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EFFECT OF SYSTEMATIC RISK ON FOREIGN DIRECT INVESTMENT IN EAST AFRICAN COUNTRIES

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Abstract

Foreign direct investment (FDI) plays crucial role in developing economies through increased capital accumulation, reduced saving-investment gaps, increased higher employment, productivity, exports, improved technology and better management skills. However, the global FDI has been on a decline and more pronounced in a majority of developing countries, which continue to experience challenges in attracting material FDI inflows compared to developed economies. Such countries are those in the Eastern Africa region, as defined by the UNCTAD investment report, which has been a low receiver of FDI inflows compared to other regions in the continent. The debate on the determinants of FDI remains unresolved, and a complex process that involves multiple causative factors both economic and non-economic. Volatile interest rates, foreign exchange instability, high inflation, and declining consumer purchasing power present material risks to maintaining a stable as well as attractive investment environment. Therefore, this study sought to assess the effect of systematic risk on FDI inflows in East African countries. The study was guided by eclectic paradigm and modern portfolio theory. A total of 9 countries along 28 years, leading to 252 data points, was analysed using Pooled OLS regression, which appeared to be the best after Hausman and Breusch-Pagan

Lagrange Multiplier tests. Results indicated that both exchange rate volatility and interest rate volatility had statistically significant negative effect on FDI inflows (β = -0.6729 and β = -0.4899 respectively) in East African region. Further findings showed that inflation rate volatility had a positive, but insignificant effect (β = 0.0153, p =0.905). These results mean that East African countries should prioritise policy measures such as developing stable monetary policy frameworks, strong foreign exchange reserves, and managing interest rates to reduce interest rate and exchange rate volatilities.

Keywords: Systematic risk, foreign direct investment, exchange rate volatility, interest rate volatility, inflation rate volatility

INTRODUCTION

The rise of globalisation over the last decades has seen economies open themselves up to greater trade as well as capital flows with others in the world (Epaphra, 2018). Foreign direct investment (FDI) is one of the international capital flows and has been received great support for its role in economic growth and development in developed and developing countries. FDI is an investment that leads to the acquisition of lasting interest in an entity running outside the borders of the of the investor's country driven by high profitability prospect, raising efficiency through reduced production cost, accessing resources (natural, physical and human), and gaining access to local markets (Islam & Beloucif, 2024). It is a longterm relationship supporting capital flows and other resources across borders. Its permanency coupled with ability to withstand crises has made it an imperative source of capital needed to bridge the savings-investment gaps. FDI provides investment money needed for business, industry, infrastructure, and economic development in developing countries (Bello et al., 2024). The host economy also benefits from greater employment, technology and knowledge transfer that enhance the skills of local manpower, and increased productivity and competition (Islam & Beloucif, 2024; Jannat, 2020).

However, developing countries have lagged behind other regions of the world in attracting the desired levels of FDI. FDI in Africa has remained low despite its large size, population, endowment of resources, and efforts to attract more inflows (Epaphra, 2018). Additionally, Eastern African economies continuously face challenges in attracting and retaining FDI inflows (Masengesho et al., 2025). Consequently, it follows that the region is in a persistent savings-investment gap state, which in turn adversely affect economic growth and development.

This dismal performance has been linked to a number of determinants with economic factors being considered the main influencers of FDI (Batschauer da Cruz et al., 2022). Ayoola

(2024) note that macroeconomic instability as characterised by volatile interest rates, foreign exchange instability, inconsistent fiscal policies, high inflation, and declining consumer purchasing power present material risks to maintaining a stable as well as attractive investment environment. Empirical literature has shown that exchange rate volatility, interest rate volatility and inflation volatility are the primary deleterious variables influencing FDI inflows (Akinlo & Onatunji, 2021). However, the findings have also been mixed. For instance, Asiamah, et al (2019), Lee and Naknoi (2014) and Rafat and Farahani (2019) established that exchange rate volatility and fluctuation resulted to insecurity and instability in the economy, thus, adversely affecting FDI inflows. In contrast, Emmanuel, et al. (2019), Fornah and Yuehua (2017) and Mokuolu (2018) Omankhanlen (2011) found that exchange rate fluctuations had positive effect on FDI inflows.

Further, studies (Al-Gasaymeh, et al., 2022; Asiamah, et al., 2019; Aromasodun, 2022) established that inflation rate fluctuations negatively affected FDI inflows while Bankole and Ayinde (2014) found it to have both positive and negative effect. There also exists mixed findings regarding the effect of interest rate volatilities on FDI inflow as Ejaz et al. (2021) and Tabash (2025) reported negative effect while Hossain et al. (2024) and Zahid (2018) reported positive effects. Therefore, this study sought to assess the effect of systematic risk measured by interest rate volatility, exchange rate volatility, and inflation rate volatility in East African countries.

LITERATURE REVIEW

Empirical Review

Appreciating that significant macroeconomic instability heightens perceived risks for investors, which may result in disinvestment, Ayoola (2024) carried out a study on the effect of such instabilities on FDI in Nigeria. They focused on GlaxoSmithKline (GSK), Kimberly-Clark (K-C), and Procter & Gamble (P&G), which had exited the market over the period 2013 to 2022. The macroeconomic instability was measured through exchange rate and inflation volatility. The research was structured around the Eclectic paradigm and risk-reward theory. The study employed a mixed-methods approach, integrating qualitative case study analysis with quantitative Ordinary Least Squares (OLS) regression and correlation analysis. It utilised secondary macroeconomic data from the Central Bank of Nigeria (CBN) alongside qualitative insights from media and academic sources. The results showed that changes in the exchange rate had a bigger negative effect on FDI inflows than inflation. Specifically, correlation results showed a strong negative correlation (r = -0.778) between exchange rate volatility and FDI and a moderately negative association with inflation volatility (r = -0.606). OLS regression indicated

a negative relationship between exchange rate volatility and FDI inflows, with borderline significance (β = -0.0156, p = 0.076) and inflation volatility had a statistically insignificant weak positive effect (β = 0.0482, p = 0.800).

Another study in Nigeria focusing on the determinants of FDI was conducted by Akinwalere and Chang (2023) using 1970-2014 period data. They considered interest rate volatility and exchange rate volatility among other control variables. Autoregressive distributed lag model (ARDL) analysis technique was used. Findings revealed that interest rate volatility had a positive and statistically significant influence on FDI (β = 0.414, p = 0.000). They further established that exchange rate volatility had negative, β = -1.122 and insignificant (p = 0.533) effect on FDI inflows. The study was conducted in Nigeria, a single country located in a different region from East African region. Given the different economic and financial conditions of these regions, the results cannot be generalised. Additionally, the current study adopts the interest rate volatility and exchange rate volatility and adds inflation volatility as constituents of systematic risk. The analysis method also differs as the reviewed study applied ARDL model while the current study will use panel data regression technique.

Ejaz et al. (2023) focused on 34 developing economies in their study examining the impact of exchange rate fluctuations on capital inflows from 1978 to 2015. The cashflows were measured through net foreign direct investment (FDI) and foreign portfolio investment (FPI). To analyse the data, the authors used the Generalised Method of Moments (GMM) on panel data, which was chosen because it could have endogeneity issues. The GARCH model was used to measure exchange rate volatility. The GMM results showed that exchange rate volatility had a negative and significant effect (coefficient -0.0415, p = 0.000), which is in line with risk-averse investor behaviour. Further results showed that real interest rate adversely affected FDI (coefficient -0.0017, p=0.000), while the Consumer Price Index (CPI), serving as an inflation proxy, indicated a negative yet insignificant impact (coefficient -0.0000, p = 0.065). While Ejaz et al. (2023) used real interest rate and inflation, the current study adopted their volatilities, which capture risks. Further, the reviewed study's findings could not be generalized to other parts of the world such as the Eastern Africa countries due their differences in macroeconomic and development fundamentals.

In their study, Akinlo and Onatunji (2021) sought to assess the effect of exchange rate volatility on FDI in six selected Economic Community of West African States (ECOWAS) countries (Côte d'Ivoire, Sierra Leone, Nigeria, Ghana, Gambia, and Togo). They utilized data from 1986 to 2017 and used the Autoregressive Distributed Lag (ARDL) model for both long-run and short-run dynamics. Their empirical findings indicated that nominal exchange rate volatility adversely affected FDI in all the selected countries, although the effect was only statistically

significant in Ghana (-3.52), Sierra Leone (-1.47), and Nigeria (-2.57). Further results indicated that real exchange rate volatility was negatively significant in Nigeria (-0.51), Togo (-3.35), Sierra Leone (-1.49), and Côte d'Ivoire (-4.55), but it was positive and insignificant in Ghana (2.01) and Gambia (2.01). Contextually, this study was conducted in a different region (ECOWAS) from Eastern Africa region, meaning that those results could not be assumed to hold in the current study. Additionally, Akinlo and Onatunji analysed the countries separately, while the current study aggregated them, meaning the results cannot be the same. The current study expanded on the explanatory variable to include interest rate volatility and inflation volatility to form systematic risk variable. For analysis, Akinlo and Onatunji used ARDL model while the current study used panel egression.

Using data for 80 developing and developed nations from 1990 to 2015, Nguyen et al. (2018) examined the effect of exchange rate volatility on FDI inflows. They used Pooled OLS regression models for analysis. The results consistently showed that exchange rate volatility and FDI inflows are negatively related. This showed that lowering this volatility was important for getting more FDI. A 10% decrease in exchange rate volatility over one year led to a 0.48 percentage point rise in FDI inflows, while the same decrease over five years could raise FDI by 0.27 percentage points. The current study served to fill a number of gaps such as the contextual gap as Nguyen et al. focused on a different region other than Eastern Africa countries, which makes it difficult to generalize the findings as the studies countries differ in terms of institutional and macroeconomic fundamentals. Conceptually, the current study adds inflation and interest rate volatility as explanatory variables.

Theoretical Review

Modern Portfolio Theory (MPT)

Advanced by Harry Markowitz (1952), the MPT states that investors optimise their investment by holding an efficient number of securities that offer the highest returns at the lowest risk level (Ilugbemi & Ogunlokun, 2020). It considers utility and risks in constructing the most efficient investment portfolio by altering the weights of securities, but ensuring the totals' weights add up to 1. It assists in eliminating specific risks to a given investment project or asset as investors pick those with uncorrelated risks. It helps investors not to assess securities as individual assets only, but rather pick those offering the highest returns and those that promise high returns at the lowest possible risk (Yu & Zhang, 2023).

The theory is based on an investment strategy called diversification where investors evaluate a universe of assets and select those that offer a more favourable risk-return profile. Diversification helps an investor to eliminate only the unsystematic risk, leaving the investment

exposed to the systematic risks, and in case of a given country, to the national systematic risk. Baylor University (2017) states that systematic risks are the investment risks that cannot be eliminated through diversification within the same market. On this note, this theory applies to this study by helping the multinational companies to further lower the national systematic risk by taking their operations in other countries. Yu and Zhang (2023) note that investors should have a global view of their portfolio when selecting investment projects and assets. Leković (2018) notes that investors engage in international diversification to lower further the portfolio risk to levels below the national systematic risk. Additionally, Broszkiewicz (2017) states that entities engage in FDI to obtain returns that are higher in the host nations than in the home ones and diversify their portfolio to minimise risk.

Eclectic Paradigm

This theory was proposed by Dunning (1977) and is also called ownership, location and internalisation (OLI) framework. Ownership denotes the firm-specific or home country advantages that would give it a competitive advantage over its rivals in the domestic as well as the foreign markets and arise from factors such as brand name, marketing skills, access to and control over raw materials, access to finances on favourable terms, economies of scale, patents, management skills, and superior technology (Asiamah, Ofori, & Afful, 2019; Atobatele, 2023).

It considers the extent and nature of competitive attractions offered by a specific location or country to create or add more value to ownership advantages (Marandu & Ditshweu, 2018). Such locational advantages are reduced transportation and/or production costs, availability of cheap production raw materials and inputs, favourable tax treatments, and lower risks due to favourable legal, economic, political, social and cultural environments (Atobatele, 2023). Internalisation considers the ability of companies to use profitably the ownership advantages themselves rather than leasing or selling them to foreign entities through management contracts or licensing (Rahman et al., 2018). With internalisation advantages, MNCs are able to delocalise their production processes to take advantage of low costs across borders.

METHODOLOGY

Research philosophy and Design

The study adopted positivism approach, which is based on the ideas that the world can be studied and understood in a systematic way of generating knowledge through quantification to support precision description of parameters as well as their relationship (Asenahabi, 2019). It

used explanatory longitudinal design. The explanatory research design helps in accounting for factors that cause patterns of change i.e. cause and effect relationship (Skinner & Dancis, 2020) while longitudinal research design emphasizes the study of change by collecting data of the same units over several intervals (Wang et al., 2017). Therefore, explanatory longitudinal research design fitted this study as the researcher sought to unearth the underlying cause of change of the outcome variable through explanatory variables.

Population of Study and Sample

The study used East African region that as analysed by the UNCTAD world investment report has 11 countries: Kenya, Uganda, Comoros, Djibouti, Ethiopia, Eritrea, Mauritius, Madagascar, Somalia, Seychelles, and Tanzania. They formed the unit of analysis and purposive sampling was used to select 9 countries that had data during the period 1996-2023 and have been relatively stable. The study period of 1996 to 2023 was selected because the international capital flows increased in developing nations in the 1990s following the 1970s and 1980s financial liberalisation reforms. The study utilised secondary data from World Bank, UNCTAD, and respective country's Central Banks.

Data Analysis

Data was analysed through descriptive and inferential statistics. Descriptive statistics helped in summarising the data (Harbison & Simmon, 2024), and include mean, standard deviation, maximum, minimum, kurtosis and skewness. Inferential statistics included correlation analysis and regression analysis. Specifically, a panel regression analysis was used and expressed as follows:

$$lnFDI_{it} = \alpha + \beta_1 lnINTV_{it} + \beta_2 lnEXV_{it} + \beta_3 lnINFV_{it} + \varepsilon_{it} \quad \ldots\ldots 1$$

Where,

Ln FDI_{it} is the natural logarithm of FDI inflows in country *i* at time *t*.

α is constant

β_1, β_2 and β_3 are the respective systematic risk elements coefficient

INTV is interest rate volatility

ERV is exchange rate volatility

INFV is the inflation rate volatility

i is 1,2….. 9 countries

t is 1,2,….28 years

ε is the error term

RESULTS AND DISCUSSION

Descriptive Results for Systematic Risk Factors

Systematic risk formed the independent variable and was measured through the dimensions of exchange rate volatility, inflation rate volatility and lending rate volatility. Their descriptive statistics are as presented in Table 1.

Table 1. Descriptive Statistics Results for Systematic Risk Factors and FDI (N = 252)

	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Exchange rate volatility	0.000	0.6903	0.105	0.118	2.646	8.908
Inflation rate volatility	0.054	42.905	2.887	5.868	4.714	25.501
Lending rate volatility	0.000	0.5255	0.089	0.077	2.246	7.937
FDI inflows	- 27,676	4,260,000	479,292	755,639	2.774	8.706

Results in Table 1 show that the minimum value for exchange rate volatility was 0% while the maximum was 69.03%, showing differences in the exchange rate regimes among the studied countries. Additionally, it is observed that the exchange rate volatility distribution has a skewness of 2.646, which is much higher than zero. This means that the distribution is highly positively skewed; indicating instances of very high volatilities, which pull the distribution to the right. This has resulted to sharp peaks as shown by the kurtosis value of 8.908. These kinds of distributions show that while the currency markets in East African region could be stable, there are instances they have big, unexpected shocks such as currency crises or policy devaluations.

The 0% is from Djibouti, which has a pegged exchange rate to the US dollar while countries such as Ethiopia have had a managed floating exchange rate system over the study period, but has since adopted the market-determined exchange rate effective 29th July 2024 (Tadesse et al., 2024). The highest volatility rate of 69% is from Seychelles, which is among the countries that operate a floating exchange rate system, which is determined by the market forces (Central Bank of Seychelles, 2025; International Monetary Fund, 2024). The mean of 10.51% shows that the regional exchange rate volatility was moderate, but the standard deviation of 11.84% confirms the significant differences across the regional countries.

The minimum and maximum inflation rate volatility was 5.36% and 4290.45% respectively. The high range in volatility is an indication that some countries and in some periods experienced episodes of monetary and fiscal policies challenges. The mean inflation rate volatility is 288.07% and the standard deviation of 586.83% confirms instances of commodity price shocks, disruptions to fiscal discipline and exchange depreciations. Its skewness is very high and positive, 4.714. This means that while most of the time the inflation rates are low or moderate, there were some times when they were very volatile, which made the distribution stretch to the right more than it should have. This is supported by very high kurtosis value (25.501), which shows that the distribution has a sharp peak and very heavy tails. This finding highlights the structural susceptibility of certain economies within the sample to inflationary pressures. These findings are consistent with the study of Agoba (2019) that African countries are characterized by institutional weaknesses such as weak central bank's independence and political institutions, poor fiscal- monetary coordination including poor inflation targeting regimes.

Interest rate volatility had the minimum and maximum values of 0% and 52.55%, showing that there are some years and countries where the lending rates remained stable and adjusted more frequently in others. Further results show that the mean interest rate volatility was 8.9% and a standard deviation of 7.69%. Similar to other variables, the lending rate volatility distribution exhibits positive skewness, with a skewness of 2.246. The distribution is pushed to the right by a few infrequent instances of extreme volatility such as abrupt changes in lending rates, but the majority of values are concentrated at lower volatility levels. The distribution also has sharper peak and heavier tails as shown by the kurtosis of 7.937. This implies that while lending rate volatility is typically low or moderate, there may be sporadic notable outliers, most likely during periods of financial crisis, monetary tightening, or changes in the policy regime affecting the credit markets. Indeed, Feyen and Zuccardi (2020) note that central banks among East African countries adopt divergent monetary policies and differ in their financial depth. Makalima et al. (2024) notes that African countries have different levels in their financial sector development, which translates to differences in risk management, provision of crucial infrastructure and services needed for efficient allocation of capital, and investment facilitation.

Results on foreign direct investment (FDI) indicate an extreme variation across the period and countries ranging from -$27.68 million to $4260 million. The negative values indicate a case of divestment or capital flight. The mean FDI was $479.29 million, but a standard deviation of $755.64 million further confirmed the high deviation in FDI inflows into the region. The negative values reflect instances of capital flight or divestment, which are often associated

with institutional fragility and political uncertainty (Ajide & Raheem, 2016). This large variance in FDI inflows aligns with UNCTAD (2024) that FDI remains highly concentrated in a few African countries as less stable economies attract minimal or inconsistent investment. Consistent with findings by Hassan (2023) and Noy and Vu (2007), these results suggest that macroeconomic instability and weak governance contribute to erratic and volatile FDI patterns across these nations.

Correlation Analysis

According to Tanni et al. (2020), correlation analysis shows whether and how strongly pairs of variables are related by giving a correlation coefficient that ranges from -1 to +1. The correlation analysis results for the study variables are shown in Table 2.

Table 2. Correlation Analysis Results

		Foreign direct investment	Exchange rate volatility	Inflation volatility	Interest rate volatility
Foreign direct investment	Pearson Correlation	1			
	Sig. (2-tailed)				
Exchange rate volatility	Pearson Correlation	-.429**	1		
	Sig. (2-tailed)	.000			
Inflation volatility	Pearson Correlation	.051	-.022	1	
	Sig. (2-tailed)	.423	.732		
Interest rate volatility	Pearson Correlation	-.320**	.026	-.015	1
	Sig. (2-tailed)	.000	.683	.810	
	N	252	252	252	252

The results in Table 2 indicate a moderate and statistically significant negative correlation between exchange rate volatility and FDI inflows ($r = -0.429$, $p < 0.01$). This suggests that increased exchange rate instability is associated with a reduction in FDI inflows, highlighting the sensitivity of foreign investors to currency risk and the importance of exchange rate stability in attracting cross-border investments. The findings are in agreement with Bello et al. (2024) and Musyoka and Ocharo (2018) who established a negative and significant correlation between exchange rate volatility and FDI inflows.

The correlation between interest rate volatility and foreign direct investment is negative and statistically significant (r = -0.320, p =0.000). It follows that an increase in fluctuations in the domestic lending rates of the studied countries undermines investment predictability leading to a drop in FDI. The results are in conformity with the study of Musyoka and Ocharo (2018), which found that interest rate changes had negative and significant correlation with FDI. However, the findings contradict Bello et al. (2024) and Perveez (2019) who found that rising interest rates had a moderately positive association with FDI inflows.

In contrast, the correlation between inflation volatility and FDI is weak and statistically insignificant (r = 0.051, p = 0.423), indicating that, within the observed period, inflation instability does not have a meaningful direct association with foreign investment behavior. The results corroborate the study of Abdurrahmani and Tmava (2024) who found that inflation changes had positive and insignificant effect on FDI inflows. Additionally, the correlations among the systematic risk factors are low and non-significant, suggesting the absence of multicollinearity and that the individual effects of each volatility measure on FDI may operate independently rather than being driven by shared dynamics.

Diagnostic Tests

Normality Test

Shapiro-Wilk (SW) test was adopted for normality testing because it is superior to other tests such as Skewness, Kurtosis, Lilliefors, Jargue-Bera, D'Agostino-Pearson, and Kolmogorov-Smirnov tests. Indeed, a study by Korkmaz and Demir (2023) established that SW test performed better than other tests in testing normality in both normal and non-normal distributions. Similarly, Siraj-Ud-Doulah (2019) tested the statistical power of 27 normality tests through simulation and established that SW test was the most powerful test for long-tailed distributions and a more powerful test alongside Cramer-Von Mises and Hegazy-Green for short-tailed distributions.

Table 3. Shapiro-Wilk (SW) Test for Normality

Test Statistic (W)	p-value	Decision (α = 0.05)
0.99552	0.6806	Fail to reject H_0

Results in Table 3 show that the test statistics (W) = 0.9955 with p – value = 0.6806, which is less than 5% significance level. Therefore, the study failed to reject the null hypothesis and stated that the data was normally distributed.

Linearity Test

The linearity of this data was tested through Ramsey RESET test. Ramsey (1969) regression equation specification error test (RESET) test is applied as a specification test for linear regression models (Christodoulou-Volos & Tserkezos, 2023; Su et al., 2025). The null (H_0) hypothesis is that the model is correctly specified/linear and alternative (H_1) hypothesis is that the model is not suitable/nonlinear (Prabowo et al., 2020).

Table 4. Ramsey RESET Test for Panel Data Linearity

Test Name	RESET Statistic	df1	df2	p-value	Decision (α = 0.05)
Ramsey RESET (1)	0.93525	2	246	0.3939	Fail to reject H_0
Ramsey RESET (2)	1.0204	3	245	0.3842	Fail to reject H_0

Results in Table 4 show that in both tests, the p-values are above the significance level of 0.05, implying that there was no misspecification of the model. The model's functional form was correctly specified.

Test for Serial Correlation

Serial correlation was tested using Breusch-Godfrey/Wooldridge test. The null hypothesis is that there is no serial correlation in idiosyncratic errors while the alternative hypothesis is that there is serial correlation.

Table 5: Breusch-Godfrey/Wooldridge Test for Autocorrelation

Test Statistic (χ^2)	Degrees of Freedom	p-value	Decision (α = 0.05)
22.73	28	0.7464	Fail to reject H_0

As shown in Table 5, the test yielded a Chi-square statistic of 22.73 with 28 degrees of freedom and a p-value of 0.7464. Since the p-value is significantly greater than the 0.05 significance threshold, the null hypothesis cannot be rejected. This indicates that there is no statistical evidence of serial correlation, and thus the model satisfies the assumption of independently distributed errors over time.

Test for Multicollinearity

To assess the presence of multicollinearity among the independent variables, the Variance Inflation Factor (VIF) and tolerance values were examined. Multicollinearity arises

when predictor variables are highly correlated, which can distort the estimation of coefficients and reduce the reliability of regression results. As a rule of thumb, VIF values exceeding 10 (or tolerance values below 0.1) are indicative of problematic multicollinearity.

Table 6. Test for Multicollinearity

	Collinearity Statistics	
	Tolerance	VIF
Log exchange rate volatility	.999	1.001
Log inflation volatility	.999	1.001
Log interest rate volatility	1.000	1.000

From Table 6 results, the VIF values for exchange rate volatility and inflation volatility were all approximately 1.001**,** with corresponding tolerance values of 0.999**.** Interest rate volatility had the same tolerance and VIF value, 1.000. These results suggest that multicollinearity is not a concern in the model, as the predictor variables exhibit minimal linear interdependence.

Test for Heteroscedasticity

The presence of heteroscedasticity in the residuals of the panel random effects model was tested using the studentized Breusch-Pagan (BP) test. The null hypothesis is that there is constant variance(no heteroscedasticity) while the alternative hypothesis is that heteroscedasticity exists.

Table 7. Test for Heteroscedasticity

Test Statistic (BP)	Degrees of Freedom	p-value	Decision (α = 0.05)
0.59143	3	0.8984	Fail to reject H_0

Results in Table 7, show p-value = 0.8984 > p = 0.05, thus the study fails to reject the H_0. This implies that the residuals have constant variance and the model does not suffer heteroscedasticity, which satisfies this assumption for regression analysis to be used.

Stationarity Test

The study adopted Im, Pesaran-Shin (IPS) Unit-Root Test, which estimates unit roots in heterogeneous panels through t-bar statistic. It allows for individual effects, common time effects as well as time trends (Barbieri, 2006). Results are shown in Table 8.

Table 8. Test for Stationarity

Variable	Test Statistic (Wt-bar)	p-value	Decision on H_0
logFDI	-6.2096	0.000	Reject H_0 ($p < 0.05$)
logEXR	-6.1155	0.000	Reject H_0 ($p < 0.05$)
logINF	-5.8465	0.000	Reject H_0 ($p < 0.05$)
logINT	-6.4775	0.000	Reject H_0 ($p < 0.05$)

Table 8 displays the stationarity test results. With p-values of 0.000, which are significantly below the 5% significance level, all of the study variables produced highly significant test statistics. Therefore, for each variable, the null hypothesis of non-stationarity was rejected.

Breusch-Pagan Lagrange Multiplier Test for Random Effects

Although Breusch-Pagan test was initially developed to test both time and individual effects, it has received the most attention in the detection of individual effects (Hahn & Shi, 2021). Therefore, to determine the suitability of a random effects model over a pooled Ordinary Least Squares (OLS) approach, the Breusch-Pagan Lagrange Multiplier (LM) test was applied. This test evaluates whether the variance of the unobserved individual-specific effect is significantly different from zero. The null hypothesis (H_0) posits that the individual effects are not present, implying that pooled OLS is an appropriate estimation method.

Table 9. Lagrange Multiplier Test (Breusch-Pagan)

Test Statistic	Degrees of Freedom	p-value	Interpretation
0.4951	1	0.4817	Fail to reject H_0

Since the p-value = 0.4817 is well above 0.05, we fail to reject the null hypothesis that there are no panel (random) effects**.** This implies that the pooled OLS model may be suitable and random effects are not statistically justified for this specification.

Systematic Risk and Foreign Direct Investment

The output from pooled OLS regression is as shown in Table 10. The results show that $R^2 = 0.2991$, meaning that exchange rate volatility, inflation volatility, and interest rate volatility as items of systematic risk accounted for 29.91% of variation in FDI during the studied period.

Table 10. Pooled OLS Regression Model Output

Y=logFDI	Coef. (β)	Std. Error	t-value	p-value
Intercept	19.6520	0.3476	56.5361	0.000
logEXR	-0.6729	0.0746	-9.0158	0.000
logINF	0.0153	0.1281	0.1192	0.905
logINT	-0.4899	0.0773	-6.3366	0.000
R-Squared: 0.2991				
F-statistic: 35.282 on 3 and 248 DF, p <0.000				

Further, the F-statistic = 35.282 (3, 248 df, p = 0.000), meaning the model was significant and could predict the effect of systematic risk on FDI in East African nations. Additionally, the coefficient of exchange rate volatility is -0.6729, meaning that holding all others constant, 1% rise in exchange rate volatility led to a reduction in FDI by 0.6729% and is significant, p = 0.000. The negative relationship is in line with what is expected theoretically, and it reinforces the intuition that instability in the exchange rate weakens confidence in investment. It increases costs related to transactions, brings too much uncertainty in the returns that are expected, and hence foreign capital is discouraged.

The negative and statistically significant negative effect (β= -0.6729, p = 0.000) of exchange rate volatility on FDI aligns with other past studies. For instance, Bhujabal et al. (2024) established that exchange rate volatility had statistically significant and negative effect on FDIs in South Asian and Southeast Asian countries. Ejaz et al. (2021) and Nguyen et al. (2018) also found a strong negative relationship between de facto exchange rate volatility and FDI inflows in both developing and developed countries. The results also support the findings of Dal Bianco and Loan (2017) that foreign exchange volatility had statistically significant negative effect on FDI in Latin American and Caribbean countries. Similarly, in Egypt and Nigeria, Abdelaziz et al. (2025) and Ben-Obi et al. (2025) respectively established that rising exchange rate volatilities led to a reduction in FDI inflows highlighting the risk-averse behavior of foreign investors when faced with currency instability. The negative relationship is also supported by Eregha's (2019) study that found that increased exchange rate volatility was associated with significant reductions in FDI inflows in West African Monetary Zone countries. As noted by Kiliçarslan (2018), the findings indicate that foreign investors are risk averse to the interest rate and exchange rate volatility risks.

However, these findings have contrasted some past studies. In Southeast Asia, Hossain et al. (2024) found that exchange rate volatility had positive effect on FDI inflows through timing opportunities and noted that it is not in all cases that exchange rate movements imply instability,

rather they signal economic dynamism. In Canada, findings by Lajevardi and Chowdhury (2024) showed that foreign exchange volatility had statistically significant positive effect on FDI inflows in both short and longrun run. These divergent outcomes suggest that the effect of exchange rate volatility is context-specific, shaped by the maturity of financial markets and the type of FDI. In the East African context, the observed negative effect appears more pronounced, likely due to limited hedging options, lower market sophistication, and a heavy reliance on export-driven investment.

Additional results show that the estimated coefficient for inflation volatility is 0.0153, and is statistically insignificant (p = 0.905). This insignificance suggests that changes in inflation during the studied period had no meaningful effect on FDI inflows into East African region or investors had discounted for it. This positive and insignificant effect of inflation fluctuations on FDI inflows corroborates findings by Ayoola (2024). These results align with the findings of Abdurrahimani and Tnava (2024) that in Western Balkan countries, a percentage increase in inflation correlated with a 0.30% rise in short-term FDI growth. Hossain et al. (2024) found similar results in Southeast Asia, that that inflation volatility positively influenced FDI. The results are also in support of the study of Bello et al. (2024) that established that inflation rates movement was favourable for FDI attraction in Nigeria, though in the shortrun. In addition, Bouchoucha and Ali's (2019) study on MENA countries, which established the effect of inflation volatility to be positive and statistically insignificant. However, the findings contradicted some studies such as Hayat (2019) that showed that inflation volatility had a significant negative impact on FDI inflows in developing countries by eroding the real value of returns and increasing uncertainty. Further, Anyanwu (2018) found that the volatility of inflation was a significant deterrent to FDI in African countries. Inflation uncertainties signal poor monetary policy credibility and macroeconomic mismanagement (Barro, 2024; Krugman, 2019). In such an environment, investment planning becomes complicated and risk premiums increased. Therefore, a stable price environment is a precondition for attracting FDI.

Results also show that the interest rate volatility coefficient is –0.4899 and is statistically significant, p = 0.000. This suggests that, when all other factors are held constant, a 1% increase in interest rate volatility corresponded to a 0.4899% drop in FDI. These findings agree with past studies such as Tabash (2025) who found that interest rate volatility significantly reduced FDI inflows in South Asian countries. Similar results were obtained by Faruq (2023) that volatility of lending rates led to a drop in FDI inflows in emerging Asian economies. The findings also align with the study of Bello et al. (2024) who found that rising interest rates discouraged FDI in Nigeria due to increased financing costs and creation of uncertainty. The findings are also in agreement with Ejaz et al. (2021) study that found that interest rate volatility

significantly and negatively affected FDI inflows. The results further agree with Ayoola (2024) and Mishkin's (2018) study that volatile interest rates create timing issues for FDI projects. If investors are uncertain about future borrowing costs, they may delay investments, thus reducing inflows. However, the results disagree with some scholars such as Hossain et al. (2024) who found a positive relationship between interest rates volatilities and FDI in Southeast Asia, suggesting that high rates can reflect economic strength. Zahid (2018) reported similar findings that a change in the Pakistan's domestic lending interest rate by 1% led to an increase in FDI inflows 0.675%, which was attributed to perceived macroeconomic stability.

CONCLUSION

The study aimed at assessing the effect of systematic risk as proxied by inflation rate volatility, exchange rate volatility and interest rate volatility on FDI inflows into Eastern Africa countries. Results indicated that exchange rate and interest rate volatilities have negative, statistically significant effect on FDI inflows while inflation has positive, but insignificant effect. The study recommends that East African countries prioritise policy measures such as developing stable monetary policy frameworks, strong foreign exchange reserves, and managing interest rates to reduce interest rate and exchange rate volatilities and improve inflation-targeting frameworks. Future research may incorporate additional African regions as classified by UNCTAD world investment report, which include Central Africa, North Africa, Southern Africa and West Africa or even Africa at large. Other studies can be comparative in nature to compare these regions as well as other regions from the rest of the world.

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