a measure of the extent to which a company can generate reasonable profit margins from its day to day operations. He further states that liquidity is the ability of the business to generate sufficient capital to meet their internal and external obligations as they emanate from the course of business.

The incidence and relative magnitude of the internal and external disruptions to business activities from risk events vary within companies depending on the nature of their business controls and internal risk measures. Firm’s need to hold sufficient capital reserves to cover the unexpected losses and be able to mitigate rough times within the business cycle (Block, 2013).

1.1.3 Research and Development and financial performance

Research and Development is a very crucial factor in the performance of any firm because it affects the liquidity and profitability of a firm. It involves huge investments. Firms in the manufacturing industry put forth large expenditures for R&D in order to maintain their competitive advantage and ensure their future viability Lee et al., (2011). Innovativeness is one of the fundamental instruments of growth strategies to enter new markets, to increase the existing market share and to provide the company with a competitive edge, Gunday et al. (2011). Past research has shown that there is a positive relationship between the amount of investment in R &D and the financial performance of the firms.

1.1.3 Manufacturing Firms in Kenya

Kenya manufacturing firms are among the key productive firms identified by the Kenya Government for economic growth and development because of their immense potential for wealth, employment creation, and poverty alleviation. In addition, manufacturing firms continue to provide impetus towards achievement of Millennium Development Goals (MDGs) both in the medium and long term particularly goal one on eradication of extreme poverty and hunger and goal eight on Global Partnerships for Development. Manufacturing firms are expected to play a key role in the growth of the Kenyan economy. The overall goal of the firms is to increase its contribution to Gross Domestic Product by at least 10 percent per annum. According to Kenya’s
Economic Outlook (2013) the manufacturing sector decelerated from an expansion of three points four in 2011 to a growth rate of three point one percent in 2012. The key objectives of the sector are strengthened production capacity and local content of domestically manufactured goods, increase the generation and utilization of Research and Development (R&D) results, raise the share of products in the regional markets from seven to fifteen percent and develop niche products for existing and new markets. Currently, there are seventeen manufacturing firms listed on the Nairobi Securities Exchange with the price movement of five of them being used to determine the daily average NSE index. The performance of the sector has been adversely affected by the high cost of production, stiff competition from imported goods, the high cost of credit, political uncertainty due to the 2013 general elections. Other challenges includes security issues with recent cases of terror attacks, arbitrary charges levied by regulatory and county authorities, inadequate government support for local produce especially procurement of local supplies, weak linkages with local suppliers for example in agriculture, inadequate/weak negotiation skills in regional trade agreement and high costs of securing financial facilities with commercial banks. However opportunity for growth exists with the roll out of common tariff under the newly integrated EAC customs union as a result of Kenya’s manufacturing sector being the largest in the region (Kenya’s Economic Outlook, 2013).

1.2 Research Problem

The performance of firms is of vital importance for investors, stakeholders, and the economy at large. For investors, the return on their investments is highly valuable, and a well-performing business can bring high and long-term returns for their investors. Furthermore, financial profitability of a firm will boost the income of its employees, bring better quality products for its customers, and have better environment-friendly production units (CG, 2009). Manufacturing firms are faced with various competitive and planning challenges attributed to the increasing support of the industrialization of the economy by the government which has led to a high proliferation of manufacturing entities in Kenya. As a result of this heightened level of competition, firms have to be more strategic and competitive in the market. Key to unlocking the potential of a firm is to increase investments to the research and
development team which will lead to increased levels of innovation and creativity which are essential for the firm differentiating its products and cutting a niche market (Krasnikov & Jayachandran, 2008).

Despite the heavy capital outlays by firms in their production units and increased support of creativity and innovation among the personnel this has not translated into better financial performance for manufacturing firms in the country. Pandit, Wasley, and Zach (2011) note that firms with high capital layout to their research and development will not necessarily experience better financial performance since high spending on research and development without acquiring patents to the products will lead to a dilution of the possible benefits from the products created or innovated.

Doyle and Navratil, (1981) states that the relationship between R & D and firm’s performance can only be solid if management implements and utilizes better control measures of R & D expenditures within the firm. Therefore, the overall effect of R & D on firm’s performance will largely depend on top management ability in terms of putting in place effective and efficient control measures for managing the R & D expenses. Hence, the total profitability that a firm should earn from a successful R & D program should be greater than the total R & D expenditures, if not, then it would be better if the R & D program is closed off. Empirical studies (African development bank, 2001), (Muigai, 2005), (Alila and Atieno 2006), (Oghiambo et al, 2004), (Onjala, 2002) done on this front have had generalized conclusions. These studies were purely descriptive and lacked the statistical rigor associated with identifying causation between variables such as investment in R&D, on one hand and manufacturing sector performance on the other. This study thus sought to determine the causality that lies between research and development and financial performance of manufacturing firms. To determine this causality, this research studied the effects of research and development on the financial performance of manufacturing firms. Thus this study sought to answer the following question. What is the effect of investment in research and development on the financial performance of manufacturing firms listed on NSE?
1.3 Research Objective

To assess the effect of research and development on the financial performance of manufacturing firms in Kenya.

1.4 Value of the Study

This research will have a number of benefits which will justify why it was undertaken.

Policy makers and business leaders widely assume that higher R&D investment translates into competitive advantages and triggers a firm’s financial performance. This means that understanding the empirical relationship between R&D and the firm’s financial performance is important for board of directors and general managers of the firm as well as other policy makers when they have to make strategic economic policies and decisions about R&D investments.

The study will enable companies to carry out cost-benefit analysis of investing in research and development activities by coming up with new and innovative products that satisfy customer’s needs thus increasing their growth, profitability and improve the company’s financial performance.

The findings of the study will detail the economic case of R&D investment. Consequently, the Government in general and the Kenya association of Manufacturers (KAM) may use the study findings as a blueprint for making R&D related policies. The donor community may also use the findings to make policies regarding the funding of manufacturing industries in less developed countries (LDC). Such donors include World Bank and African development bank group.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter deals with theoretical reviews and empirical literature related to the study and lastly the summary of the literature review.

2.2 Theoretical Framework

There are a number of theories that seek to explain the impact of research and development on the financial performance of manufacturing firms in Kenya. Among the studies on the performance, value and risk of the intangible assets R&D occupies a dominating position because of the link of this intangible element with the theories of innovation in the economy. This study will review the literature on the impacts of R&D expenditures on the firm’s performance.

2.2.1 Optimal Working Capital Structure Theory

The optimal working capital theory states that for managing liquidity efficiently, a company’s management has to decide on the optimal level of current assets and current liabilities it should carry. Very low levels of current assets expose the company to the risk of not having enough cash for meeting its maturing liabilities, losing customers through a strict credit policy or running out of inventory when an unanticipated upsurge in demand for its products occurs. Conversely carrying high levels of current assets would reduce aforementioned risks but adversely affect profitability due to excessive investment in these assets which at least in part would remain unproductively tied up either as cash or inventory (Serrasquerio, 2009).

Thus, the issue of liquidity management boils down to the management deciding on the appropriate tradeoff between risk and return. On one hand, the possible catalyzing effect of liquidity on profitability, as a consequence for greater liquidity to mean increased profitability. On the other hand, the possible restrictive effect of liquidity on profitability, as a consequence of managers investing in unprofitable projects also
seems insufficiently relevant for greater liquidity to mean diminished profitability (Serrasquerio, 2009).

Adams and Buckle (2003) obtain a negative and statistically significant relationship between liquidity and profitability for firms in Bermuda, while Goddard et al. (2005), and in the context of Belgian, French, Italian, Spanish and British Companies find positive relationships between liquidity and profitability. According to Eljelly and Abuzar (2004), if efficient liquidity management improves profitability, an inverse relationship should be expected between liquidity and profitability indicators.

Eljelly and Abuzar (2004) studied the linkage of profitability with liquidity, as indicated by the current ratio and cash cycle. Through correlation and regression analysis, a significant inverse relationship between firm profitability and liquidity was found. Albayrak and Akbulut (2008) and Sahin (2011) also found an inverse relationship between firm profitability and liquidity for Turkish manufacturing firms.

2.2.2 Static trade theory

According to this theory, more profitable firms are supposed to have the more debt serving capacity and more taxable income to shield. Therefore when firms are profitable, they are likely to prefer debt to other sources in order to benefit from the tax shield (Chakraborty, 2010). The static trade-off theory asserts that a company’s target debt-equity ratio holds the key to its capital structure. The theory states that more profitable firms have lower expected bankruptcy costs and higher tax benefits hence a positive relationship is expected between profitability and leverage.

2.2.3 The Pecking Order Theory

The Pecking order theory postulates a company’s capital structure stems from a hierarchy of decisions. Companies would give first preference to the use of internal funds or retained earnings for meeting the financial requirements of their investment projects. The Myers and Majluf (1984) pecking order theory states that firms tend to use internally generated funds first before resorting to external financing expects a negative relationship between profitability and leverage. Empirical studies generally
find a negative relationship between leverage and profitability (Titman and Wessels, 1988; Fama and French, 2002; Chakraborty, 2013)

2.3 Determinants of Financial Performance

2.3.1 Firm Size

A number of studies from the literature have shown the importance of firm size in influencing the performance. Large size companies are usually diversified and therefore less likely to go bankrupt. The Static trade-off theory’s argument is that larger size companies have a higher preference for debt financing because of a lower probability of bankruptcy. In support of this is the assumption that large firms being more diversified, are less likely to go bankrupt (Titman and Wessels, 1988). Larger firms have more capabilities and resources, achieve economies of scale. Firm size could therefore be inversely related to bankruptcy and thus directly related to profitability. Furthermore, bigger size companies can be expected to be more resourceful and therefore efficient in collecting receivables from their own credit customers. All these factors contribute towards the greater ability of larger companies in maintaining lower levels of liquidity and cash cycle, as compared to smaller size companies (Frank and Goyal, 2003). Firm size is used as a control variable in the study to check the differences of firm’s operating environment in the model. The size of the firm is measured by taking natural log of the totals assets and will be used to check the effect of firm size on the performance. Eljelly and Abuazar (2004) found that through correlation and regression analysis a significant inverse relationship between firm profitability and liquidity was found, while company size and profitability exhibited a direct and strong relationship. Şahin (2011) and Albayrak and Akbulut (2008) also found a positive relationship between firm size and profitability for Turkish manufacturing firms.

2.3.2 Ownership Structures

According to agency theory if managers of a firm also have ownership stake they are most likely to maximize shareholder wealth (Dutta, 1999). Agency conflict is an important problem associated with ownership structure. Agency costs are higher when outsiders manage the firm, and are inversely related to inside ownership concentration
but directly related to outside ownership. High inside ownership is associated with increased level of R&D, which leads to the agency conflict Bathala, Moon, and Rao (1994) Institutional and concentrated outside ownership improves monitoring and helps to reduce the agency conflict but high R&D becomes more costly for external monitors (Khan & Luintel, 2006). Some scholars found that outside ownership concentration increases with the quality of law while others reported a varying relation between quality of law and size of inside ownership (Burkart and Panunzi, 2005). However, there is a unified opinion regarding the impact of the size of the firm on the ownership structure. The composition of board of directors also affects the type of major shareholders. Short-term profitability of the firm is found to have a positive relation with institutional ownership (Ugurlu, 2000). The ownership structure of a company is a very important factor which influences the company in multiple ways. Inside ownership concentration is directly associated with financial constraints of the firm, this association is weakened by institutional ownership (Lin et al., 2011). Some studies have found that outside ownership concentration leads to restructuring and downsizing of the firm (Ugurlu, 2000). Inside ownership is also positively related to the growth of the firm but inversely related to its size (Jensen & Meckling, 1992). Inside ownership positively affects corporate performance (Kaserer and Moldenhauer, 2007). Inside ownership has a great impact on the financial choices of managers while individual ownership is unlikely to influence the choices (Elyasiani & Jia, 2010). In general, ownership structure should be carefully balanced for a firm to perform well.

2.3.3 Capital Structure

Capital structure is also an important factor that determines the performance of a firm. Capital structure refers to the ratio of debt and equity financing. In case if more debt financing the company has to face certain bankruptcy risk, but there are also some tax and monitoring benefits associated with debt financing (Su and Vo, 2010). It also mitigates the agency conflict by reducing the free cash flow of the firm. There should be appropriate capital structure that generates the maximum profit for the organization, as too less equity financing increases the control of the owners to a large extent (Abu-Rub, 2012). In case of internally generated finances, it is said that these have the highest opportunity cost Lewellen and Lewellen (2004) for the firm because
retaining profits can affect shareholder trust because it would otherwise have been distributed as dividend. Dividend announcements have a significant impact on share prices (Akbar and Baig, 2010). As far as external borrowings are concerned they are considered to be the cheapest source of financing because of the tax benefits. But they do still have certain costs like interest payments and it is widely accepted that the cost of external funds is directly proportional to the amount of these funds also while borrowing the capital structure policy of the firm has to be considered.

2.3.4 Risk Management and Firm Policies

Risky firms tend to attract the only risk-taking investors. The relationship of risk and returns has to be managed so that the investors do get the return associated and expected with the risk they are bearing certain firm characteristics are associated with high performance of firm which include size (Love and Rachinsky, 2007), growth rate, dividends, liquidity Gürbüz, Aybars, and Kutlu (2010) and sales (Forbes, 2002). Firms that have better growth rate can afford better machinery and gradually the assets and size of the firm will increase. Large firms attract better managers and workers who in turn contribute to the performance of the firm.

2.3.5 Research and Development Intensity

Research and development expenditure includes current and capital expenditure private as well as public on creative work that is conducted systematically to increase knowledge of humanity, society and cultures and the use of this knowledge in new applications. R&D covers basic and applied research as well as experimental development. Thus, R&D expenditure is inclusive of current as well as capital expenditure (Shar & Yang, 2005).

Sher and Yang (2005) define R&D intensity as one of the variables affecting firm performance. They define R&D intensity as the ratio of R&D expenditure to the total number of employees. On the other hand, Ural and Acaravci (2006) take the ratio of R&D expenditure to sales as one of the independent variables as a determinant of firm performance. The research by Shin, Kraemer, and Dedrick, (2009) confirms the ratio of R&D expenditure to sales as one of the variables that determine firm performance.
During the last few decades, scholars have increasingly stressed the importance of research and development (R&D) in the manufacturing sector. Technology-based companies in this sector put forth large expenditures for R&D in order to maintain their competitive advantage and ensure their future viability (Lee, Kim, & Lee, 2011). This implies that due to increasing competition, firms should innovate at an extraordinary pace by developing and improving new products and services, and by generating ideas expressly intended to become commercially viable and profitable business ventures (Ehie & Olibe, 2010).

Canibano, Garcia-Ayuso and Sanchez (2000) asserted that return rises with the increase of the R&D expenditures. It is by supposing that the investments in R&D help to increase future profit, thus concluding that increase resource allocation has a positive and significant link in the financial performance of a firm. However, Sundaram, John and John (1996) reached the opposite conclusion. They did not find a positive relationship between R&D expenditures and stock exchange prices. By refining their study, they showed that the reaction of the market depends on the level of competition in the sector; an increase of R&D expenditures in a non-competitive sector (weak competition) leads to a rise in the initiating firm’s stock price.

Lewin and Chew (2005) state that high spending on R&D is not a guarantee of high profitability unless firms manage it properly. R&D expenses affect profitability estimates of businesses because R&D expenditure is required to be expensed immediately. As per Altinkemer, Yasin Ozcelik, and O.(2011), ROA drops significantly in the project initiation year. Various performance and productivity measures improve in a decreasing manner after the initiation year due to fixed effects regression. According to Pauwels et al. (2004), introducing new products increases long-term financial performance and firm value. Product entry in new markets gives the highest top line, bottom line and stock market benefits. Firm revenue, firm income, firm value and the ratio of market capitalization to book value have been used as metrics for financial sustainability in their study. Artz et al. (2010) state that R&D spending is positively related to patents but there is a negative relationship between patents and ROA and patents and firm growth. However, there is a positive relationship between patents and new product announcements. Sher
and Yang (2005) observe that innovative capabilities are generally positively related to performance measured in terms of ROA.

Thathi (2008) has noted that there are many challenges related to innovating and creating new products in a firm since training will be required for each group in the organization with different needs, preferences and learning potential. Moreover, training is expensive and underestimating the needs, and the requirements are some of the reasons for exceeding budgets. Thus without proper resource allocation and efficient utilization the research and development within firms may not realize positive benefits with regard to financial performance for the firm.

2.4 Empirical Review

Due to the rising costs of R&D and the increasing dependency of companies on technology for competitive advantage, managers seek evidence of the impact of R&D on performance. The relationship of R&D and the financial performance of firms has been the subject of many extensive studies in the last decade.

2.4.1 International Evidence

To explain the link between R&D and the firm’s value, the review of the literature suggest using the “Q of Tobin” indicator. According to its creator, this ratio must equal one. However, the review of the literature studied thereafter shows that generally this is not the case, which allows for many interpretations. For Tobin (1978) this indicates an imbalance, and thus profitable investment or disinvestment opportunities. Whereas for Salinger (1978), Bulow (1985), and Wernerfelt and Montgomery (1988), this imbalance is due to the off-balance sheet elements (like the provisions for retirements), or to strategic factors (monopoly rent, diversification). The latter authors postulate that the “Q of Tobin” variable consists of measuring the difference between the current value of a firm (market value, output) and the initial value of the resources used to create the firm (historical book value, input). This ratio is thus a measurement of the firm's performance since its creation and has to be higher than 1.
Griliches (1980) studied eight hundred and eighty-three firms in the United States of America during 1957 to 1965 as a sample and using Cobb-Douglas production function found that R&D was positively correlated with operating performance of the firms. Jaffe (1986), Hall (1993) and Klette (1996) used similar methods to study the same subject, and they all supported the conclusions of Griliches (1980).

Past studies by Bae and Noh (2001) have documented that a firm’s R&D investment consistently and positively affects its market value. The evidence suggests that R&D investment creates value for the firm because it provides competitive advantage through differentiation strategies that produce new and better products and services. Studies regularly highlight that research and development expenditures of a firm increase its market value of an amount at least equivalent to the expenditures, Nakamura and Leonard (2001) However, Lev (1996) does not recognize the stock exchange as a means of evaluating intangible assets.

Ding and Stolowy (2003) worked on the reasons for which French firms capitalize their R&D expenditures and the relevance of this strategy. Their analysis did not provide any result to show this. They just identified, for the French domestic market, the firm’s characteristics (high tech industry and having a high-risk beta) that can predict their R&D capitalization.

2.4.2 Local Evidence

Locally, Onjala (2002) had unexpected results in the study linking trade openness to total factor productivity in manufacturing, agricultural and aggregate economy. According to Machuki et al (2012), if an Organization is seen as made up of resources and capabilities which can be configured and reconfigured to provide it with competitive advantage, then its perspective does indeed become inside out. In other words, its internal capabilities determine the strategic choices it makes in competing in its external environment. As such a firm’s resources and competencies are considered as determinants of performance through their contribution to firm a competitive advantage. Omagwa (2003) and Ubindi (2006) in their studies on firm performance found out that each firm had its own peculiar ways of balancing its liquidity position. This variation is due to the fact that there are no formal corporate
approved risk management practices that must be adopted in Kenya and hence each organization has a leeway to make its choice on practices it deems as best.

Gichanga, (2005) conducted a national study commissioned by the Commission for Higher Education on university research and the industry performance. The report stated that there was limited collaboration between Kenyan universities research and industry and that research enterprise in Kenya is constrained by the poor coordination and harmonization between researchers and research institutes, and the limited funding allocated to research. In general the study found that there was a positive relationship between research and the performance of the industry. Therefore, the Government should ensure that the outcome of the research is fully utilized, and adequate funding of the same is put in place.

There is a variety of approaches to developing the performance metrics and the reporting of performance. But without integration of the financial resources consumed, the firm cannot measure value for money or make informed choices about future resourcing and service priorities. One way in which the in-year operational performance and financial information can be integrated more closely is to develop a system which encourages the issues to be considered together and to develop management reports that provide a rounded picture. The best management reports detail what has happened and what is expected to happen in the future. The accounts and report provide the information needed to take any corrective action required. Such action needs to take place for the firm as a whole, so it is important that all areas are covered. This implies that the operational data and financial data are presented together in a comparable and consistent form (Kariuki, 2010).

Obamba, (2013) conducted a paper on the relationship between R&D and firm performance and concluded that effective management of research and innovation programs, as well as their linkages with national development policy planning, require coherent policy frameworks and strong governance structures. The national management matrix typically involves the production or reconfiguration of institutions, policies, stakeholders, capital resources, and the interrelationships among all of these factors. The scope and coherence of the national management framework
for research and development planning are therefore critical indicators of a firm’s performance.

2.5 Summary of the Literature Review

It is widely assumed by policy makers and business leaders that higher R&D investments translate into competitive advantages and triggers a firm’s financial performance. The high costs incurred on R&D are very critical nowadays while determining the firm’s performance. Prior researchers reviewed so far indicate that past empirical studies concerning R&D have focused largely on the accounting treatment of R & D while those that studied the effect on R&D focused on the knowledge spillover of R&D on profitability. Thus, very little research has been done to investigate the need of R&D as a factor in enhancing the financial performance of firms thus creating a research gap that needs to be fulfilled. Thus in undertaking this research, the findings of the research will be fundamental to filling the gap that exists in regard to the effects of research and development on the financial performance of manufacturing firms in Kenya.
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the general methodology which was used to conduct the study. Research is a systematic investigation and therefore the chapter specifies the research design, target population, sampling design, data collection methods and instruments and data analysis and interpretation.

3.2 Research Design

According to Kothari, (2004) research design is defined as a framework that shows how problems under investigation will be resolved. This was a descriptive survey of all the 17 manufacturing firms listed on the Nairobi Stock Exchange. A descriptive survey is as design that involves establishing what is happening as far as a particular variable is and allows the researcher to use the quantitative data in trying to establish the effect of R&D on the financial performance of manufacturing firms in Kenya.

3.3 Population

According to Polit and Hunger (1999) the population of any research is the total number of all subjects or elements conforming to specific characteristics of the study. The manufacturing sector is loosely classified into twelve (12) sub-categories based on the raw materials the companies import and or the products they manufacturer. The individual firm members are organized under the membership of Kenya Association of Manufacturers (KAM) to give them a platform for negotiating a common position with the relevant government authorities (Business Intelligence, 2011). Currently, there is a total of seventeen manufacturing firms listed on the Nairobi Securities Exchange. The study considered all the 17 manufacturing firms listed on the NSE (Appendix I)
3.4 Data Collection

Hungler (1999) data collection is the gathering of information necessary for research. This study made use of secondary data. Secondary data was collected from the annual published financial statements of the listed manufacturing firms for the years 2010 to 2014.

3.4.1 Data Validity and Reliability

Data validity determines whether the research truly measures that which it was intended to measure and how truthful the research result is (Muthoni, 2010) reference from waiver and Braun describes the validity in quantitative research as construct validity. The construct is the initial concept, notion and question on the hypothesis that determines which data is to be gathered and how it was gathered. The extent to which results are consistent with time and accurate representation of the total population under study is referred to as reliability to which the results of the study can be produced under similar methodology is considered reliable (Kirk & Miller, 1986). According to Kirk and Miller (1986) it refers to the degree to which a measurement given repeatedly remains the same, stability of measurement over time and similarity of measurement within a given period. The study used secondary data (financial records) to measure the financial performance of firms by using return on assets (ROA).

3.5 Data Analysis

Secondary data was coded, edited and analyzed using the statistical package for the social sciences (SPSS) version 20. The study used secondary data (financial records) to measure firm performance; the key type of measure was efficiency measure. This was measured by comparing the different financials ratios of the different listed manufacturing firms in the same period of time. The study also used the spreadsheet as the statistical software package which is one of the versatile and storage combination tool and it also allows for large range of conventional summary statistics which offer graphical presentation of the results of an analysis in form of pie charts, bar charts, etc. (Kombo, 2006).
3.5.1 Analytical Model

Y has been modeled as a linear function of observable variables which was measured by the ROA. The multiple regression models were finally used to predict the financial performance as follows;

\[ Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \]

Where:

Y: Financial performance of manufacturing firms measured using return on assets (ROA) which is net income divided by total assets

\( X_1 \): Research and Development Intensity calculated as a firms R&D expenditure to net sales

\( X_2 \): Leverage measured as the ratio of long term debt + current liabilities to total equity

\( X_3 \): Size of the manufacturing firms measured as the log of total assets

\( X_4 \): Liquidity test measured as current assets/current liabilities

\( \alpha \): A constant

\( \beta \): Coefficient of independent variables

\( \varepsilon \): Error term

3.5.2 Test of Significance

To test for statistical significance between research and development and the financial performance of manufacturing firms listed on the Nairobi Stock Exchange, the ‘t’ statistics was used. The research study used a 95%, a significance of \( p = 0.05 \) level since it is the generally accepted conventional level in social sciences research. This indicates that 95 times out of 100, the researcher is sure that there is a true or
significant correlation/relationship between the two variables, and there is only a 5% chance that the relationship does not truly exist.
CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 INTRODUCTION

This chapter presents the analysis and findings with regard to the objective of the research. It also covers the data analysis, findings and discussions.

4.2 Descriptive Analysis

Table 4.1 presents the descriptive analysis of the variables of the study. The data collected on the financial performance of the manufacturing companies measured by ROA which as per the study depends on the research and development intensity, leverage, size of the manufacturing firms and liquidity measure was analyzed to give the mean values for the entire period under study as well as their standard deviations.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Performance</td>
<td>0.2587</td>
<td>0.02361</td>
</tr>
<tr>
<td>Research and Development Intensity</td>
<td>0.8970</td>
<td>0.1102</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.521</td>
<td>0.681</td>
</tr>
<tr>
<td>Liquidity</td>
<td>0.737</td>
<td>0.872</td>
</tr>
<tr>
<td>Company size</td>
<td>0.678</td>
<td>0.0271</td>
</tr>
</tbody>
</table>

According to the study results in table 4.1, the average financial performance was obtained to be 0.2587 with a standard deviation of 0.02361. This shows that for the
entire period studied, the manufacturing companies’ financial performance can be summarized by ROA as 0.2587 as the standard deviation value obtained was very small indicating a small deviation of the individual values. Also, the table indicates that, the research and development intensity, leverage, liquidity and company size were summarized to be 0.8970, 0.521, 0.737 and 0.678 respectively. The standard deviations for all the variables above indicate small variations of the individual yearly data values from the mean value. Thus, these values can be relied as representatives of the financial performance of manufacturing companies studied.

4.3 Correlation Analysis

In this study, the Pearson r statistic is used to calculate bivariate correlations. Using the Pearson’s Correlation scale, the strength of the association is determined with values between 0 and 0.3 (0 and -0.3) indicating no correlation state (variables not associated), 0.3 and 0.5 (-0.3 and -0.5) a weak positive (negative) linear association, Values between 0.5 and 0.7 (-0.5 and -0.7) indicate a moderate positive (negative) linear association and Values between 0.7 and 1.0 (-0.7 and -1.0) indicate a strong positive (negative) linear association. The significance of the relationship is tested at 95% level with a 2-tailed test where a statistically significant correlation is indicated by a probability value of less than 0.025. This means that the probability of obtaining such a correlation coefficient by chance is less than 2.5 times out of 100, so the result indicates the presence of a significant association.

4.3.1 Correlation between Financial Performance and R&D Intensity

Correlation analysis results for the association between the financial performance and the research and development intensity is presented in table 4.2. It gives the Pearson’s coefficient value (correlation test) and the significance value (measuring significance of the association).
Table 4.2 Correlation between Financial Performance and R&D Intensity

<table>
<thead>
<tr>
<th>Research &amp; Development Pearson Correlation</th>
<th>0.864</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.012</td>
</tr>
<tr>
<td>N</td>
<td>17</td>
</tr>
</tbody>
</table>

From the table 4.2, the Pearson correlation value was obtained to be 0.864. This is a coefficient value in the interval 0.7 to 1.0 which indicates that the variables have a strong positive correlation. Testing the significance of the association at 5% level with a 2-tailed test, the association has a significant value of 0.012. This value is less than the critical value at 5% level (0.025, 2-tailed). This therefore confirms the significance of the association between the two variables. The results therefore suggest that there is a strong positive correlation between research and development intensity and financial performance of the manufacturing companies which is also statistically significant.

4.3.2 Correlation between Financial Performance and Leverage

The analysis of correlation aimed at testing the association between the financial performance of the manufacturing companies and leverage was conducted and tested for its significance at 5% level. The results are as presented in table 4.3.

Table 4.3 Correlation between financial performance and leverage

<table>
<thead>
<tr>
<th>Leverage</th>
<th>Pearson Correlation</th>
<th>0.833</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>17</td>
</tr>
</tbody>
</table>
Based on the findings in the table, the financial performance of the manufacturing companies and leverage has a correlation coefficient of 0.833 which is a strong and positive correlation coefficient. Its significance tested at 5% level with a 2-tailed test indicated a significant value of 0.021 less than 0.025 (the critical value). Thus, the findings indicate that there is a strong positive association between financial performance and leverage of the manufacturing companies. This association was also proved to be statistically significant hence explaining the reliability of the association.

**4.3.3 Correlation between Financial Performance and Liquidity**

Table 4.4 below presents the correlation analysis results for the test of association between financial performance and liquidity of the manufacturing companies. It gives the correlation coefficient and the significance value of the association.

<table>
<thead>
<tr>
<th>Liquidity</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Performance</td>
<td>.901*</td>
<td>.024</td>
<td>17</td>
</tr>
</tbody>
</table>

The study results in the table indicate that, the financial performance of the manufacturing companies and liquidity has a positive correlation of 0.901. This according to the Pearson’s correlation scale indicates a strong positive correlation. Its significant value is 0.024 as the table shows. This is also a value less than 0.025 at 5% level thus revealing that the association is statistically significant. The results therefore show that there is a strong and positive correlation between financial performance and liquidity of the manufacturing companies.
4.3.4 Correlation between Financial Performance and Firm Size

Table 4.5 below presents the correlation analysis results for the test of association between Financial Performance of manufacturing firms and the size of the firms. It gives the correlation coefficient and the significance value of the association.

<table>
<thead>
<tr>
<th>Financial Performance</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Size</td>
<td></td>
<td></td>
<td>17</td>
</tr>
</tbody>
</table>

The study results in the table indicate that, the firms’ financial performance and the size of the firms have a correlation of 0.847. This is also a strong and positive association according to the Pearson’s correlation scale. Testing the significance of the association at the 5% level in a 2-tailed test, the significant value is 0.015 which is less than 0.025 thus revealing that the association is statistically significant. The results therefore reveal that there is a strong and positive correlation between financial performance of manufacturing firms and the size of the firms.

4.4 Regression Analysis

The researcher performed a regression analysis to establish the association between the independent variables with the dependent variable. The dependent variable in this study was financial performance measured by the return on assets whereas the independent variables included; research and development intensity measured by expenditure on research and development, leverage, size of manufacturing firms and the liquidity.
The regression model was as follows:

\[ Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon \]

Where:

\( Y = \) Financial performance of manufacturing companies

\( \beta_0 = \) Constant which defines the performance without inclusion of independent variables

\( X_1 = \) Research and development intensity

\( X_2 = \) Leverage

\( X_3 = \) Size of manufacturing firms

\( X_4 = \) Liquidity

The regression is tested at the 5% level for the significance of the model in explaining the relationship between dependent and independent variables. The results for this analysis are presented in Table 4.6, Table 4.7 and Table 4.8 for the regression model summary, ANOVA table and the regression coefficients respectively.

**Table 4.6 Regression Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.919a</td>
<td>.899</td>
<td>.873</td>
<td>2.11371</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), research and development intensity, leverage, size of manufacturing firms, liquidity

Findings as illustrated in Table 4.6 reveals that the coefficient of determination (R2) equals 0.899. This shows that holding other factors constant, the predictor variables in
this study (Research and Development intensity, leverage, size of manufacturing firms and liquidity) explains 89.9% of the variation in the manufacturing companies’ financial performance. Thus, the variation due to other factors that were not considered in the study is 10.1% implying that the variables used have significant effect on the financial performance of the manufacturing firms.

The adjusted R Square in the table is 0.873 indicating that incase where the study population could have been changed the study results could have varied by 12.7% from the current results. Therefore, the study results are 87.3% valid as shown by the adjusted R square value.

### Table 4.7 Analysis of Variance

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>2373.422</td>
<td>3</td>
<td>791.1407</td>
<td>3.9528</td>
<td>.017a</td>
</tr>
<tr>
<td>Residual</td>
<td>2601.913</td>
<td>13</td>
<td>200.1472</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4975.335</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), research and development intensity, leverage, size of manufacturing firms, liquidity

b. Dependent Variable: Financial performance

From the table, the significance value is .017 which is less than 0.025 the critical value at the 5% level in a 2-tailed test. This therefore shows that the model is statistically significant in predicting the financial performance of the manufacturing companies with the use of the variables selected. The F critical at 5% level of significance is 3.23. From the table, the F calculated is 3.9528 which is greater than the F critical. This shows that the overall model was significant in presenting the relationship between the variables.
Table 4.8 Regression Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>6.284</td>
<td>12.394</td>
<td>1.004</td>
<td>.009</td>
</tr>
<tr>
<td>Research &amp; development</td>
<td>5.452</td>
<td>1.406</td>
<td>.054</td>
<td>.246</td>
</tr>
<tr>
<td>intensity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leverage</td>
<td>.839</td>
<td>.479</td>
<td>.916</td>
<td>1.753</td>
</tr>
<tr>
<td>Size of manufacturing</td>
<td>.389</td>
<td>.212</td>
<td>.791</td>
<td>1.835</td>
</tr>
<tr>
<td>firms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquidity</td>
<td>.016</td>
<td>.025</td>
<td>.228</td>
<td>.639</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Financial performance

The coefficients in table 4.8 answer the regression equation relating the depended and the independent variables. Testing the significance of the coefficients at 95% significance level, the table indicates that all the variables had a significance value less than 0.05 thus confirming the significance of the results. Also, from the table, all the variables indicated a positive coefficient indicating that, research and development has a positive effect on the financial performance of the manufacturing companies. Based on these coefficients, the regression model therefore becomes;

\[ Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \]

Financial performance = 6.284 +5.452 R&D intensity + 0.839 Leverage + 0.389 Size of manufacturing firms + 0.016 Liquidity

Thus, the model indicates that, holding the predictor variables constant, the financial performance of the manufacturing companies would be 6.284. Also, a unit growth in the research and development intensity would result to 5.452 times increase in
financial performance. The model also shows that, given a unit increase in leverage, financial performance would experience 0.839 times increase whereas a unit growth in the size of the firm would result to 0.389 times growth in financial performance. As well, from the model, a unit increase in liquidity level would result to 0.016 times increase in the manufacturing companies’ financial performance.

4.5 Interpretation of the Findings

The study conducted a correlation analysis to test the association between financial performance of manufacturing firms and the research and development. The significance of the association was tested at the 5% level where all the variables indicated a significant association with financial performance of the manufacturing firms. The findings on the association between financial performance and R&D intensity revealed a strong positive correlation of 0.864. A strong positive correlation was also found between financial performance of manufacturing companies and other variables. This showed a correlation of 0.833 between financial performance and leverage of the manufacturing companies; 0.901 between financial performance and liquidity of the manufacturing companies and 0.847 between financial performance of manufacturing firms and the size of the firms.

The positive association between R&D and profitability suggests that as firms mature and become more profitable, they are more willing to take on more debt, plan for extra investment in Research and development and therefore incur extra costs that will generate extra income due to the positive impact of R&D strategies. This is also consistent with the justification given by Jensen (1986) who argues that factors like leverage is not always an evil, describing it as a double edge sword. According to the study, leverage improves the efficiency of a firm. The fact that a firm is forced into liquidation when it fails to honor its contractual interest and principal payments compels management to act prudently and perform well.
Conducting a regression analysis to test the significance of the relationship between research and development and financial performance of manufacturing companies, the study findings revealed a significant influence of research and development efforts on the manufacturing companies on their financial performance. As explained by the R-square, the coefficient of determination, the influence of the predictor variables (Research and Development intensity, leverage, size of manufacturing firms and liquidity) contributes to 89.9% of the variation in the manufacturing companies’ financial performance.

The significance (reliability) of the regression model in relating the variables was also tested at 5% level of significance through the F-statistics. At the 5% level, the f-critical was set at 3.23 where the calculated F-value was 3.95 which is higher than the critical value confirming the reliability of the model. The significance value in the test was 0.017 which is less than 0.025. This therefore revealed that the model is statistically significant in predicting the financial performance of the manufacturing companies with the use of the variables selected. Thus, findings found it reliable that can be used to present the relationship between financial performance and research and development in the manufacturing companies.

The regression coefficients were all obtained to have a significant relationship with financial performance. The test results revealed that, holding the predictor variables in the study constant, the financial performance of the manufacturing companies would be 6.284. Findings as well indicated that, a unit growth in the research and development intensity in the manufacturing companies would result to 5.452 times increase in financial performance. This indicated a positive relationship between research and development intensity and financial performance of the manufacturing firms.

A positive and significant relationship was also found to exist between manufacturing firms’ financial performance and R&D. Of interest, every firm tries to maximize the profitability by preserving the liquidity which was also the case in this study where a positive relationship existed with financial performance. However, it is essential that the firm’s liquidity should be properly balanced. Because, excessive liquidity on one
hand indicates the accumulation of idle funds that don’t fetch any profits for the firm and on the other hand, insufficient liquidity might damage the firm’s goodwill, deteriorate firm’s credit standings and that might lead to forced liquidation of firm’s assets.
CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings with regard to the objectives of the study. It covers conclusions and recommendations.

The research objective of the study was to study the effect of research and development on the financial performance of manufacturing companies in Kenya.

5.2 Summary

The study was undertaken to evaluate the effect of research and development on the financial performance of the manufacturing companies listed at the NSE. It employed a descriptive survey design studying all the 17 manufacturing firms listed on the Nairobi Stock Exchange. Secondary data was used in the study that was collected from the annual published financial statements of the listed manufacturing firms for the years 2010 to 2014.

Statistical techniques of correlation and regression analysis were conducted to test the association and the relationship between the study variables. The financial performance of the manufacturing firms was the dependent variable in the study whereas the independent variables included the R&D intensity, leverage, size of manufacturing firms, and liquidity. The association was tested at the 5% level of significance. Findings illustrated that there is a strong positive correlation of 0.864 between the financial performance and R&D in the manufacturing companies; a correlation of 0.833 was found between financial performance and leverage of the manufacturing companies; 0.901 between financial performance and liquidity of the manufacturing companies and 0.847 was the correlation between financial performance of manufacturing firms and the size of the firms.

Regression analysis results revealed a positive and significant relationship between the study variables. All the variables; R&D intensity, leverage, size of manufacturing...
firms, and liquidity indicated a positive relationship where the changes in the financial performance of the manufacturing firms due to the influence of these variables was found to be 89.9%. Findings therefore showed that, R&D intensity is positively related to the financial performance of the manufacturing firms listed at the NSE.

5.3 Conclusion

The study therefore based on the findings and discussions presented makes conclusions that;

The growth of technological firms relies on its opportunities to exploit innovative products and services, thus forcing them to strongly invest in research and development (R&D). The study findings show that R&D expenditures signal the strategic positioning of a firm and significantly put strain on the financial performances in the short run whereas in the long run, the firm realizes the investment returns through strategies recommended from the R&D thus improved financial performance of the firm.

The firms’ leverage is positively related and associated to profitability. Since manufacturing firms have more revenue to shield from taxes, they prefer to use debt. The cost of internal finance in some cases might outweigh that of using retained earnings so that the firm is better off using external debt. Thus, leverage and financial performance have been established to have a positive and significant relationship.

The study also concludes that the size of the firm is directly related to the financial performance of the firm. Strategies towards the growth of the companies would see a positive impact in financial performance as suggested by the findings. Manufacturing companies’ efforts towards their business expansion and market share growth is positively associated with the growth of their revenue and financial performance in turn.

There is a positive relationship between liquidity and financial performance of manufacturing companies. It is however essential that the firm’s liquidity be properly
balanced as excessive liquidity on one hand indicates the accumulation of idle funds that don’t fetch any profits for the firm and on the other hand, insufficient liquidity might damage the firm’s goodwill, deteriorate firm’s credit standings and that might lead to forced liquidation of firm’s assets.

5.4 Policy Recommendations

There is need for the manufacturing firms to invest more in research and development strategies towards achievement of organizational goals. The management of these organizations therefore should facilitate the R&D activities so as to come up with solutions on the manufacturing process challenges thereby contributing to increased financial performance of the firms.

There is also need for the sector to ensure that all the firms are governed by the production policies and have strategies for R&D for them to keep in phase with consumer requirement towards achievement of performance goals.

The study also recommends that incentives should be tied to programs which encourage research centers and universities to work together with the private sector perhaps through generous matching of private sector funds when the project is joint between a firm and a researcher. This way, a private-sector-led growth in relevant, home-grown research and development can be realized.

5.5 Limitations of the Study

This study acknowledges that few studies have been done on the effect of research and development on the financial performance of manufacturing companies listed on the Nairobi Stock Exchange. The study however experienced some drawbacks as explained below;

This study relied on secondary data from published financial statements of the manufacturing firms posted on the website of the manufacturing companies whereby data retrieval was not easy. The use of secondary data also might put the study
reliability in question as the data accuracy is not guaranteed since information might have been compiled for other purposes other than the research which might have been altered with.

Time constraint was also a major limitation in this study and especially in balancing school work and office duties. Due to this limitation, the researcher took a very long time in compiling this report to what it is today.

5.6 Suggestion for Further Research

This research studied the effect of research and development on the financial performance of manufacturing firms.

There is need to carry our further research to examine the interrelationship using other various financial performance measurements. It is also necessary to further examine the relationships among financial performance, cost reduction, efficiency gain and profits in other industries such as the banking industry and tourism industries due to their differences from the manufacturing industry. The non-financial performance construct such as customer satisfaction improvement, corporate image improvement can be used performance measures for further research.
REFERENCES


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Appendix I – List of Manufacturing Companies

Manufacturing firms listed on the Nairobi Securities Exchange

Industrial and Allied Sector

1. Athi River Mining Ltd
2. Bamburi Cement
3. BOC Kenya
4. British American Tobacco Kenya
5. Carbacid Investments
6. Crown Berger (K)
7. East African Breweries
8. East African Cables
9. East African Portland Cement
10. Eveready East Africa
11. Kakuzi Ltd
12. KenGen
13. Kenya Power & Lighting Company
14. Mumias Sugar Company
15. Sameer Africa
16. Total Kenya
17. Unga Group

Source: Nairobi Stock Exchange Website