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## Article

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## Financial Development and Private Sector Investment in the Post-Financial Liberalization Era in Tanzania

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**Abstract:** This paper examines the relationship between financial development and private sector investment in the post-financial sector liberalization episode in Tanzania. The proxies for financial development were the financial market depth index and financial institutions depth index. Applying Autoregressive Distributed Lag (ARDL) technique, the results show the nexus between financial development and private sector investment in Tanzania. We find that the financial market depth index has a positive and significant impact on private sector investment in the long run but not in the short run. This is linked to the underdevelopment of capital markets in Tanzania at present. Similarly, we find that the financial institution depth index positively and significantly impacts private sector investment in both the long and short run. The degree of openness of the economy recorded a positive and significant impact on private investment in both periods suggesting that it has played a critical role in the financial development and growth of the private sector in Tanzania. In contrast, we observe that the real exchange rate has recorded a negative and significant impact on private investment in the long and short run. This suggests that appreciation of the real exchange rate had a negative impact on private investment. We recommend increasing financial openness and reinforcing the financial regulatory reforms to widen and deepen the financial system that can effectively support the mobilization of short, medium, and long-term finance for private sector investment.

**Keywords:** Financial development; private sector investment; financial liberalization; ARDL.

### Introduction

The implementation of structural reforms that were coupled with financial liberalization measures in the past three decades has generated a rise in many financial institutions in African countries. This has led to improved and efficient financial systems, thereby leading to wider access and better financial services in Africa. Odhiambo (2011) argues that the main thrust behind financial liberalization was to build a healthier, strong, and efficient financial system which is crucial for the private sector development. Several studies show that financial liberalization promotes financial development, which is vital in economic growth because it allows better access to finance for capital investment (Haramillo et al., 1996; Gelos and Werner, 2002; Love, 2003; Beck et al., 2008; Galindo et al., 2007; Odhiambo, 2011; O'Toole, 2012; Marc, 2018). In Africa, the financial reforms started in the mid of 1980s, by then the existing financial system was repressed as Governments controlled financial systems, and banks served as fiscal agents of Governments in most African countries. As a result of implementing a series of financial reforms, many African countries have recently witnessed a proliferation of commercial banks and microfinance institutions in their economies. However, despite the

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liberalization agenda, the full benefits of financial sector liberalization have not been achieved in many countries (Marc, 2018).

In the Tanzanian context, the financial reforms started in the 1990s. The reforms aimed to increase access to financial resources for the public, more especially the private sector at rational costs. The core of the reforms was to commercialize financial institutions and make them independent (URT, 1991). The reforms were implemented by interest rates liberalization, removal of credit controls, private ownership of banks (both local and foreign), and the Central Bank (BOT) assumed the function of overseeing financial institutions in accordance with the laws and regulations in place (URT, 2000; Randhawa & Gallardo, 2003). Moreover, in 2000 the microfinance policy was put in place. The main goal of the microfinance policy was to introduce a microfinance system that caters to the requirement of poor people, thereby helping in poverty reduction efforts (URT, 2000). However, later the policy expanded the scope of microfinance service provision by allowing non-bank financial services, community banks, savings and credit cooperative associations, etc., in service provision.

As a consequence of these reforms, the number of commercial banks, rural community banks, microfinance services, and non-bank service providers increased in Tanzania. This has led to an expansion of domestic credit provision to the private sector, thereby leading to more savings and mobilization of funds for private investment in Tanzania, which has created more opportunities for securing credits and loans. However, the existing financial system is not deep enough to represent an efficient and vibrant system as there are limited financial instruments and opportunities for investment due to inadequate lending capacities and portfolio management in financial institutions (Marc, 2018).

### **Financial sector development in Tanzania in the post-liberalization era**

Before liberalization, the financial system was weak, narrow and the services were unsatisfactory, and it was made up of three banks only (Annex 1). Liberalization of the financial system expanded the market to banks both from local and foreign countries following the enactment of the Banking and Financial Liberalization Act and Foreign Exchange Act (URT, 1991). Hence, this attracted a substantial number of banks (Annex 1). In terms of the banking services like customer services and the use of information technology, there is a significant improvement after liberalization in Tanzania. In terms of the financial institutions, while there was no community bank before liberalization, as of today, there are seven community banks and a relatively more significant number of microfinance institutions, all addressing the needs of finance for ordinary citizens, farmers, business people, etc. This has broadened a range of services and instilled a sense of competition among service providers. However, on analyzing the efficiency of the sector relative to few Sub-Saharan African countries like South Africa and Mauritius, these countries have outpaced Tanzania (Table 1). For example, in terms of the broad money supply to GDP ratio, which measures the level of financial development, Tanzania lagged behind South Africa and Mauritius by more than 50 percent. Moreover, the level of domestic credit to the private sector is lower when compared with that of South Africa and Mauritius. This suggests that more needs to be done to broaden and deepen the financial system in Tanzania.

**Table 1. Financial Efficiency indicators for the Banking Sector in 2017**

Country	Domestic credit provided by banking sector (% of GDP)	Domestic credit to the private sector (% of GDP)	Broad Money (% of GDP)	Interest Rate Spread (Lending rate minus deposit rate %)
Malawi	17	8	17	22
South Africa	186	144	70	5
Tanzania	17	13	20	6
Mauritius	107	75	102	14
Sub-Saharan Africa	46	28	38	6

Source: Marc (2018) & WDI (2020)

On the other hand, an analysis of deposits and lending mobilization trends after financial liberalization suggests that the market has been more effective in financial resources mobilization from the private sector. For example, total credit to the private sector increased steadily from TZS 171.0 billion in 1994 to TZS 17500 billion as of the end of June 2019. This is a healthy development as was not possible before financial sector liberalization. However, investment-focused banks are few in Tanzania to mobilize small, medium, and long-term investment finance. Nonetheless, the existing commercial banks provide microfinance services, such as the NMB, Akiba Commercial Bank, and CRDB (Kessy, 2010). Community banks also provide microfinance. However, like is the case with many other African countries, microfinance is at a lower stage in Tanzania compared with many other developing countries (Napier, 2011). The situation is worse in rural areas with few banks, thereby constraining their financial intermediation.

Consequently, the sector remains underdeveloped and not accessible to many credit seekers, particularly in disadvantaged areas. Moreover, the absence of a formal procedure to link informal financial intermediaries with formal financial institutions is a loss to another opportunity to contribute towards the mobilization of savings for domestic investments. Therefore, this study examines the nexus between financial development and domestic private investment in the post-liberalization era in Tanzania. This is important since several studies suggest that the availability of finance or capital is crucial for investment, and its non-accessibility is one reason for a low rate of investments and business failure in Africa (Tillmar, 2016; Lwesya, 2021). The study limits itself to the relationship between financial development and domestic private investment in Tanzania. Factors such as the degree of openness of the economy and real effective exchange rate are included in the study to gauge the impact of policy stance on financial development.

The remainder of the paper is organized as follows. Section 2 describes the literature review. Section 3 presents the research methodology and data. Section 4 discusses the results. Section 5 concludes the study and provides the policy implications.

## Literature review

Financial liberalization represents a set of measures and policy prescriptions aimed to liberalize and improve the financial system by adopting market-oriented policies (Johnston and Sundarajan, 1999). Financial liberalization seeks to remove all restrictions on financial transactions and activities by relying on market forces for financial services allocation. This leads to financial development. It is believed that an effective and efficient financial sector is vital for private sector investment and transformation both in developed and low-income countries. Nevertheless, the financial sector in many low-income countries is riddled with challenges, thus presenting constraints for private sector investment and economic transformation. As a result, in the 1990s, financial sector liberalization was adopted in many developing countries as a recipe for the dysfunctional and inefficient financial market.

This paper is premised on McKinnon (1973) and Shaw (1973) arguments which state the positive role of efficient financial markets in fostering saving, investment, and economic growth. According to them, the banking sector ought to be liberalized for interest rates to be fixed by market forces; in this way, both nominal and real interest rates will cause a rise in savings mobilization, deepen the financial intermediation process and thereby make loanable funds available to trigger investments. Therefore, according to Shaw (1973) and Levine (1997), the reforms that followed financial liberalization may stimulate financial development, promoting savings, investment, and economic growth.

Similarly, the level of private domestic investment in any country is determined by factors like the degree of trade openness, real effective exchange rate, public investment, and inflation, among others. For example, Asante (2000) examined the causal factors for private investment in Ghana. The findings indicated that funds allocated to the private

sector, inflation-adjusted exchange rate, and public investment positively affected private investment, with public investment supporting a possible complementary effect. Moreover, Suhendra and Anwar (2017) examined the factors affecting private investment in Indonesia. Their findings revealed that public investment, GDP growth rate, funds allocated to the private sector, and the exchange rate positively impacted private investment. However, interest rate and inflation were found to affect private investment negatively. This implies banks' interest rates impact funds allocated to the private sector and overall domestic private investments as savings always respond to interest rates. These results suggest that financial progress in any country is critical in promoting the mobilization of savings for micro, small, medium, and large enterprises' private investment, and its role is even more pressing for African countries.

Financial Development is a multifaceted concept, and various indicators have been used to understand levels of financial progress in various countries. Several studies used one or a combination of multiple dimensions to capture the level of financial development when its impact on capital accumulation and productivity growth was examined; among them were private credit (De Gregorio & Guidotti, 1995); Private Credit, M2/GDP, commercial versus bank (Benhabib & Spiegel, 2000); private credit, liquid liabilities (Beck et al., 2008); private credit, liquid liabilities (Rioja & Valev, 2004); financial sector as a percentage of GDP (Ghirnay, 2006); private credit, private credit by banks, liquid liabilities (Grechyna & Ductor, 2015); financial depth-access, efficiency, stability and financial openness (Naceur et al., 2017); and Bank credit to the private sector, bank deposits, Stock market capitalization (Marc, 2018). While most of the results suggest that in developing countries, financial development has influenced growth primarily through the capital accumulation channel, and its effects in middle and upper-income countries have been primarily through productivity growth, there is generally mixed evidence in the literature regarding its impacts on domestic private investment. While some studies have shown that financial reforms in some countries have reduced financial constraints to firms and improved savings, private sector investments, and contributed to economic growth (Atiyas, 1992; Harris et al., 1994; De Gregorio & Guidotti, 1995; Haramillo et al., 1996; Gallego & Loayza, 2000; Benhabib & Spiegel, 2000; Beck, Levine, & Loayza, 2000; Gelos & Werner, 2002; Galindo et al., 2007; Beck et al., 2004; Rioja & Valev, 2004; Bekaert et al., 2005; Ayyagari et al., 2006; Ghirmay, 2006; Grechyna & Ductor, 2015), some countries experienced a worse situation after financial reforms including macroeconomic instability, capital outflows, and bank failure (Bascom, 1994; Gertler and Rose, 1994; Misati and Nyamongo, 2011; Phakedi, 2014; Le Roux and Moyo, 2015; Bara et al., 2016; Naceur et al., 2017; Enwobi et al., 2017). The reasons advanced for this failure are but not limited to higher bank capitalization and foreign entry (Demirgüç-Kunt & Detragiache, 1998); rapid credit growth and its effect on non-performing loans (Davis et al. 2014; Phakedi, 2014; Le Roux & Moyo, 2015); domestic credit and international private debt flows (Caldera-Sanchez et al., 2016; Bara et al., 2016); currency devaluations, account deficits, high inflation and interest rates (Moyo & Le Roux, 2020); and weak legal and regulatory supervisory systems (Moyo & Le Roux, 2020). The reasons advanced for failures after reforms suggest that structural weaknesses in the form of regulatory, legal, and supervisory frameworks and inefficient financial markets due to lack of competition were the main drawbacks for the reforms to bring about the expected results, particularly in African countries. Therefore, this paper draws on Arestis et al. (2001) and Beck and Levine's (2002) works that distinguished markets and institutions among the factors influencing financial development. Unlike the previous studies, this paper adopts two major dimensions of financial development: the financial markets depth index and the financial institution depth index, in examining its influence on private sector investment in Tanzania.

This idea converges with the International Monetary Fund (IMF) proposal when addressing the shortcomings of using single indicators as proxies for financial development. IMF has developed indices that describe how markets and institutions behave in a country by observing their depth, access, and efficiency (Svirydzenka, 2006). This is justified since well-developed money and capital markets can play a crucial role

in the capital mobilization for investment. According to Ito and Kawai (2018), liquidity enables better trading of assets, thereby making a possible exchange of goods and services. Similarly, the quality of institutions is critical in stimulating savings for investment in low-income countries. Mullineux and Murinde (2014) argue that in most low-income economies, banks are the main source of capital for small and large businesses and the private sector as a whole. In this context, the operation and functioning of the banking sector must be efficient to allow the mobilization of saving for investment to enable micro, small, medium, and large-scale enterprises to access financial resources.

## Research methodology and data

### Methodology

The regression model (author formulation) is given as follows:

$$\ln GFC_t = \beta_0 + \beta_1 \ln FMD_t + \beta_2 \ln FII_t + \beta_3 \ln DOP_t + \beta_4 \ln REER_t + \varepsilon_t \dots \dots \dots (1)$$

Where:

$\ln GFC$ = Gross Fixed Capital formation for the private sector to Gross Domestic Product (GDP).

$\ln FMD$ = Financial Market Depth Index

$\ln FII$ = Financial Institution Depth Index

$\ln DOP$ = Degree of trade openness

$\ln REER$ = Real Effective Exchange Rate

$\varepsilon_t$  = Is the error term.

$\alpha_1$ ,  $\alpha_2$ ,  $\alpha_3$ , and  $\alpha_4$ , are the coefficients of the predictors in the model,  $\alpha_0$  is the intercept

### Variable description

- i. Gross fixed capital formation for the private sector to GDP. This variable captures private sector investment in Tanzania.
- ii. Financial development was measured by two variables which are Financial Market Depth Index and Financial Institution Depth Index, as follows:
  - (a) Financial Market Depth Index. This index measures the degree of development of capital markets. According to Svirydzhenka (2006), it focuses on stock market development.
  - (b) Financial Institution Depth Index. This is the financial sector performance measure, which includes the standard measure: bank credit to the private sector to GDP plus other indicators. This index assesses the development of financial institutions in Tanzania.
- iii. The degree of trade openness (DOP) captures the level of trade liberalization. DOP in the financial sector, deepens, widens, and brings the efficiency of financial intermediation via elimination of financial repression and offers competitive interest rates. This implies that openness is expected to positively affect financial sector development and private sector investment in Tanzania.

- iv. Real Effective Exchange rates. This captures the price competitiveness in the financial markets and is used to ascertain its influence on private investment in Tanzania.

#### **Data description**

We use data sourced from World Development Indicators (WIDI), IMF, and BOT, covering the period between 1988 and 2018.

**Table 2. Definition of variables and data sources**

Variable	Description	Source
Gross fixed capital formation, private sector to GDP	It is a private investment that covers investment by the private sector (including private non-profit agencies)	World Development Indicators (WDI)
Financial Development Proxies are Financial Market Depth Index and Financial Institution Depth Index	Financial Market Depth Index covers: <ol style="list-style-type: none"> <li>Stock market capitalization to GDP</li> <li>Stocks traded to GDP</li> <li>Stocks traded to GDP</li> <li>International debt securities of government to GDP</li> <li>Total debt securities of financial corporations to GDP</li> </ol>	International Monetary Fund (IMF)
	Financial Institution Depth Index covers: <ol style="list-style-type: none"> <li>Private-sector credit to GDP</li> <li>Pension fund assets to GDP</li> <li>Mutual fund assets to GDP</li> <li>Insurance premiums, life, and non-life to GDP</li> </ol>	International Monetary Fund (IMF)
Degree of openness of the economy	Trade liberalization index (The ratio of the sum of import and export to GDP)	World Development Indicators (WIDI)
Real Exchange rates	Measures the value of one currency against other foreign currencies.	Bank of Tanzania (BOT)

Source: Compiled by authors

#### **Research questions and testing hypothesis**

The literature shows that one of the reasons for embarking on financial liberalization policies in many countries was to stimulate financial market efficiency, thereby leading to savings, investment, and higher economic growth (Akinsola & Odhiambo, 2017). However, the evidence is mixed with regard to its impact on financial development and private sector investment in many countries (Ayyagari et al., 2006; Ghirmay, 2006; Grechyna & Ductor, 2015; Le Roux & Moyo, 2015; Bara et al., 2016; Naceur et al., 2017; Enwobi et al., 2018). Hence, using Tanzania as a case study, this study seeks to answer the following research questions and hypotheses.

#### **Research questions**

- Does financial sector development lead to domestic investment growth?
- What is the relationship between financial development and domestic investment?

#### **The Hypothesis of the study**

H<sub>0</sub>: There is no link between financial development and domestic private investment

H<sub>1</sub>: There is a link between financial development and domestic private investment

#### **Model technique**

We adopt the technique introduced by Pesaran, Shin, and Smith (2001) to study the nexus between financial development and private investment in Tanzania using An Autoregressive Distributed Lag (ARDL). This method is relevant for small sample data, but also you can mix I(1) and I(0) variables as regressors. It is denoted as follows:

$$Z_t = \mu + \sum_{i=1}^p \beta_i z_{t-i} + \varepsilon_t \dots\dots\dots (2)$$

where  $z_t$  is the vector of both  $x_t$  and  $y_t$ , where  $y_t$  is the dependent variable defined as Gross Fixed Capital Formation, private sector to GDP,  $x_t$  is the vector-matrix which represents a set of explanatory variables, i.e. Financial Market Depth Index (FMD), Financial institution Depth Index (FII), Degree of Openness of the Economy (DOP) and Real Effective Exchange Rate (REER),  $t$  is a time or trend variable. An error correction model (VECM) was developed as follows:

$$\Delta z_t = \mu + \alpha t + \lambda z_{t-1} + \sum_{i=1}^{p-1} \gamma_i \Delta y_{t-i} + \sum_{i=1}^{p-1} \gamma_i \Delta x_{t-i} + \varepsilon_t \dots\dots\dots (3)$$

Where  $\Delta$  is the first-difference operator. The long-run multiplier matrix  $\lambda$  is as follows:

$$\lambda = \begin{bmatrix} \lambda_{YY} & \lambda_{YX} \\ \lambda_{XY} & \lambda_{XX} \end{bmatrix}$$

The diagonal elements of the matrix are unrestricted, so the selected series can be either I(0) or I(1). If  $\lambda_{YY} = 0$ , then  $Y$  is I(1). In contrast, if  $\lambda_{YY} < 0$ , then  $Y$  is I(0). The co-integration test model is specified as follows:

$$\begin{aligned} \Delta(\ln GFC)_t &= \beta_0 + \beta_1 (\ln GFC)_{t-1} + \beta_2 (\ln FMD)_{t-1} + \beta_3 (\ln FII)_{t-1} + \beta_4 (\ln DOP)_{t-1} \\ &+ \beta_5 (\ln REER)_{t-1} + \sum_{i=1}^p \beta_{6i} \Delta(\ln GFC)_{t-i} + \sum_{i=1}^p \beta_{7i} \Delta(\ln FMD)_{t-i} \\ &+ \sum_{i=1}^p \beta_{8i} \Delta(\ln FII)_{t-i} + \sum_{i=1}^p \beta_{9i} \Delta(\ln DOP)_{t-i} + \sum_{i=1}^p \beta_{10i} \Delta(\ln REER)_{t-i} + \varepsilon_t \dots\dots\dots (4) \end{aligned}$$

Where:

- $\ln GFC$ =Gross Fixed Capital Formation
- $\ln FMD$ = Financial Market Depth Index
- $\ln FII$ = Financial Institution Depth Index
- $\ln DOP$ = Degree of Trade Openness
- $\ln REER$ = Real Effective Exchange Rate

Next, after Equation (4) was the Wald test ( $F$ -statistic) computation to differentiate the long-run relationship among variables. We carried out the Wald test by imposing restrictions on the long-run coefficients for  $\ln GFC$ ,  $\ln FMD$ ,  $\ln FII$ ,  $\ln DOP$ , and  $\ln REER$  as follows:

$$H_0 = \beta_1 = \beta_2 = \beta_3 = 0 \text{ (There is no long-run relationship)}$$

Against the alternative hypothesis

$$H_1 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq 0 \text{ (There is a long-run relationship)}$$

The computed  $F$ -statistic value was compared against critical values in Table CI (iii) of Pesaran *et al.* (2001) table. When the long-run relationship was detected, the long-run



and short-run of the ARDL model were estimated from equation (4). Then we selected the optimum lag in the model using Akaike Information Criterion (AIC). The model was specified as follows:

$$\ln GFC_t = Const + \sum_{i=1}^p \beta_{1,t} \ln FMD_{t-i} + \sum_{i=1}^q \beta_{2,t} \ln FII_{t-i} + \sum_{i=1}^q \beta_{3,t} \ln DOP_{t-i} + \sum_{i=1}^r \beta_{4,t} \ln REER_{t-i} + \varepsilon_t \dots \dots \dots (5)$$

Where

p,q,r = Optimal lag length used in the model

$\varepsilon$  = Residual

Then, we developed the long-run co-integration model is as follows:

$$\ln GFC_t = \frac{Const}{1 - \sum_{i=1}^p \beta_{1,t}} + \frac{\sum_{i=0}^q \beta_{2,t}}{1 - \sum_{i=1}^p \beta_{1,t}} \ln FMD_t + \frac{\sum_{i=0}^r \beta_{3,t}}{1 - \sum_{i=1}^p \beta_{1,t}} \ln FII_t + \frac{\sum_{i=0}^r \beta_{4,t}}{1 - \sum_{i=1}^p \beta_{1,t}} \ln DOP_t + \frac{\sum_{i=0}^r \beta_{5,t}}{1 - \sum_{i=1}^p \beta_{1,t}} \ln REER_t + \frac{\sum_{i=0}^s \beta_{6,t}}{1 - \sum_{i=1}^p \beta_{1,t}} + ECT_t \dots \dots \dots (6)$$

## Results and discussions

From Table 3, it appears that private investment is positively correlated with the financial market depth index, financial institution depth index, and the degree of trade openness. However, private investment is negatively correlated with the real effective exchange rate. The correlation between the financial institution depth index and the degree of trade openness with private investment is high as compared to other variables.

**Table 3. Correlations between Variables**

Variable	lnGFC	lnFMD	lnFII	lnDOP	lnREER
lnGFC	1.000	0.2185	0.7216	0.8288	-0.4453
lnFMD	0.2185	1.000	0.3774	-0.1143	0.6305
lnFII	0.7216	0.3774	1.000	0.5133	-0.0996
lnDOP	0.8288	-0.1143	0.5133	1.000	-0.5657
lnREER	-0.4453	0.6305	-0.0996	-0.5657	1.000

Source: Authors calculations

## Stationary properties of the variables

We tested the stationarity status of all variables as a preliminary step before proceeding with the ARDL bounds test. This was an important test for the order of integration. During this process, the Augmented Dicky-Fuller and Phillips Perron unit root tests were applied (Table 4).

**Table 4. ADF Unit Root Test and Phillips Perron Unit Root Test**

Level			First Difference			Status
Variable	ADF	PP	Variable	ADF	PP	
lnGFC	-2.0381	-1.7898	$\Delta$ lnGFC	-5.0606***	-4.7529***	I(1)
lnFMD	-2.3179	-1.9218	$\Delta$ lnFMD	-2.9565*	-3.2298**	I(1)
lnFII	-1.5191	-2.8328	$\Delta$ lnFII	-4.4739***	-9.6664***	I(1)
lnDOP	-2.1019	-1.8179	$\Delta$ lnDOP	-5.621113***	-5.4057***	I(1)
lnREER	-2.7431**	-4.3961***	$\Delta$ lnREER	-3.3480***		I(0)

Note: \*\*\*, \*\*, \* indicates the rejection of the null hypothesis of non-stationary at 1%, 5%, and 10% level of significance respectively,  $\Delta$  denotes the first difference.

Table 4 shows that both under ADF and PP unit root tests, lnREER was the only variable that became stationary at a level while lnGFC, lnFMD, lnFII, and lnDOP became stationary after the first difference. This means that lnREER was the only variable that was integrated of order zero (0), while all others were integrated of order one (1).

#### **Bounds F-Test for Co-integration**

According to the outcome in Table 5, the computed F-statistics is larger than the upper bound critical values. Thus the null hypothesis of no co-integration is not accepted, suggesting the presence of a long-run relationship between *lnGFC*, *lnFMD*, *lnFII*, *lnDOP*, and *lnREER*.

**Table 5. Results of Bound Test**

Computed F-Statistics: 5.8948 **, ***	Critical Values	
	Lower Bound	Upper Bound
1% Significance level	4.768	6.670
5% Significance level	3.354	4.774
10% Significance level	2.752	3.994

Notes: \*\*, \*\*\* Indicates that computed statistic falls above the upper bound values at 5 per cent and 10 per cent significance levels. The bonds critical values were obtained from Perasan et al. (2001, p 300), table: CI (iii) case III: Unrestricted intercept and no trend.

The results indicate F-statistic is larger than critical upper bound values at 5% and 10% significance levels. This finding suggests the existence of a long-run relationship between private investment and other variables such as financial market depth index (lnFMD), financial institution depth index (lnFII), the degree of trade openness (lnDOP), and the real effective exchange rate (lnREER).

#### **Long run Estimates of ARDL Process**

**Table 6. Long Run Results**

ARDL (1, 1, 1, 1, 1) selected based on AIC Dependent Variable: lnGFC				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.886963	2.193303	4.051863	0.0037*
lnFMD	0.886870	0.190268	4.661172	0.0016***
lnFII	1.004730	0.461425	2.177448	0.0611*
lnDOP	0.666324	0.172020	3.873517	0.0047***
lnREER	-0.429427	0.173954	-2.468617	0.0388**

Note: \*\*\*, \*\*, \* denote significance level at 1%, 5% and 10% respectively

The outcome of the long-run estimates of the ARDL process shows that the estimated coefficients of the long-run relationship are significant for all variables. For example, a significant financial market depth index (lnFMD) coefficient of 0.8869 means that when the financial market improves by 1%, private investment will increase by approximately 88%. This signifies a positive effect on private investment. Likewise, the coefficient of the financial institution index is positive and significant. This suggests that the quality of financial institutions is important in promoting savings and mobilizing financial

resources for private investment growth. These results justify the existence of a long-run relationship between financial development and private investment in Tanzania.

Moreover, the coefficient of the degree of trade openness is 0.6663 and statistically significant at 1%, meaning a 1% increase in trade openness would result in an approximately 0.66% rise in private investment. According to Boyd and De Nicolò (2005), the degree of openness of the economy fosters competition among financial institutions, which broadens accessibility to financial services. This is caused by the fact that higher competition among financial institutions leads to lower interest rates and better financial services. However, this result is inconsistent with the results of Michael and Aikaeli (2014) who did not find enough evidence that the degree of trade openness is related to private investment. The difference in the results is linked to the recent reforms that Tanzania has embarked on aiming at improving the investment climate particularly in areas of financial systems management, attracting local and foreign investments, and promoting more regional trade and integration.

In contrast, the coefficient of the real exchange rate is negative and significant at 5%, which implies that an appreciation of the real exchange rate lowers private investment in the long run. During the post-reform period, Tanzania implemented both undervaluation and overvaluation of currency policies; however, according to Wondemu and Potts (2016), Tanzania maintained an undervalued currency over a long period of time. This suggests that appreciation of the real exchange rate led to a decrease in private investment. This could be due to the low return of investments in the tradable sector while making imports less expensive which is a disincentive to private investment.

The long run model to ARDL (1,1,1,1,1) model for the natural log of private investment can be written as:

$$\ln GFC_t = 8.8869 + 0.886870 \cdot \ln FMD_t + 1.004730 \cdot \ln FII_t + 0.666324 \cdot \ln DOP_t - 0.429427 \cdot \ln REER_t$$

#### **Short-run Dynamics of ADRL Process**

**Table 7. Estimated Short-Run Coefficients**

ARDL (1, 1, 1, 1, 1) selected based on AIC Dependent Variable: DGFC				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FMD)	0.1935	0.1491	1.2982	0.2186
D(FII)	0.8914	0.3702	2.4081	0.0330**
D(OPENNESS)	0.5395	0.0912	5.9128	0.0001***
D(REER)	-0.6716	0.3642	-1.8441	0.0900*
ETC(-1)	-1.18002	0.3432	-3.4388	0.0049***
R-squared	0.9159		Adjusted R-squared	0.8109
Durbin-Watson stat	1.8795		F-statistic	8.7201
Prob(F-statistic)	0.00027			

Note: \*\*\*, \*\*, \* denote significance level at 1%, 5% and 10% respectively

The outcome of the estimated short-run coefficients indicates that the short-run coefficients for D(FII), D(OPENNESS), and D(REER) are statistically significant at 5%, 1%, and 10% levels, respectively. However, inconsistent with the long-run result, the coefficient of D(FMD) is positive but insignificant in the short run, this can be linked to the infancy state of capital markets in Tanzania at present. This is consistent with the findings of Odhiambo (2011), which showed that capital markets in Tanzania are not well developed enough. The coefficient of real effective exchange rate retained its negative and significant. This means that a 1% rise in the real exchange rate leads to a 67% decrease in private investment.

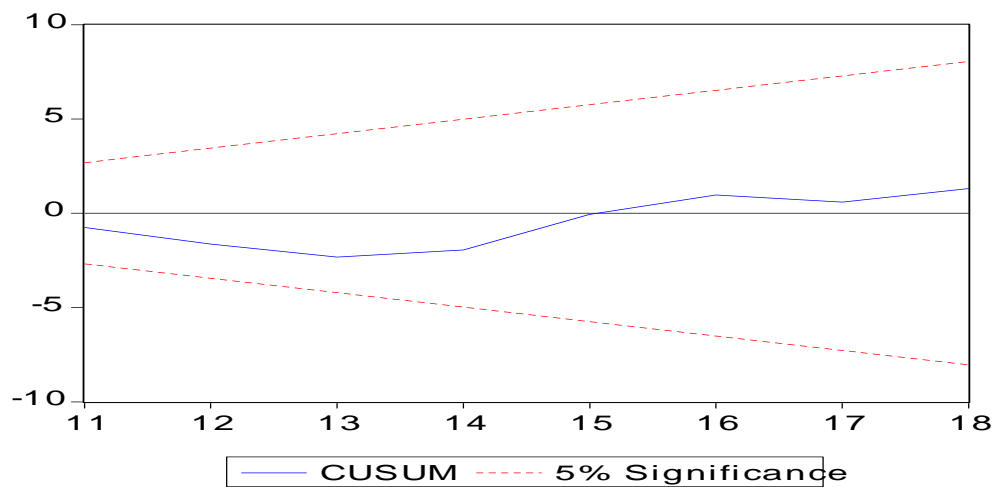
### Diagnostic checks

The diagnostic tests were checked using the Breusch Godfrey Serial correlation test, Heteroscedasticity test, Jarque bera, Cusum test, and CusumQ test. The outcome shows the validity of the ARDL- ECM Short-run model.

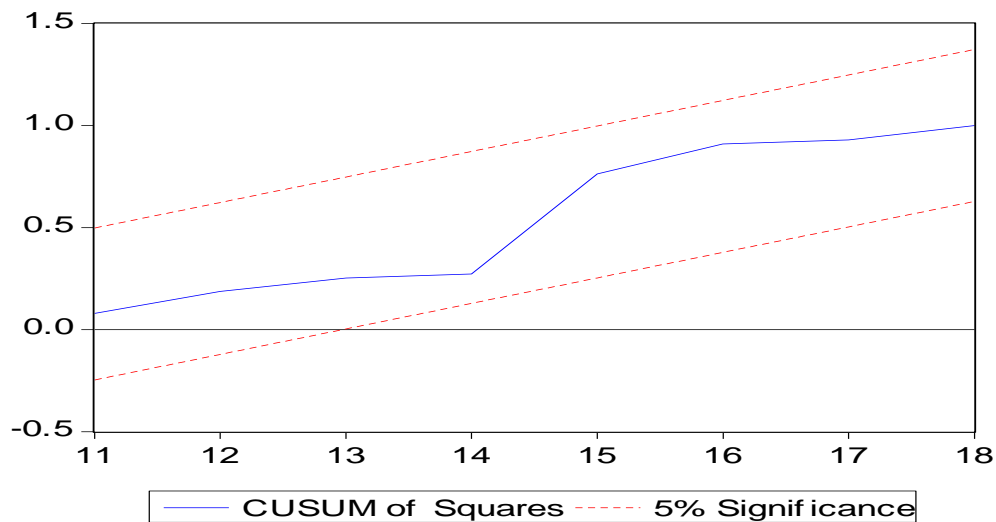
**Table 8. Diagnostic Checks**

Test	F- statistic	P.Value
Serial Correlation	0.2607	0.3265
Heteroscedasticity	1.1235	0.3814
Normality	1.2667	0.5308

\*\* denotes significance at 5%



**Figure 1: Plot of Cumulative Sum of Recursive Residuals**



**Figure 2: Plot of Cumulative Sum of Squares of Recursive Residuals**

### Conclusion and policy implication

The paper explored the nexus between financial development and private investment in Tanzania using ARDL from 1988 through 2018. Financial development was proxied by the financial market depth index and financial institution depth index. In testing the

McKinnon (1973) and Shaw (1973) hypothesis technique, the results show the nexus between financial development and private sector investment in Tanzania. This is confirmed by the estimated error correction coefficient, which is negative and significant at one percent level. These results imply that the financial market depth index (FMD), financial institution depth index (FII), degree of openness of the economy (DOP), and real effective exchange rate (REER) are co-integrated. However, on an individual basis, we find that financial development captured by the financial market depth index has a positive and significant effect on private sector investment in the long but not in the short run. This can be explained by the underdevelopment of capital markets in Tanzania at present. Similarly, we find that financial development measured by the financial institution depth index has a positive and significant impact on private sector investment in both periods. This suggests that there is an improvement in the services and quality of financial institutions in Tanzania after liberalization.

Similarly, the degree of trade openness recorded a positive and significant impact on private investment in both periods suggesting that the openness of an economy has enhanced financial development thereby leading to the development of private sector investment in Tanzania. In contrast, we observe that the real effective exchange rate recorded a negative and significant impact on private investment in the long and short run. This suggests that appreciation of the real exchange rate is bad for the growth of the private investment, and this could mean it reduced the returns on investment in the tradable sector while making imports less expensive which is a disincentive to private investment. Generally, the findings suggest that there is an improvement in the performance of the financial institutions after the liberalization episode in Tanzania. However, there is more to be done with regard to broadening and deepening the financial system in Tanzania. In particular, capital markets and financial institutions, especially in rural areas, are still underdeveloped. The findings highlight that to broaden, deepen and create a vibrant financial system in Tanzania, a more market-driven approach to financial management system will be necessary for the growth of the private sector. Therefore, we recommend increasing financial openness (trade openness), reinforcing the regulatory systems, and linking informal financial intermediaries with the formal institutions as pre-requisites to promote a vibrant financial system that can effectively support the mobilization of short-, medium- and long-term finance for private sector investment.

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**Annex 1****Comparison of Commercial Banks before and after Financial Liberalization**

1992	2020	Head Office	Branch Network
National Bank of Commerce	CRDB Bank LTD	Dar es salaam	234
Coop and Rural Dev. Bank	Akiba Commercial Bank	Dar es salaam	18
Peoples Bank of Zanzibar	Standard Chartered Bank	Dar es salaam	4
	National Bank of Commerce LTD	Dar es salaam	49
	Access Bank Tanzania	Dar es salaam	12
	Amana Bank	Dar es salaam	10
	Azania Bank	Dar es salaam	16
	BancABC	Dar es salaam	9
	Bank of Africa Tanzania	Dar es salaam	27
	Bank of Baroda Tanzania LTD	Dar es salaam	4
	Bank of India (Tanzania)	Dar es salaam	2
	Barclays Bank of Tanzania	Dar es salaam	31
	Citibank	Dar es salaam	1
	Commercial Bank of Africa	Dar es salaam	6
	DCB Commercial Bank	Dar es salaam	8
	Diamond Trust Bank Tanzania	Dar es salaam	28
	Ecobank	Dar es salaam	3
	Equity Bank (Tanzania)	Dar es salaam	15
	Exim Bank (Tanzania)	Dar es salaam	33
	Finca Microfinance Bank (Tanzania)	Dar es salaam	24
	First National Bank of Tanzania	Dar es salaam	11
	FBME Bank	Dar es salaam	4
	Guaranty Trust Bank (Tanzania) Ltd	Dar es salaam	1
	Habib African Bank	Dar es salaam	4
	I&M Bank (Tanzania)	Dar es salaam	8
	International Commercial Bank	Dar es salaam	5
	Kenya Commercial Bank	Dar es salaam	14
	Mkombozi Commercial Bank	Dar es salaam	6
	National Microfinance Bank	Dar es salaam	185
	NIC Bank Tanzania	Dar es salaam	6
	Peoples Bank of Zanzibar	Zanzibar	11
	Stanbic Bank Tanzania LTD	Dar es salaam	9
	United Bank of Africa	Dar es salaam	1
	UBL Bank Tanzania LTD	Dar es salaam	1
	Mwalimu Commercial Bank	Dar es salaam	6
	TPB Bank Plc	Dar es salaam	94
	TIB Corporate Bank	Dar es salaam	4
	China Dasheng Bank Limited	Dar es salaam	1
	Absa Bank Tanzania Ltd	Dar es salaam	24
	Letshego Bank Tanzania	Dar es salaam	5

Source: Bank of Tanzania (BOT) Reports