



MACROECONOMIC STABILITY AND THE FOREIGN DIRECT INVESTMENT IN TANZANIA

Bwana, K. M.¹ and Tumaini, J. W.²

¹*Department of Accountancy, College of Business Education, Dodoma Campus, Tanzania.*

²*Department of Business Administration, College of Business Education, Mbeya Campus, Tanzania.*

¹*kembo211@gmail.com*

²*jerrytumaini@gmail.com*

ABSTRACT

Purpose: This study examined the relationship between FDI inflows and key macroeconomic indicators in Tanzania, including inflation, exchange rate, and trade openness.

Design/Methodology/Approach: The study utilises time series data covering 50 years from 1970 to 2019. In the analysis, the key diagnostic tests such as the Augmented Dickey-Fuller (ADF) test and the Philip Peron (PP) tests for unit root/stationarity and the Johansen cointegration test to test for the long-run relationship between the variables were conducted before the primary analysis. The results of the diagnostic tests led the study into the Vector Error Correction Model (VECM), which estimates the relationship between the dependent and independent variables after discovering a long-run relationship among or between the variables.

Findings: The VECM results showed that FDI is significantly determined by its lagged (Previous years) values and exchange rate in the short run. The results also showed a significant long-run relationship between exchange rate and FDI inflows, with other factors remaining constant. These results were consistent with prior assumptions and other findings from the literature.

Research Limitation: The study considered FDI inflows in aggregate. This may have limited the analysis and discussions on the impact of the macroeconomic indicators on the general level of FDIs.

Practical Implication: The study recommends that the country continue to promote FDI inflows while stabilising its exchange rate. The two will lead to more FDI inflows and good macroeconomic performance.

Social Implication: These social implications demonstrate how exchange rate stability and FDI influence extend beyond pure economics to affect various aspects of Tanzanian society and community development.

Originality/ Value: The paper's novelty lies in the improved understanding of variable interdependencies.

Keywords: *Exchange rate. foreign direct investment. inflation. macroeconomic. stability*



INTRODUCTION

In developing countries, one of the important sources of funding from outside the country, which derives investment across different economic sectors, is Foreign Direct Investments (FDIs) (Wang et al., 2023). FDIs have contributed significantly to capital formation in developing countries, and several countries have been making different attempts to attract FDI. The leading players in foreign direct investment are multinational companies (MNCs). According to Vijayakumar *et al.* (2010), Brazil, Russia, India and China have emerged as major destinations for Foreign Direct Investments (FDI) inflows, with the leading capital accumulation trend favouring China and India. Records show that China's current domestic investment ratio is around 40 percent of the gross domestic product (GDP). In comparison, that of India is around 30 per cent of the GDP (Vijayakumar *et al.*, 2010).

Developing countries have been pursuing different economic reforms in recent decades, the major focus of which is deregulation to allow capital flow, which eventually will attract FDIs. For example, reforms done in the 1980s by China made the country the world's major recipient of FDIs in the 1990s and 2000s, a move that reflects the country's efforts to integrate with the world economy. Many Multinational Corporations (MNCs) have shifted their operations to China to enjoy the country's low labour costs and big domestic market.

FDIs have been cited as important in accelerating economic growth through investments, supporting technology transfer, and generating job opportunities. Furthermore, FDIs can also provide a platform for connecting domestic markets with international economic systems more effectively and efficiently. According to Wafure Abu and Nurudeen (2010), FDIs impact the economic growth of developing countries since they provide investment capital, provide employment opportunities, enhance the managerial capabilities of local firms, and make technological improvements, which positively impact economic performance.

The literature presents that different factors may attract FDIs, such as high savings rate, level of urbanisation, per capita income, higher export orientation, and manufacturing-based development strategy supported by substantial investment in infrastructure and education, usually will support and sustain a conducive environment for FDI inflows (Zou, 2022). Multi-national corporations (MNCs) and their allies have continued gaining bargaining power due to increased global competition (BorosTorstila, 1999). More importantly, global competition has changed the trend and forced many countries to eliminate or minimise their entry regulations, convenient taxes, and



conducive business environments and working conditions, which attract FDIs. Because of the economic importance of FDIs in economic growth, underdeveloped nations continually compete to attract large numbers of FDI inflows to enhance the expansion and growth of their economy, mainly through the industrial sectors. Some countries have succeeded through economic reforms, while some countries have failed to have attractive and conducive economic conditions for FDIs to invest in their markets, something which calls for economic researchers to investigate the relationship between the conditions of macroeconomic variables in the country and FDI flows. The study's general objective is to explore the stability of the macroeconomic variables and FDI inflows. Specifically, the study examines the short-run relationship between the FDI inflows, exchange rate, inflation rate, and trade openness. To determine the long-run relationship between the exchange rate, inflation rate, trade openness and FDI inflows

The study is significant as it will establish the status of both the short-run and long-run relationships between the macroeconomic variables of the country and FDI inflows. Information regarding the relationship of such key economic variables is essential to policymakers as it provides important inputs when it comes to reviewing the economic and trade policies of the country. The government may also pay attention to the factors that indirectly support the stability of the macroeconomic variables, such as a well-developed financial system (which brings stability to the exchange rate), a sound legal system (brings trust to investors in the financial sector and supports trade openness), good communication networks and infrastructures (support stability in inflation rate and facilitate distribution of goods and services) as well as favourable demographic trends (support the domestic market, working age population as well as influencing the employment rate). The paper is organised as follows: section one contains an introduction and background of the study, and section two provides a literature review relating to FDIs and macroeconomic variables. The research method and variables specification are presented in section three, while a discussion of the findings is reflected in *section four*. *Section five* reflects the Conclusion and recommendations as well as policy implications, and the last section, six, presents the study limitations and areas for further studies.

LITERATURE REVIEW

Vijayakumar et al. (2010) contended that a country with stable macroeconomic conditions and sustained growth prospects would experience more FDI inflows than a more unstable economy. According to Duran (1999) and Dasgupta and Ratha (2000), the variables proxies to growth and economic stability are GDP growth rates, production index, Interest rates and Inflation rates. Literature further records that inflation is considered a measure of economic stability and reflects



symptoms of the country's fiscal and monetary control. Nonnenberg and Mendonca (2004) added that investors would prefer to invest in a country with more stable macroeconomic conditions, reflecting a low degree of volatility of macroeconomic variables. Therefore, it is expected that GDP growth rate, inflation rate, Industrial production index, Interest rates to have an impact on FDI flows.

Lankes and Venables (1996) and Nunes et al. (2006) considered wage rate as a measure of labour cost and tried to link it with FDI flows, arguing that since labour cost can influence production cost therefore, it is expected that an increase in production cost will to discourage FDI inflows. On the other hand, other literature reports how the labour force influences the FDI flows positively (Bacovic et al., 2021; Sahoo, 2006; Kumar, 1994; Wheeler & Mody, 1992). The higher the employable workforce of a country, the more FDIs would be attracted to take advantage. In addition, a higher employment rate implies a lower wage rate (from the concept of demand and supply) and may influence the production cost.

Asiedu (2002) and Sahoo (2006) are among the researchers who argued that trade openness is one of the key variables that would influence FDIs. The argument is built on the ground that many FDIs are export-motivated, though they sometimes import inputs to facilitate production as well as intermediate or capital goods. Therefore, the volume of trade (export and import) will depend on trade openness; thus, trade openness is generally expected to have a positive and significant relationship with FDIs.

Trade openness is the ratio between exports and imports to GDP (Kacou et al., 2022; Nunes et al., 2006; Sahoo, 2006). Vijayakumar et al. (2010) added that currency valuation through the exchange rate is used to measure the level of inflation and the purchasing power of the FDIs in the host country. Therefore, as the currency depreciates, the purchasing power of the investors in foreign currency terms is enhanced, thus implying a positive and significant relationship between the currency value and FDI inflows.

Ruskie (2007) examined the trend and determinants of FDI inflows to South Africa from 1975 to 2005; exchange rates, trade openness and financial sector development were employed to influence FDI inflows in the long run. He added that financial development and improvement in trade openness have a positive and significant relationship with FDIs. At the same time, deterioration of the exchange rate discourages FDI inflows in the long run. The market size was found to have a positive relationship in the short run.



Pantelidis and Nikolopoulos (2008) conducted a study to identify variables discouraging or supporting a conducive environment for FDI in Greece. The variables used in the study were market size, relative interest rate, technical capability, exchange rates, human capital, the intensity of capital, imports, exports, natural assets endowment, economic activity, labour cost per unit and Greece's membership in EU. Their findings revealed that the key variables impairing FDI inflows were governance inefficiency, higher taxes, infrastructural inefficiency and general macroeconomic situations.

Azam (2010) examined the impact of economic variables on FDI for the Kyrgyzstan Republic, Armenia, and Turkmenistan using the least squares technique from 1991 to 2009. The variables used were market size, inflation, and official development assistance. Findings revealed positive influences of market size and official development assistance and a negative impact of inflation on FDI inflows. It was further found that the official development assistance variable in Armenia and inflation in the Kyrgyzstan Republic show an insignificant relationship.

METHODOLOGY

The main objective of this study was to estimate how the country's macro-economic stability determines the foreign direct investment inflows. The study made use of time series data covering a period of 50 years from 1970 to 2019. The source of this data for all the variables was the National Bureau of Statistics of Tanzania (NBS). Various variables were involved in arriving at the desired objective, including the FDI inflows measured in USD as the dependent variable and independent variables, which included inflation rate, exchange rate, and trade openness as key macroeconomic stability closely linked to FDI.

Data Analysis Procedures

The data analysis was preceded by prediagnostic tests to ensure that the data and specified analytical models produced consistent and reliable results. Firstly, the log transformation was applied because of the continuous nature of the time series data, which are, in most cases, skewed. The Log transformation naturally reduces the dynamic range of variables to preserve the differences while reducing the skew of the scale.



Secondly, the unit root tests were undertaken to test for the stationarity of the data. Two-unit root tests were conducted for confirmatory purposes, including the Augmented Dickey-Fuller (ADF) and Philip Peron (PP) tests for unit roots. The results for both tests showed that our data were not stationery / had unit roots. It is usual that when the data are not stationary, we transform them to be stationary by finding the first difference of the variables. After applying the first difference on the variables, the unit root tests were again applied, and they all became stationary. So, in other words, all of the variables were integrated into order one I (1) since they became stationary after the first difference.

It is also methodologically advised that when all the variables are integrated of order I (1), we should test for cointegration or a long-run relationship among them. Therefore, the Johansen cointegration test was conducted, and two test statistics (Trace and Maximum statistics) of the Johansen cointegration test were used as our decision criteria. The test results showed that our model had one cointegrating equation, signifying that the variables have a long-run relationship.

The idea behind cointegration is that given a set of I (1) variables (X_{1t}, \dots, X_{kt}), if there exists a linear combination consisting of all variables with a vector δ so that $\delta_1 X_{1t} + \dots + \delta_k X_{kt} = \delta' X_t$ where $\delta_1 \neq 0, j = 1 \dots k$, then the Xs are cointegrated into order one C1 (1, 1). $\delta' X_t$ is a trend stationary variable.

Having C1 variables necessitates running the Vector Error Correction Model (VECM) instead of the unrestricted Vector Autoregressive (VAR) model. Therefore, the VECM system of equations was specified as:-

$$\Delta \ln fdi = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \ln fdi_{t-i} + \sum_{j=1}^{k-1} \varphi_j \Delta \ln infl_{t-j} + \sum_{m=1}^{k-1} \gamma_m \Delta \ln exch_{t-m} + \sum_{p=1}^{k-1} \theta_i \Delta \ln open_{t-p} + \rho_1 ECT_{t-1} + \mu_{1t} \dots \dots \dots 1$$

$$\Delta \ln infl = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \ln fdi_{t-i} + \sum_{j=1}^{k-1} \varphi_j \Delta \ln infl_{t-j} + \sum_{m=1}^{k-1} \gamma_m \Delta \ln exch_{t-m} + \sum_{p=1}^{k-1} \theta_i \Delta \ln open_{t-p} + \rho_1 ECT_{t-1} + \mu_{2t} \dots \dots \dots 2$$

$$\Delta \ln exch = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \ln fdi_{t-i} + \sum_{j=1}^{k-1} \varphi_j \Delta \ln infl_{t-j} + \sum_{m=1}^{k-1} \gamma_m \Delta \ln exch_{t-m} + \sum_{p=1}^{k-1} \theta_i \Delta \ln open_{t-p} + \rho_1 ECT_{t-1} + \mu_{3t} \dots \dots \dots 3$$



$$\Delta \ln open = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta \ln fdi_{t-i} + \sum_{j=1}^{k-1} \varphi_j \Delta \ln infl_{t-j} + \sum_{m=1}^{k-1} \gamma_m \Delta \ln exch_{t-m} + \sum_{p=1}^{k-1} \theta_i \Delta \ln open_{t-p} + \rho_1 ECT_{t-1} + \mu_{4t} \dots \dots \dots 4$$

Where:-

- $k - 1$ = Lag length reduced by 1.
- $\beta_i ; \varphi_j ; \gamma_m ; \theta_i$ = Short run dynamic coefficients of the model's adjustment to the long run equilibrium.
- ρ_1 = Speed of adjustment to the long run equilibrium.
- ECT_{t-1} = Error Correction Term which is the lagged value of the residuals obtained from the regression of the cointegrating dependent variable on the regressors. This term contains the long-run information derived from the long-run cointegrating relationship.
- μ_{1t} = Stochastic error term (Impulses / Innovations / Shocks)

Therefore, the VECM was estimated using the above system of equations to obtain the main results for our study. After estimating the VECM, we had to run diagnostic tests to test the appropriateness of our model and, hence, the reliability of the results. Therefore, we tested the residuals' normality using the Jacque-Berra autocorrelation test.

RESULTS AND DISCUSSION

The unit root test was conducted using two confirmatory tests, the results of which are shown in Tables 1 and 2.



Table 1: Augmented Dickey-Fuller Unit Root Test

| Variable | At Level | | First Difference | |
|-----------|----------------|-------------------|------------------|-------------------|
| | Test statistic | 5% critical value | Test statistic | 5% critical value |
| FDI | -1.885 | -2.933 | -7.319* | -2.936 |
| Inflation | -1.931 | -2.933 | -8.628* | -2.936 |
| Exchange | -0.974 | -2.933 | -6.700* | -2.936 |
| Openness | -1.328 | -2.933 | -6.366* | -2.936 |

* Indicates rejection of the null hypothesis in favour of the alternative that there is no unit root at a 5% significance level.

The ADF test shows that all the variables were not stationary at the level but became stationary after the first difference.

The Philip Peron test for unit root was also conducted to confirm the results obtained from the Augmented Dickey-fuller test. The results of the PP test are shown in Table 2.

Table 2: Philips Peron Unit Root Test

| Variable | At Level | | First Difference | |
|-----------|----------------|-------------------|------------------|-------------------|
| | Test statistic | 5% critical value | Test statistic | 5% critical value |
| FDI | -1.631 | -2.933 | -7.762* | -2.936 |
| Inflation | -1.897 | -2.933 | -8.637* | -2.936 |
| Exchange | -0.842 | -2.933 | -6.640* | -2.936 |
| Openness | -1.578 | -2.933 | -6.463* | -2.936 |

* Indicates rejection of the null hypothesis in favour of the alternative that there is a no unit root at 5% significance level.

As seen from Table two, the PP test results confirm the ADF results that all the variables were not stationary at level but became stationary after the first difference. These results confirm that all our variables are integrated into order one (I (1)).

Before embarking on the next step, the lag selection was done based on the Likelihood Ratio (LR), Final Prediction Error (FPE), and Akaike’s Information Criteria (AIC). All three criteria proposed that the appropriate number of lags was 4.



Since all our variables were I(1) and it was necessary to run the Johansen cointegration to test for the long-run relationship among the research variables, (Johansen & Juselius, 1990; Søren Johansen, 2000). The results of the Johansen cointegration test were presented in Table 3.

As seen in Table 3, the results from the Johansen cointegration test were verified using the trace statistics and the maximum statistics criteria. However, only the maximum statistics could confirm the presence of one (1) cointegrating equation as the maximum statistic becomes lower than the 5% critical value at the first rank. The trace statistics criterion could not show any long-run relationship among the variables since none of the trace statistics had a critical value lower than 5% at any rank.

Table 3: Johansen Test for Cointegration

| Rank | Trace statistics | | Maximum statistics | |
|------|------------------|-------------------|--------------------|-------------------|
| | Trace statistic | 5% critical value | Max statistic | 5% critical value |
| 0 | 90.8301 | 47.21 | 49.7898 | 27.07 |
| 1 | 41.0403 | 29.68 | 20.8831* | 20.97 |
| 2 | 20.1572 | 15.41 | 12.7343 | 14.07 |
| 3 | 7.4229 | 3.76 | 7.4229 | 3.76 |

* indicates rejection of the null hypothesis in favour of the alternative that there is one (1) cointegrating equation.

The next step in the analysis was running the Vector Error Correction Model (VECM) to test the relationship between the dependent variable (FDI) and the independent variables, as portrayed in equations 1 to 4. The results from the model are presented in Table 4. Only the results for equation 1 are presented here to simplify the interpretations in line with our specific objectives.

From the results presented in Table 4, we can see that, in the short run, the log of FDI is significantly determined by the lagged values of FDI and the lagged values of the log of the exchange rate (*ln exchange*). This is because the variables were both significant at the 5% level.



This implies that the previous year's levels of the log of FDI and the log of the exchange rate (*lnexchange*) have a positive significant influence on the changes of the FDI in the short run¹.

Specifically, in the short run, referring to the lagged values of the log of FDI, a percentage change in the first lag (LD) of the log of FDI leads to a 51.1 percentage change in the log of FDI. Also, a percentage change in the second lag (L2D) of the log of FDI leads to 31.4 percentage changes in the log of FDI, and a percentage change in the third lag (L3D) of the log of FDI leads to 23.6 percentage changes in the log of FDI.

Table 4: Vector Error Correction Model Results

| | Coefficient | Std. Err. | P. Value |
|----------------------------|-------------|-----------|-------------|
| D_LnFDI | | | |
| Cointegrating eq. 1 | | | |
| L1 | -0.6898324* | 0.883694 | 0.000 |
| LnFDI | | | |
| LD | -0.5110441* | 0.1032722 | 0.000 |
| L2D | -0.3136269* | 0.0790951 | 0.000 |
| L3D | -0.2359573* | 0.0885066 | 0.008 |
| LnOpenness | | | |
| LD | -0.9760004 | .7379025 | 0.186 |
| L2D | 0.6199708 | .0790951 | 0.456 |
| L3D | -1.19352 | .0885066 | 0.157 |
| LnInflation | | | |
| LD | 0.4619525 | .3263938 | 0.157 |
| L2D | -0.3369591 | .347918 | 0.333 |
| L3D | 0.1020306 | .3210628 | 0.751 |
| LnExchange | | | |
| LD | -2.520427* | 1.189426 | 0.034 |
| L2D | -3.499526* | 1.481899 | 0.018 |
| L3D | -9.439118* | 1.315182 | 0.000 |
| Constant | 0.0058348 | .1831882 | 0.975 |
| Number of observations: | | | 46 |
| Sample: | | | 1974 - 2019 |

Additionally, in the short run, based on the lagged values of the log of the exchange rate (*lnexchange*), a percentage change in the first lag (LD) of the log of exchange leads to 252.4 percentage change in the log of FDI (*lnFDI*). Also a percentage change in the second lag (L2D) of



the log of exchange leads to 350.0 percentage change in *lnFDI* and percentage change in the third lag (L3D) of *lnexchange* leads to 944.0 percentage change in *lnFDI*.

The other macroeconomic variables (Trade openness and inflation) could not significantly influence the FDI in the short run since their probability values were more significant than the 5% significance level ($P > 0.05$).

In the long run, as depicted by the error correction term (-0.6898324), which was significant at the 1% level, we derived the implication that the previous year's errors (or deviation from the long-run equilibrium) are corrected for within the current year at a convergence speed of 68.9%. We therefore conclude that, in the long run, on average, *lnexchange* has an effect on FDI *ceteris paribus*.

CONCLUSION

Out of the tested macroeconomic performance indicators, the lagged values of *FDI* and *exchange* positively influenced *FDI*. This informs the conclusion that in the short run, the previous year's values of *FDI* and *lnexchange* rates can significantly explain changes in FDIs in Tanzania.

Secondly, there is a long-run significant relationship between the log of foreign exchange (*lnexchange*) and the log of FDI. This leads us to conclude that in the long run, *ceteris paribus*, changes in the exchange rate significantly determine changes in FDI.

Policy Implications

Since the previous period's level of FDI inflows has been proven to influence the current level, investment policies and strategies should consider continuously promoting FDIs. This will eventually fuel more inflows and economic growth in the long run.

The exchange rate influences FDI in the short and long run, calling for macroeconomic measures to stabilise the exchange rate of the Tanzanian shillings versus the foreign currencies. Since the relationship has been positive, preventing a too-high revaluation is important. At the same time, avoiding too much depreciation or devaluation, which may lead to unintended macroeconomic results, should also not be neglected.



Limitations and Areas for Further Studies

The study considered FDI inflows in aggregate. This may have limited the analysis and discussions on the impact of the macroeconomic indicators on the general level of FDIs. Future studies can consider disaggregating the FDI inflows sector-wise. This is because the impact of the macroeconomic indicators may be felt differently in different sectors with their different FDI inflows.

Some macroeconomic indicators, like inflation and trade openness, have not significantly impacted FDI inflows in this study. This could be a methodological limitation. Future studies can consider exploring this relationship using other methodological approaches, which can yield different results.

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