Effect of human development index on stock exchange performance in Kenya: A time series analysis (2009–2023)

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ABSTRACT

This study examines the Human Development Index (HDI) as a factor influencing Kenya's stock exchange performance, utilizing quarterly data from 2009 to 2023. It presents the HDI, a composite measure of health, education, and income, as an indicator of structural development in market analysis, moving beyond traditional macroeconomic variables and their relationships. The authors employ the Autoregressive Distributed Lag (ARDL) model after confirming that the variables are integrated in order one, I(1), through the ADF and KPSS tests. Correlation analysis reveals a very strong, statistically significant negative relationship between HDI and the NSE 20 Share Index ($r = -0.6761$, $p < 0.01$). The ARDL regression further confirms a significant short-term negative effect of HDI on stock performance, with a negative coefficient ($\beta = -5.5517$, $p < 0.01$). However, a long-term co-integration relationship was not identified using the bounds test. Diagnostic tests verify that the model is stable, normally distributed, and free from multicollinearity and serial correlation. This data indicates that while human development is essential for the long-term growth of an economy, in the short term, it affects investor sentiment and fund allocation, especially in a transitional market like Kenya. The study contributes to endogenous growth theory by framing human capital as a dynamic, potentially disruptive force, and it critiques the efficient market hypothesis by demonstrating how development information may not be immediately reflected in emerging market prices. The policy recommendations emphasize the importance of integrating development strategies with market literacy and stability initiatives.

Keywords: ARDL, Endogenous Growth Theory, Human Development Index, NSE 20 Share Index, Stock Market Performance

I. INTRODUCTION

Human development has become a crucial factor in the modern world, influencing the sustainability and inclusivity of growth within the global economy. The United Nations Development Programme (UNDP) defines HDI as a multidimensional measure of progress, combining life expectancy, educational attainment, and Gross National Income (GNI) per capita to produce a weighted score (UNDP, 2024). When HDI steadily improves, countries tend to develop more advanced capital markets because enhanced human capital drives innovation, institutional efficiency, and ultimately increases investor confidence. These empirical findings demonstrate that high HDI scores are positively linked with stable financial systems, especially in developed economies where socioeconomic well-being fosters long-term investment behavior.

In summary, the Sub-Saharan African region is diverse in terms of international perspectives on capital markets and human development. Some countries, such as South Africa and Mauritius, have converted their human development advantages into well-functioning capital markets, while others exhibit weak or inconsistent links between HDI progress and market performance. Emerging economies face a lot of these structural barriers, including underdeveloped regulatory constructs, lack of awareness by investors, and governance challenges, which may contribute to constraining the development of financial markets in these particular economies (Khanna & Palepu, 2010; Musamali et al., 2024).

Kenya presents a compelling case for such investigations. Over the past decade, the country has made significant progress in HDI indicators, driven by national development programs like Vision 2030 and the Big Four Agenda. Improvements are expected in healthcare, education, and income levels. However, the performance of the Nairobi

Securities Exchange (NSE) is known to be volatile and sometimes disconnected from broader development trends. Despite reforms in the capital market, digitization efforts, and increased financial inclusion, the NSE's performance has not consistently matched the progress seen in HDI indicators (Mumo, 2018). This divergence raises important questions about whether human development translates into better stock market performance in Kenya.

Studying the effects of HDI on stock market performance in Kenya from 2009 to 2023 analyzes quarterly trends in the NSE 20 Share Index. This study is guided by the Endogenous Growth Theory, which posits that human capital is a key factor in long-term economic growth (Romer, 1990), and the Efficient Market Hypothesis, which asserts that all financial markets reflect all available information, including macroeconomic fundamentals (Fama, 1970). This hypothesis will be tested by showing that improvements in HDI lead to increased market performance. Through short- and long-term econometric analyses, the influence of human development on investors' behavior and asset allocation is examined.

By filling a key gap in the literature, this study provides deeper insights into how restructuring affects the behavior of financial markets in emerging economies. The findings aim to assist policymakers, investors, and regulators in aligning national development objectives with capital market strategies and promoting, through evidence-based methods, the resilience of financial systems through human development.

1.1 Statement of the Problem

Human development has been recognized as a key factor as it determines economic sustainability and inclusive growth, enhanced education, health, and income to promote more stable and stronger capital markets (UNDP, 2024). Yet, while the evidence tends to suggest a positive relationship in developed economies between improvements in the Human Development Index (HDI) and better stock market performance, this relationship is not consistently present across Sub-Saharan Africa because of structural challenges such as weakness in the regulatory framework, limited investor awareness and governance constraints (Khanna & Palepu, 2010; Musamali et al., 2024).

In Kenya, evident improvement in HDI parameters having been recorded under initiatives such as Vision 2030 and the Big Four Agenda, NSE performance in Nairobi remains volatile and is unable to mirror such human development gains consistently (Mumo, 2018). This apparent disconnect creates uncertainty as to whether improvements in human development translate into improved stock market performance in Kenya, thereby rendering the effect of HDI on stock market performance empirically unclear.

1.2 Research Objective

The objective of this study is to examine the effect of the Human Development Index on stock market performance in Kenya over the period 2009–2023.

II. LITERATURE REVIEW

2.1 Theoretical Review

This study is grounded in the Endogenous Growth Theory and the Efficient Market Hypothesis (EMH). Endogenous Growth Theory emphasizes human capital as a key driver of economic growth, arguing that investments in education and health enhance labor productivity, foster innovation, and improve institutional efficiency, thereby supporting capital market development (Romer, 1990).

Complementarily, the EMH posits that financial markets reflect all available information in asset prices; thus, improvements in human development signal broader socioeconomic progress that can influence investor behavior and stock market performance (Fama, 1970). Collectively, these theories suggest that improvements in the Human Development Index (HDI) contribute positively to stock market performance through enhanced productivity, institutional quality, and investor confidence.

2.2 Empirical Review

The relationship between human development and stock market performance has gained attention in recent years across different economic contexts. Studies worldwide have shown that increases in the Human Development Index (HDI) positively influence the growth and stability of financial markets. Gwartney et al. (2022) argued that countries that consistently invest in health and education build stronger institutional capacity, boost investor confidence, and expand financial inclusion. Accumulation of human capital, therefore, engenders deeper and more efficient financial markets by raising labor productivity, stimulating innovation, and enhancing information flows (King & Levine, 1993).

However, sub-Saharan Africa has a very different perspective at the regional level. Many countries have improved in terms of the HDI, but this progress has not always led to growth in the capital markets. Evidence from a panel of studies carried out on stock markets in Sub-Saharan Africa indicates that a long-term relationship exists between stock market development and broader indices of economic and human development outcomes, while other studies have

indicated that stock market size and liquidity are positively related to human development in some countries in Africa (Ugherughe & MaryAnn, 2019). Studies also show that structural challenges still exist, such as a weak regulatory environment, limited investor bases, and low financial literacy, which restrict the full use of the HDI to promote market development.

Research in Kenya has mainly focused on empirical studies of macroeconomic variables, while overlooking the structural role of human development in stock market performance. According to Mumo (2018), the monetary condition in Kenya is essential because interest rate, inflation, and exchange rate movements significantly affect the outcome of investors at the Nairobi Securities Exchange. While these studies have helped clarify the market's short-term behavior, the long-term factors influencing capital market performance remain largely unexamined in existing literature. So far, few studies have looked into the HDI as an independent non-macro variable affecting capital market dynamics in Kenya. Therefore, this research fills this gap by empirically investigating whether improvements in HDI, covering education, health, and income, have a measurable effect on NSE performance over time.

The foundations of this study come from the Endogenous Growth Theory, which considers human capital the main driver of growth and innovation in the economy (Romer, 1990). According to this model, investments in education and health not only increase workforce productivity but also create spillover effects that improve institutional efficiency and economic stability, aiding the development of capital markets. Additionally, this study examines the Efficient Market Hypothesis (EMH): under it, financial markets reflect all available information (Fama, 1970). Therefore, improvements in HDI, seen as a sign of overall socioeconomic progress, would theoretically be reflected in market prices and influence investor behavior, thereby affecting market performance.

The conceptual framework guiding this study assumes that improving the human development index positively influences stock market performance through three main channels: increased labor productivity, higher investor confidence, and better institutional quality. These factors, in turn, affect the volume and value of capital market activities. Empirical testing was conducted using quarterly interpolated HDI values as the independent variable and the NSE 20 Share Index as the dependent variable. The ARDL approach was used to analyze long-term dynamics.

Most empirical studies in Kenya, especially those on capital markets, have been limited in their inclusion of structural development variables. While most studies focus on short-term monetary factors or political risks, they overlook the developmental aspect. Therefore, this research fills an important gap by using the HDI as a comprehensive measure of human capital development. As a result, it adds to the broader conversation about inclusive financial growth in emerging markets.

III. METHODOLOGY

This research employed a correlational time-series study to explore the relationship between human development and stock market performance in Kenya from 2009 to 2023. The design is appropriate for analyzing how variables change over time and is frequently used in empirical financial research (Gujarati & Porter, 2009).

The dependent variable was stock market performance, measured by the NSE 20 Share Index as an indicator of equity in Kenya's capital market. The independent variable was human development, assessed using the composite Human Development Index (HDI) values published annually by the United Nations Development Programme (UNDP, 2024). Since the HDI is released each year, quarterly estimates were created through linear interpolation to improve the temporal resolution of the analysis and enhance the econometric model.

3.1 Specification of Econometric Model

To examine the relationship between certain economic indicators and stock market behavior in Kenya, this study used a model linking stock market performance to the Human Development Index, Foreign Direct Investment, and interest rates. As the focus was on the HDI, the analysis was conducted using EViews Version 13.0. The variables were transformed using natural logarithms (LN) to avoid issues caused by large versus small values.

The multivariate model was as follows:

$Yt= \beta_0 + \beta_1 X_1 t + \beta_2 X_2 t + \beta 3\ X_3 t + \varepsilon$

Where;

Yt= stock performance

β0 = intercept

β=1,2,3,4 are the coefficients of the different autonomous factors.

X_1 = Human Development Index

X_2 = Foreign Direct Investment

X_3 =Interest Rate

Ɛ= error term, which is thought to be ordinarily appropriated

IV. FINDINGS & DISCUSSION

4.1 Descriptive Statistics

Comparative descriptive analysis showed that the HDI based on composite index values consistently increased throughout the study period. The correlational results reveal a statistically significant negative relationship between HDI and NSE performance ($r = -0.6761$, $p < 0.01$).

Table 1

HDI and Stock Exchange Performance Descriptive Statistics

	NSE	HDI
Mean	3302.347	0.582650
Median	3299.285	0.587875
Maximum	5317.213	0.628000
Minimum	1485.937	0.545000
Std. Dev.	1140.444	0.024314
Skewness	-0.027654	0.017275
Kurtosis	1.848786	1.995579
Jarque-Bera	3.320881	2.525139
Probability	0.190055	0.282926
Sum	198140.8	34.95900
Sum Sq. Dev.	76736199	0.034880
Observations	60	60

According to the descriptive statistics, the average value of the NSE 20 Share Index during the study period was 3302.35 points with a standard deviation of 1140.44, indicating high market volatility. The average HDI values had a mean of 0.5827 and a relatively small variability (SD = 0.0243), showing steady improvement over time. Both variables exhibited nearly zero skewness and moderate kurtosis, suggesting they approximate normality. This is supported by the Jarque-Bera probabilities: ($p > 0.05$) confirms approximate normality for both series.

4.1.1 Correlation Analysis

A correlational analysis was conducted to evaluate the strength and direction of the relationship according to the study's objectives. This analysis also involved calculating the correlation coefficient (R), which signifies positive or negative correlations. Additionally, it helps identify multicollinearity, which happens when the variables studied are highly correlated with each other. The study aimed to explore the relationship between the dependent variable, stock market performance, and the independent variable, the Human Development Index. The results of the correlation analysis are presented in the table below.

Table 2

HDI and Stock Exchange Performance Correlational Analysis

Correlation t-statistic probability	NSE	HDI
NSE	1.000000	
HDI	-0.676073* [-6.987747] (0.0000)	1.000000

Note. Values in [] indicate t-statistic and parenthesis values () indicate p-values, while * shows significance at 0.05

A statistically significant negative correlation was found between HDI and the NSE 20 Share Index ($r = -0.6761$, $p < 0.01$). Therefore, during the study periods, an increase in human development was linked to a decline in stock market performance, and vice versa. These counterintuitive results may suggest short-term structural or transitional disruptions in Kenya's capital market amid improvements in human development.

4.1.2 Stationarity Test

These are time series data that often face unit root issues because of their non-stationary nature. This indicates the variable cannot be integrated of order zero; therefore, inference is invalid and may result in spurious regression. As a result, stationarity is crucial for the model to accurately forecast future events. To ensure the results are reliable, this study used both the Augmented Dickey-Fuller (ADF) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests to examine

individual variables for unit roots. Different levels were tested, and the first difference was applied to standardize the panel data. The unit root test results are summarized in Table 3, shown at levels.

Table 3

ADF Results at Level

Variables	ADF T-statistic	Prob	Critical values			Conclusion
			1%	5%	10%	
LNHDI	-0.892137	0.7839	-3.548208	-2.912631	-2.594027	Non-stationary
LNNSE	-0.124069	0.9414	-3.548208	-2.912631	-2.594027	Non-stationary

The results of the ADF test (Table 3) show that neither LNHDI nor LNNSE is stationary at the level, with p-values of 0.7839 and 0.9414, respectively, which are both very high (greater than 0.05). In such cases, the variable is said to have a unit root, indicating that both variables contain stochastic trends.

Table 4

ADF Results at 1st Difference

Variables	ADF T-statistic	Prob	Critical values			Conclusion
			1%	5%	10%	
DLNHDI	-2.915916	0.0496	-3.548208	-2.912631	-2.594027	Stationary
DLNNSE	-6.103520	0.0000	-3.548208	-2.912631	-2.594027	Stationary

Both LNHDI and LNNSE became stationary after the first differencing (Table 4). The ADF statistic for DLNHDI is –2.9159 (p = 0.0496), indicating significance at the 5% level, while DLNNSE is strongly stationary with an ADF value of –6.1035 (p = 0.0000). These results confirm that both variables are integrated of order one, I(1).

Table 5

Kwiatkowski-Phillips-Schmidt-Shin Results at Level

Variables	KPSS T-statistic	Critical values			Conclusion
		1%	5%	10%	
LNHDI	0.941463	0.739000	0.463000	0.347000	Non-stationary
LNNSE	0.704995	0.739000	0.463000	0.347000	Non-stationary

Table 6

Kwiatkowski-Phillips-Schmidt-Shin Results at First Difference

Variables	KPSS T-statistic	Critical values			Conclusion
		1%	5%	10%	
DLNHDI	0.084497	0.739000	0.463000	0.347000	Stationary
DLNNSE	0.387472	0.739000	0.463000	0.347000	Stationary

4.1.3 Determination of Optimum Lag Length

A lag refers to the period during which the dependent variable reacts to the independent variable (Thoma, 2008). The table below presents the results of testing for the best lag length using various criteria. The Akaike Information Criterion (AIC) was used to assess the optimality of the selected lag order.

Table 7

Summary of Lag Length Determination

Lag	LogL	LR	FPE	AIC	SC	HQ
0	41.78541	NA	2.97e-06	-1.374015	-1.228027	-1.317560
1	302.9100	474.7720	4.01e-10	-10.28764	-9.557697	-10.00536
2	342.0294	65.43614*	1.75e-10*	-11.12834*	-9.814452*	-10.62025*
3	347.4271	8.243780	2.63e-10	-10.74281	-8.844963	-10.00889
4	361.5188	19.47206	2.96e-10	-10.67341	-8.191616	-9.713680
5	376.5268	18.55544	3.32e-10	-10.63734	-7.571594	-9.451791

*- is the order of lag chosen by the criterion

Table 7 shows that the AIC has an asterisk on lag two and holds the lowest value in this category. Therefore, Lag 2 is the most appropriate model.

4.1.4 Co-integration Test- Bounds Test

The co-integration process begins with a bounds test for an existing co-integrating equation between variables. If the F-statistic exceeds the 5% critical value for both the lower bound I(0) and the upper bound I(1), the null hypothesis is rejected, and vice versa, according to the bounds co-integration test.

Table 8

F-Bounds Test

F-Bounds Test		**Null Hypothesis: No level relationship**		
Test Statistic	**Value**	**Signif.**	**I(0)**	**I(1)**
		Asymptotic: n=	1000	
F-statistic	3.757530	10%	2.72	3.77
k	3	5%	3.23	4.35
		1%	4.29	5.61
Actual Sample Size	58	Finite Sample:	n = 60	
		10%	2.838	3.923
		5%	3.415	4.615
		1%	4.748	6.188
		Finite Sample:	n = 55	
		10%	2.843	3.92
		5%	3.408	4.623
		1%	4.828	6.195

Based on the bounds co-integration tests in Table 8, there was no evidence of a long-term relationship between the variables. Therefore, the researcher moves on to the regression analysis to explore potential short-term relationships between the independent variables and stock market performance in Kenya.

4.1.5 Regression Analysis

The main goal of this study was to analyze how specific economic indicators influence Kenya's stock market performance. From the pre-diagnostic tests, it's clear that the explanatory variables (Human Development Index, Foreign Direct Investment, and interest rate) are statistically significant in explaining Kenya's stock market performance.

Table 9

Regression Results

Dependent Variable: DLNNSE				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLNHDI	-5.551741	0.821721	-6.756239	0.0000
LNFDI	0.107966	0.032724	3.299337	0.0017
LNINR	0.209873	0.132085	1.588922	0.0011
C	4.564220	0.562245	8.117853	0.0000
R-squared	0.613026	Mean dependent var		8.035826
Adjusted R-squared	0.592296	S.D. dependent var		0.381242
S.E. of regression	0.243430	Akaike info criterion		0.076364
Sum squared resid	3.318451	Schwarz criterion		0.215987
Log likelihood	1.709079	Hannan-Quinn criterion.		0.130978
F-statistic	29.57092	Durbin-Watson stat		1.768722
Prob(F-statistic)	0.000000			

Table 9 shows the regression results with a p-value of (0.0000), indicating that the objectives in the models are collectively significant in explaining changes in stock market performance in Kenya at a 5% significance level. The findings also suggest autocorrelation presence since the Durbin-Watson statistic (1.768722) falls within the recommended range of 1.5 to 2.5.

The estimated regression equation is given as

$DLNNSE_t = 4.5642 – 5.5517 \cdot DLNHDI_t + 0.1080 \cdot LNFDI_t + 0.2099 \cdot LNINR_t$.

Where;

DLNNSE first difference of the Nairobi Security Exchange
DLNHDI is the first difference of the Human Development Index
LNFDI natural log of Foreign Direct Investment
LNINR natural log of Interest rate
t= time

The findings show that HDI negatively affects short-term stock performance ($\beta = -5.5517$, $p < 0.01$). The long-term coefficient was not statistically significant. This indicates that human development boosts long-term economic fundamentals but may lead to short-term transitional shocks or uncertainty for investors. Possible reasons include changes in fiscal policies, labor market reforms, and capital movement toward social services during periods of rapid development.

4.2 Discussion

This study aimed to determine whether the Human Development Index influences stock market performance in Kenya. The regression analysis showed that HDI and stock performance in Kenya are negatively correlated and statistically significant in the short term. The coefficient for the first-differenced HDI (DLNHDI) is -5.5517, with a p-value of 0.0000, indicating significance beyond the 1% level. This suggests that sudden or rapid changes in human development are more often associated with short-term declines rather than increases in the Nairobi Securities Exchange (NSE) performance. While this may seem paradoxical, it highlights that abrupt socioeconomic shifts create uncertainties and structural challenges, which can discourage investor confidence in the stock market.

The results partly support the idea from Endogenous Growth Theory that converting human capital leads to long-term economic growth. However, the opposite assumptions of EMH suggest that markets generally should internalize development gains positively. From the perspective of emerging markets like Kenya, a delay in investor sentiment may happen because of structural inefficiencies or limited market literacy, causing sentiments to move opposite to development indicators.

Several empirical studies have highlighted the complex dynamics of these relationships. Drawing on existing literature, although many studies almost consistently leave out any form of transitional dynamics in the financial market, human capital development quite positively affects economic and financial performance over the long run (Romer, 1990; Levine, 2005). Many policy-oriented studies believe that excessive or severely uncoordinated human development will momentarily unsettle the functioning of financial markets if it is not properly matched with institutional and market reform processes (UNDP, 2024; World Bank, 2020). Empirical evidence from Kenya shows that the resolution of capital markets and the expansion of retail consumption rely heavily on inclusive development and deepening of finance (Ngugi et al. 2009). This underscores the importance of communicating that reforms are developmental and implementing them gradually to avoid the perception that a policy change has occurred. Policy-wise, sequencing reforms in education, health, and income assistance can help reduce or prevent shocks to financial markets. For the CMA and Treasury, combining financial literacy initiatives with HDI benchmarks could enhance developmental progress for sustainable growth in equity markets. This study extends regional evidence to show that human development indicators can affect short-term stock market performance, it argues that long-standing structural gains are made for sub-Saharan African economies (King & Levine, 1993; UNDP, 2024).

4.2.1 Results Post-Estimation Diagnostic Tests

Multicollinearity: The test of multicollinearity was done using the variance inflation factor (VIF). The standard VIF cut-off value which indicated that there was no serious multicollinearity found in regression models was below 10 (Gujarati & Porter, 2009; Wooldridge, 2013).

Table 10
Variance Inflation Factors

	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
DLNHDI	0.675225	201.2921	1.173047

The findings above show that there is no significant multicollinearity among the independent variables, as no variable has a centered VIF exceeding 10. Autocorrelation/Serial Correlation Test: Autocorrelation describes a characteristic of time-series data where error terms are connected across different periods, leading to the error in one period being correlated with another (Gujarati & Porter, 2009). It is also possible that the error of one observation is related to that of a different observation. According to the linear regression error term, the errors were assumed to be

independent of time. The Breusch-Godfrey test was used to detect autocorrelation, which happens when lagged error terms influence current error values.

Table 11

Breusch-Godfrey Serial Correlation LM Test

Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	34.76257	Prob. F (2,54)	0.0989
Obs*R-squared	34.61110	Prob. Chi-Square (2)	0.0693

Table 11 displays the observed R-squared, which corresponds to a Chi-Square value of 0.0693, higher than 0.0500. This leads to accepting the null hypothesis that there is no serial correlation and rejecting the alternative hypothesis. Normality: The Jarque-Bera test evaluates whether the regression residuals follow a normal distribution. The null hypothesis states that the residuals are normally distributed ($p > 0.05$), while the alternative hypothesis suggests they are not ($p < 0.05$). The results of the Jarque-Bera normality test are shown in Figure 1.

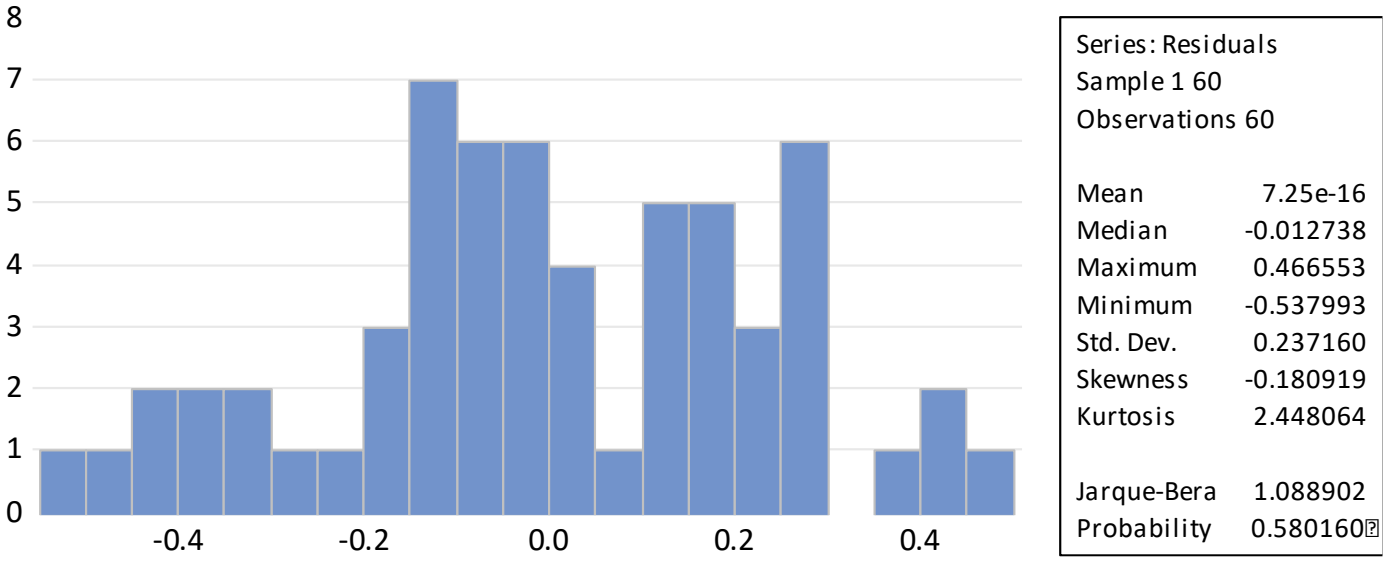

Figure 1

Jarque-Berra Test for Normality

As shown in Figure 1, the probability value from the Jarque-Bera test (0.580160) surpasses the significance level of 0.0500. Therefore, we reject the alternative hypothesis in favor of the null hypothesis based on the evidence from the above calculation; hence, the residuals are normally distributed. Heteroskedasticity: When the variance of the error term changes with different independent variables, it is known as heteroscedasticity. This variance depends on the size of the independent variables, so the error term may differ from one observation to another. Although this makes the OLS estimator inefficient, it does not affect its independence. This is because the OLS estimator has the smallest variance among all unbiased estimators in small samples but becomes asymptotically inefficient for larger samples. The Breusch–Pagan test was used to detect heteroscedasticity. The results are shown in the table.

Table 12

Breusch-Pagan-Godfrey Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
Null hypothesis: Homoskedasticity			
F-statistic	3.541427	Prob. F (3,56)	0.0802
Obs *R-squared	11.15375	Prob. Chi-Square (3)	0.0826
Scaled explained SS	6.920728	Prob. Chi-Square (3)	0.1099

From the above table, it can be concluded that the P chi-square (3) value is 0.0826, which exceeds 0.05. This provides enough evidence of the absence of heteroscedasticity; therefore, the null hypothesis was accepted. Model Stability by Use of the CUSUM Test: The cumulative sum (CUSUM) test was performed to evaluate the structural stability of the regression model over the sample period; the null hypothesis asserts that the parameters remain constant. These diagnostic checks whether the estimated coefficients are stable or have experienced structural shifts, which could

compromise the model's reliability and validity. In Figure 2, we see that all variables remain within the 5% significance level, including both the lower and upper boundaries, indicating that the regression model used in this analysis was properly fitted and deemed stable.

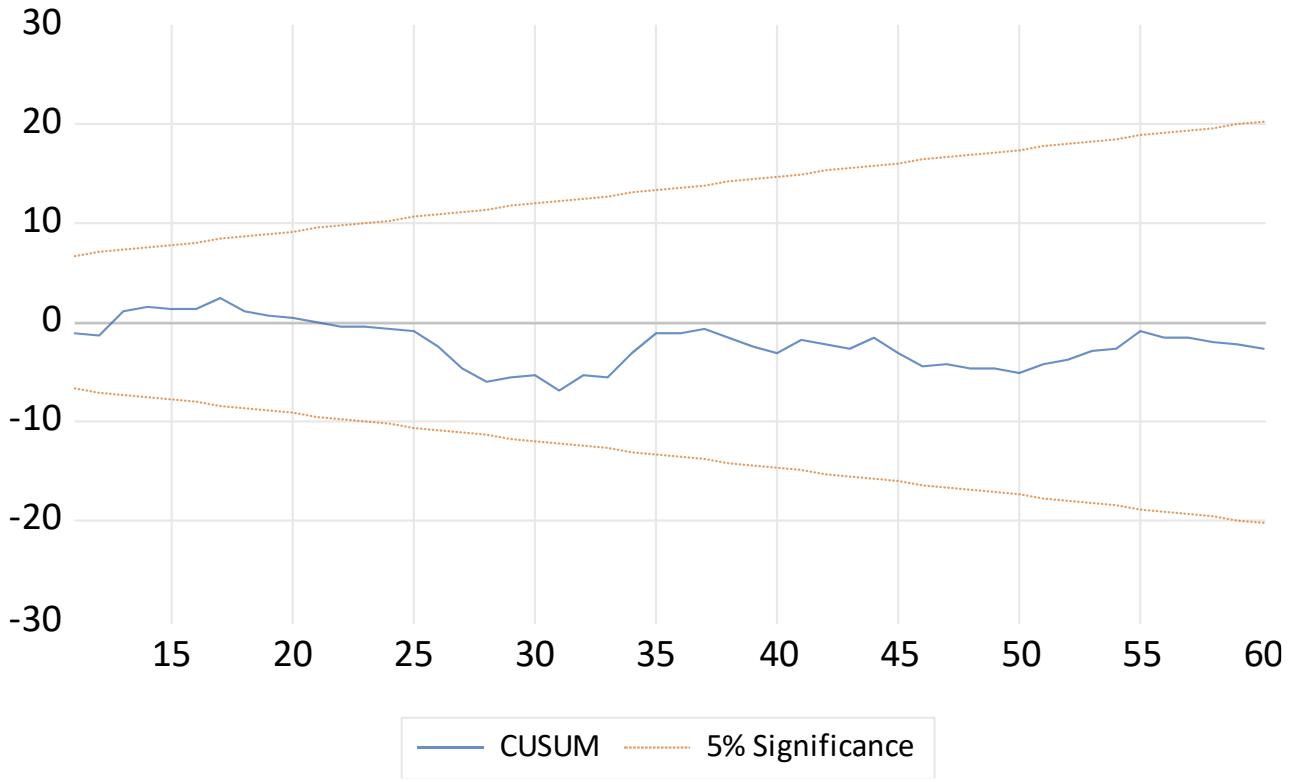

Figure 2
CUSUM Test Stability Output

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusion

Statistical evidence shows that improved human development, as measured by composite HDI scores, has a short-term negative and significant effect on stock PUR performance at the country level. The NSE seems responsive to these micro-level developmental changes, likely due to investor hesitations, capital redistribution, and policy uncertainties.

5.2 Recommendations

Economic policy reform and capital market stabilization should move forward together. The Capital Markets Authority (CMA) can enhance market literacy and provide incentives to encourage interest in long-term investments that align with national development goals. Future research on analyzing HDI components and understanding investor perception mechanisms will help create more effective strategies to strengthen capital market resilience.

Declaration of conflict of interest

The authors declare no potential conflict of interest with respect to the research, authorship, and publication of this article.

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