

# **LIQUIDITY RISK AND FINANCIAL PERFORMANCE OF MANUFACTURING FIRMS LISTED AT NAIROBI SECURITIES EXCHANGE**

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## **ABSTRACT**

Financial performances have a common goal of generating income and increasing profits in firms. However, financial performance is coupled with likelihoods of occurrence of losses relative to the expected investment return. The general objective was to establish the effect of liquidity risk on financial performance of Manufacturing Firms listed at Nairobi Securities Exchange. The research examined how financial performance is affected by asset tangibility, capital adequacy, inflation and financial leverage. The study was underpinned by Pecking Order Theory, Organizational Portfolio Theory, Stewardship Theory and trade off theory of liquidity. This study adopted both descriptive research design. The target population in this study was NSE listed manufacturing firms in Kenya. This study relied on secondary data that was obtained from the annual audited financial statements. Data was collected through secondary data captured on Microsoft Excel sheets and then imported to STATA statistical packages for analysis. Since data is both cross sectional and time series, the study used panel regression analysis. Descriptive statistics such as mean score, standard deviation, skewness and kurtosis were estimated for all the variables and information was presented in form of tables and graphs. In order to test the relationship between the variables the inferential tests including the regression analysis were

used. The study found that asset tangibility ( $\beta=0.595$ , P-value=0.022), capital adequacy ( $\beta=0.658$ , P-value = 0.000), inflation rate ( $\beta=0.603$ , P-value=0.015) and financial leverage ( $\beta=0.721$ , P-value=0.000) had positive and significant effects on the financial performance of Manufacturing Firms listed at NSE. The study concluded that financial leverage had the greatest effect on the financial performance of manufacturing firms listed at NSE, followed by capital adequacy, then inflation rate while asset tangibility/quality had the least effect on the financial performance of manufacturing firms listed at NSE. The study recommended that the management of the manufacturing firms should strive to achieve and maintain an optimal liquidity position that holds adequate cash/liquid resources for operational needs while the surplus liquid resources are invested in existing viable investment opportunities in the operating environment to enhance the growth. The study also recommends that manufacturing firms should enhance their financial leverage practices to ensure that they become more profitable hence survive in the market.

**Key Words: Financial Performance, Asset Tangibility, Capital Adequacy, Financial Leverage, Investment Return, Inflation Rate, Optimal Liquidity Position.**

## **INTRODUCTION**

It is inevitable for businesses to participate in investment initiatives aimed at improving their operating processes and thereby generating added value for investors as they continue to stay competitive (Li, Monroe & Coulton, 2018). While contemporary investment theory calls for maximization of return at a given level of risk, the level of risk has a direct effect on any project's returns; thus, without an adequate examination of the nature and scale of the risk involved, no investment process can be completed. In addition, investment funds are typically limited and it is our responsibility to find the best alternative investment choices to ensure the company's growth and profitability (Ajide, 2017).

Good financial performance of any firm not only plays a role in increasing the market value of that specific firm but also leads towards the growth of the whole industry which ultimately leads towards the overall prosperity of the economy (Banafa, Muturi & Ngugi, 2015). Assessing the determinants of performance of manufacturing firms have gained the importance in corporate finance literature because as intermediaries, these companies not only provide the mechanism of risk transfer but also helps to channelize the funds appropriated to support the business activities in the economy. Financial performance is a subjective measure of the responsibility of a substance for the consequences of its approaches, operations, and exercises evaluated for a recognized period in budgetary terms (Maaka, 2013). Three benefit measures that are all around acknowledged for their esteem to administration are profit for resources, return on value and working overall revenue. Profitability is one of the indicators of financial performance (Njoroge, 2015).

Liquidity risk assesses the inability to procure enough fund due to exceptionally high costs of liquidity transformation that may affect the financial institution's incomes and capital fund, either now or in the future (Awin, 2018). Liquidity risk is the probability that company will not be in financial capability to settle down its current obligation on due date. The risk has a significant effect on the company's performance and asset base hence becomes a key factor to consider when making investment plans. Liquidity risk determinants are many and are both internal and external. Internal factors include liquidity level, size of company, and size of debt ratio, operational risks and innovative risks. The inflation rate is also a determinant of liquidity risk. Inflation rate refers to the levels at which the general prices of goods are increasing, while purchasing power falls. Other liquidity risk determinants include asset tangibility, capital adequacy, inflation and financial leverage (Megeid, 2017).

The terms risk and investment are inseparable. This is largely because it is not rational to achieve meaningful investment without undertaking the appropriate risk analysis for the underlying future benefits from a project (Ajide, 2017). This depends on the reason that investment choices are intended to improve an organizations' efficiency in future however what's to come is to a great extent unsure. The term risk is utilized tradable to depict speculation whose benefit isn't known with supreme sureness yet for which a variety of elective results and their probabilities are known (Choo, 2018). Beyond the decision of investment options, there has been other significant research in financial and accounting literature pointed toward portraying the hypothetical just as the exact connection between

methodical risk (beta) and the different finance and accounting factors like influence, size, profit changeability, profits, development in income and development in resources (Latif, 2019).

The global financial crisis in the past decade clearly underscores the relevance of ensuring adequate liquidity management mechanisms in the financial systems across the world, in order for firms to be resilient in withstanding adverse circumstances. The financial meltdown severely disrupted economic activities in a range of industries of the global economy and adversely affects various sectors. Firms do not only suffer huge financial loss and closure, they suffer outrageous criticisms from the general public and became the center of attention of regulators. Poor liquidity risk management stood out as one of the instrumental factors of the crisis. Significant failures within the framework of the financial systems that support firms to adopt sound liquidity risks management mechanisms were exposed (Li, Monroe & Coulton, 2018).

The inability of firms to maintain a liquidity position that would enhance effective and efficient operations could be associated with financial risks that are premised on failure to match the maturity period of outflows and inflows of liquid assets and/or unexpected demand for liquidity emanating from unforeseen conditions. Therefore, the survival and prosperity of firms is greatly determined by effective and efficient liquidity risk management mechanisms adopted by the organizations (Ajide, 2017). The diversification of sources of revenue and risks profile of firms globally, is related to the regular changes in the sector and the incorporation of financial markets, thus increasing the exposure to liquidity risks (Banafa, Muturi & Ngugi, 2015).

Firms fundamentally aspire to improve financial returns and concurrently work towards maintaining sufficient liquidity to carry out their business activities. In order to enhance this conflicting objectives, it is essential that assets and liability portfolios are well managed, taking in to consideration interest rate risks, operational risks and gap analysis. Monetary policies should be used to stabilize the financial systems (Maaka, 2013). Liquidity risk needs to be monitored as part of the enterprise wide risk management process, taking into account market risk and credit risk to ensure stability in the balance sheet and dynamic management of liquidity risk. Liquidity risk is influenced by capital adequacy, firms with higher capital adequacy ratio experience lower liquidity risk (Gulen & Ion, 2016). Capitalization and size of the firm has a positive influence on liquidity risk. Larger firms, with their greater access to commercial paper markets, have lesser need for holding liquidity than small firms. Liquidity is one of the important financial stability indicators since liquidity shortfall in one firm can cause systemic crisis in the investment sector due to their interconnected operations (Shroff, 2017).

In Kenya, firms listed in NSE makes investment decisions based on either or both of the tangible and intangible investment programs that would lead to growth of a firm and its ability to sustain that growth in the long run. Muigai (2016) noted that In terms of investment,

liquidity is the ability to quickly convert an investment portfolio to cash with little or no loss in value. A liquid company is one that stores enough liquid assets and cash together with the ability to raise funds quickly from other source to enable it meet its payment obligation and financial commitment in a timely manner (Mabinda, Gregory & Iravo, 2018).

Liquidity risk determinants are perceived to affect financial performance. Makaa (2013) pointed that liquidity risk affected profitability negatively. Increase in liquidity gap causes companies to borrow from the repo market at higher rate pushing up the cost of firms. According to Mwangi (2014) management of liquidity risk is a critical determinant of financial performance. Companies manage liquidity risk by borrowing from the market to meet short term liquidity needs. In addition, holding a high level of liquid assets in relation to total assets reduces the returns to the companies. This study sought to establish the effect of liquidity risk on financial performance of Manufacturing Firms listed at Nairobi Securities Exchange.

The manufacturing sector in Kenya is mainly agro-based and characterized by relatively low-value addition, employment, and capacity utilization and export volumes partly due to weak linkages to other sectors (Avedi, 2016). Besides, 95% of Kenya's manufactured goods are basic products such as beverages, food, building materials and basic materials. Only 5% of the manufactured goods are things like pharmaceuticals which are in skill-intensive activities. The growth pattern for the manufacturing industry in Kenya has not been stable. Data from the Kenya National Bureau of Statistics show the manufacturing sector grew 3.6 percent in the first quarter of 2016, down from 4.1 percent growth in the first quarter of 2015. In the third quarter of last year, the sector's growth rate was 1.9 percent compared with 3.3 percent in the same quarter in 2015 (Kenya National Bureau of Statistics, 2016).

Manufacturing sector consists of firms engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. Manufacturing firms in Kenya are represented by Kenya Association of Manufacturers (KAM). KAM is Kenya's leading representative organization for an industry that unites industrialists, serves as a common voice for Kenya's manufacturing sector, and provides an essential link for 4 cooperation, dialogue, and understanding with the Government. The manufacturing sector was identified as one of the six key sectors under the economic pillar as having the greatest potential in the realization of Kenya vision 2030 (Were, 2016). The vision for the manufacturing sector is the development of robust, diversified and competitive manufacturing processes. The overall goal for the sector is to increase its contribution to GDP by at least 10% per annum. The sector is also expected to raise market share in regional markets from 7% to 15% and attract at least ten large strategic investors in key agro-processing industries, targeting local and international markets.

In Kenya, manufacturing firms are currently undergoing difficult times posing a great challenge to their profitability. High input costs result in expensive and often low-quality raw materials, rising labor costs, unreliable and expensive energy (Njoroge, 2015). Capital productivity in the Kenyan manufacturing sector is particularly low, compared to regional

and global productivity levels. Since 2015 some manufacturing firms in Kenya closed their business due to poor performance while others have been forced to relocate their manufacturing plants to other countries. Some companies have also scaled down their manufacturing capacity. Consequently, impacting negatively on the financial performance of manufacturing firms (Gitau & Gathiaga, 2017). This challenge when not monitored closely create major problems in the Kenyan manufacturing industry, hence the need for the current study. Nairobi Securities Exchange (NSE) is the principal bourse in Kenya, offering an automated platform for the listing and trading of multiple securities. Over the last six decades, the NSE has consistently offered a well-regulated, robust and world class platform for the trading of equities and bonds. Going forward, the Exchange will avail new products including; Exchange Traded Funds (ETFs), Financial and Commodity Derivatives and Carbon Credits. NSE is the market of choice for local and international investors looking to gain exposure to the East Africa capital markets. The NSE is publicly traded and is the second self-listed exchange in Africa (NSE, 2018). The firms under the manufacturing category of interest to this study were pharmaceutical, food (Unga Group) and beverages, (East Africa Breweries), chemical (BOC)

NSE manufacturing firms include B.O.C Kenya Ltd, A. Baumann Company Ltd, Carbacid Investments Ltd, British American Tobacco Kenya Ltd, East Africa Breweries Ltd, Mumias Sugar Company Ltd, Unga Group Ltd, Kenya Orchards Ltd, and Flame Tree Group Holdings Ltd. According to the NSE (2020), several companies listed in the security market have to be under statutory management due to liquidity issues like Uchumi supermarkets.

### **Statement of the Problem**

Kenya has experienced a fair share of listed manufacturing companies facing financial distress, notable examples are Eveready East Africa, Mumias sugar, Carbacid Investments Ltd, Athi River Mining, East Africa Portland Cement, and the East Africa Cables. For example, Mumias Sugar Limited experienced financial crisis due to the lack of liquidity despite the government involvement to support the company. On average, however, manufacturing has been growing at a slower rate than the economy, which expanded by 5.6% in 2015. This implies that the share of manufacturing in GDP has been reducing over time. Thus, it can be argued that Kenya is going through premature deindustrialization in a context where manufacturing and industry are still relatively under-developed. This therefore begs for the question of the influence of liquidity risk on financial performance of Manufacturing Firms listed at Nairobi Securities Exchange.

Besides, the benchmarks for financial performance reviewed by the Nairobi Securities Exchange indicate that listed manufacturing firms' overall financial performance on a year to year basis has been depreciating (MAPI, 2019). For instance, the market shares for most of the listed manufacturing firms reflect a decline in their prices leading to a decrease in the firms' market capitalization (NSE, 2019). Further, according to financial performance analysis by NSE (2019), most firms such as East African Portland

Cement, Eveready East Africa and Mumias Sugar show very strong negative percentages for their R.O.A and R.O.E. This can be emphasized using reported profits after tax in the year 2019 which was Ksh. 12.16 million while in the year 2016 the profits after tax for the same manufacturing firms was reported at Ksh 13.04 million showing a decrease in financial performance of sector (Athanas, 2019).

There are limited studies on effect of liquidity risk determinants on financial performance. Though there studies related to this such as Audax (2018) examined factors affecting financial performance of manufacturing firms listed in Nairobi Securities Exchange Kenya, and Musembi (2018) examined the effect of liquidity risk determinants on financial performance of commercial banks listed at Nairobi Securities Exchange, Kenya. Bulle (2017) examined financial management and financial performance of firms listed under manufacturing and allied sector at the Nairobi Securities Exchange, Kenya, and Bichenga (2016) looked at the effect of macroeconomic variables on corporate liquidity risk among microfinance institutions in Kenya. However, none of these studies explicitly explored the effect of on effect of liquidity risk determinants on financial performance. Hence this study sought to bridge this gap by establishing the effect of liquidity risk on financial performance of Manufacturing Firms listed at Nairobi Securities Exchange.

### **Research Hypotheses**

- H<sub>01</sub>:** Asset tangibility/quality has no significant effect on financial performance of manufacturing firms listed at Nairobi Securities.
- H<sub>02</sub>:** Capital adequacy has no significant effect on financial performance of manufacturing firms listed at Nairobi Securities Exchange.
- H<sub>03</sub>:** Inflation rate has no significant effect on financial performance of manufacturing firms listed at Nairobi Securities Exchange.
- H<sub>04</sub>:** Financial leverage has no significant effect on financial performance of manufacturing firms listed at Nairobi Securities Exchange.

### **Theoretical Framework**

A theoretical framework guides research in determining what variables to measure and what statistical relationships to look for in the context problems under study (Muiruri & Ngari, 2014). This section reviews theories that explain the relationship between the variables in the current study. The study was underpinned by Pecking Order Theory, Organizational Portfolio Theory, Stewardship Theory and trade off theory of liquidity.

### **Trade-off Theory**

This theory fits in the literature initiated by Modigliani and Miller (1958). The trade-off theory emphasizes on the fact that a firm will choose a financial means level by balancing the

costs and benefits of both the debt and equity financing. That is as the firm increases their debt, the marginal benefit of the debt begins to decline as the marginal cost increases. Therefore, the managers needs to establish an optimal mix that will ensure that the marginal cost remain minimum as the marginal benefit move to maximum (Li, Monroe & Coulton, 2018).

The Static Trade-off Theory argued that although the benefit of tax shields may encourage the firms to employ more debt than other external sources available to them, this mode of finance is not free from costs. Myers (1977) observed that as much as levered firms enjoy tax deductibility as a benefit of their leverage, care needs to be taken such that the cost of financial distress associated with the inclusion of debt financing in the capital structure. He observed that the firm's capital structure is at optimal at the point where the cost of using debt and equity is at minimum as compared to the benefit that accrues as a result of using the mix, to allow the firms to trade them off. The firms therefore should seek to establish this optimal point in their capital structure irrespective of their size and earnings.

Dynamic Trade off Theory on the other hand argues that the firm's capital structures may not always be as per their target assets ratios, but firms may allow the ratio to vary considering the costs and the benefits of the use of debt and equity and also the financing margin that the firm anticipates in the next period. Fischer, Heinkel and Zechner (1989) argued that a dynamic optimal capital structure is an appropriate choice in a case where the firm requires recapitalization. Unlike the static trade off theory where the emphasis is on the targeted leverage ratio that the firm will not be willing to deviate from, the dynamic trade off theory emphasizes on the firm having an optimal leverage range within which they let their leverage ratios vary. The firm only adjusts their capital structure when leverage reaches either of the two boundaries defining the range. The levels of the boundaries vary cross-sectional with firm characteristics such as the volatility of cash flows, size, earnings of the firm, interest rates and bankruptcy costs (Marty, 2018). This theory was deemed relevant to this study because it assumed that there are benefits to asset tangibility within a capital structure up until the optimal capital structure is reached. In addition, the theory recognizes the tax benefit from interest payments

### **Pecking Order Theory**

This hypothesis was posited by Myers and Majluf (1984). The thesis stated that the firm has a decision to pick a portfolio which expands the arrival for investors. The hypothesis advices firms to be one-sided when financing their activities and utilize increasingly inward financing which is held income. It further uncovers that expansive firms have higher inclination for outside financing because of the simplicity with which it tends to be gotten (Nwaolisa & Chijindu, 2016). Pecking order theory starts with asymmetric information, which indicates that managers know more about their companies' prospects, risks and values than do outside investors. Asymmetric information can in practice explain the dominance of debt financing over equity issues. The most of external financing comes from debt, even in the case of

highly information efficient market. However, none of this says that firms ought to heavily rely on debt financing. In fact, a firm with ample internally generated funds does not have to sell any kind of security (Brealey et al., 2006).

Pecking order hypothesis states that each firm has a particular method for financing their undertakings and it's in plummeting request (Meyers, Gamst & Guarino, 2016). This is on the grounds that inside financing is the most secure method for financing as it draws in no intrigue, nor will it weaken the valuations of conventional offers. The main reason regarding why a firm can utilize obligation financing is whereby; the advantages exceed the expenses (Nwaolisa & Chijindu, 2016). At the point when outside financing sources are compulsory, firms pick obligations to value in light of lower data costs relate with obligation (Chesang & Ayuma, 2016). This theory was relevant to this study as it highlights the effect of capital adequacy on financial performance of Manufacturing Firms listed at Nairobi Securities Exchange.

### **Efficient Structure Hypothesis**

The Efficient Structure Hypothesis was formulated by Demsetz (1973) who predicts that under the pressure of market competition, efficient firms defeat the competition and grow, so that they become larger, obtain greater market share, and earn higher profits. Under this hypothesis, a market becomes more efficient as it becomes more concentrated, so anti-concentration measures cause unnecessary distortion in the economy. To test this hypothesis, empirical studies have examined the relation between proxies for firm efficiency and for market performance. According to Thoraneenitiyan, (2010), company efficiency studies can be separated into those that examine scale and scope efficiency and those that examine X-efficiency or frontier efficiency. The X-efficiency hypothesis argues that companies with better management and practices raise profits and control costs, moving the company closer to the best practice. The scale-efficiency hypothesis argues that some companies achieve better scale of operation and, thus, lower costs. Lower costs lead to growth and higher profits. The efficient-structure theory implies that higher profits come first in a timing sense followed by increasing concentration. That is, better managements and practices lead to higher profits and that better performance then leads to rising market share and concentration over time. Berger (1995) argues that previous research on tests of the market-power theories produce suspect findings, since they as a rule do not control for the efficient-structure theories. He found out that support for only two of the four hypotheses – the relative-market-power and the X-efficiency hypotheses using simultaneous test of all four competing hypotheses – two market-power and two efficient structure by adding measures of X-efficiency and scale efficiency to the standard tests. Empirically tested this hypothesis (“Efficient-Structure” theory) using data set over 2700 companies, he found no relationship between market concentration and profitability, while significant positive correlation between profitability and market share was present (Smirlock, 1985). The efficiency structure theory was relevant to this study as it highlights how inflation affects financial performance of Manufacturing Firms listed at Nairobi Securities Exchange.

## **Theory of Net Operating Income Approach**

Durand has put forth this approach (1952). The theory implies that the change in the company's debt or the change in leverage does not impact the firm's overall value. The WACC and the overall value of a firm, as per this approach, are independent of a company's decision on the capital structure or financial leverage. A company's capital structure is a combination of debt and equity in the mode of funding of the company. This ratio of debt is also known as financial leverage in the capital structure. Some businesses prefer more debt, and others prefer more equity while their assets are funded. A company's ultimate objective is to increase its market value and its earnings.

Eventually, the question remains in front is the connection between the capital design and estimation of a firm. There is one way of thinking supporting that expanding the debt part or the influence of an organization will build the estimation of a firm. Then again, expanding the influence of the organization likewise builds up the risk of the organization. There are different hypotheses which build up the connection between financial leverage, weighted average cost of capital and the complete estimation of the firm. One such hypothesis is the Net Operating Income Approach. The market value depends, as per this approach, on the company's operating income and the related business risk. Any of these variables will not be influenced by financial leverage. Financial leverage can only influence the proportion of revenue received by debt holders and equity holders, so it can not affect the company's operating profits. Therefore, change in debt to equity ratio cannot make any change in the value of the firm. It further says that with the increase in the debt component of a company, the company is faced with higher risk. To compensate that, the equity shareholders expect more returns. Thus, with an increase in financial leverage, the cost of equity increases. Therefore, the concepts of financial leverage and performance are anchored on this theory.

## **RESEARCH METHODOLOGY**

### **Research Design**

This study adopted the descriptive research design. Descriptive research design was used because the study sought to describe characteristics of the manufacturing firms and the variables being studied and describe, what exists with respect to variables and conditions in a situation as recommended by Kamau (2015). Further, the design was chosen because the study is confined to the collection and description of the data, but sought to determine the existence of certain relationships among the research variables. Hence, the design was selected to satisfy the aspect of the study. The design is justified because it was used to sort out the existence and magnitude of causal effects of one or more independent variables (asset tangibility, capital adequacy, inflation and financial leverage) upon a dependent variable of interest (that is financial performance) at a given point in time. The design analysis based on

frequencies and percentages of the study variables in the defined population (Sekaran & Bougie, 2016).

### **Target Population**

The target population in this study was NSE listed manufacturing firms in Kenya. Currently, there are twelve manufacturing companies that are listed in the Nairobi Securities Exchange (NSE) namely Baumann Company Limited; B.O.C Kenya Ltd; British American Tobacco Kenya; Carbacid Investment Ltd; East Africa Breweries Limited; Eveready East Africa Limited; Kenya Orchards Limited; Mumias Sugar Company; Marshalls (E.A.) Ltd; and Unga Group Limited (NSE, 2020). NSE listed manufacturing firms were selected mainly because NSE exercises heavy control over them hence they adhere to the standards of manufacturing operations, further data from these firms are easily available. The study's unit of analysis were the 12 CEOs of the firms. Data was collected from all the 12 CEOs of the manufacturing firms listed in NSE Kenya. Due to the small size of the population, all the NSE listed manufacturing firms in Kenya took part in the study as Were (2016) opined that when the target population is small, all the elements in the population take part in the study. Thus, all the 12 firms took part in the study. In this regard, the study used census sampling technique where all members of the population take part in the study.

### **Research Instrument**

This study relied on secondary data that was obtained from the annual audited financial statements. The data was obtained from the income statement, balance sheets and statements of cash flow of the listed firms, which included; total assets of the firm, cash flow balances, total revenues, net profit and tax paid. According to Martins, DA Cunha and Serra (2018), secondary sources of information can yield more accurate data than that obtained through primary research. This is not always true but where a government or international agency has undertaken a large scale survey, or even a census, this is likely to yield far more accurate results than custom designed and executed surveys when these are based on relatively small sample sizes. The secondary data sources are chosen because they are very easy to access, are absolutely free for use or at very low costs, time-saving, and allows the researcher to generate new insights from previous analysis. The annual published financial reports were obtained from the Nairobi Securities and used data of the most recent years for last 5 years (2016–2020). Five years panel data is able to get enough data points that can give reliable secondary data for at a finance research (Young & Holsteen, 2020).

### **Data Collection Procedure**

The research procedure included obtaining financial statements and annual reports from the company websites of the 12 manufacturing firms listed in NSE. This was followed by the extraction of information from the annual financial statements and reports of the selected firms. The researcher used annual financial statement information for the last 5 years (2016–2020).

### **Data Processing, Analysis and Presentation**

The obtained data from the field was in raw form hence hard to analyze. The collected data was therefore sorted, coded and analytically prearranged in a way that can facilitate the analysis through the use of the Microsoft Excel sheets and STATA statistical packages for analysis. Descriptive statistics such as mean score, standard deviation, skewness and kurtosis were estimated for all the variables and information was presented in form of tables and graphs. Descriptive statistics was used because they enable the researcher to meaningfully describe distribution of scores or measurements using few indices (Meyers, Gamst & Guarino, 2016). Since data is both cross sectional and time series, the study used Panel regression analysis. The data was presented using tables and graphs.

In order to test the relationship between the variables the inferential tests including the panel data regression analysis was used. The following regression model was used to establish the relationship between the variables.

The regression equation was of the form;

$$Y_t = \alpha + \beta_{1t}X_{1t} + \beta_{2t}X_{2t} + \beta_{3t}X_{3t} + \beta_{4t}X_{4t} + \epsilon_t \dots \dots \dots (i)$$

Whereby: Y represents financial performance

t=1, 2, 3, 4

$\alpha$  is the Constant

X<sub>1</sub> represents Asset Tangibility/Quality (Logarithm of total assets)

X<sub>2</sub> represent Capital adequacy ratio (CAR) Core capital divided by total customer deposits

X<sub>3</sub> represent Inflation (consumer price index)

X<sub>4</sub> represent Financial Leverage (ratio of total debt to total capital of a firm)

$\beta_i$  (i= 1, 2, 3, 4) = Regression Coefficients.

e = Error Term

The coefficient of determination ( $R^2$ ) was used to measure the extent to which the variation in financial performance of listed manufacturing firms is explained by the independent variables and the moderating variables. F-statistic and t-statistics were also computed at 95% confidence level to test whether there is any significant relationship between the independent variables and the dependent variables.

### **RESEARCH FINDINGS AND DISCUSSION**

## **Tests of Assumptions of Regression Model**

### **Unit Root Test**

The unit root test to determine the stationarity of the data in the time series was conducted. According to Herranz (2017), a times series is said to be stationary when the statistical attributes, such as; mean, variance and covariance of the distribution are constant over time. The unit test uses a probability scale of 0.05 or 5%, and a rule that if the probability of unit test is  $<0.05$  there is no unit root therefore the time series is stationary. If there is a p value  $>0.05$  there is a unit root and the time series is non-stationary. The Augmented Dickey-Fuller Test was conducted and the results were as shown on Table 1 for the probability values for Level and 1<sup>st</sup> difference using the unit roots in Intercept and Trend and intercept.

**Table 1: Unit Root Test**

Independent Variables	Level		1 <sup>st</sup> difference	
	Intercept (p-value)	Trend & Intercept(p-value)	Intercept (p-value)	Trend & Intercept(p-value)
Asset Tangibility	0.9992	0.9735	0.0012	0.0006
Capital Adequacy	0.1545	0.0068	0.0003	0.0090
Inflation rate	0.0001	0.0001	0.0002	0.0001
Financial Leverage	0.6145	0.6466	0.0004	0.0027

Results from the stationarity test indicated that for asset tangibility/quality level intercept  $p=0.9992$   $p>0.05$ , while trend and intercept  $p = 0.9735$   $p>0.05$  while for 1<sup>st</sup> difference intercept  $p=0.0012$  and Trend and intercept  $p=0.0006$ , therefore there non stationarity in the time series for asset tangibility/quality in level and but stationary in the 1<sup>st</sup> difference Unit root tests.

The capital adequacy had a level intercept  $p= 0.1545$  and trend and intercept  $p=0.0068$   $p>0.05$  while for the 1<sup>st</sup> difference intercept  $p =0.0003$   $p>0.05$  while trend and intercept was  $p= 0.0090$   $p>0.05$ , the study concluded that there was non-stationarity in the level intercept unit tests but stationarity in the 1<sup>st</sup> difference intercept tests.

For the inflation rate there p values all recorded results with p values  $<0.05$  therefore there was stationarity in both pairs of level and 1<sup>st</sup> difference tests and therefore no unit root and the time series is stationary for both unit root tests.

Results from the stationarity test indicated that for financial leverage level intercept  $p=0.6145$   $p>0.05$ , while trend and intercept  $p = 0.6466$   $p>0.05$  while for 1<sup>st</sup> difference intercept  $p=0.0004$  and Trend and intercept  $p=0.0027$ , therefore there non stationarity in the time series for financial leverage in level and but stationary in the 1<sup>st</sup> difference unit root tests.

### **Multicollinearity Test**

Multicollinearity test is a test done to find out the correlation between independent variables. Vanegas and Paula (2016) notes that the test is conducted to ensure that the data collected would not be a result of undesired trends in the distribution of data within the study.

**Table 2: Multicollinearity Test**

Model		Collinearity Statistics	
		Tolerance	VIF
1	Asset Tangibility/Quality	0.516	1.938
	Capital Adequacy	0.626	1.596
	Inflation rate	0.480	2.082
	Financial Leverage	0.785	1.274

- a. Dependent Variable: financial performance of Manufacturing Firms listed at Nairobi Securities Exchange

Tolerance and VIF are utilized as a metric for the existence of multi-collinearity in a regression model, according to Borssoi, Paula and Galea (2020). To build a model fit for the investigation, they proposed that the tolerance margins be constricted above 0.1 ( $> 0.1$ ) and the VIF be constricted below 10 (10). Tolerance values of less than 0.1 and VIF outputs of more than 10 are, however, deemed undesirable in the model.

Tests from Table 2 indicated that all the independent variables: asset tangibility/quality (VIF = 1.938), capital adequacy (VIF = 1.596), inflation rate (VIF=2.082) and financial leverage (VIF=1.274), pass the collinearity test since tolerance levels were above 0.1 while VIFs were all below 10.

### **Autocorrelation Test**

This test was conducted to check whether the values of the residuals are independent and that was to ensure that the observations are independent from one another and uncorrelated. The Durbin-Watson test was conducted to indicate the level of autocorrelation. The statistic's value ranges from 0 to 4. Non-autocorrelation is shown by a number near 2; positive autocorrelation is indicated by a value near 0; and negative autocorrelation between independent variables is indicated by a value near 4.

**Table 3: Autocorrelation Test Durbin Watson**

Model	Durbin-Watson
1	2.078392

Table 3 results show Durbin Watson statistic value is 2.078392. Chen (2016) notes that test statistic values in the range of 1.5 to 2.5 indicates no autocorrelations hence the conclusion is that there is no autocorrelation between the independent variables.

### **Normality Test**

Jarque-Bera was used to ascertain the normality of the data. The outcomes are shown in Table 4.

**Table 4: Normality Test Results**

	Jarque-Bera Coefficient	P-value
Asset Tangibility/Quality	5.304	0.202
Capital Adequacy	1.763	0.315
Inflation rate	2.153	0.227
Financial Leverage	3.239	0.300
Financial Performance	3.145	0.201

From the findings, the p-values for asset tangibility/quality, capital adequacy, inflation rate, financial leverage, and financial performance were greater than 0.05. Therefore, the study resolved the data was deemed to be normally distributed.

### **Hausmann Test**

The Hausman test is used to choose between models in panel data investigations, according to Sheytanova (2014). The Hausman test examines whether the panel model has endogeneity. The hausmann test, which defines whether a fixed or random effects panel model should be employed, is one of the tests used to determine a suitable model. For data analysis, a dynamic panel data model can use either fixed effects (FE) or random effects (RE) models. Fixed-effects (FE) models, according to researchers and academics, are the best starting point for studying panel data because they allow analysts to compensate for unobserved time-constant heterogeneity (Vaisey & Miles, 2017). The results of the dynamic panel analysis can be affected by some unobserved time-constant variables such as the business models or culture of firms that could affect the dependent variables over the study period. Unobserved variables pose the greatest challenge to causal inference, and if the independent variables are associated with these unobserved factors, estimates of their effects will be skewed.

The Random effects models differ from the fixed effects models based on the assumption they presuppose regarding the relationship between the unobserved variables and the observed predictors (Cameron & Trivedi, 2010). In general, random effects models assume that the observed predictors in the model are uncorrelated with the unobserved variables, whereas fixed effect models allow for correlation between the two variables. The fixed effect model is a more suitable regression analysis model because all the unmeasured time constant factors of the independent variables should in reality be correlated to the variables that are measured (Bell et al., 2019).

**Table 5: Hausmann Test**

---- Coefficients ----

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	Fixed	Random	Difference	S.E.
AT	-8.015	-5.033	-2.981	1.717
CA	-11.45	-6.405	-5.051	1.478
IR	-0.017	0.621	-.639	0.329
FL	-0.006	-.004	-.0014	0.0026

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: Random effect model is appropriate

H<sub>1</sub>: Fixed effect model is appropriate

$$\chi^2(4) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 5.7052$$

$$\text{Prob} > \chi^2 = 0.026868$$

Hausman test -

Null hypothesis: GLS estimates are consistent

From the above results, the P value is 0.026868, which is less than 0.05 (P<0.05)

So this research will choose the fixed effect model.

The study used the fixed effect model or estimator which allowed for heterogeneity and individuality between the 12 Manufacturing Firms listed at Nairobi Securities Exchange by allowing each company to have its own intercept value. The fixed effect was also ideal due to the fact that although the intercept may differ over the different companies it will not vary over time making it time invariant.

### Hypotheses Testing

The researcher conducted a multiple linear regression analysis to ascertain the relationship between financial performance of Manufacturing Firms listed at Nairobi Securities Exchange and the four independent variables namely: asset tangibility/quality, capital adequacy, inflation rate, and financial leverage.

**Table 6: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.951	0.904	0.897	1.290

The results in Table 6 indicate an adjusted R<sup>2</sup> of 0.897. This means that 89.7% of variation in financial performance of manufacturing firms listed at Nairobi Securities Exchange is explained by financial leverage, asset tangibility/quality, capital adequacy and inflation rate in the model and that 10.3% of the variation is due to factors not considered in this model. The results also reveal that these liquidity risk determinants affect financial performance of manufacturing firms listed at Nairobi Securities Exchange significantly. The results are supported by Banafa, Muturi and Ngugi (2015) who stated that good financial performance of any firm not only plays a role in increasing the market value of that specific firm but also

leads towards the growth of the whole industry which ultimately leads towards the overall prosperity of the economy.

**Table 7: ANOVA Results**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	909.918	4	227.480	129.555	2.62E-27
	Residual	96.572	55	1.756		
	<b>Total</b>	<b>1006.49</b>	<b>59</b>			

The results in Table 7 show that the overall significance of the model was statistically significant at  $F=129.555$  and  $P\text{-value}=2.62E-27 < 0.05$ . This means that the model was statistically significant at 95% confidence level. The findings also imply that there was a significant effect of the liquidity risk determinants used in the study. Consequently, the findings indicate that for the effective financial performance, the manufacturing firms listed at Nairobi Securities Exchange should incorporate the four variables so that the desired objectives can be achieved. The results are in agreement with Li, Monroe and Coulton (2018) who asserted that firms do not only suffer huge financial loss and closure, they suffer outrageous criticisms from the general public and became the center of attention of regulators. Poor liquidity risk management stood out as one of the instrumental factors of the crisis. Significant failures within the framework of the financial systems that support firms to adopt sound liquidity risks management mechanisms were exposed.

**Table 8: Regression Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.423	0.228		1.855	0.068
	Asset Tangibility/Quality	0.595	0.254	0.443	2.343	0.022
	Capital Adequacy	0.658	0.163	0.532	4.037	0.000
	Inflation rate	0.603	0.242	0.404	2.492	0.015
	Financial Leverage	0.721	0.156	0.717	4.622	0.000

a. Dependent Variable: financial performance of manufacturing firms

Based on the results, the predictive model was formulated as:

$$\text{Financial performance of manufacturing firms} = 0.423 + 0.595x_1 + 0.658x_2 + 0.603x_3 + 0.721x_4$$

Where,  $x_1$ = Asset tangibility/quality

$x_2$ = Capital adequacy

$x_3$ = Inflation rate

$x_4$ = Financial Leverage

The coefficient results in Table 8 revealed that the relationship between the asset tangibility/quality and financial performance of Manufacturing Firms listed at Nairobi Securities Exchange was statistically significant ( $\beta=0.595$ , P-value=0.022). This implies that for one unit increase in asset tangibility/quality, financial performance of manufacturing firms listed at Nairobi Securities Exchange will increase by a factor of 0.595 when holding other factors constant. Since the p-value=0.022<0.05, the null hypothesis that asset tangibility/quality has no significant effect on financial performance of Manufacturing Firms listed at Nairobi Securities, was rejected. The findings are in line with Rajan and Zingales (1995) who stated that assets tangibility is a relevant liquidity risk determinant that affects financial performance of any organization.

Similarly, the relationship between capital adequacy and financial performance of manufacturing firms listed at Nairobi Securities Exchange was statistically significant ( $\beta=0.658$ , P-value = 0.000). This implies that an increase of capital adequacy by one unit is expected to increase the financial performance of manufacturing firms listed at Nairobi Securities Exchange by a factor of 0.806. Since the p-value=0.000<0.05, the null hypothesis that capital adequacy has no significant effect on financial performance of Manufacturing Firms listed at Nairobi Securities, was rejected. The findings differ with Chechet and Olayowola (2014) who concluded that a higher proportion of debt in capital structure has a negative impact on the firms' profitability and equity financing positively affects the profitability of a firm's profits though not significantly.

The relationship between inflation rate and financial performance of manufacturing firms listed at Nairobi Securities Exchange was also statistically significant ( $\beta=0.603$ , P-value=0.015). This implies that an increase in inflation rate by one unit will lead to an increase in financial performance of manufacturing firms listed at Nairobi Securities Exchange by a factor of 0.603 when holding other factors constant. Since the p-value=0.015<0.05, the null hypothesis that inflation rate has no significant effect on financial performance of Manufacturing Firms listed at Nairobi Securities, was rejected. The results disagree with Megeid (2017) who found a negative relationship between rate of inflation and profitability, in a bid to reduce inflation central banks employs contractionary monetary policies by increasing the base lending rate this encourages credit rationing which in turn decreases aggregate demand and real investment.

Further, the relationship between financial leverage was statistically significant ( $\beta=0.721$ , P-value=0.000). This infers that an increase in financial leverage by one unit will lead to an increase in financial performance of manufacturing firms listed at Nairobi Securities Exchange by a factor of 0.721 when holding other factors constant. Since the p-

value=0.000<0.05, the null hypothesis that financial leverage has no significant effect on financial performance of Manufacturing Firms listed at Nairobi Securities, was rejected. This is accordance with Mabinda, Gregory and Iravo (2018) who stated that financial leverage is the extent to which a firm relies on debt and is measured using debt to equity ratio and financial leveraging strategies. Financial leverage is a relevant liquidity risk determinant that affects financial performance of any organization.

Overall, the financial leverage had the greatest effect on the financial performance of manufacturing firms listed at Nairobi Securities Exchange, followed by capital adequacy, then inflation rate while asset tangibility/quality had the least effect on the financial performance of manufacturing firms listed at Nairobi Securities Exchange. All the variables were significant since their p-values were less than 0.05.

The study concluded that all the null hypothesis were rejected. Therefore the asset tangibility, capital adequacy, inflation and financial leverage affect financial performance of Manufacturing Firms listed at Nairobi Securities Exchange.

### **Conclusion of the Study**

The study concluded that asset tangibility/quality positively and significantly affects performance of Manufacturing Firms listed at Nairobi Securities Exchange. The study deduced that a larger share of tangible assets increases the liquidation value of a company. This is because the tangible assets constitute collateral for the debt in case of bankruptcy. When a firm is solvent, tangible asset increase the firm value by allocating assets to better uses. In addition, when the firm is in distress, tangible asset sales represent the cheapest source of funds for the firm. Moreover, asset sales allow the firm to finance continued operation of its remaining assets without requiring external capital.

The study concluded that capital adequacy positively and significantly affects performance of Manufacturing Firms listed at Nairobi Securities Exchange. The research deduced that an increase investment in fixed assets may contribute to significant contribution to after tax returns for the companies.

The study concluded that inflation rate positively and significantly affects performance of Manufacturing Firms listed at Nairobi Securities Exchange. The study further concluded that firms tighten their credit policy during inflation hence reducing their Accounts receivable period, this relationship exhibits the same pattern of flight to quality that is experienced in the financial sector during inflation. The results also shows that as size increase CCC decreases which means that large firms are able to negotiate for longer credit lines from suppliers but decrease the debtors conversion period.

The study concluded that financial leverage positively and significantly affects performance of Manufacturing Firms listed at Nairobi Securities Exchange. In line with the study objective, the study also concluded that financial leverage risk has significant negative effect

on financial performance of manufacturing firms listed at Nairobi Securities Exchange. An increase in financial leverage risk would therefore result to a significant increase in financial performance of manufacturing firms listed at Nairobi Securities Exchange.

### **Recommendations of the Study**

The study recommended that the management of the manufacturing firms listed at Nairobi Securities Exchange should strive to achieve and maintain an optimal liquidity position that holds adequate cash/liquid resources for operational needs while the surplus liquid resources are invested in existing viable investment opportunities in the operating environment to enhance the growth and financial performance. In addition, management of financial performance should identify and address other factors that may be affecting their financial performance other than liquidity.

The study recommends that manufacturing firms should enhance their financial leverage practices to ensure that they become more profitable hence survive in the market. Particularly, the managers of the manufacturing firms listed at the NSE should employ minimal debt level or use an optimal debt level which will not affect the firm's performance due to the inverse relationship between financial leverage and financial performance.

The research therefore recommends the manufacturing firms listed at Nairobi Securities Exchange to evaluate the tax benefits and the bankruptcy costs that come along with debt financing. Debt levels should be kept at optimal points since it has been found out that high level of debts increase stock returns. This will ensure the goal of maximizing shareholders' wealth is attained.

The study recommends the management of the manufacturing firms listed at Nairobi Securities Exchange to focus on asset tangibility since it was found to have a significant effect on the financial performance. The study found out that the asset tangibility had a significant effect on financial performance of manufacturing firms listed at Nairobi Securities Exchange. Therefore, the researcher recommends that the policy makers in the financial sector to embrace asset tangibility on their strategic decision-making.

The study recommends that the Central Bank of Kenya to formulate and enact a policy which makes commercial debt cheaper hence reduce cost of operations of financial firms, management of manufacturing firms listed at Nairobi Securities Exchange to reduce interest rates so as to attract investors who will inject more funds into these firms.

The inflation rate plays an important role in determining the economic growth and market returns in Kenya's such that there exist a negative relationship between inflation rate and financial performance. The Central Bank should endeavor to reduce the inflation rate as a way of promoting economic growth and financial performance of manufacturing firms listed

at Nairobi Securities Exchange. High inflation rates erode investments especially interest rates.

The researcher recommends the adoption of capital adequacy in order to improve financial performance of manufacturing firms listed at Nairobi Securities Exchange. The study findings support the view that capital adequacy has a significant effect on financial performance. Policies should ensure that companies pay their corporate income tax promptly and consequently better financial performance of manufacturing firms listed at Nairobi Securities Exchange. The study recommends that it is necessary to ensure that firms have sufficient capital. Capital regulations are therefore put in place to ensure that banks meet the minimum capital requirements expected of them.

Since this study explored the effect of liquidity risk on financial performance of Manufacturing Firms listed at Nairobi Securities Exchange, the study recommends that; similar studies should be done in other countries for comparison purposes and to allow for generalization of findings on the relationship between liquidity and financial performance of Manufacturing Firms.

Other studies should consider companies in other sectors listed at the Nairobi Securities Exchange. The study recommends further research for these sectors to confirm if there is indeed a relationship between liquidity and profitability in these firms. A study on the relationship between liquidity and financial performance for companies which are not listed at the NSE is also recommended. This includes the companies in the financial sectors for example, the SACCO's and also non-financial companies for example, manufacturing companies. This may help come with recommendations for companies which are not listed at the NSE to better their financial performance and liquidity management.

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