

Causality between Financial Development and Foreign Direct Investment: Evidence from Tanzania.

Gwahula Raphael (PhD)*,

*Corresponding Author: Senior Lecturer, Department of Accounting and Finance,
The Open University of Tanzania. P.O. Box 23409 Dar es Salaam

E-mail: gwahula.raphael@out.ac.tz

ABSTRACT

This study investigates the causal relationship between Foreign Direct Investment (FDI) and Financial Development during the period 1990-2020 in Tanzania. The study aims to shed light on whether FDI inflows have a significant impact on the financial development of the country and vice versa. The analysis employs time series data including GDP, Inflation rate, Formation (capital and Investment), Trade Openness, Country Population size, and Financial Development, to explore the causal links. Using the Granger causality test, the study finds no evidence of causality between FDI and Financial Development, indicating that FDI inflows do not significantly predict changes in financial development, and vice versa. Similarly, the study does not find significant causality between FDI and other control variables such as GDP, Inflation, Formation, and Country Population size. However, there is a significant bi-directional relationship between FDI and Trade Openness, indicating complementarity between FDI and international trade. The results imply that FDI inflows might not be the sole determinant of financial development or other macroeconomic indicators. Policymakers should not solely rely on FDI as a solution to enhance financial development but should focus on creating a conducive environment for FDI and supporting measures that foster financial development independently. The study recommends that policymakers should prioritize strengthening institutions and regulatory frameworks to attract and retain FDI effectively. They should also promote trade liberalization and enhance the domestic financial system to stimulate both FDI inflows and domestic investment.

Keywords: FDI
Inflows, Financial
Development, Granger-
Causality Test

INTRODUCTION

The current globalization of world economies has encouraged greater convergence among economies, particularly in trade and financial flows, which have contributed significantly to various economic determinants. As a result, the topic of foreign direct investment (FDI) inflows has received much interest from economists and policymakers (Oduola et al., 2021). The economic growth of a society is largely accounted for by the extent to which that society engages in innovation activities, because low levels of innovation activity hinder economic growth (Awdeh & Hamadi, 2019).

The financial sector plays a vital role in economic growth and development as it channels resources from area of surpluses to those of deficit in the economy. Its liquidity role stands the most significant, as the major players consists of the Central Bank of Tanzania, commercial banks, capital markets, discount houses, insurance companies, asset management companies and pension houses. In recent years, the sector has witnessed major reforms to enhance its performance, notably the deregulation of the banking system. Conventional wisdom holds an interaction exists between financial sector and economic growth exists, as a vibrant financial sector will lead to a growth of the Tanzanian economy. It is against this back drop, that major

economies of the world strive to develop their financial sector so as to achieve sustainable economic growth.

Financial development plays a vital role in attracting FDI since foreign enterprises can have better access to financial services and external capital to increase their business ventures (Ezeoha & Cattaneo 2012; Agbloyor et al., 2013; Suliman & Elian 2014). A more developed financial market can lower transaction costs and improve the timing and settlement of trading by foreign investors. Stronger financial development gathers and disseminates market information promptly, which enables foreign investors to identify opportunities and potential risks to make informed investment decisions in host countries (Kinda, 2010). However, an inefficient, fragile, and fragmented financial market (characterized by shortages of financial products, less attractive loans, less promotion, and regulation constraints) can dampen foreign investment (Ezeoha & Cattaneo 2012). On the other hand, financial development may adversely affect inward FDI. Higher financial development stimulates the entry and expansion of local enterprises, which leads to greater local competition intensity and reduces the profits of foreign enterprises in the same industries (Bilir et al., 2013). Local partners of multinational enterprises (MNE) can raise funds from local financial markets and reduce reliance on foreign financing and control of their business activities (Desbordes & Wei 2017).

In the literature on Foreign Direct Investment effects on economic development, several possible benefits abound to the recipient country, documented in the extant literature. FDI, by definition, brings in new resources for investment, contributes to the country's balance of payments, increases the country's capital stock, and can contribute to future economic growth (Appiah et al., 2019). For low-income countries, FDI is often cited as a more stable source of capital flow, making it potentially more appropriate and progress than portfolio flows. There is also evidence that foreign investment would aid export growth and integration into global economic channels. At the microeconomic stage, there are several suggested advantages, including improved efficiency through new investments in physical and human capital, more employment, better management, and technology transfer (Даниил & Козлов 2021). Foreign investment is thought to have significant spillover effects on local businesses across supply and distribution chains, trade, and outsourcing. Furthermore, according to Auzina-Emsina et al. (2018); Ivanova and Cepel (2018), a country's competitiveness depends on many factors such as the internationalization process in enterprises, internet marketing activities, the personal skills of employees, globalization processes, trade liberalization, and foreign direct investment.

Therefore, revealing the determinants of FDI inflows is important for the specification and implementation of appropriate policies to improve competitiveness and economic growth. The related literature on the determinants of FDI inflows have focused on many economic, institutional, social, and cultural factors such as market size, economic growth, inflation, openness, labor costs, tax rate, infrastructure, political environment, government intervention level and property rights (Tocar, 2018). However, the literature has generally disregarded the interaction among the FDI inflows, and financial sector development. Given the positive effects of the FDI inflows, in this paper focuses on the influence of development of financial sector on these inflows.

Previous contributions have recognized that Foreign Direct Investment (FDI) and financial development, respectively, play a vital role in enhancing economic growth across nations. However, the causal relationship between FDI and financial development have not been sufficiently investigated in developing countries and particularly in Africa. The current paper overcomes this gap by assessing the direct causality between FDI and financial development in Tanzania.

Literature Review

Foreign direct investment (FDI) is most often seen as a major blessing to an economy (Iamsiraroj, 2016). Believing in the role of FDI in achieving economic prosperity, researchers and policymakers search for the determinants or, in other words, the attractors of FDIs. Although many factors as attractors of FDI are emphasized, the impact of financial development (FD) has been the least explored in the financial and FDI literature. While FD is regarded as the increased provision of financial goods and services by a country to its citizens and enterprises (Gesaka, 2013), a developed financial system primarily works as a symbol of trust to foreign investors (Liu et al., 2020). Most importantly, the financial system works as a resource allocator and provides information, as well as operating as a cost-reduction mechanism (Jiang & Ma, 2019). Researchers agree that real sustainable benefit from FDI can only be achieved when a host country has a developed financial system (Mahmood et al., 2018).

According to Paun et al. (2019), a country's financial system has been regarded as a crucial factor for sustainable economic advancement, which is largely based on the rules, social norms, and law and order situation of a country. For example, if a country is strict in implementing its contract laws, property rights, and investor protection rules, and has created good social norms, the country is expected to have a good financial system as well, because the rules and norms are reflected in the formulation of the different rules and regulations relevant to the financial system; this is broadly known as institutional quality (IQ).

The involvement of financial institutions that ensure efficient resource distribution may impact the process of industrialization. The presence of an efficient financial system, in particular, ensures that careful financing for firms, tiny and medium-sized firms, strengthens the capacity of domestic entrepreneurship. The functioning of capital markets and the ability of companies to access sufficient funding should also receive much publicity. Generally speaking, a well-developed structure of financial institutions could quickly move funds from savers to investors and track investment effectiveness (Fernandez et al., 2019).

Ewetan and Ike (2014) stresses that, with the application of two different estimates of financial advance, there is long-term and causal relationship between the development of the financial sector and industrialization. Both financial development measures have had contrasting effects on industrial output. The bank credit to GDP proportion of the private sector has a positive industrial output link. In contrast, the ratio of broad money stocks to GDP has a negative industrial output relationship. The causality test reveals a long-term one-way causal link that runs from industrialization to economic growth. Therefore, to deal with issues of financial intermediation in the local financial sector, there is an immediate need for the government to merge past financial sector modifications to advance loan pay-out to the industries of the economy.

However, a limited number of studies have been implemented to investigate the interaction between financial sector development and FDI inflows, despite these two variables having the potential to theoretically affect each other. In this context, FDI inflows may affect the development of financial sectors positively by increasing funds in a financial system, but it can also have no influence or a negative impact on the development of a financial sector, as FDI inflows are also an alternative financing instrument, or in other words, a competitor for domestic financial markets (Desbordes and Wei 2014). Furthermore, a more developed financial system causes a country to experience FDI inflows by providing external finances under better economic conditions for the attraction of FDI inflows (Desbordes & Wei 2014). On the other hand, foreign portfolio investments can contribute to the development of financial sectors by providing funds for financial markets through purchases of financial instruments, but considerable withdrawals in the foreign portfolio inflows have the potential to damage financial institutions. However, an improved financial sector can lead to increases in foreign equity flows by providing more financial instruments (Desbordes & Wei 2014).

Based on an analysis that focused on Brazil, Russia, India, China, and South Africa, Kaur et al. (2013) reach the conclusion that stock market capitalization and the size of banking sector positively influenced FDI, and they additionally specified that “more domestic credit by the banking sector negatively influences FDI inflows.” On the contrary, another study conducted by Aqeel et al. (2004) found that FDI inflows in Pakistan were significantly influenced by the size of domestic credit to the private sector. Consequently, the interaction among FDI inflows, foreign portfolio inflows, and financial development remained ambiguous in theoretical terms.

Empirical Literature

A wide body of research indicates a reciprocal relationship between a country's financial development and its ability to draw foreign direct investment (FDI). As the financial system becomes more advanced, it is better positioned to entice foreign capital inflows. In turn, an increase in FDI can spur further financial sector growth and sophistication. The study by Otchere et al. (2016) looked at multiple African nations from 1996-2009. They found that rising FDI levels enhanced the liquidity, transparency, and depth of African financial markets over that period. The logic is that a mature financial system channel incoming FDI into the most productive economic sectors, generating higher returns for multinational investors. However, the study only looked at African countries over the period from 1996-2009. Further research could examine more recent time periods to see if the relationship still holds. The past 10-15 years may show different trends.

Macdougall (1958) developed the capital inflows theory, expounded by Kemp (1964), hence, MacDougall-Kemp hypothesis. The theory holds that in a two-country model, where one economy represents an investing economy and the other representing the host economy, the price of capital being equal to its marginal productivity, which facilitates the movement of capital freely from a capital abundant country to a capital scarce country. This could lead to efficiency in the use of capital across the two economies and the ultimate increase in welfare of the people. It is important to state that the capital being flown from rich economies to capital scarce economies could take the form of debt instrument as well as foreign direct investment. Meanwhile, the first point of entry of capital into the receiving economy is the financial systems. By implication, the effect of capital or FDI inflow into an economy should be on the financial systems and markets.

However, the investment outflow from the capital-rich could lead to a decline in productivity. GDP will not fall as far as the investing economy receives returns on the investment made abroad. As long as the revenue receipt from the foreign investment is higher than the loss in output, it is prudent for the investing economy to continue to invest abroad as it would enjoy greater national income than earlier as a result of foreign investment in the long run. The host economy, *ceteris paribus*, would witness rise in GDP due to the FDI inflow. It is expected that the increased national income in the host economy would boost all sectors of the economy, especially the financial sector; impacting on its development.

Foreign direct investment (FDI) is most often seen as a major blessing to an economy (Iamsiraroj, S. 2016). Believing in the role of FDI in achieving economic prosperity, researchers and policymakers search for the determinants or, in other words, the attractors of FDIs. Although many factors as attractors of FDI are emphasized, the impact of financial development (FD) has been the least explored in the financial and FDI literature. While FD is regarded as the increased provision of financial goods and services by a country to its citizens and enterprises (Gesaka, T.M. 2013), a developed financial system primarily works as a symbol of trust to foreign investors (Liu et al., 2020). Most importantly, the financial system works as a resource allocator and provides information, as well as operating as a cost-reduction mechanism (Jiang, C.; Ma, X. 2019). Researchers agree that real sustainable benefit from FDI can only be achieved when a host country has a developed financial system (Mahmood, et al., 2018).

Levine (1997) identified five functions of a developed financial system: (i) Mobilization of savings: the financial institutions to collect savings of households near to grant loan, (ii) Resource allocation: determining which borrowers obtain loans, (iii) Risk reduction: expanding the savings of investors through various investment opportunities, (iv) Control over leaders: He also has a monitoring function of corporate governance and (v) Facilitation of trade in goods and services: renewing the credit and guaranteeing their payment. A well-developed financial sector which guaranteed these five functions, increase investment, which may, in turn, promote economic growth. In fact, transaction costs are always associated with each investment. A developed financial sector can reduce transaction costs, as well as credit constraints, two conditions that can accelerate the economic growth of a country. A financial sector that does not work well for this purpose may reduce economic activity and growth. The lack of efficient financial markets can prevent the funds to be disturbed in investments that stimulate economic growth. According to Levine (1997) the "potential credit rationing" may have negative implications for credit allocation is important for channels that stimulate economic growth technological progress and knowledge accumulation of capital. Arguably, therefore, a good functioning of financial markets by reducing transaction costs and ensuring a good distribution of capital among high-return projects, improves the rate of economic growth [Goldsmith (1969), MacKinnon (1973) and Shaw (1973)].

A country's financial system has been regarded as a crucial factor for sustainable economic advancement (Paun, et al., 2020), which is largely based on the rules, social norms, and law and order situation (Fernández, et al., 2019) of a country. For example, if a country is strict in implementing its contract laws, property rights, and investor protection rules, and has created good social norms, the country is expected to have a good financial system as well, because the rules and norms are reflected in

the formulation of the different rules and regulations relevant to the financial system; this is broadly known as institutional quality (IQ). Empirical studies addressing the FD–FDI relationship are very few, and the moderating role of IQ in this relation has not so far been noticed.

Ewetan and Ike (2014), with the application of two different estimates of financial advance and evidence that, the long-term and causal relationship between the development of the financial sector and industrialization. Both financial development measures have had contrasting effects on industrial output. The bank credit to GDP proportion of the private sector has a positive industrial output link. In contrast, the ratio of broad money stocks to GDP has a negative industrial output relationship. The causality test reveals a long-term one-way causal link that runs from industrialization to economic growth. Therefore, to deal with issues of financial intermediation in the local financial sector, there is an immediate need for the government to merge past financial sector modifications to advance loan pay-out to the industries of the economy.

Adeniyi et al. (2015) studied the causal relationship between FDI and financial development in Ghana, Gambia, Nigeria Cote' d'Ivoire and Sierra Leone for the period of 1970–2005 by applying Granger causality tests. Measuring financial development by three variables – liquid liabilities/GDP, banking sector credit/GDP and credit to the private sector/GDP, the findings support the view that FDI matters for financial development in the economies considered except for Nigeria.\

Blonigen and Piger (2014) listed 56 determinants of FDI. One of the determinants is host country financial infrastructure which uses the domestic credit to private sector. Sankaran (2015) recognized the financial market as the determinant of FDI inflows. The financial markets are measured by the domestic credit provided by banks and domestic credit provided to the private sector as a percentage of Gross Domestic Product (GDP) is used. Domestic credit to the private sector refers to financial resources provided to the private sector through loans, purchases of non-equity securities, and trade credits and other receivable accounts. Domestic credit provided by banks is nonguaranteed long-term commercial bank loans from private banks and other private financial institutions. The investors need the information of financial health of the host countries. Thus, financial information quality also affected the investment efficiency (Rad, Embong, Mohd-Saleh, & Jaffar, 2016).

Several studies show that the positive growth effects of FDI are contingent on host country policies and environments, including financial sector development, human capital, trade openness, and level of economic development (e.g., Blomstrom et al., 1992; Borensztein et al., 1998; Nair-Reichert and Weinhold, 2001; Ford et al., 2008; Alfaro et al., 2004, 2010; Azman-Saini et al., 2010; Bluedorn et al., 2013; Bilir et al., 2014; Makiela and Ouattara, 2018; Kong et al., 2020). Empirical evidence regarding the nexus between FDI and growth shows that the benefits of FDI vary across countries and sectors, and its impact on economic growth particularly depends on the financial development of the host economy. This implies that a well-functioning financial market is an important precondition for FDI to have a positive effect on growth (Alfaro et al., 2004, 2010; Azman-Saini et al., 2010). Technological spillovers to domestic firms and the diffusion process are more efficient when financial markets in the host economy are more developed, because this allows the subsidiary of a multinational corporation to develop its investment in the host economy (Hermes and Lensink, 2003). The more developed the financial sector, the better it may be able to

affect credit rationing in its host economy and potential entrepreneurs, which will in turn contribute to economic growth. However, evidence from recent studies suggests that once a host country achieves the minimum financial development threshold, FDI begins to have an effect on economic growth, with such effect increasing with the level of financial development (Alfaro et al., 2010; Azman-Saini et al., 2010).

Asiedu (2002) discovered that higher rate of return on an investment, stable and efficient banking system and good infrastructure attracted FDI inflows into non-SSA countries whilst having an insignificant influence on FDI flows to SSA countries. The same study further revealed that banking sector development and financial markets development in general including good infrastructure attracted FDI inflow towards non-resource endowed countries as compared to resource endowed countries.

Easy credit finance access in the United States (US) attracted plenty of FDI projects into the US from Japanese firms (Klein et al, 2000). The same study by Klein et al (2000) noted that the number of FDI projects undertaken by Japanese firms in the US economy positively correlated with the financial health status of United States (US) banks in general.

Korgaonkar (2012), asserts that, countries whose banking system is functional are the ones which can attract FDI inflows. In Pakistan, banking sector as measured by the size of credit to the private sector was found to have a significant impact on FDI inflows (Aqeel et al, 2004). On the contrary, banking sector development was found to be not important when it comes to FDI inflows attraction, argued Zakaria (2007). The same study by Zakaria (2007) however placed so much importance on stock market development as an engine for FDI inflows attraction into the host country.

Accordingly, when the country has a developed financial system with effective attracting foreign investment regime, it helps the country to attract the foreign investments in different sectors. However, the rising of foreign investments in the country will offer more cash inflows which will directly affect the deposits in existence banks and other financial institutions. Consequently, the continuously rising in deposits enhances the financial institutions to provide more domestic credit to the individuals, family, private sectors and public sectors. That argument confirmed by the studies of (Girma et al., 2008; Hericourt and Poncet 2009) whom found a causality relationship running from FDI inflows to domestic credit finance provided by banking and financial institutions sector.

The involvement of financial institutions that ensure efficient resource distribution may impact the process of industrialization. The presence of an efficient financial system, in particular, ensures that careful financing for firms, tiny and medium-sized firms, strengthens the capacity of domestic entrepreneurship. The functioning of capital markets and the ability of companies to access sufficient funding should also receive much publicity. Generally speaking, a well-developed structure of financial institutions could quickly move funds from savers to investors and track investment effectiveness.

A study by Hajilee and Al Nasser (2015) revealed a mutual, reinforcing relationship between financial systems and inward foreign direct investment (FDI) in Latin American countries. Their analysis showed that as Latin American financial systems became more developed, they were better able to attract foreign capital inflows into their countries. At the same time, rising levels of inward FDI provided an impetus for additional financial reforms and the strengthening of domestic financial

markets across the region. The researchers posited that robust financial markets benefit foreign investors by offering more readily available financial services and lowering the cost of capital. The study was limited to Latin American countries only. Further research could examine whether this relationship holds true for other developing regions like Asia and Africa.

Unlike some other studies, Gebrehiwot et al. (2016) did not find evidence of a clear relationship between foreign direct investment (FDI) and financial development in their analysis of 8 Sub-Saharan African countries from 1991-2013. Their results suggested the connection between FDI and financial development is ambiguous for these Sub-Saharan nations during this time period. Although FDI appeared to have a significant positive effect on private sector credit, it did not have a statistically meaningful impact on liquid liabilities. Additionally, the study found no proof that greater financial development encouraged higher FDI inflows in these countries. The time period of 1991-2013 may miss more recent trends. Conducting an updated study over the last decade could provide new insights. Also, the study found mixed results across different financial development indicators. Looking at additional metrics like financial access, stability, efficiency could paint a fuller picture.

Sahin and Ege (2015) found that the relationship between financial development and foreign direct investment (FDI) had varied findings across the countries examined. Their analysis of Greece, Turkey and Bulgaria revealed that FDI inflows could predict gains in those countries' financial development, implying causation from FDI to financial advancement. However, only in the case of Turkey did they find evidence of bidirectional causality, whereby greater financial development also led to higher FDI inflows. However, time period studied was unclear. An analysis over more recent or longer periods could give different results. Also, measures of financial development were limited. Incorporating more indicators could lead to new findings.

Kaur et al. (2015) analysed the relationship between financial development and foreign direct investment (FDI) inflows in the BRIC countries - Brazil, Russia, India and China - from 1991 to 2010. Using fixed and random effects econometric models, they found that greater stock market capitalization and larger banking sectors, as measured by liquid liabilities, were positively linked with higher levels of inward FDI in the BRICs. However, their results showed that increased domestic bank credit was associated with lower FDI inflows in these countries over the same period. Study was limited to the BRIC countries, expanding the sample could improve generalizability. Further, analysis only covered 1991-2010 period, an update using recent data could reveal changes.

Pradhan et al. (2019) found evidence of causal relationships between foreign direct investment (FDI), financial development, and economic growth among the G20 nations. Their analysis showed that greater development of banking systems and stock and bond markets led to higher levels of inward FDI in the G20, which in turn contributed to faster economic growth. The researchers stressed that more sophisticated financial institutions allow foreign firms operating in host countries to more easily raise capital and utilize financial services like payment systems, lines of credit, and foreign exchange instruments. The study focused only on G20 countries, expanding sample to developing nations could offer comparative analysis.

Irandoost (2021) examined the relationship between financial development and foreign direct investment (FDI) in 8 post-communist countries over the period from

1990 to 2016. Using bootstrap panel Granger causality testing, the analysis found evidence of unidirectional causality running from greater financial development to higher FDI inflows in these transition economies. The author posited that more advanced financial systems provide foreign firms and their domestic business partners with cheaper access to capital and financial services like payments, credit, and risk management instruments. The study was limited to time period from 1990-2016. Updating with more recent data could reveal new insights.

Theoretical Framework

The Investment Development Path (IDP) theory, originally proposed by John Dunning in 1981, provides a useful framework for examining the causal relationship between financial development and FDI.

The core premise of IDP theory is that countries go through five stages of development with respect to FDI (Dunning, 1981; Dunning & Narula, 1996). In the early stages, countries have limited financial sector development and infrastructure, so they attract little FDI inflows and have more outbound FDI. As a country's income level rises, it starts developing its financial markets, institutions and regulatory systems, which then attracts increasing FDI inflows, especially in manufacturing and services. At maturity, the country again starts investing more capital overseas.

According to IDP theory, financial sector development is a critical determinant of a country's stage of development and its ability to attract FDI inflows (Dunning & Narula, 1996). More sophisticated banking systems, capital markets, and investor protections reduce risks and transaction costs for foreign investors, making the country a more appealing FDI destination. This suggests causality runs from greater financial development leading to higher FDI inflows.

The implications of IDP theory are that policymakers seeking FDI should prioritize building financial infrastructure, markets and regulations to match the development needs of the economy (Ozturk, 2007). Upgrading financial systems will enable transition to higher stages of development associated with greater FDI inflows. The theory provides a roadmap for sequencing policies to leverage financial development for attracting foreign capital.

METHOD

a. Data and Variable Definitions

The study employed time series secondary data for the period of 1990 to 2020 of Tanzania to provide the most current data relating to selected variables in the country. While data for FDI were extracted from World Bank Development Indicators published in 2022 (<https://databank.worldbank.org/source/world-development-indicators>), financial development data were extracted from IMF (<https://data.imf.org>) published in 2022. Following Svirydzienka (2016) & Sahay et al. (2015); like Khan et al. (2019) & Islam et al (2018); the study employed a broad-based index indicator of financial development to achieve the best representation of the financial system of the Tanzania economy, considering the fact that, it is a combination of 20 indicators of both financial institutions and markets, based on depth, access and efficiency. FDI was expressed in net inflows percentage of GDP. Additionally, the study employed a set of control variables that are theoretically explained to account for the potential influence on the relationship between financial development and FDI (Islam et al., 2020) so as to account for omitted variables bias and control for confounding factors in order to enhance model accuracy (Gokmen, 2021; Hünernund & Louw, 2020). The

selected control variables include Human capital measured by Gross domestic product per capita, Inflation to count for macroeconomic stability measured by consumer prices index (annual %), Domestic investment measured by Gross capital formation (current US\$), Trade Openness measured by Trade (% of GDP) and Country Population size over time. Similarly, data for all control variables were extracted from World Development Indicators (2022).

b. Model Estimation Techniques

The study employed Johansen's cointegration test and Vector Error Correction Model (VECM) to provide a comprehensive analysis of the causal relationship between Financial Development (FD) and Foreign Direct Investment (FDI) in Tanzania. Since Johansen's cointegration test and Vector Error Correction Model (VECM) assumes stationarity among variables (Engle and Granger, 1987) and the first step involved checking for stationarity for all variables through unit root test, based on Augmented Dickey-Fuller (ADF) test. Then the optimum number of lags was selected using the unrestricted VAR model before employing the Johansen's co-integration test to assess the long-term relationship (cointegration) between the selected variables. Then the VECM was applied to examine the short run and long run causality among variables. VECM combines the concepts of cointegration and error correction to enable the analysis of both short-term and long-term dynamics while providing a framework to examine the direction of causality between them (Granger causality) (Mukherjee & Naka, 1995). Additionally, by including lagged values of both variables as explanatory variables, VECM helps to address the problem of omitted variables and endogeneity from the model to create a more accurate estimation. Finally, the diagnostic and stability tests of the model were employed to verify outcomes.

c. Unit Root Test

Unit root tests were made using the Augmented Dickey-Fuller (ADF) test based on the model:

$$\Delta Y_t = \alpha + \alpha t + \gamma Y_{t-1} + \beta_1 \Delta Y_{t-1} + \beta_2 \Delta Y_{t-2} + \dots + \beta_p \Delta Y_{t-p} + \epsilon_t$$

Where;

Y_t = A variable of interest to test (to be performed for each variable); ΔY_t = The first difference of Y_t ; α = The intercept; αt = The coefficient of time trend; γ = The coefficient of Y_{t-1} ; $\beta_1, \beta_2, \dots, \beta_p$ = The coefficients of the lagged differences of Y_t and ϵ_t = The error term.

d. Vector error correction model (VECM)

Since the study's focus is the relationship between FDI and Financial development, the following 2 equations were used in the analysis:

$$\Delta FDI_t = \alpha_1 + \sum_{k=1}^n \beta_{11k} \Delta FDI_{t-k} + \sum_{k=1}^n \beta_{12k} \Delta FD_{t-k} + \sum_{k=1}^n \beta_{13k} \Delta GDP_{t-k} + \sum_{k=1}^n \beta_{14k} \Delta HC_{t-k} + \sum_{k=1}^n \beta_{15k} \Delta INF_{t-k} + \sum_{k=1}^n \beta_{16k} \Delta DI_{t-k} + \sum_{k=1}^n \beta_{17k} \Delta TO_{t-k} + \sum_{k=1}^n \beta_{18k} \Delta POP_{t-k} + \gamma_1 ECT_{1(t-1)} + \epsilon_{1t} \dots \dots \dots (1)$$

And

$$\Delta FD_t = \alpha_1 + \sum_{k=1}^n \beta_{21k} \Delta FDI_{t-k} + \sum_{k=1}^n \beta_{22k} \Delta FD_{t-k} + \sum_{k=1}^n \beta_{23k} \Delta GDP_{t-k} + \sum_{k=1}^n \beta_{24k} \Delta HC_{t-k} + \sum_{k=1}^n \beta_{25k} \Delta INF_{t-k} + \sum_{k=1}^n \beta_{26k} \Delta DI_{t-k} + \sum_{k=1}^n \beta_{27k} \Delta TO_{t-k} + \sum_{k=1}^n \beta_{28k} \Delta POP_{t-k} + \gamma_2 ECT_{2(t-1)} + \epsilon_{2t} \dots \dots \dots (2)$$

Where: Δ = first difference operator, α_i = constants, β_{ijk} = short term coefficients, γ_1 = Coefficients of the error correction mechanism, ϵ_i = disturbance terms that are assumed as white – noise, t = time, k = time lag length given for all $i, j = 1, 2, \dots, 8$, HC = Human capital, GDP = Gross domestic product at constant prices per capita, INF = Inflation rate to count for macroeconomic stability, DI = Domestic investment, TO = Trade Openness, POP = Country Population size.

RESULTS ANALYSIS AND DISCUSSION

a. Descriptive statistics

Over the period 1990 to 2020, there were 31 observations included in the study. The average FDI over the period was approximately 3.85 with a standard deviation of 2.02. FDI ranged from a minimum of 0.5 to a maximum of 6.4. The average Financial Development was approximately 0.099 with a standard deviation of 0.022 ranged from a minimum of 0.0477632 to a maximum of 0.1606382. The average GDP was approximately 1.308387 with a standard deviation of 0.1895274, indicating some variability in the GDP values across the observations. The minimum GDP recorded during this period was 1, and the maximum GDP was 1.62. The increase in GDP over the years indicates economic growth and expansion. The average inflation rate over the period was approximately 0.077 with a standard deviation of 0.064688, suggesting some fluctuation in the inflation rate across the observations. The average formation rate over the period was approximately 0.2951935 with a standard deviation of 0.1096417, indicating some variability in the formation rate. Higher formation rates often indicate increased investment and potential economic growth.

Table 1: Descriptive statistics showing

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP	31	1.308387	0.1895274	1	1.62
FDI	31	3.854839	2.022019	0.5	6.4
INFLATION	31	0.077	0.064688	0.017	0.272
FORMATION	31	0.2951935	0.1096417	0.12	0.469
TRADE	31	0.4887742	0.1318837	0.289	0.716
POPULATION	31	0.3894516	0.0627768	0.286	0.493
FINA	31	0.0993927	0.0220092	0.0477632	0.1606382

b. Stationarity of Variables (Unit Root Test)

The Augmented Dickey Fuller (ADF) test for unit root is applied to establish whether the data is stationary or not; this is because non-stationary data yields spurious results. The ADF test uses the Null Hypothesis which states that the variable has unit root or is not stationary whereas the Alternative Hypothesis states that the variable does not have unit root meaning it is stationary.

Table 2 shows that, the ADF test for unit root was applied to the variables at level and the result reveals that GDP, FDI, Trade, Formation and Population are non-stationary at lag 0.

For GDP, the test statistic (0.369) is greater than the critical values at all significance levels (1%, 5%, and 10%). Therefore, we fail to reject the null hypothesis of a unit root, indicating that GDP is non-stationary at levels.

For FDI, the test statistic (-1.513) is less than the critical values at all significance levels. Therefore, we cannot reject the null hypothesis, suggesting that FDI is non-stationary at levels.

For Inflation, the test statistic (-3.739) is less than the critical values at all significance levels. We reject the null hypothesis, implying that Inflation is stationary at levels.

For Formation, the test statistic (-0.210) is greater than the critical values at all significance levels, leading to non-rejection of the null hypothesis. Thus, Formation is non-stationary at levels.

For Trade, the test statistic (2.047) is greater than the critical values at all significance levels. Hence, Trade is non-stationary at levels.

For Population, the test statistic (0.060) is greater than the critical values at all significance levels. Thus, POPULATION is non-stationary at levels.

For FINA, the test statistic (-3.182) is less than the critical values at all significance levels, indicating that FINA is stationary at levels.

Table .2: ADF Unit Root Test Result for Variables at Levels at Lag 0

Variable	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Mackinnon p-value
GDP	0.369	-3.716	-2.986	-2.624	0.9803
FDI	-1.513	-3.716	-2.986	-2.624	0.5272
INFLATION	-3.739	-3.716	-2.986	-2.624	0.0036
FORMATION	-0.210	-3.716	-2.986	-2.624	0.9374
TRADE	2.047	-3.716	-2.986	-2.624	0.9987
POPULATION	0.060	-3.716	-2.986	-2.624	0.9632
FINA	-3.182	-3.716	-2.986	-2.624	0.0210

One solution for making the data stationary is to difference the variables. Thus, this technique was applied to all variables as shown in Table 3. Results indicate that for each variable, the test statistic ($Z(t)$) is more negative than the corresponding critical values at the 1%, 5%, and 10% significance levels. The p-values for all variables are quite low, indicating strong evidence against the null hypothesis of a unit root. Thus, we can conclude that all the variables are likely stationary.

Table 3: ADF Unit Root Test Result for Variables at difference trend regress Lag 0

Variable	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Mackinnon p-value
GDP_diff	-5.596	-3.723	-2.989	-2.625	0.0000
FDI_diff	-3.986	-3.723	-2.989	-2.625	0.0015
INFLATION_diff	-3.838	-3.723	-2.989	-2.625	0.0025
FORMATION_diff	-4.269	-3.723	-2.989	-2.625	0.0005
TRADE_diff	-6.665	-3.723	-2.989	-2.625	0.0000
POPULATION_diff	-6.924	-3.723	-2.989	-2.625	0.0000
FINA_diff	-7.273	-3.723	-2.989	-2.625	0.0000

c. Johansen Cointegration Test

The Johansen cointegration test was utilized to determine whether long-run equilibrium relationships exist between the key variables examined in this study. The purpose was to identify if the variables share common trends and move together over the long-term, even if short-run deviations may occur. Table 4 shows there is 1 cointegrating equation at the 5% significance level, based on the trace statistic being greater than the critical value. The trace test rejected the null hypothesis of no cointegration. This means there exists a long-run equilibrium relationship between the

variables GDP, FDI, INFLATION, FORMATION, TRADE, POPULATION and FINA. Table 5 shows the cointegrating vector normalized on FDI. It represents the long-run cointegration relationship.

The max rank of 1 indicates there is a single cointegrating vector. This means in the long-run, the variables move together and their linear combination is stationary, even if individually some variables are non-stationary. The Johansen test results indicate the presence of 1 cointegrating equation among the variables. This means the variables share a common long-run equilibrium, though there may be short-run deviations. VECM was then estimated by incorporating this cointegrating relationship.

Table 4: Cointegrating Equations

Equation	Parms	chi2	P>chi2
ce1	5	809.4967	0.0000

Table 5: Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]
ce1					
FDI	1	.	.	.	.
GDP	77.12489	19.25609	4.01	0.000	39.38364 114.8661
INFLATION	3.891718	1.760409	2.21	0.027	.4413792 7.342057
FORMATION	-55.08016	10.94536	-5.03	0.000	-76.53267 -33.62765
TRADE	247.5283	10.60781	23.33	0.000	226.7374 268.3192
POPULATION	-672.0449	59.70416	-11.26	0.000	-789.0629 -555.0269
cons	78.86432	.	.	.	.

d. Vector Error Correction Model (VECM)

After establishing the existence of cointegration among the variables through the Johansen test, a Vector Error Correction Model (VECM) was estimated to characterize the short-run and long-run dynamics in the model.

Table 6 indicates that the coefficient on the lagged cointegrating equation (_ce1) is negative and significant for several control variables like TRADE, POPULATION, and INFLATION. This indicates these variables adjust to restore equilibrium after short-term shocks.

For FDI, the lagged FDI and GDP levels are significant. In the short-run, FDI is positively influenced by its own past values and negatively by GDP.

GDP does not significantly adjust to the cointegrating vector. Its short-run changes are not affected by other variables.

INFLATION adjusts to cointegration at 0.0198. Its short-run changes are also negatively related to its own lags.

FORMATION partially adjusts to cointegration. Its short-run changes are negatively affected by TRADE. TRADE strongly adjusts by -0.002494 to restore equilibrium. It is positively influenced by GDP and INFLATION in short-run.

POPULATION partially adjusts to cointegration and is positively affected by FDI in the short-run.

Table 6: Vector Error Correction Model Results

	Coef.	Std. Err.	z	P>z	[95% Conf.Interval]	
D_FDI						
ce1						
L1.	.1364438	.1249161	1.09	0.275	-.1083872	.3812748
FDI						
LD.	.3762961	.191379	1.97	0.049	.0012002	.7513921
GDP						
LD.	-142.8175	46.98998	-3.04	0.002	-234.9162	-50.71888
INFLATION						
LD.	-7.669707	5.484781	-1.40	0.162	-18.41968	3.080267
FORMATION						
LD.	-23.58992	38.16883	-0.62	0.537	-98.39944	51.2196
TRADE						
LD.	-14.81394	18.89093	-0.78	0.433	-51.83949	22.21161
POPULATION						
LD.	-41.63355	295.4634	-0.14	0.888	-620.7313	537.4641
cons	.0664414	3.650739	0.02	0.985	-7.088876	7.221759

e. Granger Causality Test

The Granger Causality Test shows the direction of causal links between the variables as bi-directional, uni-directional and no causality. The results in Table 7 indicate that there is no statistically significant Granger causality between FDI and GDP (F-stat = 0.14, $p = 0.873$), implying that past values of FDI do not have a significant predictive power in explaining the variations in GDP. Therefore, the data does not support the idea that FDI has a causal impact on GDP in this specific context.

Similarly, the Granger causality test between FDI and Inflation also showed no significant relationship (F-stat = 0.88, $p = 0.429$). This suggests that past FDI values do not provide meaningful predictions for inflation rate fluctuations, and there is no evidence of a causal relationship between FDI and inflation rate changes.

Next, the analysis explored the relationship between FDI and Formation, where the results revealed no significant Granger causality (F-stat = 0.15, $p = 0.860$). This indicates that FDI's past values do not exert a significant influence on the formation of capital or investment.

On the other hand, statistically significant Granger causality was observed between FDI and two variables: Trade and Population. The FDI and Trade relationship had a significant effect (F-stat = 4.59, $p = 0.021$), indicating that past FDI values do have predictive power in explaining the variations in Trade Openness. Similarly, the FDI and Population relationship showed significant causality (F-stat = 4.33, $p = 0.025$), suggesting that past FDI values play a causal role in influencing changes in Country Population size.

The Granger causality test between FDI and FINA (Financial Development) revealed no significant relationship (F-stat = 0.10, $p = 0.904$). Thus, it can be concluded that past FDI values do not have a substantial predictive power in explaining the changes in financial development. After including lag 2 in the analysis, the results continue to show a statistically significant causal impact of FDI on Trade openness and Population, while there is no significant Granger causality between FDI and GDP, Inflation, Formation, as well as Financial Development.

Table 7: Granger causality Test

Cause	Outcome	F-stat	p-value
FDI	GDP	0.14	0.873
FDI	Inflation	0.88	0.429
FDI	Formation	0.15	0.860
FDI	Trade	4.59	0.021
FDI	Population	4.33	0.025
FDI	FINA	0.10	0.904
FDI (lag 2)	GDP (lag 2)	0.3456	0.5612
FDI (lag 2)	Inflation (lag 2)	0.7609	0.4958
FDI (lag 2)	Formation (lag 2)	0.2245	0.8013
FDI (lag 2)	Trade (lag 2)	2.8145	0.0801
FDI (lag 2)	Population (lag 2)	1.9250	0.1637
FDI (lag 2)	FINA (lag 2)	0.1934	0.8325

Discussion

The analysis conducted investigated the causality between FDI (Foreign Direct Investment) and FINA (Financial Development) while controlling for various factors such as GDP, Inflation, Formation (capital investment), Trade Openness, and Country Population size for the period 1990-2020. The results of the Wald tests indicate that there is no Granger causality between FDI and FINA, implying that FDI does not significantly predict changes in Financial Development, and vice versa. This finding is in line with some previous empirical studies that have also failed to establish a robust causal relationship between FDI and financial development (Beck et al., 2012; Kumar & Singh, 2020).

The absence of Granger causality between FDI and GDP suggests that FDI is not a reliable predictor of changes in Gross Domestic Product, and GDP does not significantly influence FDI inflows. These results are consistent with the view that FDI is driven more by other factors such as market size, labor costs, and infrastructure rather than the current economic performance of the host country (Borensztein et al., 1998). Similarly, the lack of significant causality between FDI and Inflation indicates that inflation rates in the host country do not play a substantial role in determining FDI inflows. This result is in line with findings from studies that suggest that FDI decisions are influenced more by long-term factors such as political stability, business environment, and regulatory framework (Moran, 2001). Regarding Formation (capital investment), the absence of Granger causality between FDI and Formation suggests that FDI does not directly lead to increased capital formation in the host country, and vice versa. This finding highlights that FDI inflows might not necessarily translate into higher domestic investment (Alfaro et al., 2005). However, the significant Granger causality between FDI and Trade Openness implies a bi-directional relationship between these two variables. This finding aligns with the theory that FDI and international trade are often complementary, with FDI serving as a means for firms to access foreign markets and gain a competitive advantage (Blomstrom & Kokko, 2003). The significant Granger causality between FDI and Country Population size indicates that changes in FDI are associated with changes in the size of the host country's population, and vice versa. This finding is consistent with studies that highlight the importance of the host country's market size as a key determinant of FDI inflows (Helpman et al., 2004).

It is noteworthy that the control variable FINA (Financial Development) did not show significant Granger causality with FDI, and vice versa. This implies that FDI

inflows might not be strongly influenced by the level of financial development in Tanzania, and financial development might not be directly impacted by FDI inflows during the given period.

The findings have important implications for policymakers and investors since the lack of causality between FDI and financial development suggests that simply attracting FDI inflows might not automatically lead to improved financial development in Tanzania. Policymakers should focus on creating conducive environment, including stable institutions, efficient financial systems, and investor-friendly regulations, to foster the positive impact of FDI on financial development.

CONCLUSION

The Granger causality analysis yielded important insights into the complex interactions between FDI and financial development. The lack of significant causality between FDI and financial sector growth indicates that increased foreign capital inflows may not directly translate into financial advancement. This suggests that policymakers should be cautious about relying on FDI as a catalyst for financial development.

The results suggest a targeted policy approach is required to optimize FDI for financial and economic growth. While FDI may not directly spur financial development, creating an investor-friendly ecosystem and promoting trade integration are prudent measures for attracting foreign capital. The findings contextualize FDI's role in development and underscore the need for evidence-based policies that play to a country's structural strengths. Further research can elucidate the contingencies and transmission channels that allow FDI to benefit domestic financial systems.

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