

The moderating role of macroeconomic factors in the relationship between asset structure and firm value: A case study of the Nairobi Securities Exchange in Kenya

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Abstract

Purpose – The study aims to explore how macroeconomic variables moderate the relationship between asset structure and firm value among firms listed on the Nairobi Securities Exchange (NSE) in Kenya.

Theoretical framework – The study contributes to the existing knowledge on asset structure and firm value by introducing macroeconomic factors as moderators of firm valuation models.

Design/methodology/approach – A causal-comparative research design was employed, and secondary data were collected from 51 firms listed on the NSE between 2010 and 2019. The hypotheses of the study were tested using panel data regression and multiple linear regression methods. The normality, heteroscedasticity, multicollinearity and linearity of the results were tested to verify their robustness.

Findings – Asset structure significantly impacts firm value. Moreover, macroeconomic factors play a significant role in moderating the relationship between asset structure and firm value. This indicates that changes in the macroeconomic environment impact the relationship between asset structure and firm value.

Practical & social implications of research – The results can be used by investors, managers and policymakers because they highlight the importance of considering macroeconomic conditions when making decisions about asset allocation, investment strategies and financial policy in emerging markets.

Originality/value – The research contributes to the existing body of knowledge on emerging markets by depicting how macroeconomic variables soften the interrelation between asset structure and firm value. It provides a reputable empirical basis for future studies on firm-level financial choices in varying macroeconomic settings.

Keywords: Asset structure, firm value, macroeconomic factors, Nairobi Securities Exchange, emerging markets.

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1 Introduction

Firm valuation is a key issue for investors, managers, and policymakers, as it summarises market expectations regarding future profitability, growth opportunities, and risk. Among the firm-specific determinants, the asset structure comprising property, plant, and equipment (PPE), financial assets, and current assets plays a dominant role in influencing firm value, as it determines liquidity, collateral capacity, operational efficiency, and the ability to finance. However, the effectiveness of asset allocation is not independent, but is greatly influenced by current macroeconomic factors such as inflation, interest rates, exchange rates and economic growth (Baker et al., 2020).

While previous empirical research has reported that asset structure influences firm performance and that macroeconomic factors do not have a mutual impact (Issah & Antwi, 2017; Egbunike & Okerekeoti, 2018), the current literature is deficient in two major respects. First, most research examines the independent effect of macroeconomic variables or the direct impact of asset structure on company value, without considering their interconnections or moderating effects. Second, there is limited empirical evidence on new developing capital markets, especially in Africa, even though such economies are characterised by increased macroeconomic volatility (Segodi & Sibindi, 2022). Moreover, much of the research assumes that asset structure and macroeconomic conditions are distinct factors affecting firm value and that macroeconomic volatility could dampen the impact of asset allocation decisions. While recent studies have highlighted the need to consider the impact of firm-specific factors within a wider macroeconomic context (Chen, 2010; Al-Malkawi et al., 2014), there is limited empirical evidence on capital markets in Africa. This study addresses these issues by combining asset structure and the macroeconomic environment within a single framework. It also examines the direct effects of these factors and analyses the moderating influence of macroeconomic volatility on firm valuation (Ibrahimov et al., 2025).

This research makes three unique and novel contributions. First, it provides comprehensive empirical data for the first time on the moderating role of macroeconomic conditions in the relationship between asset structure and firm value for firms listed on the Nairobi Securities Exchange (NSE). This broadens asset structure and valuation studies beyond developed markets. Second, the

research deepens agency theory by showing that the value implications of asset allocation decisions are contingent on external macroeconomic conditions. This implies that agency costs and benefits associated with asset positions differ under different inflationary, interest rate, growth and exchange rate regimes (Moreira & Savov, 2017). Building on the use of agency theory, the research places the decision-making process for asset allocation in a more comprehensive macroeconomic context than that of the firm. It reveals that agency costs and benefits are affected by inflation, interest rates, growth and exchange rates.

Third, the study clearly discusses the issue of endogeneity with respect to reverse causality and firm heterogeneity, which were not observed by utilising dynamic panel generalised method of moments (GMM) and two-stage least squares (2SLS) as robustness checks.

The study employs panel data from 51 companies listed on the NSE between 2010 and 2019 to model the effects of the interaction between asset structure components and important macroeconomic variables. The results provide managers, investors, and policymakers with useful information on how the strategic management of assets can increase firm value in different macroeconomic environments in an emerging economy.

In an international context, the valuation of firms and asset allocation are key components of the financial economy due to their impact on investment efficiency, financial markets, and economic development. Firms currently operate in a constantly changing macroeconomic environment characterised by inflation, fluctuating interest rates, exchange rates and uncertainty regarding economic growth. Therefore, it is crucial to elucidate the importance of asset structure in relation to the macroeconomic environment. Systematic research is therefore fundamental, especially in the context of the developed world.

This study is particularly significant in emerging and developing economies, where the shallow capital base, stringent financial environment and macroeconomic conditions mean that asset structure plays a strategically significant role in liquidity, risk and financial flexibility, directly affecting firm valuation (Segodi & Sibindi, 2022).

In Kenya, the NSE is a key platform for corporate funding and investment. The importance of the macroeconomic environment in the Kenyan economy is illustrated by substantial volatility in macroeconomic variables such as inflation, interest rates, exchange rates, and economic growth. These factors significantly impact

corporate balance sheets and the valuation of firms in Kenya. However, the literature on the impact of asset structure on firm valuation in Kenya is limited, particularly with regard to the impact of different macroeconomic environments on the NSE (Wanjiru & Waweru, 2025).

From a sectoral perspective, companies traded on the NSE are highly sensitive to changes in the macroeconomy as their valuations are constantly influenced by market expectations. Consequently, the composition of assets affects not only how efficiently companies operate, but also how they are valued in different economic climates. The securities exchange environment is therefore exceptionally favourable for examining these interrelationships.

The rationale for the present investigation is both practical and theoretical. From a practical standpoint, the results could guide managers and investors in aligning asset allocation strategies with the macroeconomic environment, potentially enhancing firm value. From a theoretical standpoint, the investigation contributes to the broader context of valuation and agency theory, demonstrating that the value impact of asset structures depends on the macroeconomic environment and providing localised results for a developing capital market (Baker et al., 2020). The literature review and the theoretical background are provided in Section 2. Section 3 describes the data, variables and methodology. The empirical findings and the robustness checks are presented in Section 4. Section 5 covers the implications for theory and practice, while Section 6 contains the conclusion and recommendations/directions for future research.

2 Literature review and theoretical background

2.1 Agency theory and asset structure

According to the agency theory by Jensen and Meckling (1976), the divergence in ownership and control creates conflicts where managers will act to advance the interests of parties other than the owners, whose interests are aligned with those of the managers. Agency problems are particularly susceptible to decisions regarding the allocation of assets; tendencies towards non-productive fixed-asset investment, surplus liquidity or the retention of financial assets for personal gain will destroy firm value.

Agency costs can be mitigated by designing well-managed portfolios of assets, as this reduces managerial

discretion and increases monitoring efficiency. Physical property, plant and equipment (PPE) act as collateral in a sense, reducing the cost of loans and disciplining manager behaviour. Conversely, an over-concentration of current or financial resources will create a free cash flow issue if they are not utilised efficiently. In addition, macroeconomic conditions significantly moderate the level of such agency effects. For example, inflation or high interest rates might increase inefficiencies in asset utilisation, but strong economic growth can mitigate them.

This paper uses agency theory to argue that the relevance of asset structure depends on macroeconomic conditions and is case-specific.

2.2 Asset structure, macroeconomic conditions and firm value

Empirical evidence from the literature suggests the existence of a relationship between macroeconomic variables and firm value. Egbunike and Okerekeoti (2018) observed that macroeconomic variables such as inflation and GDP growth have an extremely significant impact on firm performance in Nigeria. However, the research has focused mainly on the accounting-based approach rather than the market-based approach. Mohd and Siddiqui (2020) examined the relationship between macroeconomic variables and firms' financial performance in the context of Pakistan.

The literature emerging in the context of developing and Asian economies has observed the significance of conditional effects. Alfadli and Rjoub (2020) found that macroeconomic variables impact the performance of banks in Gulf Cooperation Council countries. Ullah et al. (2020) observe the impact of the asset turnover ratio and capital structure on firms' performance. However, the extent of this impact depends on the context.

Governance-based research also sheds light on the fact that firms' results depend on the interaction between internal decision-making processes and environmental factors. As Saleh (2024) demonstrates, the activities of the audit committee influence earnings management. Foreign ownership mediates this relationship. Similarly, Saleh et al. (2025) demonstrate that gender diversity affects corporate risk by considering environmental, social, and governance factors. Mansour et al. (2024) provide evidence from Asian companies showing that leadership traits affect innovation outcomes. Taken together, these studies prove that mechanisms of interaction rather than individual factors affect firm value.

Despite recent changes, less empirical research has been conducted on the moderating effect of macroeconomic factors on the correlation between asset structure and firm value, especially in the African market. The current research aims to fill this gap.

Overall, empirical research appears to assume that firm characteristics and the macroeconomic environment significantly impact firms. Studies conducted in developed, emerging and even frontier economies suggest that macro-environmental factors such as inflation, interest rates, exchange rates and GDP growth rates influence the relationship between firms' performance/risk profiles and financing terms (Ibrahimov et al., 2025). Similarly, asset structure variables such as assets, liquidity, and asset utilisation are recognised as vital factors in operational efficiency.

Despite this general consensus, however, there are significant inconsistencies in the literature regarding the magnitude and direction of these effects. Some studies find that high levels of investment in tangible assets support firm performance and value by increasing collateral capacity and accessibility to external financing. In contrast, other studies identify smaller or even negative impacts, especially in macroeconomic environments subject to high inflation, exchange-rate volatility or underdeveloped financial systems. Similarly, evidence shows that the effects of macroeconomic variables differ across countries, sectors and periods, thus demonstrating that corporate outcomes are heavily context-dependent (Nguyen et al., 2021).

A major limitation of existing empirical studies is that they examine only the direct and independent effects. Most research focuses on either the role of asset structure in firm performance or the independent effect of macroeconomic conditions. Of course, this assumes stable, additive relationships. However, in recent years, governance and institutional studies have increasingly shown that firm outcomes are affected by the interaction between internal firm decisions and external economic environments. These results contradict the idea of uniform effects and highlight the importance of conditional relationships (Filatotchev & Nakajima, 2014).

Nevertheless, the literature on empirical studies that directly examine the moderating role of macroeconomic conditions on the asset structure–firm value relationship is lacking. Methodological limitations further contribute to this gap, as much of the available literature is dominated

by accounting-based performance measurement methods and fixed-estimation methods. These methods pay little attention to market-based valuation metrics and issues of endogeneity, including reverse causality and unobserved heterogeneity.

Another relevant research gap is the lack of empirical data on African capital markets. Due to the high level of macroeconomic volatility, financing issues, and institutional malfunctions that are typical of these markets, findings from developed and other emerging economies may not be applicable to the African market (Sibindi & Makina, 2018). An empirical framework is needed that clearly introduces the effect of macroeconomic moderation and utilises sound estimation methodology in order to address these inconsistencies and contextual gaps.

This study directly addresses these gaps by modelling the moderating effect of macroeconomic conditions on the relationship between asset structure and firm value using a market-based valuation measure and a more dynamic panel approach. Figure 1 shows the conceptual framework, which presents the hypothesised relationships among the study variables to enhance the reader's understanding.

3 Hypotheses development

3.1 Hypotheses development

The following hypotheses were developed:

1. PPE does not affect the value of firms listed on the NSE.
2. Current assets do not affect the value of firms listed on the NSE.
3. Financial assets do not affect the value of firms listed on the NSE.
4. Interest rates have no moderating effect on the relationship between asset structure and the value of firms listed on the NSE.
5. Economic growth rates have no moderating effect on the relationship between asset structure and the value of firms listed on the NSE.

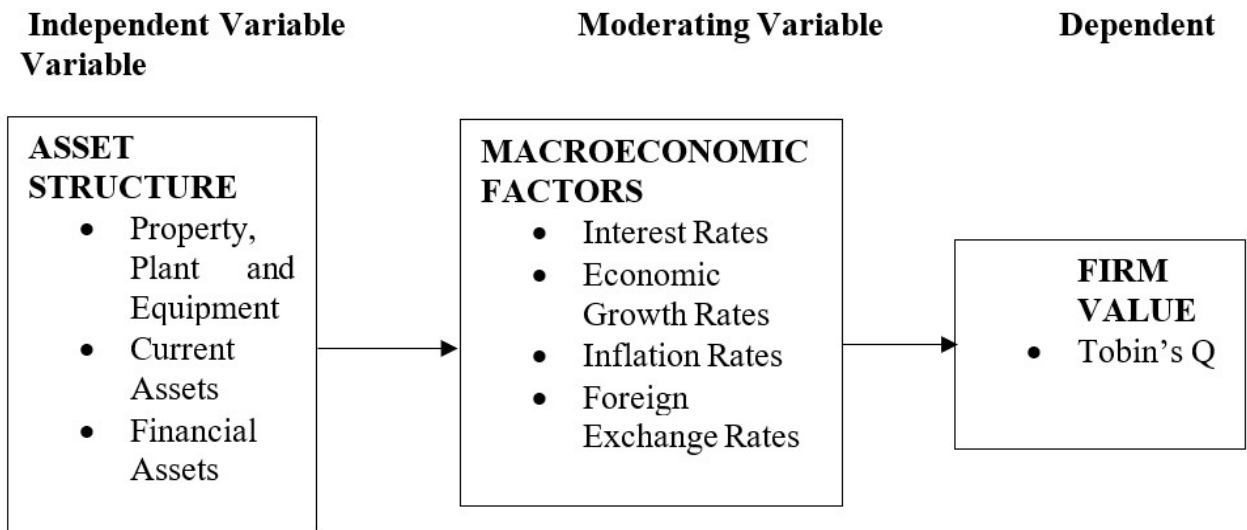


Figure 1. Conceptual framework

6. Inflation rates have no moderating effect on the relationship between asset structure and the value of firms listed on the NSE.
7. Exchange rates have no moderating effect on the relationship between asset structure and the value of firms listed on the NSE.

information necessary to examine the interaction between asset structure, the macroeconomic environment, and firm valuation.

4.2 Definition of variables

The key variables have been defined as follows in the context of this study (Table 1).

4.3 Research design and measurement of variables

A causal-comparative research design was adopted, using secondary panel data from 51 firms listed on the NSE between 2010 and 2019 (Baba, 2013). Asset structure was measured as PPE to total assets (Jin et al., 2022), while financial assets were measured as financial assets to total assets (Seretidou et al., 2025). Current assets were measured as current assets to total assets (Karim et al., 2023), while inflation rates were measured as the average yearly inflation rate (Ha et al., 2023). The average GDP growth rate (Riley, 2025) was used as an indicator of economic growth. Interest rates were measured as the average annual interest rate (Benigno et al., 2024), and foreign exchange rates were measured as the average annual KSh/US dollar exchange rate (Davis & Zlate, 2025). Firm value was calculated by dividing the market value of the firm by its book value (Gurung, 2026). Table 2 shows the measurements of the research variables.

4 Methodology

4.1 Data and sources of data

Ordinary least-squares (OLS) regression was suitable for analysing all the statistical tests performed in Stata using the generalized method of moments (GMM) and robustness checks with two-stage least squares (2SLS) analysis (Supplementary Data 3 – Stata Script). Pandas was used to process and structure the data at the firm and macroeconomic levels accurately and efficiently. This study relies on secondary data drawn from the audited financial statements of 51 firms listed on the NSE, complemented by macroeconomic indicators obtained from the Central Bank database. The dataset covers the period from 2010 to 2019, enabling analysis across different phases of economic volatility. Firms were selected based on continuous listing during the study period and the availability of complete audited financial records (Supplementary Data 1 – Dataset; Supplementary Data 2 – Codebook). These sources provide the consistent, reliable, and comparable

Table 1
Operationalisation and measurement of research variables

Asset Structure	The proportion of various types of assets that a firm holds, as indicated in its statement of financial position, is used to secure debts.
Firm Value	The market value of a firm relative to its book value.
Macroeconomic Factors	These are broad economic variables and indicators that influence the overall performance of an economy on a national or global scale.

Table 2
Operationalisation and measurement of research variables

Variable	Indicator	Measurement
Asset Structure	PPE	PPE/Total assets
	Financial assets	Financial assets/Total assets
	Current assets	Current assets/Total assets
Macroeconomic Factors	Inflation	Average annual inflation rate
	Economic growth	Average GDP growth rate
	Interest rates	Average annual interest rate
	Foreign exchange rates	Average annual KSh/US dollar exchange rate
Firm Value	Tobin's Q	Market value of the firm/Book value of the firm

Source: Authors.

4.4 Model specification

Tables 3 and 4 present the dynamic GMM regression outputs. The positive and statistically significant regression coefficient on the lagged firm value ($\beta = 0.422$, $p = 0.000$) indicates that entity value persists over time. These results prove that the present firm value is partly determined by the previous realisations, thus supporting the application of dynamic specification.

The direct coefficients relating to the asset structure elements, including PPE ($\beta = 0.283$, $p = 0.015$), financial assets ($\beta = 0.196$, $p = 0.032$) and current assets ($\beta = 0.163$, $p = 0.025$), are all negative and statistically significant. This suggests that asset holdings alone can negatively impact firm value. However, the interaction terms between asset structure and macroeconomic variables are all positive and significant. Notably, there is a positive and significant correlation between PPE and inflation ($\beta = 0.311$, $p = 0.000$), financial assets and inflation ($\beta = 0.297$, $p = 0.000$), and current assets and inflation ($\beta = 0.286$, $p = 0.000$). Similarly, the correlations between PPE and economic growth ($\beta = 0.327$, $p = 0.000$), financial assets and economic growth ($\beta = 0.333$, $p = 0.000$) and current assets and economic growth ($\beta = 0.318$, $p = 0.000$) are strong and positive. Furthermore, the interaction terms between PPE and the interest rate ($\beta = 0.342$, $p = 0.000$),

financial assets and the interest rate ($\beta = 0.328$, $p = 0.000$) and current assets and the interest rate ($\beta = 0.316$, $p = 0.000$) are all positive and statistically significant. Exchange-rate interactions follow the same trend: PPE and the exchange rate ($\beta = 0.306$, $p = 0.000$), financial assets and the exchange rate ($\beta = 0.317$, $p = 0.000$) and current assets and the exchange rate ($\beta = 0.332$, $p = 0.000$).

This suggests that the interaction between asset structure and firm value is influenced by macroeconomic conditions. This reduces the negative impact of asset holdings when firms adjust their portfolios in response to inflation, economic growth, interest rates and exchange rates.

The diagnostic results support the validity of the dynamic GMM estimates and diagnosis. The Arellano-Bond test can be used to verify the absence of the second-order serial correlation ($AR(2) = 0.88$, $p = 0.383$). Conversely, the Hansen J-test confirms the exogeneity of the instruments (J-statistic = 21.42, $p = 0.282$). Furthermore, the number of instruments (28) is smaller than the cross-sectional sample size (51 firms), thus preventing the proliferation of the instruments.

Overall, the empirical findings of the dynamic GMM model coincide with the base and interaction specifications, indicating that the specified associations cannot be attributed to endogeneity bias. Accordingly, the

Table 3
Generalised method of moments regression results

Variable	Coefficient	Std. Error	z-Statistic	p-Value
Firm Value (t-1)	0.422	0.062	6.79	0.000
PPE	-0.283	0.118	-2.41	0.015
Financial Assets	-0.196	0.091	-2.16	0.032
Current Assets	-0.163	0.074	-2.22	0.025
Inflation Rate	-0.083	0.057	-1.46	0.144
PPE * Inflation	0.311	0.061	5.11	0.000
Financial Assets * Inflation	0.297	0.058	5.14	0.000
Current Assets * Inflation	0.286	0.054	5.31	0.000
Economic Growth	-0.069	0.052	-1.33	0.184
PPE * Economic Growth	0.327	0.064	5.09	0.000
Financial Assets * Economic Growth	0.333	0.061	5.48	0.000
Current Assets * Economic Growth	0.318	0.059	5.41	0.000
Interest Rate	-0.091	0.066	-1.38	0.168
PPE * Interest Rate	0.342	0.067	5.09	0.000
Financial Assets * Interest Rate	0.328	0.064	5.14	0.000
Current Assets * Interest Rate	0.316	0.061	5.20	0.000
Exchange Rate	-0.074	0.059	-1.25	0.211
PPE * Exchange Rate	0.306	0.060	5.08	0.000
Financial Assets * Exchange Rate	0.317	0.062	5.13	0.000
Current Assets * Exchange Rate	0.332	0.063	5.26	0.000

*Denotes an interaction term.

Source: Authors.

Table 4
Diagnostic tests (model validity)

Test	Statistic	p-Value	Interpretation
AR (1)	-2.61	0.009	Expected
AR (2)	-0.88	0.383	No second-order autocorrelation
Hansen J-test	21.42	0.282	Instruments valid
Number of Instruments	28		< number of firms
Firms	51		
Observations	510		

Source: Authors.

results provide robust evidence that asset structure has a conditional impact on firm value and that macroeconomic variables play a significant moderating role in the case of NSE-listed firms.

4.5 Analytical techniques and justifications: endogeneity and econometrics

One of the most significant methodological issues is endogeneity, which is caused by reverse causality (i.e. high-value firms can obtain more assets) and unobservable firm-specific heterogeneity. The endogeneity of the asset structure–firm value relationship can occur through

different channels. First, reverse causality occurs where more valuable firms are better able to accumulate assets. Second, omitted variable bias arises from unobserved management quality or firm strategy. Third, there is dynamic persistence, whereby past realisations determine the value of a firm. These issues are considered using a dynamic GMM model involving lagged dependent variables and internal instrumentation. Endogeneity can occur in three primary ways: reverse causality, omitted variable bias due to unobserved managerial quality or firm strategy, and dynamic persistence of firm value. The dynamic panel model directly attributes these channels through the use of lagged dependent variables and

internal instrumentation. Although fixed-effects estimates can adjust for time-invariant heterogeneity, they fail to capture reverse causality and dynamic feedback between the asset structure and the value of a firm. In this instance, a dynamic GMM estimator would be a more suitable model for causal inference.

To address this issue, the research used a panel dynamic GMM estimator (Arellano & Bond, 1991).

While fixed-effects estimates can adjust for time-invariant heterogeneity, they fail to capture reverse causality and dynamic feedback between asset structure and firm value. In this instance, a dynamic GMM estimator would provide a more accurate causal inference. Internal instruments were expressed in terms of lagged asset structure variables, and it was assumed that previous asset allocation choices would influence current firm value without being correlated with current error terms. Lagged asset structure variables were used as a set of relevant instruments since asset allocation decisions are persistent over time, meaning they are highly correlated with the current asset structure. Concurrently, when previous asset allocation decisions are assumed to affect current firm value only through the current asset structure, these lagged variables are realistically exogenous to current valuation shocks. The instrument matrix was collapsed to prevent the proliferation and overfitting of instruments by restricting lag depth, as described by Roodman (2009)

Another robustness test involved 2SLS estimation using lagged asset structure variables as instruments. The GMM and 2SLS results were consistent with the baseline estimates, indicating that the results were not obtained due to endogeneity bias. The similarity in the signs and significance values of the coefficients in the baseline fixed-effects, 2SLS, and dynamic GMM estimations indicates that the results are not due to endogeneity bias, therefore enhancing their causal nature.

5 Empirical results

Table 5 shows that the mean value of firms is 0.463, the standard deviation is 0.338, the maximum value is 1.309, and the minimum value is 0.100. The findings show that the value of some firms increased by up to 1.39 times their book value. This implies that the market value of these firms (i.e. the value at which they are traded on the stock exchange) is approximately 46.34% of their book value. In other words, the market value of these firms is significantly lower than their recorded book value. This can have several implications. A market-to-book ratio below 1 indicates that investors value the firms lower than their books suggest. This could cause investors to view the firm negatively.

Table 6 shows a mean value of 0.22 for PPE. The maximum, minimum and standard deviation are 0.727, 0.13 and 0.12 respectively. The findings show that the mean ratio of PPE to total assets is 0.22, with a maximum of 0.727 and a minimum of 0.13. This mean value demonstrates that, on average, 22% of total assets will be devoted to PPE. Corporations with a lower PPE-to-total-assets ratio may be more diversified or focused on less demanding asset operations. This may mean that such businesses depend more on factors such as technology, intellectual property, or services, and are therefore more flexible and able to adapt to changing markets. The results give financial assets a mean value of 0.37, with a maximum of 0.408, a minimum of 0.007, and a standard deviation of 0.06. The results suggest that the fraction of financial assets to total assets ranges from 0.007 to 0.40, with a mean of 0.37.

The mean value of 0.37 for financial assets as a percentage of total assets suggests that, on average, about 37% of total company assets are invested in financial assets. However, these implications may differ depending on the specific industry being considered. For instance, financial institutions such as banks are expected to have a larger financial asset base than manufacturing companies.

Table 5
Descriptive results for firm value

Variable		Mean	Std. Dev.	Min	Max	Obs
Firm Value	Overall	.463	.338	.100	1.390	N = 510
	Between		.334	.106	1.315	n = 51
	Within		.071	.252	.744	T = 10

Source: Authors.

Table 6
Descriptive results for asset structure

Variable		Mean	Std. Dev.	Min	Max	Observations
PPE	Overall	.22	.123	.133	.727	N = 510
	Between		.120	.1483	.558	n = 51
	Within		.031	-.000	.403	T = 10
Financial Assets	Overall	.37	.061	.007	.408	N = 510
	Between		.055	.157	.399	n = 51
	Within		.027	.192	.599	T = 10
Current Assets	Overall	.40	.088	.128	.466	N = 510
	Between		.087	.143	.451	n = 51
	Within		.018	.219	.596	T = 10

Source: Authors.

The current assets reported have a mean value of 0.40, a maximum of 0.466, a minimum of 0.128 and standard deviation, of 0.088. Therefore, the current assets to total assets ratio is 0.40, falling within the range [0.128, 0.466]. Furthermore, the mean non-fixed assets ratio of 0.40 implies that, on average, 40% of total company assets are invested in current assets. A higher current assets-to-total assets ratio indicates a higher liquidity position, enabling companies to meet short-term obligations, capitalise on new business opportunities or cover unforeseen expenses, particularly for those with a large base of liquid current assets. Conversely, a low current assets ratio can indicate a possibility of a lack of cash flow and the inability to pay short-term liabilities.

Table 7 shows an average inflation rate of 5.91%, ranging from a high of 9.4% to a low of 1.4%, with a standard deviation of 2.2%. This implies that the average price of goods and services increased by 5.91% over the period in question. The table also shows that the average economic growth was 5.86%, ranging from a high of 8.4 to a low of 4.6. Thus, it appears that the economy grew at an average rate of 5.86% during this period, with the highest growth rate being 8.4%. This performance can be attributed to government measures or other factors that fuelled economic activity and ensured an environment conducive to investment.

The mean interest rate was 8.314%, the maximum was 9.81%, the minimum was 7.17% and the standard deviation was 0.704%. These figures indicate that the interest rates in the dataset are between 7.17% and 9.81%, with 7.17% representing the minimum possible interest rate (although some rates in the dataset can approach the upper limit of 9.81%). Lastly, the mean foreign exchange rate was 100.74, with a maximum of 103.23, a minimum

of 90.6 and a standard deviation of 3.53. On average, one unit of the domestic currency could be exchanged for approximately 100.74 units of the foreign currency. The maximum exchange rate suggests that the domestic currency was stronger than the foreign currency, while the minimum exchange rate shows that the domestic currency weakened.

Table 8 shows an overall probability of 0.002, which is less than the commonly used level of 0.05. This indicates that the model as a whole is suitable for estimation. The coefficient of -4.21 indicates a decline in firm value in the absence of asset structure. The regression coefficient for PPE equals 2.10 at a probability value of less than 0.05. This suggests that adjusting other variables to zero increases firm value by 2.1 units, with one unit of this increase being attributable to the PPE variable. When regressed at a p-value of less than 0.05, financial assets yield a value of 0.28. This suggests that adjusting the other variables to zero would result in a rise in firm value of 0.28 units for each unit increase in financial assets. Holding the other variables constant, augmenting a unit's current assets increases firm value by 1.88.

Moreover, the coefficient of firm size is positive and statistically significant. At 0.287, it suggests that larger firms are more likely to have a higher firm value. Leverage is also positively and significantly related to firm value ($b = 0.326$, $p < 0.05$), indicating that leverage is associated with increased firm value. Conversely, the negative and significant coefficient of firm age (-0.005) suggests that it could reduce firm value slightly. In summary, the findings show that the value of a firm is critical to its asset structure elements and chosen characteristics.

Table 9 presents the regression results examining how different types of assets influence firm value. The

Table 7
Descriptive results for the moderating variables

Variable	Mean	Std. Dev.	Min	Max	Obs
Inflation Rate	5.91	2.204	1.4	9.4	N = 10
Economic Growth	5.86	.984	4.6	8.4	N = 10
Interest Rate	8.31	.704	7.17	9.81	N = 10
Foreign Exchange Rate	100.74	3.530	90.6	103.23	N = 10

Source: Authors.

Table 8
Regression results of asset structure and firm value

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept (C)	-4.216	0.594	-7.087	0.000
PPE	2.103	0.433	4.849	0.000
Financial Assets	0.283	0.049	5.707	0.000
Current Assets	1.878	0.621	3.023	0.002
Firm Size	0.287	0.077	3.717	0.002
Leverage	0.326	0.021	15.542	0.000
Firm Age	-0.005	0.001	-4.039	0.001
P-Value	0.002			

Source: Authors.

Table 9
Regression results for the relationship between asset structure and firm value

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept (C)	-4.204	0.840	-4.815	0.001
PPE	0.811	0.289	2.806	0.009
Financial Assets	0.552	0.245	2.253	0.001
Current Assets	0.068	0.015	4.533	0.000
R-Squared	0.340			
p Value	0.007			

Source: Authors.

negative coefficient (-4.204) indicates that if the value of all assets were set to zero, the firm's value would also be negative. However, this is mostly a reference point for comparison rather than a direct interpretation. The positive coefficient (0.811) indicates that as a firm increases its investment in PPE, its value tends to rise. As the p-value (0.009) is below 0.05, this relationship is statistically significant. The positive impact of an increase in financial assets on firm value is indicated by the coefficient (0.552). The low p-value (0.001) confirms that this effect is significant. This category has the smallest coefficient (0.068), meaning that its positive impact on firm value is smaller than that of PPE and financial assets. However, the very low p-value (0.000) shows that the relationship

is highly significant, with the asset structure explaining about 34% of the variation in firm value. While other factors also influence firm value, asset composition plays an important role. The model's p-value (0.007) is below 0.05, indicating that the regression model is statistically significant and the results are therefore unlikely to be due to random chance.

In summary, the findings suggest that firms with higher investments in PPE, financial assets and current assets tend to have higher firm values, with PPE having the most potent positive effect (Table 10).

Although the estimated coefficient of 1.558 is positive, the probability statistic of 0.943 implies that there is no statistically significant information regarding

Table 10

Relationship between asset structure, inflation rate, interaction terms and firm value

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept (C)	1.558	24.19	0.065	0.943
PPE	-0.316	0.102	-3.098	0.003
Financial Assets	-0.309	0.106	-2.915	0.004
Current Assets	-0.308	0.104	-2.947	0.002
Inflation Rate	-0.506	0.812	-0.624	0.537
PPE * Inflation Rate	0.383	0.072	5.319	0.001
Financial Assets * Inflation Rate	0.394	0.072	5.472	0.001
Current Assets * Inflation Rate	0.377	0.072	5.236	0.001
R ² Overall	0.129			
p-Value	0.121			

*Denotes an interaction term.

Source: Authors.

the independent variable and firm value (statistical non-significance). Interestingly, each type of asset is negatively correlated with firm value, meaning that higher levels of asset holdings may be associated with lower levels of firm value. This could potentially be explained by asset inefficiency and depreciation during periods of inflation. The inflation rate coefficient of -0.506 ($p = 0.537$) suggests that inflation alone can decrease firm value, but this outcome is not significant ($p > 0.05$). Therefore, firm value is not strongly supported to be affected by inflation in this data. The PPE/inflation coefficient (0.383, $p = 0.001$), financial assets/inflation coefficient (0.394, $p = 0.001$), and current assets/inflation coefficient (0.377, $p = 0.001$) are all highly significant ($p = 0.05$). These positive, highly significant coefficients suggest that the interaction between inflation and asset structure offsets the negative influence of each individual asset category, resulting in a positive impact on firm value. This implies that companies with properly developed asset portfolios will be able to mitigate the negative impact of inflation. However, the explanatory power of the model ($R^2 = 0.129$, $p = 0.121$) suggests that the factors within the model alone only explain a somewhat limited portion (12.9%) of firm value. The p-value of 0.121 for the overall model is greater than the standard significance level, implying that the model as a whole lacks statistical significance. However, some of the individual parameters will be significant. Therefore, the research findings highlight the need for firms to prioritise strategic asset management during periods of inflation to maximise firm value.

Table 11 analyses how asset structure and economic growth affect firm value, including their interaction

effects. The intercept (C) (1.576, $p = 0.948$) is positive but not statistically significant ($p > 0.05$), meaning that it does not provide meaningful insight into firm value on its own. PPE (-0.316, $p = 0.003$), financial assets (-0.309, $p = 0.004$) and current assets (-0.308, $p = 0.002$) suggest that increasing asset holdings reduces firm value without considering economic growth. This may be due to the assets being used poorly or to external economic factors influencing asset returns. The economic growth coefficient is -0.518 ($p = 0.524$), implying a negative relationship between greater economic growth and firm value. However, this effect is not statistically significant (p -value exceeding 0.05), indicating insufficient evidence to conclude that economic growth directly affects firm value. The positive and highly significant interaction terms ($p < 0.05$) – asset structure $\times$ economic growth, PPE $\times$ economic growth (0.376, $p = 0.000$), financial assets $\times$ economic growth (0.395, $p = 0.001$) and current assets $\times$ economic growth (0.385, $p = 0.000$) – suggest that the adverse effects of individual assets are reversed when asset structure interacts with economic growth. This implies that firms can benefit from economic growth if they manage their assets effectively in response to changing economic conditions. Model performance ($R^2 = 0.131$, $p = 0.121$) indicates that the model explains 13.1% of the variation in firm value, meaning that other unaccounted factors significantly influence firm value. The probability value of 0.121 being beyond 0.05 indicates that the model is statistically insignificant, although some individual variables are significant.

Table 12 analyses the impact of asset structure and interest rates on firm value, as well as their respective

Table 11

Relationship between asset structure, economic growth, interaction terms, and firm value

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept (C)	1.576	24.221	0.065	0.948
PPE	-0.316	0.102	-3.098	0.003
Financial Assets	-0.309	0.106	-2.915	0.004
Current Assets	-0.308	0.1045	-2.947	0.002
Economic Growth	-0.518	0.7993	-0.648	0.524
PPE * Economic Growth	0.376	0.072	5.222	0.000
Financial Assets * Economic Growth Rate	0.395	0.072	5.486	0.001
Current Assets * Economic Growth Rate	0.385	0.072	5.347	0.000
R ² Overall	0.131			
p-Value	0.121			

*Denotes an interaction term.

Source: Authors.

Table 12

Relationship between asset structure, interest rate, interaction terms, and firm value

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept (C)	1.575	24.22	0.065	0.948
PPE	-0.316	0.102	-3.098	0.003
Financial Assets	-0.309	0.106	-2.915	0.004
Current Assets	-0.308	0.105	-2.947	0.002
Interest Rate	-0.509	0.803	-0.634	0.527
PPE * Interest Rate	0.385	0.072	5.347	0.000
Financial Assets * Interest Rate	0.385	0.072	5.347	0.001
Current Assets * Interest Rate	0.385	0.072	5.346	0.002
R ² Overall	0.127			
p-Value	0.120			

*Denotes an interaction term. Source: Authors.

interaction effects. The intercept (C) (1.575, $p = 0.948$) has a positive value, but is not statistically significant ($p > 0.05$). This means that it does not provide any meaningful information on its own. PPE (-0.316, $p = 0.003$), financial assets (-0.309, $p = 0.004$) and current assets (-0.308, $p = 0.002$) exhibit a negative relationship with firm value, implying that an increase in these assets is linked to a decline in firm value when interest rates are not taken into account. This could indicate the high cost of maintaining assets or asset wastage. The interest rate coefficient (-0.509, $p = 0.527$) is negative, meaning that an increase in interest rates tends to reduce firm value. However, this effect is not statistically significant ($p > 0.05$), meaning there is no strong evidence that interest rates alone directly impact firm value. The interaction terms – asset structure $\times$ interest rate, PPE $\times$ interest rate (0.385, $p = 0.000$), financial assets $\times$ interest rate (0.385, $p = 0.001$) and current assets $\times$ interest rate (0.385,

$p = 0.002$) – are positive and statistically significant, indicating that when firms actively manage their asset structure in response to interest rate changes, firm value increases. This suggests that firms that strategically adjust their investments in PPE, financial assets and current assets in response to interest rate fluctuations can offset some of the adverse effects. Model performance ($R^2 = 0.127$, $p = 0.120$) indicates that this model explains 12.7% of the variation in firm value, meaning that other factors play a significant role. While individual interaction terms are significant, the overall model p-value (0.120) is above 0.05, meaning that the model as a whole is not statistically significant.

Table 13 compares the effects of asset structure and foreign exchange rates on firm value, considering both direct and interaction effects. The intercept (C) (1.587, $p = 0.948$) is not statistically significant ($p > 0.05$), meaning it does not provide much information about firm value.

Table 13

Relationship between asset structure, foreign exchange rate, interaction terms, and firm value

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept (C)	1.587	24.19	0.065	0.948
PPE	-0.316	0.102	-3.098	0.003
Financial Assets	-0.309	0.106	-2.915	0.004
Current Assets	-0.308	0.104	-2.947	0.002
PPE * Foreign Exchange Rate	0.375	0.072	5.208	0.000
Financial Assets * Foreign Exchange Rate	0.388	0.072	5.389	0.000
Current Assets * Foreign Exchange Rate	0.399	0.072	5.542	0.000
R ² Overall	0.128			
p-Value	0.121			

*Denotes an interaction term.

Source: Authors.

Negative coefficients are present in PPE (-.316, $p = .003$), financial assets (-.309, $p = .004$) and current assets (-.308, $p = .002$). This indicates that the only factor reducing firm value is holding more assets. This may be due to increased maintenance costs, inefficient asset utilisation, or foreign exchange risk affecting asset returns. The interaction terms – asset structure $\times$ foreign exchange rate, PPE $\times$ foreign exchange rate (0.375, $p = 0.000$), financial assets $\times$ foreign exchange rate (0.388, $p = 0.000$) and current assets $\times$ foreign exchange rate (0.399, $p = 0.000$) – are all highly significant, meaning that firms that actively manage their assets in line with changes in foreign exchange rates report an increase in firm value. This suggests that firms engaging in strategic foreign exchange management (e.g., hedging currency risk or adjusting asset allocations) can offset the negative effects of asset holdings. The R² value of 0.128 means that the model explains 12.8% of the variation in firm value, implying that many other factors also influence firm value. Although the overall model p-value (0.121) is above 0.05, indicating that the individual interaction terms are significant, the model as a whole is not statistically significant.

6 Discussion of findings

The descriptive analyses indicate that companies listed on the NSE have a relatively low market valuation compared to their book values. This suggests investor confidence holding back over the research period. The asset mix shows that total assets shifted towards current assets and financial assets at the expense of investment in PPE, which is relatively small. This indicates a strategic focus on liquidity and operational flexibility.

Baseline regression results show that the constituent parts of the asset structure (i.e. PPE, financial assets and current assets) have a positive and statistically significant relationship with firm value. This suggests that enterprises with a stronger asset base were awarded greater market value. Conversely, the addition of macroeconomic variables as independent predictors yields negative coefficients for the asset structure variables, implying that the mere existence of such assets can reduce firm value in environments with varying macroeconomic settings.

The interaction models provide strong evidence of moderating effects. The interaction terms are positive and significant in the context of inflation, economic growth, interest rates, and exchange rates. This means that companies that restructure their assets in line with macroeconomic indicator fluctuations are likely to have a high firm value. These results are supported by dynamic GMM estimations, which show persistence in firm value and that adverse effects of asset holdings are offset by macroeconomic factors. Diagnostic tests support the validity and strength of the obtained estimates.

The positive relationship between asset structure and firm value, as established by the baseline models, is consistent with prior empirical evidence suggesting that tangible and liquid assets enhance firm value by improving collateral capacity, liquidity, and access to external finance (Harc, 2015). These results corroborate the findings of Stulz and Johnson (1985), who argued that fixed assets enhance firms' borrowing capacity and valuation.

However, the negative signs of the coefficients obtained when macroeconomic variables are included

separately suggest that asset accumulation itself may reduce firm value in times of economic hardship. High maintenance costs, low asset valuations and reduced returns resulting from inflation, changes in interest rates and exchange rate volatility provide a reasonable explanation for the inconsistencies observed in earlier empirical studies.

The positive and statistically significant interaction effects with all macroeconomic variables provide strong reason to believe that macroeconomic conditions mediate the correlation between asset structure and firm value. Companies that can flexibly manage their asset portfolios in response to changes in the macroeconomic environment seem to be in a better position to mitigate risk and focus on firm value. This interpretation is also supported by dynamic GMM findings that consider endogeneity and prove that asset structure decisions become value-enhancing when adjusted to current macroeconomic situations.

These results further the existing literature by showing that choices concerning asset structure in emerging markets are conditional and not homogeneous. The experience of stock exchange-traded companies on the NSE shows that firm value is affected by the interaction between internal asset allocation and external macroeconomic factors.

7 Conclusion and implications

The current research confirms that a firm's asset structure has a significant moderating effect on its value, and that macroeconomic variables play an important role in moderating this relationship. According to the empirical evidence, simply accumulating assets is not enough to increase firm value; value creation occurs when the decision to allocate assets is consistent with the existing macroeconomic environment. In turn, firm value is supported in an emerging market setting by strategic asset management, which is supported by inherent macroeconomic stability. Based on empirical evidence from companies traded on the NSE, the analysis sheds new light on the literature on emerging-market finance, showing that the effectiveness of asset allocation decisions depends on external economic factors. The findings also highlight the existence of interactive processes in the mediation of firm valuation between resource allocation within the firm and the macroeconomic environment. Methodologically, using the dynamic panel model increases the internal strength of the results by addressing the issue of endogeneity and

supporting the temporal persistence of firm value. Future research should focus on industry-specific dynamics and explore the nature of governance, such as ownership and board composition, as well as other macroeconomic and institutional modulators, to advance insights into the nature of firm valuation in emerging market contexts.

This study contributes to the academic discussion on asset structure and firm valuation by demonstrating that the value relevance of asset allocation depends on the macroeconomic environment. The findings are also extended through agency theory, revealing variations in asset-related agency costs and benefits across various regimes defined by inflation, interest rates, economic growth and exchange rates. This explains the dynamic nature of relationships between managers and between external economic variables.

The study also contributes to the body of knowledge on emerging-market finance by providing empirical evidence from the African capital market, in which macroeconomic volatility plays a significant role in determining the added value of corporate asset structuring. These results emphasise the importance of using contextual macroeconomic variables when evaluating a firm's valuation model, as these variables represent the efficiency of a firm's asset allocation decisions.

Observational data from firms listed on the NSE supports a conditional approach to firm valuation, thus highlighting the importance of incorporating contextual instruments of macroeconomic variables in asset allocation models to better reflect the calibre of decisions in terms of asset allocation.

For managers, the results highlight the importance of adaptive asset management strategies. Accumulating assets is not enough; firms must also respond to changes in inflation, interest rates, economic growth and exchange rates by altering their asset portfolios to maximise value. Liquidity, collateral capacity and operational efficiency can be enhanced by aligning the structure of assets to surrounding macroeconomic conditions.

For investors, asset composition indicates the firm's resilience in the face of macroeconomic uncertainty. The allocation of firms' resources to PPE, financial accumulation and current assets can inform choices regarding portfolios, risk and anticipated returns in new markets.

For policymakers, the findings support the issue of macroeconomic stability. The value-enhancing function of corporate asset structures can be reduced by volatility in inflation, interest rates and exchange rates. Optimal

allocation of assets in line with predicted macroeconomic conditions can enhance firms' ability to create value, thus contributing to overall economic growth.

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SUPPLEMENTARY MATERIAL

Supplementary material accompanies this paper.

Supplementary Data 1 – Dataset

Supplementary Data 2 – Codebook

Supplementary Data 3 – Stata Script

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