

**EFFECT OF OPERATIONAL EFFICIENCY ON FINANCIAL
PERFORMANCE OF MANUFACTURING FIRMS LISTED AT THE
NAIROBI SECURITIES EXCHANGE, KENYA**

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DECLARATION

This research project report is my original work and has not been submitted to any other institution for any academic merits.



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LIST OF ABBREVIATION & ACRONYMS

| | |
|------------|-----------------------------|
| NSE | Nairobi Securities Exchange |
| OLS | Ordinary Least Squares |
| ROA | Return on Assets |
| ROE | Return on Expenditure |
| ROI | Return on Investment |

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Operational efficiency was defined as a practice that encompass a process that intertwine all organs of a firm and rely on employees with right qualifications and capabilities, managers with right decision-making skills, supply chains that ensure products are delivered when needed, use of the right technology and availability of any other resource that the organization needs. Due to scarcity of resources in a competitive economy, it's not possible to have everything that a firm need. Firms that have effective plans to maneuver the challenges in their environment have a better chance of achieving efficiency in their operations. Firms across sectors aspire to have best performance in terms of finances and operations in order to meet their daily operations and grow to be market leaders in the industry and a mass massive wealth that enable huge investment across markets (Chen, Lin & Liu, 2018). Due to volatility, supply chain problems and competitiveness in the manufacturing sector, low efficiency levels have led to declined financial performance in firms.

The study was guided by a theoretical framework comprising of three theories; the rent theory of benefit propounded by Francis Amasa Walker (1887) also known as Walker's Theory of Profit (Chethana, 2019). Walker (1887) considered benefit to be the extra pay that outcomes from the distinction in capacity that one business person might have over others. The conventional economic efficiency theory is accredited to Aly 1990, in view of the theory, ideal creation can be accomplished by economies of scale (Ginting, 2021). In addition, there is the production competence theory attributed to Hayes & Wheelwright, 1979, it holds that firms involved in manufacturing in a synchronized process, competence is to be expressed as a variable as opposed to a fixed characteristic (Dao & Nguyen, 2020).

Kenya aims at being an industrialized country as captured in the vision 2030 blue print; the major contributor to this dream is the manufacturing sector and its allied companies (Karim & Rashid, 2020). Over the years, the sector has contributed immensely in Kenyan economy growth through providing employment opportunities and earning the government revenue

through taxation. According to economic survey reports by the Kenya Bureau of Statistics, the sector is one of the four big contributors of the economic growth and it's expected to become the top contributor in years to come with the huge investments witnessed in export processing zone, Cement factories, Car manufacturing and high demand for construction materials in the real estate sector (Lestari, 2021). The manufacturing sector in Kenya has been growing at a slower rate than other sectors of the economy such as Fintech and the Real estate sectors of the economy (Mobutu & Nzulwa, 2021). In Kenya, firms dealing in processing of goods are considered as one of the key employer in the country and a source of revenue to the government. The sector is capital intensive as owners and managers require loads of money to capitalize on investment opportunities that require expensive manufacturing plants, raw materials and other form of infrastructure before operations begin. This calls for operational efficiency in the sector if managers achieve profitability and firm growth.

1.1.1 Operational Efficiency

Operational efficiency is defined as a measure of how successful a company is at turning expenses from product development, sales, and marketing into revenue (Mahindra & Irwandi, 2017). In another way, the term is used to mean ability of firm managers to maximise output from all organization resources by minimizing waste and maximum utilization of human resources that deliver high standard goods and services to firm customers (Kajola, Alao, Sanyaolu & Ojurongbe, 2019). Translated in a similar way, it relates to how firms make good use of available resources, using the right methods and people to produce goods that meet the standards set in the market and earn a higher value for the organization (Obaje & Abdullahi, 2021). Diversification of portfolios is also done to avoid business risks, once portfolios are diversified risk is spread and firms become more competitive. Firm managers that seek to invest all their resources in one firm risk losing all their investments when operations stop or a complete collapse.

Different metrics can be applied to assess operational efficiency of firms across various economic sectors. The most common metrics included Total Asset Turnover ratio that is normally applied in assessing the capability of organizations to attain more sales for goods produced (Habrosh, 2017). The second metric that can be applied is the Fixed-Asset

Turnover ratio that assesses the value of all items with a long term value possessed by the firm (Habib & Shahwan, 2020). The third metric that can be used in assessing operation efficiency of a firm is Equity Turnover ratio that is used by firm managers to assess sales generated compared to total amount of capital realized through selling of shares. This study used Total Asset Turnover ratio in assessing operational efficiency of manufacturing firms listed at the Nairobi Securities Exchange.

1.1.2 Financial Performance

It's a term that can be described as a function by organization managers in enhancement of organization productivity. Financial performance can also be expressed in profitability, increase in sales, reduced costs, growth and increased return on investments (Ginting, 2021). As most managers look into the positive of productivity, reduced financial performance is also of significance to help managers identify underlying problems facing the company. Managers in other organizations combine both financial and non-financial indicators to prove or disapprove growth or decline in firm productivity (Essuman, Boso & Annan, 2019). Therefore, changes in financial performance can be used as a metric to assess firm size and firm development as a pointer to whether firms have benefited from borrowed funds.

A number of monetary ratios are normally used by managers in assessing the productivity of firms which include; ROA, ROE and ROI that look into the ratios of financial aspect for a given financial year period (Hasan, Shiming, Islam & Hossain, 2020). Subsequently, financial performance estimates productivity, size, and development rates are fundamental for screen in general monetary execution and progress. Various scholars have used varied financial ratios in determining financial performance of businesses as they determine returns on assets, expenditure and interest. Other managers in organizations have used non-financial measures such as customer satisfaction, on-time delivery, customer orientation and product quality as metrics of assessing operational efficiency in organizations. Of the financial measures described above, this study adopted Equity ratio turn over as it was the appropriate measure that gave accurate results.

1.1.3 Operational efficiency and Financial Performance

It has been proven through research that firm managers that adopt best operation efficiency practices achieve high levels of efficiency and effectiveness in management (Bendickson & Chandler, 2019). Effective operations efficiency practices commonly translate into improved financial performance as costs are lowered and firms are able to overcome disruptive uncertainties. It should be noted that, efficient operations also contribute to other better performances that are non-financial such as quality production of goods and services, reduced lead times, lean production, uninterrupted supply chains and proper utilization of raw materials (Daryanto, Samidi & Siregar, 2018). Failure or success of manufacturing firms can directly be connecting to operation efficiency because of shortage of resources and long supply chain of rare raw materials.

To many managers across sectors of the economy and specifically to firms dealing with processing of goods participating at the securities markets adds more capital through equity that can be used to expand business, acquire more materials, hire more skilled employees that contribute heavily in reducing wastages and increase output and positive returns (Dey, Hossain & Rahman, 2018). Given that the manufacturing sector is capital intensive and returns are realized after a long period as compared to other ventures, it's prudent for manufacturing firm managers to focus more on productive portfolios, availability of sufficient raw materials and a network of suppliers that can avail materials not available in the locality (Gitari & Mohamed, 2021).

1.1.4 Manufacturing Firms listed at the Nairobi Securities Exchange

The share trading authority in Kenya (NSE) has the sole mandate to list and ensure firms operating in the country and beyond sell and buy shares, trade on equities and sale of bonds and selling market data (NSE, 2020). The activities of NSE fall under the watchful eye of CMA that regulates how share can be bought and sold by investors, CMA also oversees the adoption and implementation of good governance in all firms approved and trading at the securities market. Due to the strength of the Kenyan Economy, Nairobi Securities is among the most developed securities market in the region. A total of 61 firms are registered and licensed to trade at NSE, the listed firms are both local and foreign owned firms (NSE, 2020).

Companies registered as manufacturing & allied entities are ten companies that have operations in the country (NSE, 2016). Over the past year's economist have supported the full development of this sector as it has shown a positive growth in the recent past, economic statistics show that the sector grew by 0.3 % between 2014 and 2015. The growth is attributed to the heavy investments that have been recorded from foreign investors as they seek to take investment opportunities (NSE, 2020). One category of the manufacturing firms such as the cement manufacturing firms has seen a big rise due to the big infrastructure projects in bridges, highways, the standard gauge railway, the port of Lamu development and construction of Dams. Kenya Manufacturing rely heavily on debt from commercial banks to fund their operations, for example, total of Ksh. 366.9 billion credit was advanced to manufacturing firms in 2019 compared to an increase to Ksh. 409.1 billion in 2020. Due to slow growth in the sector, firms have failed to be profitable and yet meet their financial obligations of repaying borrowed funds (Jayawardena, 2020).

1.2 Research Problem

In a competitive business environment, even for the best performing firms there exists huge boundaries to accomplishing financial performance (Gitari & Mohamed, 2021). It is especially significant for the manufacturing firms to work proficiently, on the grounds that they regularly have less restricted assets because of shortage and long inventory network of materials. Different obstructions have been referred to by authors on effective arrangement of administrations to financial performance (Kajola, Alao, Sanyaolu & Ojurongbe, 2019). Scholars have described the concept and practice of operational efficiency from various dimensions, there is no universal standard which can be used by firm managers in the manufacturing sector or in other sectors that produces the same result. The varying definitions and application of operational efficiency practices in organization show that there was still lack of consensus on standard and acceptable practices in operation efficiency.

According to Bauer, E. (2018), manufacturing firms are relied upon to expand benefits from its capital base, yet there has been diminishing pattern throughout the long term. The decrease in monetary execution over the period under study can be credited to the frail firm size (Mugetha, 2019). Unlike the previous years in 2010 when manufacturing firms listed

at NSE raked in a total Kenya shilling 14.17 billion, in 2016 there was recorded a decline of 8 billion shillings which was attributed to harsh economic conditions and high capital costs as many investors were cautious on the electioneering period that had just started. Under vision 2030, the manufacturing sector is a high priority for creating job opportunities for the jobless youth, once the new government came into office many initiatives were adopted to rejuvenate the sector, however, the performance was yet to meet satisfactory levels as envisioned by many (Barus, Muturi, Kibati & Koima, 2017).

Researchers have made attempts to look into the relationship between the study variables, although they obtained varying results into the relationship. For instance, Osazefua (2019) examined the effect of functional effectiveness on the monetary maintainability of recorded manufacturing organizations in Nigeria. The discoveries uncovered that according to ROA, working costs and resource turnover had negative and positive huge relationship individually. The study was not done in Kenya; its findings are not applicable in our case. Pham, Nguyen, Vu and Hoang (2020) studied the relation between operational efficiency and productivity of logistics firm in Vietnam to repay borrowed capital to discover long haul answers for expanding business adequacy. The outcomes showed that functional productivity has huge and positive relationship on dissolvability, while size of organization, level of monetary autonomy, absolute resources and deals decidedly affect Operational Efficiency. The study was not done in Kenya; its findings are not applicable in our case. Audax (2018) targeted manufacturing companies registered at the NSE, however, research was based on financial determinants of the companies and failed to address the issue of operational efficiency. Most studies reviewed focused on operational efficiency and its effect on varied determinants of performance. The study by Ndolo (2015) focused on operational efficiency and financial efficiency but covered all listed firms and did not address specific factors under each category. The gaps identified necessitated the need for this study to provide answer to the question; does operational efficiency affect financial performance of manufacturing firms listed at the NSE?

1.3 Research Objective

The objective of the study was to examine the effect of operational efficiency on financial performance of manufacturing firms listed at the Nairobi Securities Exchange.

1.4 Value of the Study

Study findings are useful to policy makers in the manufacturing sector and government officials in guiding their understanding underlying issues in manufacturing firms declined performance and can formulate strategies that can go a long way in aiding the sector from collapse or further decline. Furthermore, the study is in a position to point out the areas with high weaknesses; hence, comprehensive measures were suggested that also protect other firms listed at the Nairobi Securities Exchange.

To individuals interested in buying and owning share in manufacturing companies, these findings show them the profitability trends of the firms over time and make concrete decisions as to whether to invest into them or not. For managers running the manufacturing firms, they now understand what ails the organizations and minimize the capital risk exposure as a result of underperforming that is unattractive to investors.

Results of this research promote further research on operational efficiency in the manufacturing area in Kenya. Furthermore, the study enhances knowledge on operational efficiency in Kenya, providing a resource for future researchers on the subject. The content of this study is assisting researchers with the necessary information in understanding how operational efficiency affects financial performance of a firm.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter covered the study theoretical review, empirical review, determinants of financial performance, gaps and conceptual framework.

2.2 Theoretical Review

The study was guided by three theories i.e Rent theory of profit, Conventional economic efficiency theory and Production Competence Theory.

2.2.1 Rent Theory of Profit

This is a profit inclined theory that was brought into the field of management by Walker Francis Amasa in the year 1887. To some scholars of the 18th century, the theory is a walker's theory and describes the differences between a high achieving organization as compared to non-high achieving organizations which do not priorities profit making in their business operations (Dao & Nguyen, 2020). According to the proponents of the theory, high achievers rely mostly in their financial and human capabilities that give firm an edge in the sector due to resources at manager's disposal and a management team that is more efficient and efficient in managing scarce resources (Daryanto, Samidi & Siregar, 2018).

Given the dynamic nature and unpredictability of the business environment, management decisions can be a big determinant in a firm's sustainability (Dey, Hossain & Rahman, 2018). In ability to adopt strategies that enhance efficiency such as using of less costly technology or high salaried employees makes it possible for a firm to minimize production and maximize on profits. Customer needs and preferences vary from time to time, hence diversification might be required. For managers, recycling of materials can be an effective way, adding value to existing products or modifying products features might prove much easier than sourcing for new raw materials to be used in production of goods and services (Essuman, Boso & Annan, 2019).

Critics of the theory point out that proponent of the theory do not recognize the differences in organizations (Ginting, 2021). Managers have different techniques and in most cases are guided by the owner's interests; the plan cannot be similar even though profitability stands out as the main goal. As organization survive, they have many outcomes to achieve both financial and non-financial, hence profitability cannot be used as the only measure of achieving efficiency in organizations (Habib & Shahwan, 2020). As a measure of productivity, profitability was supported by many in research and practice as an indicator of firm efficiency hence this study finds this theory was appropriate in explaining the effect of liquidity in enhancing financial performance of manufacturing and allied firms.

2.2.2 Conventional Economic Efficiency Theory

The conventional economic efficiency theory is accredited to Aly (1990) and is fundamental in explaining the operational efficiency in organizations (Habrosh, 2017). Proponents of the theory point out that the best way of utilizing resources by maximizing the economies of scale, big companies are much better at taking advantage of the economies than small companies due to their financial muscles. Operational efficiency can be achieved both in the short-term and long-term plans as long as input is efficiently managed and production costs lowered (Shaalán, 2019). In the long-run, firms can enhance their production capacity using partnership and leverage financing so as to increase their market share.

This theory borrows heavily from the principles of macro and micro economies, proponents normally bring into focus the forces of demand and supply into determining what a firm should produce (Walker, 2018). In the likelihood that a firm over produce or oversupply to its customer base, then the product is likely to fetch low prices making it difficult to recover production costs and make a profit. Managers therefore are advised to develop strategies that support optimal production levels and ensure they meet the right levels of demand in the market. The theory assumptions contradict other forms of market pricing strategies that firms can adopt to enter and grow in a market (Ginting, 2021).

The most noticeable shortcoming of the theory is imperfect information in the industry that make it difficult for firm managers to decisions and transactions (Walker, 2018). This situation creates power imbalances among firms that has a negative effect of negotiation

capabilities of firm managers. Another notable limitation is non-consideration of moral hazard by proponents of the theory, they assume that allocation of resources is risk free and firm managers will incur minimal costs which rarely applies to all firms compared to their size and performance. Some forces in the wider business environment may force firm managers to under-produce at a time when resources are abundant (Yu, Tianshan, & Din, 2018). Scholars observing this situation in many organizations allude to the fact that many factors contribute to the running of an organization and a failure in one part of management may make it difficult for managers to meet the interest of firm stakeholders. In some organizations, sustainable efficiency is achieved by giving priority to operational plans both in the short and over the long haul. In using this theory in research, scholars find it useful as it recognizes all issues management in an organization that can contribute or efficiency or inefficiency (Anand, Sharma & Kohli, 2020). By producing at optimal levels, firms in the market can easily avoid overpricing and unnecessary cost, hence the theory was useful in explaining how firms made use of financial leverage.

2.2.3 Production Competence Theory

The production competence theory is attributed to Hayes & Wheelwright, 1979, it holds that firms involved in manufacturing in a synchronized process, competence is to be expressed as a variable as opposed to a fixed characteristic (Yulianti & Diyani, 2018). This means that it can vary with time to respond to dynamic customer requirements. It is important to appreciate the general characteristics of manufacturing functions to optimize on manufacturing capacity and productivity. This is because product process changeovers have proven to be expensive and time consuming because of the standardized methods in process manufacturing firms. Their markets are also well established with customers informed on their quality and what the competition offers (Chen, Lin & Liu, 2018).

This theory acknowledged the formalized processes and procedures under controlled work schedules with minimal variations in the reporting (Yulianti & Diyani, 2018). These firms enjoy economies of scale because of their standardized processes and procedures which do not compromise on quality. These sentiments are qualified by Ginting (2021) who argues that possession of well qualified and experienced employees enable manufacturing firms to better manage their practices as compared to incompetent employees who keep reacting

to outcomes of an underlying process. Successful introduction of new processes and technologies require that a conducive environment in which knowledge can easily be assimilated and shared so that continuous learning can take place to improve absorption capacity (Al-Qubaisi & Ajmal, 2018). The theory was useful to this study as it helped in maximizing product quality advantages in enhancing operational efficiency in listed manufacturing firms.

2.3 Empirical Review

Ndolo (2015) conducted a study to look into the associations that exist between efficiency in organization operations and productivity of companies trading at the NSE Kenya. The research was conducted over a 5-year duration starting 2019 and ended in 2013. The researchers adopted a descriptive research approach and relied on published data mainly from financial records over the targeted period. Information collected was analysed for like mean, standard deviation, correlation coefficient and regression coefficient using the SPSS package. The investigation revealed a positive relation between efficiency in organization operations and productivity of listed companies. The researcher proposed for consideration of fluctuations in the internal and external environments.

Osazefua (2019) examined the association that exist organizational operation efficiency and organization sustainability with focus on manufacturing firms in the state of Nigeria. The study relied on published data from financial records and company verified sources covering a period of 5 years. Data obtained from secondary sources was investigated by use of OLS techniques and it was established that organizational operation efficiency had a negative impact on sustainability of manufacturing companies in the state of Nigeria.

Pham, Nguyen, Vu and Hoang (2020) examined factors affecting effective operation efficiency and efficient management of organization resources in share trading companies registered at the Vietnam Securities market. The target population for the research study was 30 registered firms. Furthermore, the study relied on published data from the 30 registered companies. Inferential and descriptive analysis techniques were used by the researcher to compute the data obtained and it was discovered that a positive association between the variables was positive and significant. The study recommended that firms restructure their assets so as to improve their insolvency.

Megeid, Abd-Elmageed and Riad (2019) conducted an investigation to look into the association that exists between organizational efficiency and productivity of companies share trading the Egyptian stock market. A total of 65 registered companies that were in operation between 2013 and 2019 were engaged in the study. In computing study data, the researchers relied on panel data to assess regression and correlation coefficient through a social package for social sciences. The study obtained the following results; profitability realized by companies registered at the securities market is directly related to debt and equity structure while levels of organizational efficiency are inversely related to the capital setup of organizations. Researcher proposed the adoption of efficiency frameworks that address all the issues in an organization.

Olarewaju and Obalade (2015) examined operational efficiency factors in commercial banks licensed and operating in the state of Nigeria. Research relied on financial records published by the targeted commercial banks listed the securities market in the state of Nigeria. The key determinants identified by the researcher as having negative effect on operational efficiency of commercial banks in Nigeria included; labor charges, borrowed capital, deposit and savings. The study recommended as a matter of urgency the need to embrace and invest in more sophisticated technology as a mean of minimizing staff costs in addition to effective human resource management to ensure activities are effectively supervised.

Lausa (2016) investigated the relationship between organizational operational efficiency in IT department of college and Universities in the Philippines and productivity levels. A descriptive research approach and a questionnaire as a primary tool of data collection was adopted by the researcher. This tool enabled the researcher collect data directly from the study participants which included students and head of faculties in educational institutions. Study findings proved that operational efficiency in colleges and universities was at high levels and this contributed positively to their sustainable growth and expansion. The study recommended for the need of firm managers to prepare their employees for change as information technology is dynamic.

Audax (2018) conducted an in-depth inquiry on factors affecting profitability of companies dealing in manufacturing business and licensed to trade at NSE. Data was collected from

financial records published in company's verified sources. Analysis of data from the reliable financial records was computed using inferential and descriptive techniques and presented through descriptive summaries and illustrated in tables and figures. It was found that firm size greatly influenced the productivity levels of the targeted firms. A recommendation for the adoption of lean techniques and modern production technologies were made as means of improving efficiency in the firms.

Mutunga & Owino (2017) conducted a research study to look into the relationship of enhanced capacity in manufacturing firms and their levels of productivity. The study adopted a descriptive approach and collected data primarily using questionnaires. The study targeted 180 companies in the manufacturing sector that had been in operation for more than 10 years. After analysis of study findings, the study established a positive and significant relationship between enhanced capacity and higher levels of productivity of companies in the manufacturing sector. The most notable factor that contributed to improved production capacity was training of employees on modern production methods.

Domenek and Moori (2022) carried out a study to look into the effect of operational and procurement practise efficiency of 138 companies based in Brazil dealing with capital goods. The approach adopted by the researcher was based on a theoretical framework review and model reviews. Data for the study was mainly obtained from literature review, a comparative analysis was done to see how common practise are done across the sector. The study found that efficient and effective procurement and operation processes aided targeted firms in improving profitability over the years they were under observation.

Maket (2021) Undertook a study to determine the impact of operation strategies used by SACCOs in milk processing activities in major agricultural areas of Kenya. Specifically, the study focused on investment and expenditure plans on a target of 5313 SACCO members in the milk processing sector. The approach used by the study was descriptive and relied on primary data instruments such as questionnaires and secondary data sources such as accounting reports that were published at end of financial years. Analysis of data collected reported that effective implementation of operation strategies and techniques significantly led to an improvement in production levels of targeted SACCOs.

2.4 Determinants of Financial Performance

This study brought out the conceptual and contextual arguments of financial determinants of financial performance, they include; Operational efficiency, Firm leverage, Firm liquidity and Firm size.

2.4.1 Operational Efficiency

The terminology relates financial control measures that improve efficiency and effectiveness in organizations (Mahindra & Irwandi, 2017). The proficiency of organization operations is can be used to mean minimize wastage of firm resources in order to maximize the output of a firm (Mahindra & Irwandi, 2017). Translated in a similar way, it relates to how firms make good use of available resources, using the right methods and people to produce goods that meet the standards. To overcome over reliance on a single source of material, firms diversify into other portfolios or engage a number of suppliers in a network that ensure timely supply of resources at all given time (Obaje & Abdullahi, 2021). Firm managers that seek to invest all their resources in one firm risk losing all their investments when operations stop or a complete collapse of the firm happens as they will have deprived of any source of income to sustain operations or meet any financial obligations (Habrosh, 2017). When a firms realizes low profit margins, it can be said to be inefficient in its operations necessitating firm managers to adopt best strategies that reduce wastages of the firm (Dey, Hossain & Rahman, 2018).

2.4.2 Firm Leverage

The term monetary leverage is defined as the proportion capital that a business acquires through borrowing from financial institutions (Gitari & Mohamed, 2021). As firms grow, meeting the financial obligation from equity may be a challenge too many managers hence resort to debt financing to invest or acquire materials that the firm do not have. Accounting principles offers a number of benefits to firm using debt through relaxed taxation which gives firm managers an opportunity to lower operations cost as the seek better returns from investments. The manufacturing sector is heavily reliant on financial leverage; equipment's, raw materials and technologies need in the production of goods are very expensive and require huge amount of cash that may not be raised through share trading (Habib & Shahwan, 2020).

Overtime, reliance on financial leverage has been identified to boost firm growth and make it possible for managers to expand in a short period of time (Habrosh, 2017). However, poor mismanagement of debt has been recorded as the most recorded reason of companies collapsing. When financial institutions give out credit and managers fail to repay, they can use legal procedures to take ownership or put firm under administrator whom will help them recover their cash. To the owners of the firm, they lose control and profits through dividends (Dao & Nguyen, 2020). The best way for managers to effectively use leverage is balancing equity and debt and ensure that high levels of efficiency are maintained at all levels of the organization.

2.4.3 Firm Liquidity

A term closely related to adequacy, financial liquidity is concerned with a firm position to meet the daily cash demands for running the operations of an organization. In research, scholars have paid increased attention to this concept as it helps address the challenges faced by managers in meeting their financial obligations (Dey, Hossain & Rahman, 2018). Liquidity management requires keeping up with liquidity in everyday activities to guarantee its smooth running and meet monetary commitments when they fall due. An organization ought to guarantee that it has adequate liquidity to meet its transient commitments (Diaz de Rivera, Dick & Evans, 2020). Concentrating on liquidity is imperative to both the inside and the outer exploration in view of its cozy relationship with everyday activities of a firm.

The management of liquidity is among the four cardinal choice spaces of monetary administration, for which each business arranged association needs to decide (Essuman, Boso & Annan, 2019). The liquidity parts of an association's monetary administration manage the liquidity part of a firm and subsequently major for the viable and effective tasks just as the supportability of its business continuation. A firm that does not have the necessary money to counterbalance every day costs would simple be able to be term as broke and may open the firm to disappointment as activities might grind to a halt (Ginting, 2021).

2.4.4 Firm Size

The size of a firm is the amount and variety of production capacity and ability a firm possesses or the amount and variety of services a firm can provide concurrently to its customers (Daryanto, Samidi & Siregar, 2018). It's well known that big companies enjoy massive economies of scale as compared to small sized companies. With big size, a firm is presumed to have sufficient resources to recruit the most skilled employees available, hire talented and experienced managers, acquire the most sophisticated technology and develop a strong supply chain that will ensure effective delivery of raw materials and supply of finished products. To small and medium sized companies, they lack these kinds of capabilities and may disadvantage managers when seeking to have an edge in the market and multiply firm's profits.

According to Ginting (2021) many big sized companies struggle a lot as compared to small sized companies due to huge levels of debt that in most cases affect profitability negatively. Small but innovative companies with huge potentials can easily accumulate a lot of wealthy from risk taking investors that see the potential of the firm in the future. Share trading fluctuates hence the variation in profit realized change from time to time, big firms with a good reputation or effectively marketing their challenges well in the industry may also attract huge capital from equity. Big firms are also in a better position to minimize risk by diversifying their portfolio which helps cushion the firm from revenue when revenue from main business deteriorates (Dao & Nguyen, 2020).

2.5 Summary of literature review and Research Gaps

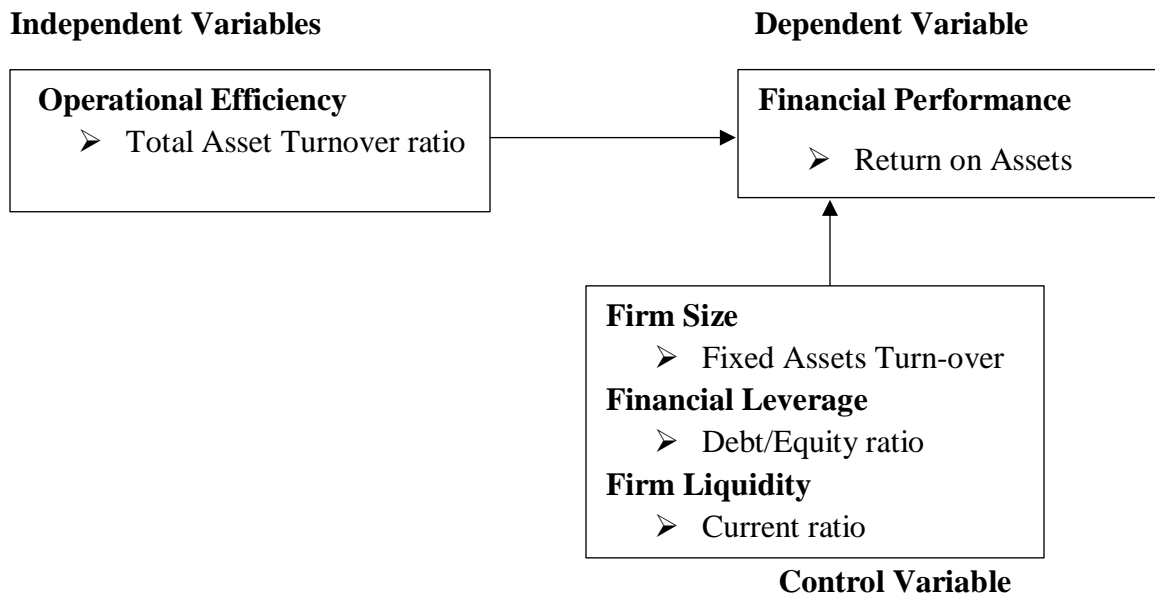
In this chapter, a comprehensive review of literature and theoretical review was given as a basis of understanding the possible relationships that exist between study independent and dependent variables. The research has reviewed a number of studies, Osazefua (2019) examined the effect of functional effectiveness on the financial maintainability of recorded manufacturing organizations in Nigeria. The study was not done in Kenya; its findings are not applicable in our case. Pham, et al. (2020) studied the impact of operational efficiency and ability of logistics firm in Vietnam to repay borrowed capital to discover long haul answers for expanding business adequacy. The outcomes showed that functional productivity had huge and positive relationship on dissolvability, while size of

organization, level of monetary autonomy, absolute resources and deals decidedly affect Operational Efficiency. As evidenced from the review, there was limited research on the topic being invested in the country.

2.6 Conceptual Framework

This is an illustrative configuration of association between study variables i.e operational efficiency, financial performance and firm size (Gubler, Larkin & Pierce, 2018). The conceptual framework of the research study was as shown in Figure 2.1.

Figure 2.1: Conceptual Framework



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter covered the research design, target population, sample and sampling technique, data collection techniques, data analysis and presentation, diagnostic tests and test for significance.

3.2 Research Design

This was an overall program that guided the research activities in data collection, analysis and reporting of findings (Safavi & Karatepe, 2018). The study adopted a descriptive research design with an aim of providing a thorough investigation of the variables under study (Vannette, 2018). The research design was appropriate for the study as the researcher was able to describe the nature and strength of the relationships.

3.3 Target Population

As per Garaizar & Reips (2019) it's an arrangement of individuals, administrations, components, and occasions, gatherings of things or families that are being explored. The study targeted 10 companies dealing with manufacturing and listed at the NSE. Given that the population was small, sampling was not useful in this study, instead a census method was adopted and all 10 targeted companies were involved in the study.

3.4 Data Collection Techniques

The research collected data from targeted manufacturing firms from secondary sources comprising mainly of financial statements published in the past 5 financial years. From the financial statements of the firms, the researcher processed the ratios relating to each study variable. Financial statements used in this study were sourced from listed manufacturing firm websites and Capital Market Authority websites. The study used a data collection sheet to collect data relating to Financial performance, Operational efficiency, Firm size, Liquidity and Financial leverage.

3.5 Data analysis and Presentation

Data obtained was analysed through descriptive and inferential techniques with the help of statistical package for social sciences and presented on bars, graphs, pie charts etc.

Qualitative data on the other hand was presented descriptively. A multi-linear regression model was used to analyze the data. The model equation was presented as follows;

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

Y = Financial Performance

X₁ = Operational efficiency

X₂ = Leverage

X₃ = Liquidity

X₄ = Firm Size

ε = Error term

β_0 indicated the intercept of the model which is a constant. β_1 to β_n i.e. are the constants that show the co-efficient. e is the error term which is random in nature and there was an assumption that was normally distributed.

3.5.1 Diagnostic Tests

This study carried out a number of diagnostic tests to ascertain the suitability of the multiple linear regression model. The first test was test for multicollinearity that was done using variance inflation factor and tolerance levels. If the tests result into low levels of VIF, then the results from the regression analysis was adversely affected. The second test to be conducted was a Durbin-Watson test for autocorrelation of study dependent variables. Outcome of the tests was gauged on a scale of 0-4, where 0 score was assumed to portray positive correlation while a score ≥ 4 was assumed to portray negative correlation.

Linearity of collected data was assessed using residual plots, if values were found to be evenly distributed along the regression line, then the distribution of residuals was linear. Furthermore, Pearson moment of correlation was used to test the direction and magnitude of the relationship at 95% significance level. The study tested Heteroscedacity using residual plots to check the spread of residuals over the range of measured values.

3.5.2 Significance Tests

The significance of the study variables was determined by comparing individual p-values obtained from a regression analysis against the standard p-value of ≤ 0.05 . The study used a 95% significance level to conduct t-test, z-test, F-test and Anova test.

3.5.3 Operationalization of Variables

| Variable | Definition | Measure | Reference |
|-------------------------------|--|----------------------------|------------------|
| Financial performance | A function by organization managers in enhancement of organization productivity | Return on Assets | Chethana (2019) |
| Operational efficiency | Measures of how successful a company is at turning expenses from product development, sales, and marketing into revenue. | Total Asset Turnover ratio | Mugetha (2019) |
| Leverage | defined as the proportion capital that a business acquires through borrowing from financial institutions | Debt / Equity ratio | Walker, (2018) |
| Liquidity | a firm position to meet the daily cash demands for running the operations of an organization. | Current ratio | Mugetha (2019) |
| Firm Size | Scale or volume of operations turned out by a single firm | Fixed Assets Turn-over | Lausa (2016) |

CHAPTER FOUR
DATA ANALYSIS AND PRESENTATION

4.1 Introduction

Covered in this section is descriptive statistics, diagnostic test analysis, correlational analysis, model summary, Anova analysis and regression co-efficient analysis. findings are presented in charts and tables.

4.2 Descriptive Statistic Analysis

Data was analysed to assess the effect of operational efficiency on financial performance of manufacturing firms listed at the Nairobi securities exchange, Kenya. The variables were analyzed using the mean and its standard deviation. The results enabled the study to compute the industrial average of each variable for the sampled firms in the period 2011 - 2021 period. The study also computed the skewness and kurtosis statistics of each variable.

Table 4.1: Descriptive Results

| Variable | Std. | | | | | | |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|
| | Range | Mean | Deviation | Skewness | Kurtosis | | |
| | Statistic | Statistic | Statistic | Statistic | Std.error | Statistic | Error |
| OE | 0.070 | 0.030 | 0.012 | -0.377 | 0.23 | 0.563 | 0.457 |
| ROA | 0.158 | 0.080 | 0.032 | -0.168 | 0.23 | -0.262 | 0.457 |
| Lev | 5.712 | 0.188 | 0.127 | -0.319 | 0.231 | 0.62 | 0.459 |
| Liq | 0.931 | 0.395 | 0.167 | -0.455 | 0.23 | 0.394 | 0.457 |
| FS | 20.331 | 31.501 | 6.888 | 0.169 | 0.23 | -1.309 | 0.457 |

Source: Research Data (2022)

Key:

OP: Operation efficiency

ROA: Return on Assets

Lev: Leverage

Liq: Liquidity

FS: Firm Size

The results in Table 4.1 shows that the Operating Efficiency recorded a mean of 3.01% (mean=0.0301, SD=.0116) with a range of 7.03% during the entire study period; 2011-2021. In the same period, it is observed that ROA recorded 8.02 percent points (M=.080, SD=.0317). The Leverage recorded an 18.77 % points with standard deviation of 12.69% in the same period. The liquidity of the manufacturing firms recorded an average of 39.47 % with a standard deviation of 16.67 Percent and a range of 93.13 percent in the 2011 to 2021 period. Finally, the firm size measured which had the log of total asset scored an average of 31.500 and std.dev of 6.888. Kurtosis and Skewness statistics show that, all the ratios, except the firm size ratio, were normally distributed since the Kurtosis and Skewness values were all less than 1. However, the firm size takes a slightly negative Kurtosis.

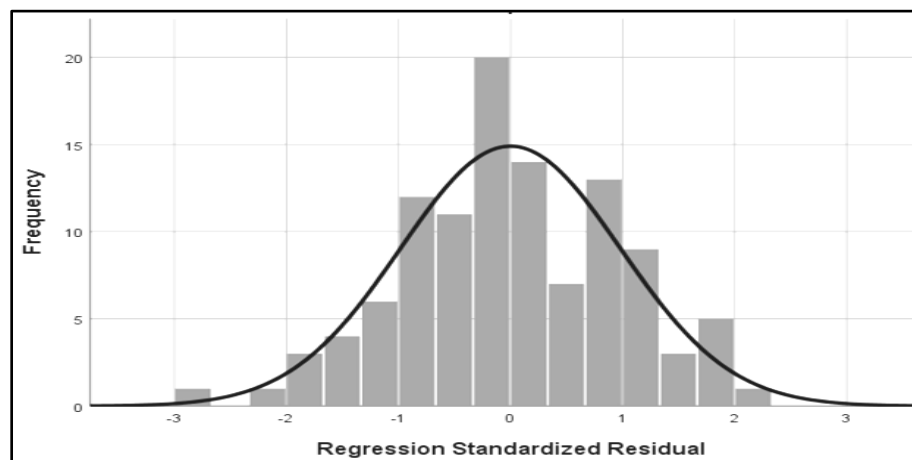
4.3 Diagnostic Test

This study carried out a number of diagnostic tests to ascertain the suitability of the multiple linear regression model. The tests carried out include; test for multicollinearity, Durbin-Watson test for autocorrelation, Linearity test, significance test and Heteroscedacity test.

4.3.1 Test for linearity

Linearity of collected data was assessed using residual plots as illustrated in the figure below;

Figure 4.1: Test for Linearity



Source: Research Data (2022)

As shown in figure 4.1 above; linearity of residuals assumption was assessed using the plot of residuals versus fitted values. It is seen that the residuals are distributed evenly below and above the regression line ($y=0$ line) thus the linearity assumption is met. This implies that the independent variable and the dependent variable data can adequately be modeled using linear model.

4.3.2 Test for multi-Collinearity

The multicollinearity test was assessed using the Variance Inflation Factor test. It was assumed by the study that, the VIF should be less than 10 to conclude that the data does not suffer from significant multicollinearity which makes biases the regression estimates.

Table 4.2: VIF values to test for no multicollinearity assumption

| Model independence Variable | Tolerance | VIF |
|-----------------------------|-----------|-------|
| Operation | .968 | 1.033 |
| Leverage | .985 | 1.015 |
| Liquidity | .983 | 1.017 |
| Firm Size | .975 | 1.026 |

Source: Research Data (2022)

The results in table 4.2 shows that the condition is not violated; all the VIF values are less than 10. The no multicollinearity assumption was also met concluding that the fitted model co-efficient are not biased.

4.3.3 Test for Auto-correlation

Test for autocorrelation was done using a Durbin-Watson test. Outcome of the tests were gauged on a scale of 0-4, where 0 score was assumed to portray positive correlation while a score ≥ 4 was assumed to portray negative correlation.

Table 4.3: Test for Autocorrelation

| Model | R | R-Square | Adjusted R-Square | Std. Error of Estimate | Durbin Watson |
|-------|-------------------|----------|-------------------|------------------------|---------------|
| 1 | .724 ^a | .524 | .506 | .627 | 1.311 |

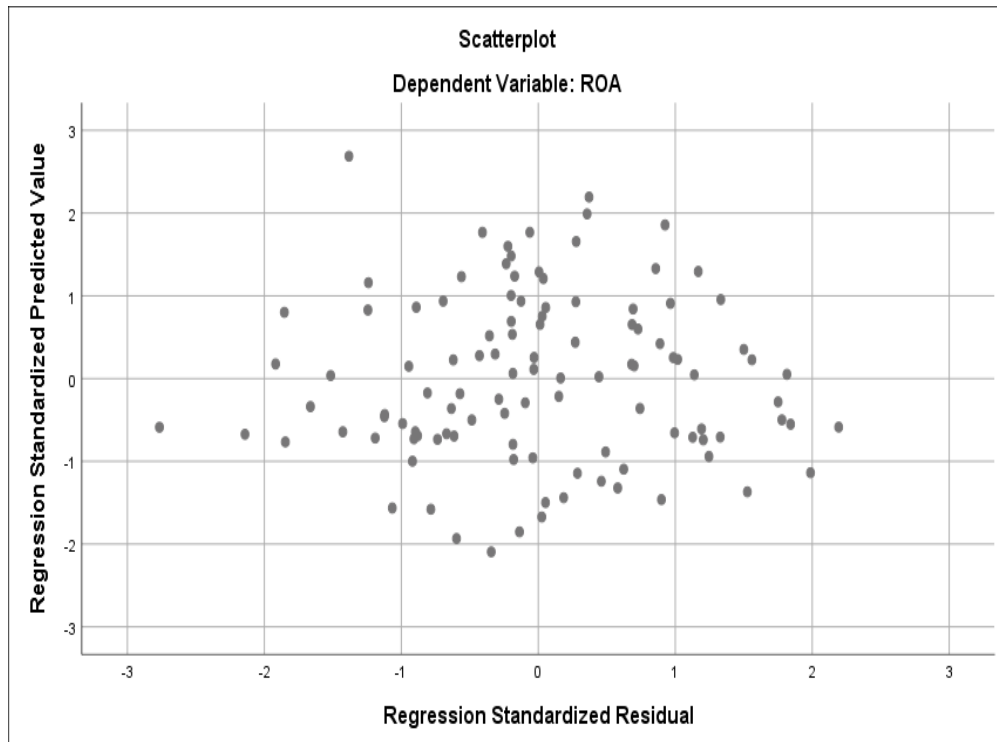
Source: Research Data (2022)

From table 4.3, it can be observed that; Durbin-Watson was used to test Auto-correction and it indicated a value of 1.311 which lies between the values 0 and 4, hence, Auto-correction is non-existent.

4.4.4 Test of Heteroscedacity

The study tested Heteroscedacity using residual plots to check the spread of residuals over the range of measured values. These tests were pegged on the assumption that all residuals were drawn from a population that had a constant variance.

Figure 4.2: Test of Heteroscedacity



Source: Research Data (2022)

The results in figure 4.2 shows that there is no apparent pattern across the range of the DV thus indicating the constant variance assumption is met.

4.4 Correlation Analysis

The study carried out a correlation analysis to ascertain the magnitude of the relationship between study variables i.e Leverage, Liquidity, Firm size and operation efficiency on financial performance of listed Manufacturing firms in Kenya. The findings of the correlational analysis are as illustrated in table 4.4 below;

Table 4.4: Correlation Analysis

| | | OE | Lev | Liq | FS | Perf/ROA |
|------------------|---------------------|-----------|------------|------------|-----------|-----------------|
| OE | Pearson Correlation | 1 | | | | |
| | Sig. (2-tailed) | | | | | |
| Lev | Pearson Correlation | .624** | 1 | | | |
| | Sig. (2-tailed) | .000 | | | | |
| Liq | Pearson Correlation | .175** | .214** | 1 | | |
| | Sig. (2-tailed) | .001 | .000 | | | |
| Firm Size | Pearson Correlation | .219** | .261** | .578** | 1 | |
| | Sig. (2-tailed) | .000 | .000 | .000 | | |
| Perf/ROA | Pearson Correlation | .382** | .240** | .513** | .216** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | |

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Research Data (2022)

Key:

OE: Operation Efficiency

ROA: Return on Assets

Lev: Leverage

Liq: Liquidity

FS: Firm Size

The correlation results in table 4.4 shows that operational efficiency has positive and significant correlation with ROA (r=.382, p<.001) indicating that high efficient

manufacturing firms are associated with higher performance. The correlation between leverage ratio and financial performance (ROA) is positive and significant ($r=.240, p<.001$) an indication that manufacturing firms with good leverage have a good performance chances. The Liquidity of manufacturing firms is positively and significantly associated with ROA ($r=.513, p<.001$) indicating that high liquid manufacturing firms are likely to perform than less liquid firms. Finally, the result shows that large firms are associated with better performance compared to small firms. The correlation between firm size is positive and significant ($r= .516, =p<.001$).

4.4 Regression Analysis

The study conducted a regression analysis to test the significance and strength of relationships between the independent variables and dependent variables. The analysis was based on; Model summary, Analysis of Variance and regression co-efficient.

4.4.1 Model Summary

The model summary table reports the strength of the relationship between the model and the dependent variable.

Table 4.5: Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|--------------|-------------------|-----------------|--------------------------|-----------------------------------|
| 1 | .724 ^a | .524 | .506 | .627 |

Source: Research Data (2022)

The model summary provides the proportion of variance of the dependent variable explained by the set of model predictors represented by R-square statistic. In this regard, the model summary results show that the set predictor (Operational efficiency, Leverage, liquidity and size) explain 52.4 percent ($R^2=.524$) of variations in financial performance among manufacturing firms. When adjusted for number of model variables, the predictors explain 50.6% ($R^2=.502$). This means these four factors are important because they explain half of performance of the manufacturing firms.

4.4.2 ANOVA Analysis

Analysis of Variance was adopted in this study to test the differences among the means of the population by examining the amount of variation within each sample, relative to the amount of variation between the samples.

Table 4.6: ANOVA

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|--------------|-----------------------|-----------|--------------------|----------|-------------|
| 1 Regression | 45.496 | 4 | 11.374 | 28.940 | .000b |
| Residual | 41.267 | 105 | .393 | | |
| Total | 86.764 | 109 | | | |

Source: Research Data (2022)

ANOVA results shows that overall fitness of the whole model. The model used in analysing the variable relationship was fit as indicated by the values $F_4=28.940$, $p<.000$.

4.4.3 Regression Co-efficient

In regression analysis, the regression coefficient results show the significance of each predictor variable in predicting the DV by comparing the corresponding p-value of each regression coefficient with threshold value. In this study, the regression coefficient results are presented in Table 4.7.

Table 4.7: Regression Coefficients

| | Unstandardized Coefficients | | Standardized Coefficients | | |
|------------|------------------------------------|-------------------|----------------------------------|----------|-------------|
| | B | Std. Error | Beta | t | Sig. |
| (Constant) | .278 | .241 | | 1.152 | .252 |
| OE | .227 | .114 | .219 | 1.994 | .049 |
| Lev | .176 | .040 | .156 | 4.390 | .000 |
| Liq | .283 | .122 | .302 | 2.309 | .023 |
| FS | .164 | .050 | .298 | 3.274 | .002 |

Source: Research Data (2022)

Key:**OE:** Operation Efficiency**Lev:** Leverage**Liq:** Liquidity**FS:** Firm Size

Considering the whole regression results in which the model is found as a fit model and each predictor variable significant predictor of performance, the fitted model for manufacturing firms is therefore of the form;

$$Y = .278 + .227OE + .176Lev + .283Liq + .164FS + \varepsilon$$

From the table above: A unit change in operation efficiency influence performance by .227; 1 unit change in financial leverage influence performance by .176; 1 unit change in liquidity influence performance by .283 while 1 unit change firm size influence performance by .164. All variables were positively significant to the study as illustrated above.

4.6 Discussion of Findings

From the regression analysis it was observed that operational efficiency positively and significantly influences financial performance ($\beta=.227$, $p=.049$) since the p-value is within the threshold value of less than 0.05. The results show that every one-point increase in the efficiency ratio, the performance increase by 0.227 points. These findings are similar to Ndolo (2015) who conducted a study to look into the associations that exist between efficiency in organization operations and productivity of companies trading at the NSE Kenya. The investigation revealed a positive relation between efficiency in organization operations and productivity of listed companies.

Financial Leverage in manufacturing firms positively and significantly influence financial performance ($\beta=.176$, $p<.001$). The results indicate that an increase in financial leverage ratio by one point, the performance record an increase of 0.176 performance points. Similar findings were made by Megeid, Abd-Elmageed and Riad (2019) whom conducted an investigation to look into the association that exists between organizational efficiency and productivity of companies share trading the Egyptian stock market. The study established that profitability in firms registered at the securities market is directly related to debt and

equity structure while levels of organizational efficiency are inversely related to the capital setup of organizations.

Financial Liquidity in manufacturing firms positively and significantly influence financial performance ($\beta=.283$, $p<.023$). The results indicate that an increase in financial leverage ratio by one point, the performance record an increase of .283 performance points. Contrary, Olarewaju and Obalade (2015) in a study that examined operational efficiency factors in commercial banks licensed and operating in the state of Nigeria, identified negative effect of labor charges, borrowed capital, deposit and savings on operational efficiency of commercial banks in Nigeria.

Finally, firm size, as measured by total asset, positively and significantly influence financial performance ($\beta=.164$, $p<.001$). The coefficient is 0.164 indicates that an increase in financial leverage ratio by one point, the performance records an increase of 0.164 points. Similar findings were found by Audax (2018) who found that, the size of the manufacturing firms listed at the security market greatly influenced the productivity levels of firms listed at the NSE.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter covered the summary of findings, conclusion, recommendations and suggestions for further studies.

5.2 Summary of Research Findings

The study findings established that: operational efficacy had positive and significant influence on financial performance of listed manufacturing firms. This finding is supported by Ndolo (2015) revealed a positive relation between efficiency in organization operations and productivity of listed companies NSE Kenya. Secondly, Financial Leverage had positive and significant influence on financial performance of listed manufacturing firms. This finding is similar to that of Megeid, Abd-Elmageed and Riad (2019) which established that profitability in firms registered at the securities market is directly related to debt and equity structure while levels of organizational efficiency are inversely related to the capital setup of organizations.

Furthermore, financial liquidity had positive and significant influence on financial performance of listed manufacturing firms. This finding vary with that of Olarewaju and Obalade (2015) which found a negative effect of labor charges, borrowed capital, deposit and savings on operational efficiency of commercial banks in Nigeria. Lastly, Firm size had positive and significant influence on financial performance of listed manufacturing firms. This finding is similar to that of Audax (2018) in study conducted on factors affecting profitability of companies dealing in manufacturing business and licensed to trade their shares at the NSE which found that the size of the manufacturing firms listed at the security market greatly influenced the productivity levels of the targeted firms.

5.3 Conclusion

The study concluded that operational efficiency positively and significantly influences financial performance of manufacturing firms listed at the Nairobi Securities Exchange. Liquidity had the highest level of influence on financial performance with firm size having less influence on financial performance. Similar findings were made by Lausa (2016)

whom investigated the relationship between organizational operational efficiency in IT department of college and Universities in the Philippines and productivity levels. Study findings proved that operational efficiency in colleges and universities was at high levels and this contributed positively to their sustainable growth and expansion

5.4 Recommendations

The study established that firm size had the least influence on financial performance of manufacturing firms listed at the Nairobi Securities. The operation efficiency of a firm can best be achieved through improvement of processes not necessarily the rise in asset base. The study recommends for manufacturing firms to put more emphasis on skilled and talented employees, acquisition of best technology in operations and development a strong supply chain that will ensure effective delivery of raw materials and supply of finished products. The study also recommends to manufacturing firm managers to optimally balance equity and debt in meeting the financial obligations as many of the manufacturing firms had huge debt levels that were affecting their sustainability.

5.5 Suggestion for Further Studies

The study managed to cover 52.4 percent of the factors influencing financial performance among manufacturing firms listed at the Nairobi securities exchange. A further study needs to be done to look into factors influencing performance that were not covered by this study.

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APPENDIX 1: MANUFACTURING FIRMS LISTED AT THE NSE

- i. B.O.C Kenya Ltd
- ii. British American Tobacco Ltd
- iii. Carbacid Investments Ltd
- iv. East African Breweries Ltd
- v. Mumias Sugar Co. Ltd
- vi. Unga Group Ltd
- vii. Eveready East African Ltd
- viii. Kenya Orchards Ltd
- ix. A. Baumann Co. Ltd
- x. Flame Tree Holdings Ltd

APPENDIX 2: DATA COLLECTION SHEET

| Year | Operating expenses /Net sales | Total Debt / Total Equity | Current Assets / Current Liabilities | Total assets | Net incomes / Sales | Total Fixed assets |
|-------------|--------------------------------------|----------------------------------|---|---------------------|----------------------------|---------------------------|
| 2021 | | | | | | |
| 2020 | | | | | | |
| 2019 | | | | | | |
| 2018 | | | | | | |
| 2017 | | | | | | |
| 2016 | | | | | | |
| 2015 | | | | | | |
| 2014 | | | | | | |
| 2013 | | | | | | |
| 2012 | | | | | | |
| 2011 | | | | | | |