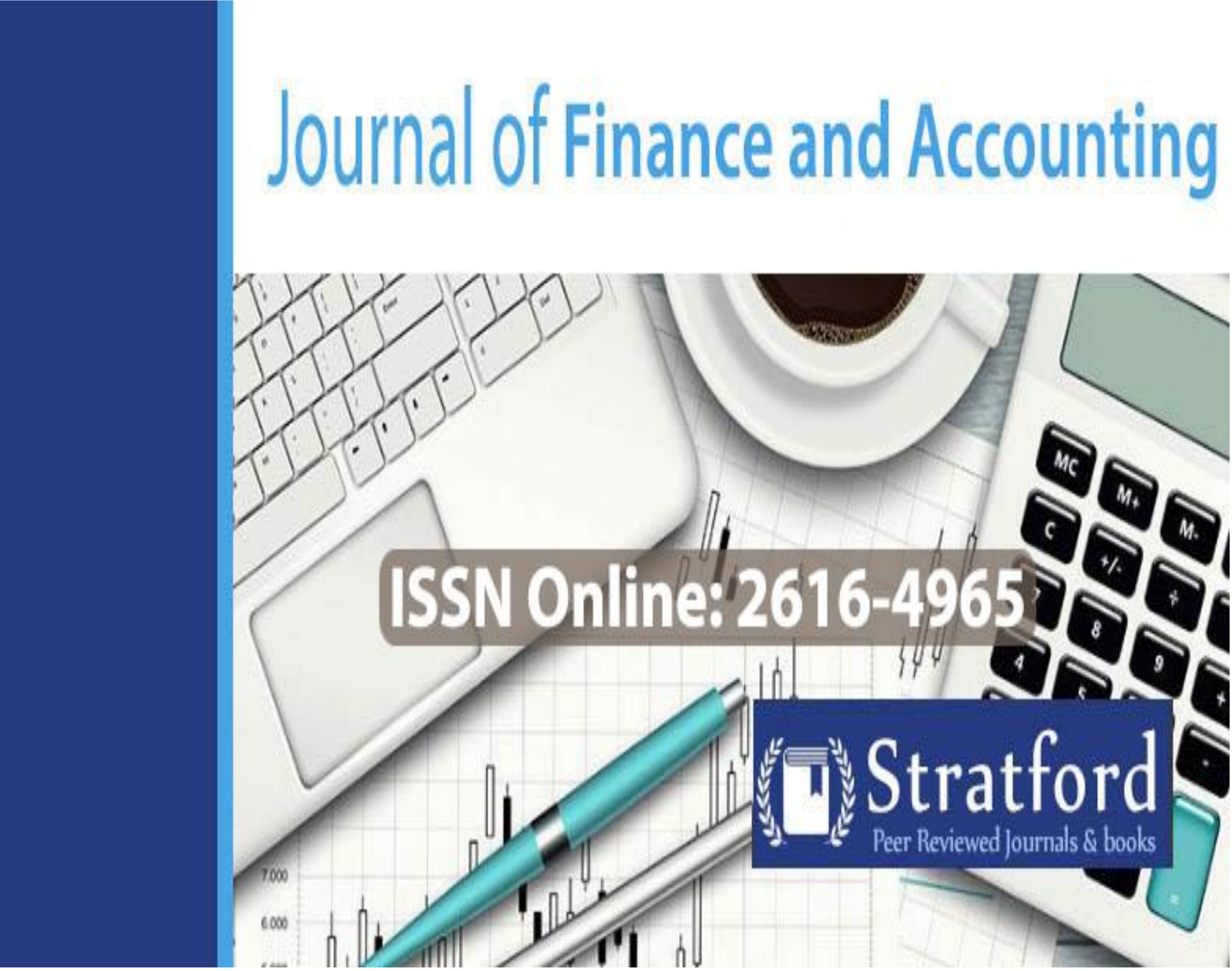

Asset Tangibility and Financial Performance: The Moderating Role of Economic Growth and Earnings Volatility

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Asset Tangibility and Financial Performance: The Moderating role of Economic Growth and Earnings Volatility

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Abstract

The Kenyan manufacturing sector's contribution to the economy has been declining. It has stagnated at 10% of the gross domestic product (GDP), contributing to an average of 10% from 1964-1973 and marginally increased to 13.6% from 1990-2007 and has been below 10% in recent years further dropping to 8.4% in 2017 and 7.1% in 2020 ultimately hitting its lowest in 2022 of 7.2%. The government has renewed its efforts to revive the sector to grow its contribution to GDP to 20% by 2030. Asset tangibility is a significant determinant of how counterparties and external financiers value a firm and hence turn around its fortunes. This study applied Dynamic Unbalanced Panel analysis techniques using Secondary data for 10-year period (2010 - 2019) with the study population comprising of 9 listed firms. A census of the firms was done and resulted to 86 observations. Focus was on asset tangibility moderated by economic growth rate and earnings volatility on firm value which was proxied by Tobin's Q and EVA. Pecking order guided the study. Longitudinal research design was used as it is appropriate when dealing with panel data. STATA version 15 was used for analysis. Model estimation followed a two Step System GMM testing the study hypotheses at 5 % significance level. Pearson correlation coefficient was used to show the strength and direction of association among the study variables. ATNG was positively correlated with Tobin Q (r = 0.4331) and LnEVA (r = 0.3683). The regression weights were also positive and significant. The study therefore concluded that asset tangibility is imperative as it directly determines the financial burden firms face in their operations and recommended that the managers of manufacturing firms need to consider project financing to limit exposure to credit risk. Future studies can consider a balanced panel analysis and other panel data econometric techniques.

Keywords: *Asset tangibility, Firm Value, Financial Performance, Manufacturing firms.*

1.1 Introduction

Tangibility denotes the extent of financing by use of non-current assets. Fixed assets value is therefore used as a proxy for a firm's tangibility (Baloch, Ihsan, Kakakhel & Sonia, 2015). Firms use non-current assets in production to generate revenue and therefore they are intended to be retained by an organization for longer periods and are not to be sold to customers (Kenton, 2017). These assets appear as property, plant and equipment (PPE) on the statement of financial position. Included are assets like machinery used in production, trucks, plant, property, office furniture, equipment and buildings among others since they can vary depending on the nature of the organization (Kenton, 2017; Birch, 2016 and Downes & Goodman, 2003).

It has been established that Asset tangibility significantly determines the ability of an organization to raise funds externally for investment purposes as they strengthen the balance sheet and assure of the reality of going concept of accounting (Almeida & Campbello, 2007). The reasoning to this is that asset tangibility is a significant determinant of how counterparties and external financiers value a firm by virtue of the transferrable assets in case the firm defaults on its obligations (Diemo, 2007). To improve the overall market value, firms need to be innovative and diversify financing choices by either adopting lease financing, issuance of convertible bonds, warrants, forward contracts, trade bond swaps and other marketable securities in various proportions to minimize costs of financing and in turn raise the market value of the firm (Abor, 2005).

The manufacturing sector is the foundation of innovation and technical change since most innovations are first introduced and commercialized in this sector, making it the core driver of technical change and economic development hence occupies an extraordinary position in the minds of policy-makers. (UNIDO, 2013). Industrialization is therefore critical to economic growth and development. It is increasingly being recognized and supported that market forces only cannot steer industrialization to the level of Germany, Japan or the United States which begun industrialization early enough. To trounce the challenge, greater focus is being made by Policymakers developing frameworks on industrial policies aimed at establishing resource centers to allocate resources to specific manufacturing sectors in an attempt to promote and revive the sector (UNIDO, 2020). High growth economies have been persistently supported by manufacturing, industrialization and exports. The Four Asian Tiger countries of Singapore, South Korea, Taiwan and Hong Kong have achieved and consistently maintained high levels of economic growth since the 1960s making them join the league of the wealthiest nations in the world. South Korea and Taiwan are the hubs for global manufacturing and information technology while Singapore and Hong Kong are prominent global financial centers.

Reorientation of the Chinese economy from export to a consumer driven economy is instrumental in shaping the manufacturing sector in Kenya. Financing options relying on Low cost of capital in Asian countries has enabled the manufacturing sector in those countries to access funding cheaply, thereby speeding the sector's development. This is a component of financing structure which if provided, could enhance productivity of the sector in Kenya and hence profitability (Were, 2016). Historically, Kenya's economy has benefited little from manufacturing as the sector's contribution to the gross domestic product (GDP) has been deteriorating. Between 1964-73, it accounted for 10% of GDP and improved to 13.6% from the year 1990 to 2007 but thereafter reduced to below 10%, reaching 8.4% in 2017 and further declining to 7.2% in 2022 (KAM, 2023). There is however a renewed effort by the government to revamp the sector. The government expects to achieve 20% contribution to GDP by the year 2030 from the manufacturing sector to realize the expected economic resilience and stability (KAM, 2022).

Past studies have been carried out on asset tangibility and performance. Findings from these studies are however divergent. For instance, a study by Pouraghajan, Malekian, Emamgholipour, Lotfollahpour and Bagheri (2012) found that asset tangibility ratio significantly and positively influenced ROA and ROE of listed firms on Tehran stock exchange. On the other hand, Ansari and Gowd (2017) studied Indian firms and found that asset tangibility had a negative and significant effect on financial performance since the assets tie financial resources which could have an alternative use.

Further, Musah, Kong and Osei (2019) in the case of non-financial firms which were listed on the Ghana Stock Exchange found existence of a positive but not significant relationship between asset tangibility and ROA, while the relationship with ROE and ROCE was negative and significant. The findings by past researchers therefore reveal mixed and incongruent findings. Further, the studies adopted accounting-based performance proxies. The current study therefore focused on economic based performance proxies as well as a different time scope to study and hence narrow the research gap in the manufacturing sector in Kenya.

1.2 Statement of the problem

The success of the Kenyan Manufacturing sector is vital to propel the country to realize the Big 4 agenda. The agenda is the country's development blueprint comprising of four key pillars namely; food security, affordable housing, affordable healthcare and manufacturing. Manufacturing being key to propel the nation to be fully industrialized and hence spearhead development depends on its ability to identify appropriate financing structure that will enable it to generate viable returns to shareholders and stay afloat. Globally, the sector was found to be the main engine of fast growth. The sector's contribution to Kenya's GDP has been on a downward trajectory to an average of less than 10%. For instance, its contribution to GDP was at 10% in 2014, declined to 9.4% in 2015, 9.1% in 2016, 8.4% in 2017, 7.61% in 2020 and further declined to 7.2% in 2022 (KAM, 2022). This is an indication of deindustrialization hence, government in collaboration with its trading partners has entrenched the revival of the manufacturing sector to improve its contribution to GDP to 20% by 2030 so that the economy can realize stability and hence become resilient amidst shocks (KAM, 2022). Considering that most developed nations including the Asian tigers have achieved their current status majorly due to a thriving manufacturing sector, the role and financial health of the manufacturing sector is critical for any country to realize sound economic growth and prosperity. Empirical studies have not shown consistent results maybe because of the different economic conditions and different variable combination and measurement. Most of past studies have taken place in USA, Europe and Asian Tiger Nations that have different economic activities, opportunities and comparatively robust and large manufacturing sectors. The current study further sought to estimate both the short run and long run dynamics to test the behavior of the model in both situations.

1.3 Objective of the study

i. To establish the effect of asset tangibility on the financial performance of manufacturing firms listed on the Nairobi Securities Exchange.
ii. To assess the moderating effects of economic growth and earnings volatility on the relationship between asset tangibility and financial performance of manufacturing firms listed on the Nairobi Securities Exchange.

1.4 Research Hypotheses

H_{01}: There is no significant relationship between asset tangibility and financial performance of manufacturing firms listed on the Nairobi Securities Exchange.

H_{02}: Economic growth rate and earnings volatility do not have a significant moderating effect on the relationship between asset tangibility and financial performance of manufacturing firms listed on the Nairobi Securities Exchange.

2.0 Literature review

2.1 Theoretical Framework

2.1.1 Pecking Order Theory

This theory gives the main challenge to trade off theory. It was initially proposed by Donaldson (1961) who advanced that managers desire to raise finances internally for growing the company. In the absence of the internal sources, the theory endorses conversion of assets then issuing debt and lastly through external equity as the last option. Stewart, Myers and Majluf (1984) later popularized the theory by affirming the notion of hierarchical financing choice by firms; first, use internal sources comprising of retained earnings and reserves, then go for debt and then consider preferred stock and issue common stock as the last option. The theory does not therefore recommend an optimal financing structure as the point of reference and instead propose the preference of firms to choose internal financing options over external sources. In the event that internal finances fall short of financing the investments to be undertaken, firms have an option to either raise finances externally or defer the investment. If they choose to acquire funds externally, they will carefully select the option that will subject the firm to minimal incremental cost of asymmetric information. External funds are expensive to raise since the external investors consider the moral hazard and failure risk of the normal firm (Akerlof, 1970).

External investors discount the share price judiciously when firms issue equity rather than debt and therefore, managers avoid raising finances through equity issuance if possible (Myers & Majluf, 1984). The Myers and Majluf model envisages a pecking order approach in financing. The internal source is a resultant of accumulated profits retained due to unavailability of sound opportunities to invest in and this gives rise to financial slack to shield firms from raising future funds externally. Firms with high profits can manage to create reserves and this builds up more retained earnings which prevents them from being highly leveraged (Khemiri & Noubbigh, 2018). Further, profit making firms tend to finance their needs through retained earnings since they do not impose any cost to the firm (Fama & French, 2002; Moradi & Paulet, 2019). On the contrary, loss-making firms are normally linked with high leverage level which further exacerbates the losses causing a negative relationship between leverage and profitability. The theory can thus be termed to imply that debt and profitability have an inverse relationship.

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Omollo, Muturi and Wanjare (2018) study on the effect of Equity Financing Options on Financial Performance is in support with this theory based on their finding that retention ratio has positive effect on ROA while common stock ratio has negative effect on ROA. The positive effect of retained earnings concur with the proposition that corporate managers should first consider retained earnings financing before any other source. The theory ranks common stock lastly as a financing option and this also concurs with the finding of negative effect of common stock on performance and agrees with the reasoning by Myers and Majluf model (1984) of external investors discounting share price of a firm and managers can avoid this by not raising finances through equity issuance. Further, Al – Najjar and Belghitar (2011) acknowledged that leverage and profitability influence retentions of cash considering Pecking Order Theory.

The theory however is subject to some shortcomings as it ignores the effect of taxes, costs of financial distress, costs of floating securities, agency costs or the bundle of investments within the reach of the organization basing on the real financing structure. The theory further fails to consider the lost opportunities for a firm when it accumulates huge retentions as well as the immunity a firm gains due to so much financial slack. This theory was relevant to this study particularly on asset tangibility.

2.2 Empirical review

Pouraghajan, Malekian, Emamgholipour, Lotfollahpour and Bagheri (2012) studied the relationship between Capital Structure and Firm Performance evaluation Measures on 12 industrial groups listed on the Tehran stock exchange. The study used secondary data covering the periods 2006 to 2010. Asset tangibility ratio was found to have a positive and significant effect on the firms' financial performance that was measured by ROA and ROE and hence firms need to invest in more tangible assets to realize higher profitability since the assets could be securitized to raise funds through leverage. This however, could deny firm's liquidity for trading since the assets could face a risk of market illiquidity. Previous studies have justified other performance measures such as Tobin's Q as a superior measure of performance and hence the current study focuses to fulfill this. Model diagnostic tests and panel data stationarity tests are necessary before analyzing this kind of data and therefore, these were considered in the current study.

In Sri Lanka, Pratheepan (2014) studied the determinants of profitability for the 55 manufacturing companies listed on the Colombo Stock Exchange for a 10-year period through 2003 to 2012. The panel data was analyzed using static panel models. ROA was used as a proxy for profitability while leverage, firm size, liquidity and tangibility were used as proxies for the explanatory variables. The study found that tangibility had a statistically significant negative relationship with ROA and recommended that firms should innovate and invest more in research and development activities for them to realize profitability. The study however adopted a static panel model while research has found that performance is naturally dynamic and hence the dynamic panel data model could be more suitable for a study of this nature hence the current study used a dynamic model and different performance proxies to find out if the results change.

Ansari and Gowd (2017) investigated the impact of asset tangibility and capital structure on financial performance of listed oil and gas companies in India. The study employed a descriptive research design on a sample size of 11 oil and gas companies whose secondary data over the period 2007-2016 was used. The research findings revealed the existence of a positive and significant relationship between capital structure and financial performance and a negative and significant relationship between asset tangibility and financial performance and concluded that profitability decreases as asset tangibility increases hence companies with less asset tangibility enjoy higher EPS. The study however did not incorporate the effect of moderator variables and did not conduct appropriate panel data analysis tests hence the current study incorporated these and used more robust firm performance measures.

Musah, Kong and Osei (2019) examined the nexus between Asset Tangibility and Financial performance of Non – Financial firms listed on the Ghana Stock Exchange (GSE). ROA, ROE and ROCE were used as performance proxies while asset tangibility was proxied by ratio of total tangible assets to total assets of the firm. Correlational research design was adopted and secondary data of 15 firms through the period 2008 to 2017 was collected. The study found that asset tangibility had a positive but insignificant relationship with ROA, and a negative and significant relationship with both ROE and ROCE. The study recommended that firms should invest more in intangible assets to realize an improved performance. The study however did not focus on other financing variables, did not consider the effect of a moderating variable and did not conduct relevant panel data stationarity and diagnostic tests, hence the current study sought to incorporate them.

Mule and Mukras (2015) investigated the financial leverage and performance of listed firms in a frontier market: panel evidence from Kenya using annual data for the period 2007 – 2011. The study variables included leverage, ownership, asset tangibility on ROA, ROE and Tobin's Q. Asset tangibility had a positive and significant effect on ROE and Tobin's Q while having a negative but not significant effect on ROA. The study concluded that asset tangibility is a significant predictor of firm performance. The current study introduced an additional performance measure and more variables to test if the relationship changes over an extended study period focusing on the manufacturing sector.

Kodongo, Mokoteli and Maina (2015) studied on the capital structure, Profitability and Firm value: Panel evidence of listed firms in Kenya. Leverage, Firm size, Asset tangibility, Sales growth on ROA, ROE and Tobin's Q were used as variables of the study. Annual data for the period 2002 – 2011 was used and static panel data models were used for analysis. The study found that Asset tangibility also affects profitability negatively. The study adopted a static panel model while research has found that performance is naturally dynamic and hence the dynamic panel data model could be more suitable for a study of this nature hence the current study deviated and used a dynamic model and included more proxies of independent variable and an economic performance measure.

2.3 Conceptual Framework

The conceptual framework reveals the interplay among study variables. Financing structure was conceptualized in terms asset tangibility. Financial performance was based on economic performance proxies indicated by Tobin q and EVA. This was moderated by economic growth and earnings volatility. Financial performance of manufacturing entities could be influenced by other factors but this study focused only on financing structure variables. The interplay between the study variables is portrayed in the figure 1.

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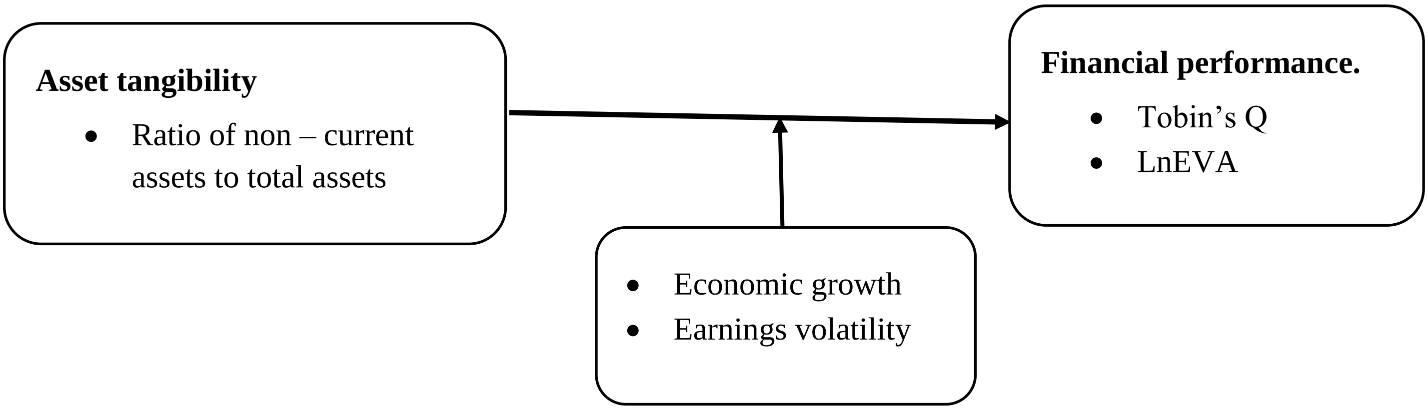

Independent Variables **Moderating Variable** **Dependent Variable**

Figure 1: Conceptual framework

(Source: Researcher, 2023)

3.0 Research Methodology

The study adopted Positivism Philosophy given the fact that firms end year financial data is prepared based on facts and principles for a particular period and expected to predict performance in future. This study adopted a longitudinal research design approach which allows collection of data on the same unit at different points in time hence qualifying to utilize panel data that was collected for this study. Panel data gives more informative data as it includes the time series and cross-sectional dimensions thus allowing the researcher to control for individual heterogeneity. It also allows the researcher to analyze change over time, study the dynamics of adjustment, provides less collinearity among the variables, more degrees of freedom and more efficiency because more information is available on the variables and subjects under study (Baltagi, 2008; Hsiao, 2003; Klevmarken 1989). Previous researchers have also employed panel data with the recent ones being Oyieke (2016), Museve et al (2016).

The study was carried out in Kenya since the units of study were also domiciled in Kenya. The country is geographically located in Eastern Africa with latitude of 5°N and 4 1/2^{0}S and a longitude of 34° E and 42°E hence Kenya lies entirely on the east of the Prime Meridian. The country is bisected by the equator as shown by the GPS coordinates. The target population for this study comprised the nine manufacturing firms which were listed on the Nairobi Securities exchange (NSE) for the period 2010 to 2019. Focus on listed firms was justified by the fact that they are required to publish their financial statements and they are closely regulated by the CMA hence the study accessed all the required data. A census of the 9 manufacturing firms which were listed on the Nairobi Securities exchange (NSE) for the period 2010 to 2019 was carried out. This comprised a total of 86 observations due to missing data during the study period hence the Unbalanced Panel Analysis approach.

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3.1 Validity

Validity refers to the degree to which a research instrument measures what it purports to measure (Bryman, 2012). The document analysis guide was tested for both content and face validity. Content validity was done to ensure the research instrument has the adequate content coverage on the study variables. Face validity is a subjective assessment based on expert opinion and getting their feedback on whether these measures are relevant in measuring what they intend to measure. It deals with formatting the instrument and appropriateness of language. Expert analysis and opinion given by the university supervisors certified both content, construct and face validity.

3.2 Data analysis and Model selection

STATA Version 15 software was used for data analysis. Descriptive statistics such as mean, median, skewness, kurtosis and standard deviation were generated from the data. Inferential statistics were employed to test the study's hypotheses. Results were presented by the use of graphs and tables. Model Selection followed Arellano &Bond (1991) Panel data procedures.

Panel data applies the one-way error component model of the pooled OLS given by;

$Y_{it} = \alpha_{it} + \beta X_{it} + \varepsilon_{it}$ ……………………………………………………………3.1

Y_{it} represents financial performance (Tobin's Q and EVA) of the manufacturing firm *i* at time *t*, with $i = 1 \ldots N = 9$ and $t = 1 \ldots T = 10$.

α denotes the constant term.

β denotes the slope of the explanatory variables.

X_{it} represents a vector of financing structure variables

ε_{it} is the error component which can be decomposed into two components as under;

$\varepsilon_{it} = \mu_i + \upsilon_{it}$ ……………………………………………………………………….3.2

with $\mu_i \sim$ IID $(0, \delta^2\mu)$ and $\upsilon_{it} \sim$ IID $(0, \delta^2\upsilon)$ are independent of each other and among themselves. Where μi represents the fixed effects, which denotes the individual firm specific effects which are time invariant and are therefore not included in the regression. Furthermore, v_{it} is the idiosyncratic error term which denotes the remainder of the disturbance that varies with individuals and time and can be thought of as the usual disturbance in the regression. Panel data offers techniques to remove μ_i through the use of forward orthogonal deviations.

Panel data models follow the static or dynamic approaches depending on the nature of the dependent variable. Dynamic models take account of lags of the dependent variables among the regressors while the static models do not (Baltagi, 2005). The dynamic panel analysis techniques comprise the one-step and two-step system and difference GMM estimators. The FE and RE static models are biased in a dynamic model of panel data and pooled OLS is biased and inconsistent even if ε_{it} is not serially correlated (Baltagi, 2008). Moulton (1986) further stressed that inference based on OLS can be totally misleading even when there is no correlation between the individual effects and the regressors. Additionally, when there is endogeneity among the regressors, there is extensive bias in OLS and the RE estimators as both yield misleading inference (Baltagi, Bresson & Pirotte,

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2003). Application of OLS methods to estimate parameters in a dynamic model that includes a lagged dependent variable would thus produce biased coefficients (Flannery and Hankins, 2013). Performance is naturally dynamic since performance of the previous period normally affects the current period's performance hence the dynamic panel approach in analysis. The dynamic model is formulated by the equation 3.3

$y_{it} = \alpha + \delta y_{it-1} + \beta x_{it} + \mu_i + \upsilon_{it}$ ………………………………………...3.3

Given that y_{it} is the dependent variable, y_{it-1} is the lag 1 of the dependent variable, x_{it} is a group of explanatory variables. Lag selection is purely an empirical issue and there is no hard rule on it. Given annual data was used, the study could use a minimum of 1 lag to a maximum of 2 lags. The study chose lag 1 to avoid losing degrees of freedom.

The Generalized Method of Moments (GMM) technique as proposed by Arellano and Bond, (1991) is more efficient and accounts for normality, autocorrelation and heteroskedasticity (Lee, Liang, Lin & Yang, 2015). System GMM method has been documented as the best method in estimating parameters that have incorporated lagged dependent variables (Flannery & Hankins, 2013) as was suggested by Blundell and Bond (2000). This estimator also controls for unobserved heterogeneity and is more robust in improving efficiency gains and reducing finite sample bias (Blundell & Bond, 1998). It also addresses the unit root property problem and provides more accurate findings (Bond, 2002). System GMM also corrects for endogeneity problem by introducing more instruments to improve efficiency and transforming the instruments to make them uncorrelated with the fixed effects; μ_i and also minimizes data loss since it is more robust than difference GMM and works well in unbalanced panels. The two-step system GMM estimator was chosen for this study since the one step estimation is less efficient as it assumes homoscedastic errors. It was derived by estimating a system of two equations, one in levels using lagged first differences as instruments and the second in first difference and using lagged levels as instruments.

. Data analysis was guided by the following empirical model;

$Y_{it} = \alpha_0 + \delta y_{it-1} + \beta_1 X_{1it} + \varepsilon_{it}$………3.4

i =1..., N; t =1..., T

With *i* denoting the firms and t denoting time; the *i* subscript therefore, denotes the cross-section dimension whereas *t* denotes the time-series dimension.

X_1= Asset tangibility (ATNG)

α_0, and $\beta 1$ are regression equation coefficients.

i = cross sections (unit that we observe)

t = time dimension

ε_{it} = error term.

Where, Y= Performance proxied by Tobin's Q and LnEVA.

$Tobin\ Q_{it} = \alpha_0 + \delta TobinQ_{it-1} + \beta_1 ATNG_{it} + \varepsilon_{it}$………..3.4a

$LnEVA_{it} = \alpha_0 + \delta LnEVA_{it-1} + \beta_1 ATNG_{it} + \varepsilon_{it}$… ……...3.4b

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Introducing the moderator variables of Economic Growth Rate (EGR) and Earnings Volatility (EVOL) and including this in the equations 3.1a and 3.1b led to the following sets of equations;

$Tobin\ Q_{it} = \alpha_0 + \delta TobinQ_{it-1} + \beta_1 ATNG_{it} + \beta_2 EGR_{it} + \beta_3 EVOL_{it} + \varepsilon_{it}$…………………....3.5a

$LnEVA_{it} = \alpha_0 + \delta LnEVA_{it-1} + \beta_1 ATNG_{it} + \beta_2 EGR_{it} + \beta_3 EVOL_{it} + \varepsilon_{it}$ ……………………….3.5b

The study also estimated the long run model for the study variables to assess the behavior of the relationship over time. The model was estimated using the method below;

$Long\ run\ model = \frac{\beta k}{1-\Phi}$; Where;

β_k is the short run coefficient for the independent variable.

Φ is the short run coefficient for the lagged dependent variable

4.0 Results and Discussion

4.1 Normality Test

The data was subjected to normality tests by examining the skewness and kurtosis of the distribution. The results in Table 1 indicate that the variables are normally distributed having the skewness values ranging between -3 to +3 which is within the acceptable range for normally distributed data. On the other hand, the kurtosis values ranged from -4 to +4. This implies that the study variables are normally distributed and therefore appropriate for further analysis.

Table 1: Normality Test

Variable	N	Skewness	Kurtosis
ATNG	86	0.1879	-0.5200
EGR	86	1.4269	2.1822
EVOL	86	0.3099	3.6876
Tobin Q	86	1.2871	0.3783
Ln EVA	86	-1.2052	3.6585

Source: Research data (2023)

4.2 Panel line plots for the study units

The study generated panel line plots to show the behavior of the dependent variables across time for each firm. The line plots revealed that the dependent variables do not exhibit large variability in the long run and therefore, they exhibit mean reversion. This is depicted in figure 2.

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Figure 2: Panel line plots for the study units

Source: Research data (2023)

Key: 1= BOC, 2= BAT, 3 = Eveready, 4 = Carbacid, 5 = EABL, 6 = Unga – Group,

7 = Mumias Sugar, 8 = Kenya Orchards, 9 = Flame Tree

4.3 Unit Root Tests

The panel data was subjected to unit root tests to establish stationarity conditions. **4.3.1 Im-Pesaran-Shin unit-root tests**

The results in tables 2 and 3 Show the unit root test results for Tobin Q and ln EVA respectively based on the Im-Pesaran-Shin unit-root test. The test was applied due to its applicability in unbalanced panels. The header of the output summarizes the exact specification of the test and dataset. The IPS W-t-bar statistic is -11.2819 with a p – value of 0.0000 for Tobin Q while the W-t-bar is -0.7061 and p – value of 0.0198 which are significantly less than the 5% significant level and therefore the null of all panels contain unit roots is rejected in favor of the alternate hypothesis that some panels are stationary. This rejection of the null means that some series are mean reverting over time.

Table 2: Im-Pesaran-Shin unit-root test for Tobin Q

. xtunitrootipsTobinQ, lags(1)

Im-Pesaran-Shin unit-root test for Tobin Q

Ho: All panels contain unit roots	Number of panels = 9
Ha: Some panels are stationary	Avg. number of periods = 9.56
AR parameter: Panel-specific	Asymptotics: T,N -> Infinity
Panel means: Included	sequentially
Time trend: Not included	
ADF regressions: 1 lag	

	Statistic	p-value
W-t-bar	-11.2819	0.0000

Source: Research data (2023)

Table 3: Im-Pesaran-Shin unit-root test for Ln EVA

. xtunitrootipsLnEVA, lags(1)

Im-Pesaran-Shin unit-root test for LnEVA

Ho: All panels contain unit roots	Number of panels = 9
Ha: Some panels are stationary	Avg. number of periods = 9.56
AR parameter: Panel-specific	Asymptotics: T,N -> Infinity
Panel means: Included	sequentially
Time trend: Not included	
ADF regressions: 1 lag	

	Statistic	p-value
W-t-bar	-0.7061	0.0198

Source: Research data (2023)

4.4 Fisher type unit root tests

The study also conducted the Fisher type unit root tests of Augmented Dickey Fuller (ADF) and Phillips – Perron (PP) unit root tests. Tables 4 and 5 display stationarity test results based on ADF for Tobin Q and Ln EVA respectively. Additionally, tables 6 and 7 show the unit root test results for Tobin Q and Ln EVA based on PP. These tests were chosen as they are robust in dealing with unbalanced panel data as was the case for this study. The findings strongly reject the null hypothesis and therefore the data is stationary and will not give spurious or misleading statistical evidence.

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The Fisher – type tests consider the parameter P for the autoregressive equation to vary across panels and therefore are panel specific. Choi's (2001) simulation results suggest that the inverse normal Z statistic offers the best trade-off between size and power, and recommends its use in applications. It was observed that the inverse logit L^* test concurs with the Z test. Z has a standard normal distribution and L^* has a t distribution with 5N+4 degrees of freedom under the null hypothesis. The low Z and L^* values cast doubt on the null hypothesis. The inverse chi-squared (X^2) P test is applicable when the number of panels is finite. This statistic has a chi-square distribution with 2N degrees of freedom and large values support the rejection of the null hypothesis. On the other hand, Choi (2001) proposes the use of modified inverse chi- squared Pm for large panels and therefore, the large value of Pm casts doubt on the null hypothesis. Choi's simulation results do not however give a specific value of N for which Pm should be preferred to P.

Table 4: Augmented Dickey – Fuller unit-root test for Tobin Q

. xtunitroot fisher TobinQ, dfuller trend lags(1)

Fisher-type unit-root test for TobinQ

Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots	Number of panels = 9
Ha: At least one panel is stationary	Avg. number of periods = 9.56
AR parameter: Panel-specific	Asymptotics: T -> Infinity
Panel means: Included	
Time trend: Included	
Drift term: Not included	ADF regressions: 1 lag

		Statistic	p-value
Inverse chi-squared(18)	P	87.3387	0.0000
Inverse normal	Z	-2.9060	0.0018
Inverse logit t(49)	L*	-6.8575	0.0000
Modified inv. chi-squared	Pm	11.5564	0.0000

Source: Research data (2023)

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Table 5: Augmented Dickey – Fuller unit-root test for Ln EVA

. xtunitroot fisher LnEVA, dfuller trend lags(1)
Fisher-type unit-root test for LnEVA
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots	Number of panels = 9	
Ha: At least one panel is stationary	Avg. number of periods = 9.56	
AR parameter: Panel-specific	Asymptotics: T -> Infinity	
Panel means: Included		
Time trend: Included		
Drift term: Not included	ADF regressions: 1 lag	

	Statistic	p-value
Inverse chi-squared (18) P	31.1776	0.0275
Inverse normal Z	-1.8986	0.0288
Inverse logit t (49) L*	-2.0225	0.0243
Modified inv. chi-squared Pm	2.1963	0.0140

Source: Research data (2023)

Table 6: Phillips – Perron unit-root test for Ln EVA

. xtunitroot fisher TobinQ, pperron trend lags (1)
Fisher-type unit-root test for TobinQ
Based on Phillips-Perron tests

Ho: All panels contain unit roots	Number of panels = 9
Ha: At least one panel is stationary	Avg. number of periods = 9.56
AR parameter: Panel-specific	Asymptotics: T -> Infinity
Panel means: Included	
Time trend: Included	
Newey-West lags: 1 lag	

	Statistic	p-value
Inverse chi-squared (18) P	46.5081	0.0003
Inverse normal Z	-2.3527	0.0093
Inverse logit t (49) L*	-3.2820	0.0010
Modified inv. chi-squared Pm	4.7514	0.0000

Table 7: Phillips – Perron unit-root test for Ln EVA

. xtunitroot fisher LnEVA, pperron trend lags (1)
Fisher-type unit-root test for LnEVA
Based on Phillips-Perron tests

Ho: All panels contain unit roots	Number of panels = 9
Ha: At least one panel is stationary	Avg. number of periods = 9.56
AR parameter: Panel-specific	Asymptotics: T -> Infinity
Panel means: Included	
Time trend: Included	
Newey-West lags: 1 lag	

		Statistic	p-value
Inverse chi-squared (18)	P	52.3147	0.0000
Inverse normal	Z	-3.0195	0.0013
Inverse logit t (49)	L*	-4.0639	0.0001
Modified inv. chi-squared	Pm	5.7191	0.0000

Source: Research data (2023)

4.5 Collinearity Diagnostics

To check for correlations with linear combinations among the independent variables, Variance inflation factor (VIF) and tolerance tests were carried out on each of the variables used to generate the model. Table 8 represents the results with VIF values being less than 10 and tolerance greater than 0.1 suggesting that multicollinearity was not a problem in this study (Guajarati, 2007; Field, 2015).

Table 8: Collinearity diagnostics

Dependent variable: Tobin Q, Ln EVA

Variable	Tolerance	VIF
ATNG	0.853	1.173
EGR	0.943	1.06
EVOL	0.713	1.402

Source: Research data (2023)

4.6 Correlation Matrix

Table 9 shows the correlations between independent and dependent variables. Asset tangibility (ATNG) is positively correlated with the performance measures as shown by a moderate, positive and significant correlation with Tobin Q (r = 0.4331) and a moderate, positive and significant correlation (r = 0.3683) with Ln EVA this finding concurs with Pouraghajan, Malekian, Emamgholipour, Lotfollahpour and Bagheri (2012) in the case of listed firms on Tehran stock exchange who found that asset tangibility ratio significantly and positively influenced ROA and ROE of listed firms. An increase in tangible assets in the firms lead to an improvement in financial performance since the tangible assets significantly determines the ability of an organization to raise funds externally for investment purposes as they strengthen the balance sheet and assure of the reality of going concept of accounting (Almeida & Campbello, 2007). This finding however differs with Ansari and Gowd (2017) studied Indian firms and found that asset tangibility had a negative effect on financial performance since the assets tie financial resources which could have an alternative use. This difference in finding could be due to difference in economic environment and study period.

Table 9: Correlation matrix

pwcorr ATNG TobinQLnEVA,sig

	ATNG	TobinQ	LnEVA
ATNG	1.0000		
TobinQ	0.6331	1.0000	
	0.0022		
LnEVA	0.3683	0.4607	1.0000
	0.0005	0.0763	

Source: Research data (2023)

4.7 Model estimation and hypothesis testing

Tables 10 and 11 below show the results of the two-step system GMM dynamic panel regression models for Tobin Q and EVA respectively as measures of financial performance of manufacturing firms listed on NSE Kenya in the short run.

4.7.1 Model Reliability and Fitness

The dynamic two step system GMM was tested for reliability using the Wald chi2 – statistic. Tables 10 and 11 show that the Wald statistic is significant at the 5% level. The Wald chi2 p-value of 0.0000 < 0.05 leads to rejection of the null hypothesis of zero coefficients and we therefore conclude that all the explanatory variable coefficients are significantly different from zero at the 5% significance level. The model also appears to fit well as the Sargan and Hansen test results for instrument validity are > 0.05 and hence we fail to reject the null that instruments are valid and therefore no evidence of over identifying restrictions. The models also do not suffer from second order serial correlation as shown in table 4.15 and 4.16 by Arellano-Bond AR (2).

The Dynamic nature of the model was captured by incorporating the lagged dependent variables up to lag 1 to avoid losing more degrees of freedom since the study used annual data. This differencing of the once resulted in data loss of an observation for each unit under study and therefore the observations reduced from 86 to 77 observations. The lagged dependent variables of (Tobin Q L1 and LnEVA L1) measure the extent to which past year's performance contributes to the current year's performance of MAFs. The coefficients of the lagged dependent variables are 25.38% (significant at 5%) and 30.30% (significant at 5%) for Tobin Q L1 and LnEVA L1 respectively as shown in table 10 and

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11. The significance of these lagged coefficients indicate existence of persistence in performance of MAFs and this therefore justified the use of a dynamic model.

Table 10: Dynamic panel-data estimation, two-step system GMM: Tobin Q

Dynamic panel-data estimation, two-step system GMM						
Group variable: Firm_ID			Number of obs = 77			
Time variable : Year			Number of groups = 9			
Number of instruments = 9			Obs per group: min = 6			
Wald chi2(6) = 7821.93			avg = 8.56			
Prob> chi2 = 0.000			max = 9			
TobinQ	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
TobinQ						
L1.	.2537811	.0625076	4.06	0.000	.2451604	.8624019
ATNG	.0572843	.0121623	4.71	0.000	.3948779	1.856048
_ cons	.5429004	.2513428	2.16	0.031	.0912827	1.918587
Arellano-Bond test for AR(1) in first differences: z = -1.72 Pr > z = 0.085						
Arellano-Bond test for AR(2) in first differences: z = -0.18 Pr > z = 0.861						
Sargan test of overid. restrictions: chi2(2) = 0.57 Prob> chi2 = 0.750						
Hansen test of overid. restrictions: chi2(2) = 0.99 Prob> chi2 = 0.609						

Source: Research data (2023)

Table 11: Dynamic panel-data estimation, two-step system GMM: LnEVA

Dynamic panel-data estimation, two-step system GMM						
Group variable: Firm_ID			Number of obs = 77			
Time variable : Year			Number of groups = 9			
Number of instruments = 9			Obs per group: min = 6			
Wald chi2(6) = 33052.63			avg = 8.56			
Prob> chi2 = 0.000			max = 9			
LnEVA	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
LnEVA						
L1.	.3027194	.1073473	2.82	0.005	.0636539	.5423842
ATNG	.0427016	.0212446	2.01	0.044	.5402681	1.275384
_cons	.6949332	.1946592	3.57	0.000	.4352974	4.845316
Arellano-Bond test for AR(1) in first differences: z = -2.16 Pr > z = 0.071						
Arellano-Bond test for AR(2) in first differences: z = 0.59 Pr > z = 0.558						
Sargan test of overid. restrictions: chi2(2) = 6.54 Prob> chi2 = 0.058						
Hansen test of overid. restrictions: chi2(2) = 1.39 Prob> chi2 = 0.498						

Source: Research data (2023)

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The models were therefore predicted to;

$$Tobin\ Q\text{it} - 1 = 0.5429 + 0.2538 TobinQit - 1 + 0.0573 ATNG$$

$$LnEVA\text{it} - 1 = 0.6949 + 0.3027 LnEVAit - 1 + 0.0427 ATNG$$

4.7.2 Hypotheses tests

The study hypotheses developed were tested per objective as follows;

4.7.2.1 Asset tangibility and financial performance of Listed Manufacturing firms in Kenya

The third objective of the study was to establish the effect of asset tangibility on performance of listed manufacturing firms in Kenya. The null hypothesis was therefore stated as follows;

> **H_{01}**: Asset tangibility has no significant effect on performance of listed manufacturing firms in Kenya.

The study finding for ATNG variable show a positive relationship with both performance proxies. The regression coefficient of ATNG equals 0.0572843 and 0.0427016 for Tobin Q and EVA respectively. The Z –statistic is positively significant hence the null hypothesis is rejected. This positive effect implies that asset tangibility significantly improves a company's valuation as a financing target. MAFs should therefore invest in more tangible assets for financing operations as they can be securitized as special purpose vehicles to raise their own finances for expansion. The ATNG financing enable the MAFs to qualify for investment deductions against annual profits for taxation and therefore acts as a saving to the firm.

This positive effect result is in agreement with Mule and Mukras (2015) who found that asset tangibility had a positive and significant effect Tobin's Q and concluded that asset tangibility is a significant predictor of firm performance. Firms with more tangible assets are able to secure financing at low cost since they are considered stable and will exist in the long-term period. Therefore, this lowered cost minimizes an outflow of resources hence improving the financial performance.

However, this finding differs with the finding by Kodongo, Mokoteli and Maina (2015) who found that asset tangibility also affects performance negatively. This difference could be due to different study period, variables combination and the nature of the model estimation adopted.

MAFs need to consider project financing to limit exposure to credit risk as the deal is secured by the project's future revenues from production. This will not have adverse effects on performance since the creditor cannot pursue the firm for payment but only the assets and cash flows of the project itself. Further, firms could consider collateralization of assets by creating special purpose vehicles from their asset pools which can raise their own finances and become separate legal personalities. This could guarantee the counterparties of the firm that their obligations will be met even if the main entity which is the Manufacturing firm goes under. This finding further supports Donaldson model about asset conversion after internal financing.

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4.8 Long run models

Table 12 and 13 show the results of the long run coefficients of financing structure variables on Tobin Q and LnEVA respectively.

Table12: Long run model: Tobin Q

TobinQ |	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ATNG |	.0767661	.0329468	2.33	0.020	-1.789139	2.517129

Source: Research data (2023)

Table 13: Long run model: LnEVA

LnEVA |	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ATNG|	.0612401	.0334645	1.83	0.077	-.126983	.6835135

Source: Research data (2023)

4.8.1 Long run effect of Asset tangibility financing on performance of MAFs

The long run coefficients for ATNG are 0.0767661 and 0.0612401 when the dependent variable is Tobin Q and LnEVA respectively. This implies that a percentage increase in ATNG improves Tobin Q by 7.68% and EVA by 6.12% in the long run on average, *ceteris paribus*. The coefficient for ATNG with Tobin Q is significant at the 5% level and hence the null hypothesis is rejected for the long run coefficients as was the case in the short run. The regression weight is however higher in the long run (7.68%) than the short run coefficient (5.73%) run. The coefficient of ATNG with LnEVA was however not significant in the long run and hence we fail to reject the null hypothesis for the long run coefficient. The effect size is however bigger in the long run (6.12%) compared to the short run (4.27%).

4.9 White test for Heteroscedasticity

Table 14 shows the results of White test for heteroskedasticity. The White's test gave the same p-value to the Cameron & Trivedi heteroskedasticity test. Using a significance p-value of 0.05, the regression model does not violate the homoscedasticity assumption and therefore, the null hypothesis that the errors are homoscedastic was not rejected and hence heteroskedasticity was not a problem in this study. The same applies to the skewness and kurtosis assumptions whose p values are also well above the 0.05 significance level.

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Table 14: White test for heteroscedasticity

```
. estat imtest, white
White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity
         chi2(20)     =     18.24
         Prob > chi2  =    0.5719
Cameron & Trivedi's decomposition of IM-test
              Source |     chi2    df      p
  Heteroskedasticity |    18.24    20    0.5719
            Skewness |     8.69     5    0.1220
            Kurtosis |     1.60     1    0.2063
               Total |    28.53    26    0.3331
```

Source: Research data (2023)

4.10 Effect of the Moderating variables

The study used two moderating variables; economic growth rate and earnings volatility. Earnings volatility was used to measure risk and cost of financial distress while economic growth rate measured macroeconomic performance. The moderating variables were implied from the trade – off model. The two-step system GMM model was estimated and presented in table 15 and 16.

The EGR which show macroeconomic growth shows a positive and significant effect on both Tobin Q and LnEVA having regression weights of .1582140 and .2052327 respectively. This shows that economic growth rate has a significant positive influence on performance of the manufacturing sector in Kenya. The average economic growth was 0.0584 (5.84%) through the study period as measured by real GDP growth rate. This positive economic outlook created an appropriate environment for investment and consumption which enabled manufacturing to thrive. This further supports the finding by (Ngugi, 2008) that GDP growth rate has a positive impact on leverage which is a trajectory of investor confidence in a growing economy to stimulate demand hence the possibility upside profits.

EVOL which was used to measure risk and cost of financial distress showed a negative but not significant effect on Tobin Q while having a negative and significant effect on LnEVA. The EVOL had a standard deviation of 0.0761 showing a small variability in earnings which affects performance negatively. EVOL averaged 0.0754 through the study period for the MFAs and this exposes the firms to agency cost of borrowing which curtails their performance. This finding further affirms the finding of Fama & French (2002) who identified a direct relationship consistent with the agency cost of debt, resulting in risky firms borrowing more. This negative effect further supports the argument that earnings volatility has a positive and significant effect on leverage which in turn curtails performance (Saif-Alyousfi, Md-Rus, Taufil-Mohd, Taib, & Shadar, 2020). The moderator variables improved the effects of ATNG on Tobin Q and LnEVA. This improvement could be attributed to the positive effect of EGR which neutralises the negative effect of EVOL to some extent through reduced capital costs in a growing economy.

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Table 15: Dynamic panel-data estimation, two-step system GMM: Tobin Q with moderator variables

Dynamic panel-data estimation, two-step system GMM						
Group variable: Firm_ID			Number of obs = 77			
Time variable : Year			Number of groups = 9			
Number of instruments = 11			Obs per group: min = 6			
Wald chi2(8) = 5676.33			avg = 8.56			
Prob> chi2 = 0.000			max = 9			
TobinQ	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
TobinQ							
L1.	.2173323	.0620950	3.50	0.001	.1832243	.8514403
ATNG	.0734261	.0219839	3.34	0.000	-2.948885	4.005571
EGR	.1582140	.0577423	2.74	0.006	.4616602	1.038149
EVOL	-.0605143	.0364544	-1.66	0.097	-3.874636	.5936071
_ cons	.6179752	.3185429	1.94	0.052	-.6755146	1.619465
Arellano-Bond test for AR(1) in first differences: z = -0.43 Pr > z = 0.664						
Arellano-Bond test for AR(2) in first differences: z = 0.06 Pr > z = 0.951						
Sargan test of overid. restrictions: chi2(2) = 0.89 Prob> chi2 = 0.642						
Hansen test of overid. restrictions: chi2(2) = 1.12 Prob> chi2 = 0.571						

Source: Research data (2023)

Table 16: Dynamic panel-data estimation, two-step system GMM: LnEVA with moderator variables

Dynamic panel-data estimation, two-step system GMM						
Group variable: Firm_ID			Number of obs = 77			
Time variable : Year			Number of groups = 9			
Number of instruments = 11			Obs per group: min = 6			
Wald chi2(8) = 1135.32			avg = 8.56			
Prob> chi2 = 0.000			max = 9			
LnEVA	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
LnEVA						
L1.	.2377314	.0729237	3.26	0.001	.7475293	4.127934
ATNG	.0862353	.0284605	3.03	0.003	1.130962	6.420493
EGR	.2052327	.0430257	4.77	0.000	.3929039	2.38825
EVOL	-.1827439	.0048862	-3.74	0.000	-1.129942	4.65339
_ cons	.6583926	.3275585	2.01	0.044	.3931527	3.653804
Arellano-Bond test for AR(1) in first differences: z = -1.53 Pr > z = 0.106						
Arellano-Bond test for AR(2) in first differences: z = -0.43 Pr > z = 0.581						
Sargan test of overid. restrictions: chi2(2) = 2.13 Prob> chi2 = 0.394						
Hansen test of overid. restrictions: chi2(2) = 0.46 Prob> chi2 = 0.796						

Source: Research data (2023)

The moderated models were estimated as follows;

$Tobin\ Q = 0.6180 + 0.2173 TobinQit - 1 + 0.0734 ATNG + 0.1582 EGR - 0.0605\ EVOL$ $LnEVA = 0.6583 + 0.2377 LnEVAit - 1 + 0.0862 ATNG + 0.2052 EGR - 0.1827 EVOL$ **4.11 Long run effect of the moderating variables on performance of MAFs**

Table 17 and 18 show the results of the long run coefficients of the moderating variables on Tobin Q and LnEVA respectively.

Table 17: Long run Model: Tobin Q with moderating variables

TobinQ |	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
EGR |	.2021471	.0437548	4.62	0.000	1.602135	3.715872
EVOL |	-.0773180	.0525973	-1.47	0.142	-.822649	1.542374

Source: Research data (2023)

Table 18: Long run Model: LnEVA with moderating variables

LnEVA |	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
EGR |	.2692394	.0658287	4.09	0.000	-.537174	2.131476
EVOL |	-.2397369	.1192721	-2.01	0.009	-1.860992	1.168002

Source: Research data (2023)

For the long run model, the hypothesis of economic growth rate and earnings volatility was tested as follows;

Long run moderating effect of EGR on Tobin Q and EVA (0.2021471 and 0.2692394 respectively).

A percentage increase in growth rate is associated with 20.21 % and 26.92% improvement in Tobin Q and EVA in the long run on average, *ceteris paribus*. These coefficients are significant at the 5% level and the Z –statistic > 1.96 (critical value). EGR therefore has a positive and significant moderating effect on performance of MAFs both in the short run and in the long run. However, it has a larger positive effect in the long run than in the short run. The coefficients are significant hence the null hypothesis is rejected.

Long run effect of EVOL on Tobin Q and EVA (- 0.0773180 and -0.2397369 respectively).

A percentage increase in EVOL is associated with 7.73% and 23.94 % decrease in Tobin Q and EVA in the long run on average, *ceteris paribus*. The coefficient with Tobin Q is however not significant at the 5% level and the Z –statistic < 1.96 (critical value), hence the null hypothesis was not rejected in the long run. The coefficient with LnEVA is however significant and hence the null hypothesis is rejected for the long run coefficient as was the case for the short run coefficients. The study therefore concluded that EVOL has a negative and significant effect on LnEVA of MAFs both in the short run and in the long run.

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5.0 Conclusion

The study found that asset tangibility (ATNG) had a statistically significant and positive effect on performance of MAFs. The ATNG financing enable the MAFs to qualify for investment deductions against annual profits for taxation and therefore acts as a saving to the firm. ATNG enable firms create an asset pool that can work as a special purpose vehicle for financing which can achieve a favorable credit enhancement. The special purpose vehicle can issue various notes which are backed by the asset pool for financing. The study therefore concluded that ATNG financing creates significant wealth and value for firms.

6.0 Recommendations

The study recommends that the National Treasury needs to formulate an incentive driven policy targeting the manufacturing sector due to its critical role in Economic development as can be seen from the industrialized economies. Moreover, MAFs need to consider project financing to limit exposure to credit risk as the deal is secured by the project's future revenues from production. This will not have adverse effects on performance since the creditor cannot pursue the firm for payment but only the assets and cash flows of the project itself.

7.0 Suggestions for Further study

For purpose of future studies, this study can be varied to consider a balanced panel analysis to consider equal weighting of the study units. Other panel data econometric techniques could be applied to confirm if the effect changes, a different sector as well as inclusion of other moderating variables.

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