

Original Research

Financial Development, Foreign Direct Investment and Economic Growth: Evidence from Southern Africa Development Community (SADC)

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Abstract

The study followed up on the observations made by Bara et al., (2016) who observed that there was a deficit in analyzing the growth-finance nexus using data from SADC countries. The purpose of the study was therefore to ascertain the impact of foreign direct investment on economic growth through the domestic financial market channel of SADC countries. A sample of countries from the SADC region was employed with the data ranging from 1980 to 2018. The data was obtained from the IMF and the World Bank's World Development Indicator data base. The regressors used in the study include foreign direct investment, financial sector development, interaction of financial development and foreign direct investment, trade openness, gross capital formation, inflation and government expenditure. Fixed Effects panel regression was used after the Hausman Test revealed that the FEM was the most appropriate model. The outcome of the study revealed that FDI does not have a statistically significant impact on GDP without the interaction with financial sector development. However, the effects were amplified when financial sector development is introduced in the model. With the presence of financial sector development, FDI had a positive and statistically significant impact on GDP and at the same time financial sector development had a positive impact on GDP. Recommendations emanating from the study encourage monetary authorities to strengthen their financial services sector so as to fully benefit from FDI.

Keywords: Trade openness, Economic Development, panel regression, pairwise Granger causality tests, Hausman tests.

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Introduction

Several studies have been conducted to examine the effect of financial development on economic growth (Yıldırım et al, 2013; Svirydzenka, 2016 and Muma and Maphosa, 2017). Previous studies adopted a number of measures to estimate the degree or extend of financial development. Svirydzenka (2016) observed that previous studies usually employed percentage of private credit to GDP as well as the stock market capitalization to GDP. However, these measures have been criticized for their inability to consider the complicated nature or rather the multidimensional nature of financial development. The study intends adopt a measure of financial development which captures the multifaceted aspect of financial development developed by the International Monetary Fund depicted in fig 1 below.

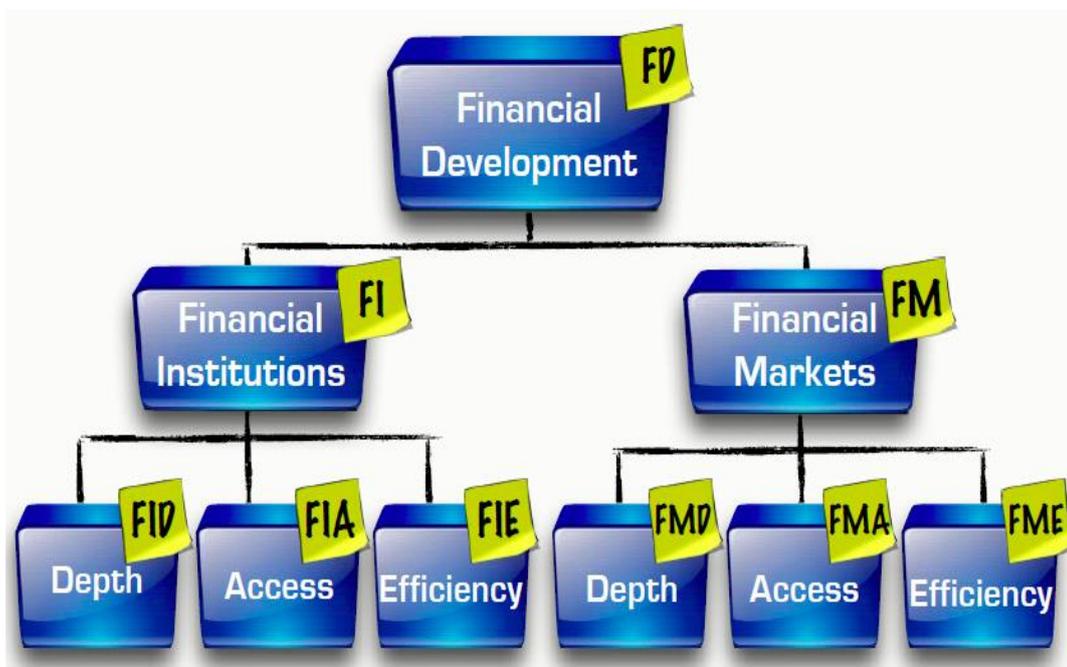


Figure 1 Financial Development Index Pyramid
Source: IMF staff, based on Čihák et al. (2012)

The research is a critic of previous studies and hence adopts a more robust measure of financial development. Figure 1 above indicate the robust measure of financial development index which is estimated using the standard three-step approach employed in various research papers and published in the OECD Handbook on Constructing Composite Indicators (OECD, 2008). The study further adopted the definition of financial development proposed by Čihák et al. (2012) and Svirydzenka, (2016). Data on financial development was obtained from the Global Financial Development Database (GFDD) developed by the International Monetary Fund. The index provides a detailed assessment of how financial markets and institutions are developed taking into account their level of accessibility, efficiency and depth. The financial development index takes into account all these qualitative factors of financial institutions and markets into a single robust index. The FDI provides a standard measure of uniformity and comparability amongst countries which has been lacking in previous studies where researchers estimated FDI using their

own yardsticks. Suliman and Elian (2014) attempted to analyse the causal linkages amongst FDI, GDP and financial development. In their study financial development was estimated using the size of the equity market as well as the bank credit sector. However, this study is a critic of such measures in that these measures do not provide a comprehensive measure of financial development, (IMF, 2016). The researcher observed that the growth and improvement of the financial sector for SADC countries plays a key role or rather is a prerequisite for the economies in the region to reap the positive effects of FDI. Hermes and Lensink (2003), ascertained that the growth of the financial sector in an a economy improves the allocative efficiency of financial resources and that trickles down to enhancing the absorptive capacity of the region as FDI flows into recipient countries.

1.1 Background of the Study: Financial Development in Southern Africa

Bara et al (2016) observed that studies attempting to examine the effects of financial development on economic growth using data from Southern Africa Development Community (SADC) are scant. The limited literature on the growth-finance nexus in the SADC region has created a gap on the evaluation of financial development in the region as a whole. As the region is moving towards economic integration, the growth of the financial sector cannot be ignored. Several studies ignored the interaction of Foreign Direct Investment (FDI) and financial development on economic growth. Allen et al., (2011) and KPMG (2014) concurred that most economies in the SADC region with the exception of South Africa have an under-developed financial sector which is characterized with extremely higher levels of financial exclusion.

The region has adopted a financial liberalization resolution amongst its members with the intention of minimizing restrictions and regulatory controls over the financial institutions. Interest rates and credit distributions within the regions are mainly would be mainly determined by market forces. Numerous countries across the region have benefited from the financial liberalization efforts of the region and these countries include Mauritius, Seychelles and South Africa (SADC Annual Report, 2020). The countries have recorded raising interest rates which promoted the culture of savings in the countries. In addition, reports from international observers' suggested that the liberalization policies have immensely contributed towards sustainable economic growth and development within the SADC region.

The financial liberalization drive adopted by the region is consistent with theoretical framework proposed by McKinnon (1973), who suggested that liberalization promote the deepening of financial markets. Financial deepening refers to the widespread use of financial markets by deficit and surplus units as well as the monetization of the entire economy. McKinnon (1973) further suggested that financial liberalization allows the efficient allocation of resources within the economy amongst individuals and institutes. McKinnon (1973) further suggested that financial liberalization contributes towards the savings culture and reduction of restrictions on capital accumulation which increases optimal allocation of investment through the transfer of capital to more economically productive sectors of the economy.

Furthermore, improved efficiency in the banking industry has been noticed in Angola, Madagascar and Malawi where accessibility of credit by domestic investors as well as a general improvement in the credit systems. However, the expansion of the financial liberalization efforts by the region has failed to transform the overall macroeconomic

performance of the region (SADC Annual Report, 2020). The region has witnessed rising inflation which has been slightly above interest rates as well as huge differences in economic transformations amongst member states. In addition, the majority of the members of the region has limited access to global markets and is not fully integrated into the universal economy. The region has also been plunged into conflict which hampered the efforts of the region to improve infrastructure. These conflicts have inversely impacted the economic transformation of the region. It is the hope of the region that as the financial sector is fully liberalized, more foreign direct investment flows into the region and contributes towards the efforts already adopted by the region of creating a regional economic powerhouse. Table 1 below provides an overview of the financial sector in Southern African.

Table 1. Selected Financial Depth and Efficiency indicators for SADC countries (2020)

Country	Domestic credit to private sector (% of GDP)	Broad Money (M2) (as % of GDP)	Market capitalization of listed companies (% of GDP)	Stocks traded, turnover ratio (%)
Angola	12.0727	35.2557	-	-
Botswana	37.6607	49.6475	-	-
Comoros	15.0515	31.5282	-	-
DRC	7.2242	-	-	-
Lesotho	-	-	-	-
Madagascar	15.6146	26.8603	-	-
Malawi	-	137.7729	-	-
Mauritius	95.9707	163.8415	56.4374	2.8474
Mozambique	24.7922	59.3902	-	-
Namibia	71.9075	70.6937	17.4503	0.3408
Seychelles	49.9521	127.0786	71.8701	
South Africa	-	82.8030	348.276	97.3200
Tanzania	13.1642	20.8976	10.3862	0.02967
Zambia	-	29.2963	-	-

Source: IMF and World Bank's Development Indicators Data Base.

Table 1 above indicated that during the financial year 2020 banks in Mauritius offered an estimated 96% of credit as GDP to domestic borrowers and this was the highest amongst all the countries. The Democratic Republic Congo had the lowest share estimated at 7.2%. Table 1 indicates that accessibility to credit by domestic consumers was very low during the year. On the other hand broad money supply was relatively high with Mauritius have increased broad money supply by approximately 164% of GDP and this was the highest whilst Tanzania increased broad money supply by nearly 21% which happened to be the lowest during 2020. South Africa had the largest market capitalization of all the listed companies expressed as a percentage of GDP. Studies examining the growth-finance nexus using data from SADC have observed that South Africa has the most advanced financial sector in the region.

Statement of the Problem

Previous studies have indicated that financial development plays a pivotal role in the economic growth of both developing and developed countries (Ilgun, 2016). Given the relevance of financial development on economic transformation, Bara et al (2016) observed that studies examining the impact of financial development on economic growth using data from SADC countries have not been fully examined. The study therefore intends to analyze the impact of FDI on economic growth rates through the channel of domestic markets. Specifically, the study intends to analyze the relationship between economic growth and FDI, and how the level of financial development helps amplify the benefits or impact of FDI on economic growth. In addition, the study intends to establish the causal linkages between financial development, FDI and economic growth.

Research Objectives

The goals of the research paper are broadly categorized into primary and secondary objectives.

Primary objective

The research study intends to analyze the impact of financial development and its interaction with foreign direct investment on economic growth.

Secondary Objectives

The study is a following up on the observations made by Bara et al (2016) on the scantiness of studies analyzing the effect of the interaction of financial development and foreign direct investment on economic growth. Hence the study intends to achieve the following secondary goals:

- i) To establish the level of financial development within the SADC region
- ii) To ascertain the causal linkages amongst economic growth, financial development and foreign direct investment
- iii) Lastly, to determine the effect of financial development and its interaction with foreign direct investment

Research Questions

Given the above goals of the study, it is imperative that the study seeks to provide answers to the following research questions.

- What is the level of financial development within the SADC region?
- Does economic growth granger cause financial development?
- Does foreign direct investment granger cause economic growth?

- Does financial development granger cause foreign direct investment?
- What is the impact of financial development and its interaction with foreign direct investment on economic growth?

Statement of Hypothesis

Hypothesis 1

H_{1.0}: Financial development has a positive impact on GDP

Hypothesis 2

H_{2.0}: Foreign direct investment has a positive impact on GDP

Hypothesis 3

H_{3.0}: The interaction of financial development and foreign direct investment has a positive impact on GDP.

Hypothesis 4

H_{4.0}: Inflation has a negative effect on GDP

Hypothesis 5

H_{5.0}: Trade Openness has a positive effect on GDP

Hypothesis 6

H_{6.0}: Gross Fixed Capital Formation has a positive effect on GDP

Hypothesis 7

H_{7.0}: Government consumption measured as central government expenditure to GDP has a positive/ negative effect on GDP.

Significance of the study

Given the background of limited studies examining the effect of financial development and its interaction with foreign direct investment, the study intends to establish the relationship amongst these key variables. Innumerable studies have attested the positive effects of financial development on economic growth using panel data but however the region of southern Africa had limited literature which indicates if financial development is significant to the economic transformation of the region. Furthermore, the study intends to establish the impact of other key macroeconomic variables on economic growth rate and provide a contemporary analysis of the macroeconomic environment in the region.

Scope of the study

The study intends to ascertain the impact of financial development and its interaction with financial development on economic growth using data mainly from SADC member states. The study adopted annual or yearly data from 1980 to 2018. The variables employed in this research paper include GDP, financial development index, foreign direct investment, trade openness, government expenditure, Gross Fixed Capital Formation and inflation.

Limitations of the study

The study was largely hindered by unavailability of data of key macroeconomic variables that are believed to be essential or key for a much more reliable and informative outcome. The SADC data base failed to provide the all the key variables. However, to provide a much more dependable outcome alternative sources of macroeconomic variables were used and these include the World Bank's development indicators, IMF and AfDB.

Assumptions Underpinning the Research Study

In order to produce reliable and consistency outcome the study adopted the following axioms:

- ❖ The SADC region is in pursuit of economic growth through diversifying the economies of its member states that largely depend on exports of natural resources.
- ❖ Financial development plays a pivotal role in the economic transformation of a country and hence there is need for policymakers to pay attention on the developments in the sector.
- ❖ For the SADC region to fully benefit from the positive effects of foreign direct investment there is need for the region to have a robust financial sector.
- ❖ Governments in the SADC region are pursuing a research based decision making approach.
- ❖ The study further assumes that the SADC region is in pursuit of economic growth as a solution to key macroeconomic problems such as increasing poverty levels and unemployment amongst the youths and the women.

Structure of the Rest of the Study

The current portion of the study managed to bring to light the background, problem statement, hypothesis, objectives, scope and also the limitation of the study. The next chapter reviews and discusses the theories and definitions of financial development as well as related empirical literature review. Chapter three provides a framework that links economic growth and financial development based on a theoretical approach. Research findings presentations and analysis is provided in chapter four and lastly research based recommendations and conclusions are presented in chapter five.

Literature Review

There are plentiful studies that have attempted to examine the growth-finance nexus using data from both developed and developing countries. In this portion of the study researchers made a follow up on the definitions of financial development proposed in previous studies and further provide the leading theories and latest empirical evidence on the growth finance nexus.

Debates on the Definition of Financial Development

Innumerable propositions have been forward by various researchers on the definition of financial development. One of the earliest definitions of financial development was that it encompasses the guidelines, aspects and institutes that contribute towards the most competent financial intermediation and proficient markets (Financial Development Report, 2012). The definition was extended to include the accessibility of capital and other key services offered in the sector. In a closely related research study, FitzGerald (2006) expanded the definition of financial development as involving the creation and enlargement of financial institutes, tools or instruments and the existence of the market which funds the investments and development process.

Dodd (2011) provided a different definition by suggesting that financial development is more of a table supported by its four legs. These legs are

- i) The Securities and the capital market which is responsible for delivering and trading bonds and equity shares.
- ii) The Banking sector which plays a pivotal role in the distribution of loanable funds from surplus units to deficit units as well as a platform of settling services.
- iii) The insurance and pension funds sector which is responsible for smoothing income to future periods and provision of collateral security for borrowing
- iv) Lastly, the table is supported by the derivatives markets which play a critical role of managing risks and price adoptions in the market.

The above mentioned legs play a crucial role of supporting the table which is the financial system of any economy. Each leg plays a vital role in the development and stability of the sector. Latest contributions to the definition of financial development involve the smart execution of the major role of the banking sector which is financial intermediary which promotes investments, accumulation and distribution of loanable funds to deficit units or domestic and foreign investors within the borders of the country. The researchers concluded that financial development is a broad term which encompasses the availability of loanable funds at competitive rates which contributes towards the economic transformation of the county by creating employment and reducing rampant poverty levels. In addition, the researchers noted that financial development plays a crucial role in unpacking the benefits of FDI in significantly contributing towards sustainable economic growth. This helps in improving the absorptive capacity which helps in resolving various financial market imperfections. Development finance experts and economists concurred that financial development is a gateway through which FDI

passes through as it positively contributes towards economic development (Alfaro et al 2004).

Growth-Finance Theoretical Framework

Studies have indicated that endogenous growth models are the foundation for finance-growth model (Bara et al, 2016). The study adopted an endogenous model formulated by Kenourgios and Samitas (2007) that considers the stage of financial sector development and growth rates stated at an initial time (t=1). The model is outlined in equation 1 below:

$$g = A \frac{1}{Y} - \delta = A\phi s - \delta \quad (1)$$

In equation (1) above, Y represents growth in productivity, the constant A stands for the yield of capital, δ is the consumption rate in the event of goods being invested (i.e. the rate of depreciation), gross savings are represented by S lastly, transaction costs (loss) through financial intermediation is depicted by $(1 - \phi)$.

In the process of developing the model, Kenourgios and Samitas (2007) suggested that in order to increase the efficiency accumulation (The equivalency of boosting ϕ) there is need to enhance the model by introducing or adding financial development. This had an effect of increasing the savings rate (s) which would further positively influence the marginal productivity of capital (A). If the consumption rate of the invested good is excluded from the equation above, it would translate to equation 2 indicated below:

$$g_{t+1} = A\phi s_t \text{ alternatively represented as } \Delta y_t \\ = A\phi_t s_t \quad (2)$$

The above equation represents a production function and through the adoption of the assumption that the function depends on capital stock $y_t = Af(k_t)$ through the process of differentiation it transforms to:

$$\Delta y_t = A \frac{dk_t}{y_t} f'(k_t) = A\phi_t s_t \quad (3)$$

The above equation has been previously known as the AK endogenous growth model including financial intermediation (Mankiw, 1995). The AK endogenous growth model depicts the famous production function which connects output and factors of production such as capital and labour which can then be transformed into the Cobb Douglas production function:

$$Y_{i,t} = A_{i,t} C_{i,t}^\beta K_{i,t}^\gamma \quad (4)$$

In the production function above i and t depicts country and time in that order. Real per capita income is denoted by Y and the explanatory variables like capital and other control variables are denoted by C and K. In order to make the above model linear through taking the logarithm of each side the model would be in its expanded form. Hassan et al., 2011, observed that various studies often adopted the linear functional form of the above

model including several structural variables. This therefore reduces the equation to the form specified below:

$$y_{i,t+k,k} = -\rho Q_{i,t} + \gamma' X_{i,t} + \varepsilon_{i,t+k,k} \quad (5)$$

The determining factors of per capita income or the controlling variables are denoted by $X_{i,t}$ for all the represented countries in the sample. The model is in the form of panel data representing both time series and cross-sectional elements of data. The model is similar to the one employed by Levine (1997) to estimate the growth-finance nexus using data for 77 countries as well as Bara et al., (2016) using data from fifteen SADC countries. The model was also employed by Coporale *et al.* (2009) who modified the augmented Barro growth regression by incorporating financial development variables which then translated to the functional form stated below:

$$\text{GROWTH}_{i,t} = \alpha_i + \beta_i[\text{FINANCE}]_{i,t} + \gamma_i[\text{CONDITIONINGSET}]_{i,t} + \varepsilon_{i,t} \quad (6)$$

Alternately equation 6 can be written as:

$$\text{growth}_{i,t} = y_i - y_{i,t-1} = \alpha_i + \beta_i f_{i,t} + \gamma_i C_{i,t} + \mu_i + \varepsilon_{i,t} \quad (7)$$

Ultimately, growth measured as real per capita income is depicted by y , in which the growth rate is represented by $g_{i,t}$, and development in the financial sector is represented by $f_{i,t}$, the rest of the independent variables are denoted by $C_{i,t}$, u_i and ε_t are the country-specific and white noise error terms respectively, i is the specific country and t is the time period.

Empirical Literature Review

The study was mainly biased towards empirical studies which employed panel regression models which are closely related to this study. This bias was as a result of creating a basis for comparison with these other previous studies from other regions.

In a more closely related study, Hermes and Lensink (2003) analysed the part played by the development of the financial services sector in contributing towards the positive linkages between GDP and FDI. Their study employed a sample of 67 countries in which 37 of these had adequately sophisticated financial markets such that FDI would freely enhance positively to economic growth rates. The sample of the countries was largely from Latin America and Asia. Their research paper was based on the assumption that the expansion of the financial system is a prerequisite for FDI to positively contribute towards the enhancement of GDP. The outcome of their study observed that FDI on its own does not positively contribute towards the growth of per capita income. However, the study revealed that the interaction of FDI and measures of financial development such as credit from the domestic financial sector positively and significantly contributed towards economic growth. The outcome of the study concurred with the assumption of the study. The researchers however noticed that the sample excluded countries from SADC region and further criticised the study for its approach of mixing countries with different characteristics and regions in a single study.

Nwezeaku et al., (2013) adopted a small sample of countries from Sub-Saharan African countries namely Nigeria, Ghana and South Africa to establish the effect of financial development on economic growth. Their study developed three separate models each country adopting GDP as economic growth as well as four regressors constructed as alternatives for financial development. The study employed annual data with a coverage period from 1980 to 2012 from respective central banks of the countries as well as the World Bank and IMF. Variables were tested for unit root using the Augmented Dicky Fuller test (ADF). The study employed the OLS estimation method including co-integration and causality tests. The study revealed that financial development had a positive impact on economic growth in South Africa with limited positive effect in Ghana and Nigeria. The study ignored the effect of FDI and used a smaller sample of countries from sub-Sahara Africa. Furthermore, the study employed OLS estimation procedures whilst other studies employed GMM models and Panel regression models.

In an attempt to examine the causal relationship amongst FDI, financial development and GDP, Sghaier and Abida (2013) adopted a sample of 4 countries from North Africa namely Tunisia, Morocco, Algeria and Egypt. The study employed yearly data with coverage from 1980 to 2011. The uniqueness of the study was on its ability to dump the common cross-sectional examination and paid attention on ways in which FDI flow into a country or region could contribute towards economic growth for the recipient country. The study adopted the Generalized Method of Moment (GMM) panel data analysis to achieve the objectives of the study. As a result, the study concluded that a positive connection exists between FDI and GDP. This however, was in contrast with the results obtained 10 years prior to their study by Hermes and Lensink (2003) who indicated that without the influence of financial development, FDI does not positively contribute towards economic growth. Similarly, the studies concluded that the development of domestic financial systems was a paramount precondition necessary for FDI to enhance economic growth. Their study recommended policy makers in North Africa to adopt local-level reforms which would enhance the existence of FDI. Unlike Hermes and Lensink (2003) who examined the causal linkages between FDI, financial development and GDP using a wide range of countries from several regions, Sghaier and Abida (2013) employed a sample of countries from the same region and with closely related characteristics.

Using a sample of countries from the SADC region Bara et al., (2016) observed that the analysis of the growth-finance nexus in this particular region was scant. They further observed that the transition from wholesale to retail banking which supports SME's necessitated the re-examination of the growth-finance nexus. The objective of their study was to ascertain the causal linkages between GDP and financial development considering the part played by financial reforms. Like the study conducted by Sghaier and Abida (2013), their study employed Generalised Methods of Moments (GMM) Estimations and Panel OLS Estimation with Fixed and Random Effects. The results of the study observed that an inverse relationship exists between financial development and economic growth within the SADC region. The outcome could have been influenced by various factors which include massive financial exclusion within the region. The study further concluded that there exist a bi-directional causality between finance and growth. The study was different from this current study in that it did not consider the interaction of FDI on financial development even though the study concentrated on the SADC region. Bara et

al., (2016) downplayed the effect of FDI in enhancing the positive contribution of financial development on economic growth.

Lastly, Jalloh et al., (2017) analyzed the effect of financial Deeping, interest rates and economic growth using data from sub-Saharan countries. The study employed annual data ranging from 2000-2013. The study adopted a dynamic panel approach to estimate the linkage amongst financial deepening, interest rates and economic growth. The study concluded that financial deepening, exports and gross national savings positively contribute towards economic growth of the sampled countries. The study differs from the current study in that the sample of the current study concentrated on SADC region unlike Jalloh et al., (2017) which concentrated on all the countries from sub-Saharan countries.

Econometric Research Methodology

Introduction

The major objective of this section of the study is to outline the framework that links FDI, financial development and economic growth. Studies have indicated that panel regression is the most common approach in attempting to achieve the objectives of the study. In addition, the study intends to deliver the researcher's points of view for the approaches adopted in gathering and treatment of data used to achieve the goals and research questions of the study. Lastly, the chapter intends to formulate a growth-finance model for the SADC region which has all its variables included and theoretically justified.

Research Paradigm

A closely analysis of the literature concluded that the study is mainly based on a qualitative research paradigm. Bayai and Nyangara (2013) observed that a quantitative approach is suitable where the research problem under scrutiny is both narrative and observable in nature. In this case growth and finance are both quantifiable and the rest of the explanatory variable's effect on growth can also be measured.

Data Collection Methods

The data used in this study was obtained from the World Bank's development indicators data base, SADC statistical data base as well as the IMF. The data employed in this study was secondary data which concurred with previously conducted studies (Sghaier and Abida (2013); Bara et al., (2016) and Jalloh et al., (2017)). These studies employed data from international institutions such as the WB and IMF. Researchers across the globe have used data from the WB and IMF and its deemed credible as the sources are responsible for compiling economic data for all the countries which is published at a given interval. The study used annual data for each country in the sample to estimate the growth-finance model as well as the correlation co-efficient (R), coefficient of determination (R-squared) and the adjusted R-squared.

Econometric Model

The intention of this study is to come up with an econometric model in which FDI through financial markets channel brings about positive effects to economic growth. The inclusion of FDI in the growth-finance nexus was ignored by Bara et al., (2016) and this makes the study different from that previous study. Prominent researchers in this field of study most notably Alfaro et al. (2004) developed an empirical model premised on the assumption that economies need to pass through their transitional dynamics since they do not easily achieve their steady state levels. The study there subscribes to that assumption and the research initially explores the direct impact of FDI on growth rates using the GMM method of estimation.

$$\mathbf{GDP}_{i,t} = \beta_0 + \beta_1 \mathbf{GDP}_{i,t-1} + \beta_2 \mathbf{FDI}_{i,t} + \beta_3 \mathbf{X}_{i,t} + \mu_t + \mathbf{n}_i + \epsilon_{i,t} \quad (8)$$

In equation (8) above $\mathbf{GDP}_{i,t-1}$ represents the original level of per capita GDP, whereas FDI is the annual foreign direct investment expressed as a percentage of GDP. The rest of the control variables are denoted by $\mathbf{X}_{i,t}$. The components μ_t and \mathbf{n}_i represents the time specific effect and unobserved country-specific fixed effect respectively whilst $\epsilon_{i,t}$ is the error term. Equation (8) intends to test if the marginal impact of FDI on GDP, β_2 is statistically significant.

It has been observed that FDI has the capacity to influence per capita income through several channels, the next equation attempts to provide a link between FDI and GDP through financial markets. The study intends to test the hypothesis that does the level of financial development in a specific recipient country influences or affects the effect of FDI on GDP. To achieve the objective the FDI indicator variable is interacted with the FDI indicator and finally test for the statistical relevance of the interacted coefficient. If the outcome of the coefficient has positive impact, it implies that the impact of FDI on GDP can be improved through deeper financial markets. This would therefore provide a strong foundation which supports the complementary role between FDI and financial development. Equation 9, indicate the model that need to be estimated:

$$\mathbf{GDP}_{i,t} = \beta_0 + \beta_1 \mathbf{GDP}_{i,t-1} + \beta_2 \mathbf{FDI}_{i,t} + \beta_3 \mathbf{FinDev}_{i,t} + \beta_4 (\mathbf{FDI}_{i,t} \cdot \mathbf{FinDev}_{i,t}) + \beta_5 \mathbf{X}_{i,t} + \mu_t + \mathbf{n}_i + \epsilon_{i,t} \quad (9)$$

As noted previously that growth-finance models are premised on endogenous growth models and to consider the issue of endogeneity and country- specific unobserved characteristics, panel regression estimation methods was employed to estimate the equation. Hall (2009), observed that panel regression models offers a methodologically suitable way of attaining reliable as well as providing estimators that are asymptotically normally distributed. Panel Regression models have widely been adopted in the field of economics and finance.

The matrix “X” is composed of a set of control variables which include: the rate of inflation denoted by the consumer price index which measures changes in the prices of goods and services in the economy and a measure of macroeconomic stability in the economy. In addition, the “X” vector also includes trade openness which provides more benefits through foreign exchange. Furthermore, to capture the level of new investments

and changes in inventory in the economy the study adopted the gross fixed capital formation as a percentage of GDP. Lastly, the model included the government consumption component which includes expenditure by government on goods and services. Like previous studies employing panel regression estimation procedures the study included the lagged per capita income to accommodate the convergence of economic growth in the regression model.

Results Analysis and Interpretation

The study intends to ascertain the impact of FDI on real income through the domestic financial markets using data from a sample of SADC countries ranging from 1980 to 2018. It is the intention of this chapter to present and analyse the results of the study. The study analysed the data using panel regression estimations and granger-causality tests amongst the key variables namely FDI, GDP and Financial development. In order to identify the presence of multicollinearity amongst the explanatory variables the study employed the correlation matrix to detect the presence of multicollinearity.

Quantitative Analysis

The study employed E-view statistical package to estimate equations (8) and (9) as well as other diagnostic tests which are presented below:

Descriptive Statistics

Table 2. Summary Descriptive Statistics

Measure	GDP	GDP (t-1)	FDI	FSD	FSD*FDI	GCF	GOVT Exp	INF	Trade
Mean	1.1990	1.2204	3.2933	0.1618	0.5929	2.2704	3.8445	1.7523	3.2057
Median	1.3545	1.3331	1.7095	0.1172	0.2155	2.9530	1.7816	1.8802	4.0263
Max	15.5582	15.5582	57.8376	0.6484	16.4731	3.9888	109.5099	10.0763	5.4162
Min	-26.4112	-26.4118	-6.8977	0.0000	-1.3793	0.0000	-68.2379	-9.6162	0.0000
Std. Deviation	4.4681	4.5229	5.4651	0.1352	1.1591	1.4458	13.2918	1.6460	1.8759
Kurtosis	7.1380	6.9841	31.4573	4.0615	69.7517	1.8863	19.8429	9.2166	2.2658

Table 1 above indicate the summary descriptive statistics for the variables selected in the model (equation 9). The mean indicate the average value of the variable whilst the median refers to the middle value if the variable is sorted in either ascending or descending order. The median and mean are classified under measures of central tendency. The maximum and minimum value refers to the largest and smallest values for a given variable. The difference between these two is known as the range. The standard deviation is classified under measures of dispersion or variability and indicates how the data is spread or dispersed from its mean. Lastly, kurtosis is used to explain the distribution of the variable. Large values of the Kurtosis indicate that the data exceeds tails of the normal distributions.

Correlation Matrix

Table 3. Correlation Matrix Results.

Variables	GDP	GDP (t-1)	FDI	FSD	FDI*FSD	GCF	GOVT	INF	TRADE
GDP	1								
GDP(t-1)	0.403	1							
FDI	0.154	0.209	1						
FSD	0.174	0.193	0.081	1					
FDI*FSD	0.140	0.223	0.869	0.332	1				
GCF	0.194	0.237	0.168	0.384	0.238	1			
GOVT	0.236	0.209	0.071	0.003	0.023	0.061	1		
INF	-0.194	-0.168	-0.041	-0.036	-0.098	-0.113	-0.083	1	
TRADE	0.226	0.2361	0.203	0.425	0.281	0.887	0.037	-0.195	1

Gujarati and Potter, (2009) described the correlation matrix as a $K \times K$ square and symmetrical matrix whose values indicate the correlation between two variables. Gujarati, (2004) further observed that a higher pairwise correlation between variables indicates a serious problem of collinearity. Researchers generally concurred that higher pairwise correlation existing between explanatory variables is a red flag which signals the presence of collinearity. The presence of multicollinearity may result in large variances and covariances for the variables and this hinders precision in estimations even though the estimators remain BLUE. If the pairwise correlation between two variables is greater than 0.80 it is recommended that the variables are dropped, but however researchers recommended not to rely on bivariate correlation coefficients since they do not uphold the assumption that other variables are constant when being computed. The study therefore did not drop the variables with high pairwise correlation coefficients. These variables include the interaction of FDI and FSD and FDI as well as trade and gross capital formation (gcf) whose pairwise correlation coefficients are in excess of 0.80.

Pairwise Granger-Causality Test

It is part of the objectives of the study to ascertain the causal linkages between the key variables of the study. Table 4 below indicates the pairwise granger causality test results amongst the key variables adopted for the study.

Table 4. Pairwise Granger-causality Test results.

Null Hypothesis	Obs.	F-Statistics	Prob.
FDI does not Granger Cause GDP	518	2.1605	0.1163
GDP does not Granger Cause FDI		3.9828	0.0192
FSD does not Granger Cause GDP	518	2.5241	0.0811
GDP does not Granger Cause FSD		3.9698	0.0195
FSD does not Granger Cause FDI	518	0.1827	0.8331
FDI does not Granger Cause FSD		0.6203	0.5382

Table 4 above indicated that the probability that FDI does not granger cause GDP is 0.1163 which is above 0.05 hence we do not reject the null hypothesis and conclude that FDI does not granger cause GDP. The study also intended to investigate if GDP granger causes FDI and the p-value was 0.0192 which is less than 0.05 hence we do not accept the null hypothesis and conclude that GDP granger causes FDI.

In addition, the p-value that FSD does not granger cause GDP was 0.0811 which is greater than 0.05 implying that we do not reject the null hypothesis but rather accept it and conclude that Financial sector development does not granger cause GDP. However, the probability that GDP does not granger cause FSD was 0.0195 which is less than 0.05 meaning that we can reject the null hypothesis and conclude that GDP causes FSD.

Finally, the p-value that FSD does not granger cause FDI was 0.8331 which is greater than 0.05 implying that we cannot reject the null hypothesis and conclude that FSD does not granger cause FDI as we accept the null hypothesis. Lastly, the p-value that FDI does not granger cause FSD was 0.5382 which is greater than 0.05 implying that we accept the null hypothesis and conclude that FDI does not granger cause FSD.

Hausman Test Results

The Hausman Test was conducted to determine whether the fixed effects or the random effects model should be conducted for the panel regression model. The null and alternative hypotheses of the test are established below:

H_0 : Random Effects model is the appropriate estimator or $Cov(\omega_i, X_{it}) = 0$

and the alternative hypothesis expressed as follows:

H_1 : Fixed Effects model is the appropriate estimator or $Cov(\omega_i, X_{it}) \neq 0$

If the p-value of the Chi-Sq. statistic is less than 0.05 we reject the null hypothesis and conclude that the Fixed Effects Model is the most appropriate but if the p-value is greater than 0.05 we accept the null hypothesis and conclude that the Random Effects Model is the most appropriate model. Table 5 below indicates the Hausman test results.

Table 5. Correlated Random Effects - Hausman Test Results

Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	31.287976	8	0.0001

The Hausman test results indicated that the Fixed Effects Model is the most appropriate one since the p-value of the Chi-Sq. Statistic was 0.001 which is less than 0.05. This implies that we reject the null hypothesis and conclude that the random effects model is not the appropriate model.

The estimated Fixed Effects Models for equations 8 and 9 are provided in the following section of this chapter.

Estimated Econometric Fixed Models

Table 6 below illustrate the estimated models for equations 8 and 9 and the results are interpreted as follows. Equation 8 intended to establish the impact of FDI on GDP without the interference of financial development. The results established that FDI had a statistically insignificant impact on GDP without the role of financial development. This is depicted by a p-value of 0.1787 which exceeds 0.05. The estimation of equation of equation 9 concluded that FDI had a positive impact on GDP and is statistically significant. Holding all factors constant, a 100% increase in FDI would result in a 16.15% in GDP. Furthermore, financial sector development (FSD) also had a positive impact on GDP. A 10% increase in FSD would result in a 61.57% in GDP. The estimation of equation of 9 also revealed that the interaction between foreign direct investment and financial sector development (FSD*FDI) had a statistically insignificant impact on GDP. The result was largely similar to those obtained by Sghaier and Abida, (2013) who concluded that the growth of the domestic financial system is a condition necessary for FDI to have a positive impact on GDP. The results are depicted in table 6.

Table 6. Estimated Models Equations 8 and 9

Equation 9: FDI interacting with FSD			Equation 8: Impact of FDI on GDP without FSD	
Variables	Fixed Effects Model	P-Values	Fixed Effects Model	P-Values
Constant	-0.7174	0.2398	-0.0777	0.8771
GDP(t-1)	0.2339	0.0000	0.2378	0.0000
FDI	0.1615	0.0421	0.0484	0.1787
FSD	6.1572	0.0438	-----	-----
FSD*FDI	-0.7053	0.0849	-----	-----
Trade	0.5584	0.0186	0.6043	0.0108
GCF	-0.2974	0.3343	-0.2562	0.4058
INF	-0.4435	0.0011	-0.4082	0.0025
GOVT EXP	0.0477	0.0004	0.0486	0.0003

GDP denotes the growth rates in gross domestic product
 GDP (t-1) denotes the lagged values of Gross domestic product
 FDI represents Foreign Direct Investment
 FSD denotes Financial Sector development Index
 FSD*FDI depicts the interaction of foreign direct investment and financial sector development.
 Trade is a measure of Trade Openness
 GCF Gross Capital Formation
 INF Inflation rate measure by the Consumer Price Index
 GOVT EXP is a measure of the size of government size represented by government expenditure.

The other control variables were adopted to counter the weaknesses of previous studies which omitted key regressors hence producing spurious results. To avoid the exclusion of key predictor variables in the growth regression and maintain the sensitivity of the outcome the following control variables were adopted. To capture the stability of the macroeconomic environment the Consumer Price Index (CPI) was adopted, government

expenditure was incorporated to capture the size of the government, to capture the benefits of the international trade the study incorporated trade openness as well as gross capital formation which contributes significantly to GDP.

Conclusions

The Fixed Effects Model had 7 seven explanatory or regressors (GDP_{t-1} , FDI, FSD, $FDI*FSD$, Trade, GCF, INF and Govt Exp). The impact of these independent variables on the dependent or regressand is explained as follows below:

1. The lagged value of GDP (GDP_{t-1}) has a statistically significant positive impact on GDP implying that previous levels of GDP play a significant role in the continuous growth of current levels of GDP.

2. FDI had a positive statistically significant effect on GDP which has been amplified by the presence of financial sector development. Several previous studies have also indicated the positive impact of FDI on GDP.

3. Financial sector development had a statistically significantly positive impact on the dependant variable. Researchers have observed that financial sector development improves the absorptive capacity of the economy.

4. The interaction variable ($FSD*FDI$) between FDI and FSD had a statistically insignificant impact on GDP. This could be explained by the huge financial exclusion recorded in most countries within the region of SADC.

5. Trade openness has positive and a statistically significant impact on economic growth rates. Trade openness brings with it investment and technology which enhances the level of economic growth.

6. Gross capital formation has a statistically insignificant negative impact on GDP. The quality of capital formation in many countries in the region has been of low quality.

7. Changes in the price levels measured by the consumer price index have a negative and statistically significant impact on GDP growth rates.

8. Lastly, the size of the government measured by its expenditure has a positive and statistically significant impact on GDP.

The study intended to analyse the impact of foreign direct investment on economic growth rates through the financial markets channel. The study was a follow up on the previous study by Bara et al., (2016) who observed that there were limited studies on the growth-finance nexus using data from SADC countries. Chapter one provided a detailed statement of the problem and background of the study. The literature was thoroughly reviewed in chapter two and gaps were identified. The course of action was stream-lined through the chronologically explained framework of the methodology. The study was concluded by the conclusions and recommendations which were provided in the last chapter. The study recommended that SADC countries adopt policies that promote foreign direct investment, invest in the financial sector among other recommendations.

Recommendations

Based on the conclusions mentioned above, the study provided the following recommendations to key stakeholders in the SADC region:

1. To promote economic growth rates respective governments in SADC are encouraged to attract more foreign direct investment as it contributes towards economic growth and brings into the region technologically advanced equipment.
2. In addition, massive investment in the financial service sector plays a crucial role in the economic development of the region. The region should pay special attention on financial inclusion.
3. The region is highly recommended to engage in international trade which opens up the economy to raw materials, access to new markets for local firms and it also enhances innovation in the face of competition.
4. The SADC region should also maintain lower levels inflation rates which as high inflation rates discourage consumption and investment which are key drivers of economic growth. Inflation distorts the functions of money.
5. Lastly, government expenditure drives economic growth and should be maintained at minimum levels such that expenditure continues to be a key driver of economic growth.

Propositions for Further Research

The concept of finance-growth has been exploited by various researchers using data from individual countries and longitudinal data for several regions of the world. However, the link between LTI's and economic growth has not been receiving much attention. The sub-Saharan region as whole has been lagging behind on the issues of Fintech and LTI's role on the traditional financial systems markets. In addition, future studies should also pay attention on the effect of pandemics on the adoption and utilisation of Fintech and LTI's.

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