

Original Research Paper

# Stock Market Development and Economic Growth in SADC Region

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**Abstract:** The study investigates the relationship between stock market development and economic growth in the Southern African Development Community (SADC) region for the period 1993-2017. The controversy around the stock market development and economic growth nexus is of concern to the SADC which has been experiencing retarded growth while their stock markets are at different levels of development. To establish the relationship among variables of interest, the study used the Auto Regressive Distributive Lag (ARDL) model. The results revealed that there is bi-directional causality both in the short and long run between stock market development and economic growth. The findings further show that trade openness and investment significantly determine stock market development and economic growth in the long run. The result calls for SADC member countries to develop policies that enhance economic growth as well as improving stock market development.

**Keywords:** Stock Market, Economic Growth, SADC, ARDL, Causality

## Introduction

There has been great interest in investigating the relationship between financial sector development and economic growth. The theoretical genesis of this association is found in the early discussions of Bagehot (1873). He contended that the financial system plays an important role in enabling the mobilization of capital and economic growth. The argument was stretched by (Schumpeter, 1911; Robinson, 1952; Hicks, 1969) among others, who argued that the services provided by financial institutions are key drivers of innovation and economic growth. Similar studies flourished in the 1990 and 2000 s (Osaseri and Osamwonyi, 2019; Qamruzzaman and Wei, 2018; Levine, 1997; Dailami and Atkin, 1990).

The contentious issue emanating from the debate on nexus between stock market development and economic growth centres around the direction of causality between stock market development and economic growth (Kapaya, 2020; Osaseri and Osamwonyi, 2019; Qamruzzaman and Wei, 2018; Maposa and Muma, 2017; Popoola *et al.*, 2017; Tsaurai, 2016). The view that stock market developments drive economic growth is based on the understanding that development on the stock market feeds into consumption and investment decisions made by individuals and firms (Maposa and Muma, 2017; Popoola *et al.*, 2017). This implicitly assumes that consumers' confidence and their spending drives economic growth.

Stock markets play a strategic role in allocating capital to firms which impact the real economy. Debt finance is scarce in developing countries. Bank loans are limited to a few corporates and individual investors. The financial sector including stock markets affect long run economic growth through capital accumulation and rate of technological progress (Alshammary, 2014). Greenwood and Jovanovic (1990) argue that stock market liquidity promotes long-term economic growth in developing countries. Levine (1997) opines that stock market liquidity and well-developed banks promotes economic growth. Of great interest is the fact that greater stock market liquidity leads to faster growth no matter what the level of banking development. On the other hand, banking sector development leads to faster economic growth regardless of the level of stock market liquidity. Each of these components (banks and stock markets) of the financial system is an independent strong predictor of growth. Given the aforementioned, being an important support of the economy, the stock market plays an essential part in the growth of industry and commerce.

The Southern African Development Community (SADC) has a mandate of ensuring an all-inclusive development among member countries. The growth rates in SADC region has been retarded while the stock markets are not very developed except for South Africa and Zimbabwe. The SADC member countries have been facing enormous challenges raising capital for

development post the global financial crisis. The twin challenge of retarded economic growth and lack of developed stock markets brings to the fore the role of the stock markets in enhancing economic growth in this region. In light of this dilemma, the current study seeks to evaluate the causal nature of the relationship between economic growth and stock market development. The two variables are important to SADC countries since they form part of the macroeconomic convergence matrix. The current study therefore looks at the nexus between stock market development and economic growth in the SADC region.

### Background to SADC Stock Markets

The majority of countries in Africa adopted financial sector reforms to liberalise their financial systems as well as to enhance their non-bank financial institutions and capital markets (Kapaya, 2020; Osaseri and Osamwonyi, 2019; Qamruzzaman and Wei, 2018; Naik and Padhi, 2015). The rationale behind the reforms was the desire to expand financial intermediation through non-bank financial institutions and stock markets so as achieve sustained economic growth. The development of stock markets in developing countries is also suggestive of the conviction in a link between stock market development and economic growth. The development and growth of stock markets in developing nations has therefore, been fast in recent times, particularly in Africa.

There was deliberate policy moves by a number of African countries to create stock markets in the 1990s. Before adopting this move, stock markets existed only in Egypt, South Africa, Tunisia, Kenya, Zimbabwe and Nigeria. The early to mid-1990s witnessed rapid growth in the number of stock markets in Africa. The coming on board of these stock market changed the structure of the financial systems in most African countries, now characterized not only by money markets, but also capital markets. There is little knowledge about the degree of development of most African stock markets. This has been hindering research on how stock markets in Africa has been performing. There are a number of stock market development indicators, yet there has been hardly any systematic effort at documenting stylized facts about African stock markets (Komla and Amo, 2007).

The Southern African Development Community (SADC) is a Regional Economic Community comprised of 16 Member States. The block was established in 1992. It is dedicated to regional integration and poverty eradication within Southern Africa through economic development and ensuring peace and security.

As part of the SADC regional financial system, capital markets are an important part of the region. The requirements for finances in the region are massive. These finances are required for long-term infrastructural projects and social development programmes. These are usually raised by capital markets through stocks, bonds and other investments offerings. Financing of these projects and programmes in SADC is important as the block seeks to attain a status of a modern and integrated economy. This requires member countries to attract private sector investment. This has led to the inclusion of the protocol on finance and investment among the various protocols of the block. The SADC seeks to establish harmonised securities' market throughout the region that can attract investment and allow the regional economy to compete on a global scale. To this end the region has agreed on harmonisation of stock markets listing requirements, shared research and information management on market surveillance, regulation and investor encouragement.

Table 1 shows the various statistics pertaining to the stock exchanges in the SADC region. The table reflects that the stock markets have listed corporates ranging from 14 to above 400. This basically reflects that the different economies in the SADC are too heterogeneous with countries such as South Africa being big economies with a great deal of listed corporates. There are also smaller countries such as Malawi which are very small and have small exchanges with only 14 corporates listed. The implication of the number of corporates have an effect on the liquidity and efficiency of the stock exchanges. Those countries with a big number of listed firms are more likely to be efficient and liquid. This then provides investors with increased options of where to put their investments.

The results show that save for the South African stock market, all other exchanges are undervalued as reflected by their market capitalisation as a proportion of GDP of less than 100. The stock turnover ratio measures the extent shares exchange hands. It shows the degree to which shares are converted into revenues. South Africa seems to be doing well in the SADC region in terms of stock turnover with a ratio of 40.93%.

**Table 1:** SADC (Stock Market Statistics, 2017)

Country	Listed companies	Market capitalisation (% of GDP)	Value traded (Million-US \$)	Stock traded: Turnover Ratio (%)
Botswana	44	23.8	\$135.60	2.71
Namibia	29	11.8	\$494.51	0.34
Malawi	14	20.0	\$16.18	1.57
Zimbabwe	64	42.8	\$448.20	11.31
Tanzania	25	33.0	\$32.38	0.39
Zambia	24	52.8	\$68.32	0.73
South Africa	403	159.3	\$408 628.96	40.93

Sources: SADC website

## Literature Review

Several empirical studies have focused on probing the association between stock market and economic growth, reaching varying conclusions. Even studies that have looked at the same country or region have come up with different findings. These findings can be categorised into four. These are stock market development-led economic growth, economic growth-led stock market hypothesis, the feedback effect and the neutrality hypothesis.

Kapaya (2020) studied the causal relationship between stock markets and economic growth in Tanzania. The study applied the Autoregressive Distributed Lag Model (ARDL) with bound testing procedures. The findings of the study showed that stock market development granger causes economic growth in both the short and long run.

Osaseri and Osamwonyi (2019) evaluated the relationship between stock market development and economic growth in BRICS for the period 1994-2015 using the panel least squares estimation method. They found that the stock market development significantly impacts economic growth. The study established a positive correlation between stock market development and economic growth. They recommended BRICS countries should focus on strengthening their economic systems.

Qamruzzaman and Wei (2018) studied the connection among economic growth, financial innovation and stock market development in Bangladesh for the period 1980-2016. The study adopted the Autoregressive Distributed Lagged (ARDL) bounds testing approach and granger causality test to ascertain the long run and causal relationship among the variables respectively. The ARDL bounds testing approach established that there is long-run relationship among the variables. The Granger-causality test found that there is the bi-directional causality in both the long and short run.

Maposa and Muma (2017) studied the nexus between financial development and economic growth in Zimbabwe. The study used the vector error correction model. A positive relationship between the stock market and economic growth was established in both the short and long run. They established that financial sector development is critical for sustainable economic development.

Popoola *et al.* (2017) undertook a short and long run causality test between stock market development and economic growth in Nigeria. A long run relationship was established between the stock market performance and economic growth. Specifically, a negative significant relationship between an all-share index and economic growth was established. The study also found that economic growth granger causes stock market performance.

Musharavati (2017) examined the nexus between financial development and economic growth in Zimbabwe. The study employed time series analysis. The results revealed that causality results were dependent on how financial development was measured.

In a study of Belgium, (Tsurai, 2016) evaluated the nexus between stock market development and economic growth. The study applied the ARDL approach with annual time series data for the period 1988-2012. GDP per capita was adopted as a proxy for economic growth and stock market development was approximated by stock market capitalization as a ratio of GDP. The results found no evidence of long run causality running from stock market development to economic growth.

Auckbarally and Subadar (2015) applied the panel data method to ascertain the relationship between stock market development and economic growth among SADC countries for the period 1980-2011. The study established that there is a strong association between stock market development and economic growth. The results supported the argument that economic growth can be boosted by a developed and functional stock market.

Ishioro (2013) evaluated the causality relationship between stock market development and economic growth in Zimbabwe for the period running from 1990 to 2010. The study used the long-run Granger non-causality estimation technique. The results of the study supported the supply leading hypothesis which was shown by a bi-directional causality between economic growth and stock market development.

Simwaka *et al.* (2012) examined causation between financial development and economic growth in Malawi. They applied the Autoregressive Distributed Lag (ARDL) model to search for the relationship. The results established that there is a positive and significant relationship between financial development and economic growth in the long run. Granger causality tests found evidence of economic growth driving financial development.

Petros (2012) evaluated the relationship between stock market development and economic growth in Zimbabwe for the period 1991-2017. The study used the Auto Regressive Distributive Lag (ARDL) and Error Correction Model (ECM) model. The results found that stock market development positively impacted economic growth both in the short and long run in Zimbabwe.

Alajekwu and Achugbu (2012) probed the impact of stock market development on economic growth in Nigeria. They applied the ordinary least squares method using time series data for the period 1994-2008. The study found evidence of weak negative correlation between stock market capitalization and stock market development. Stock market turnover was found to have a significant positive impact on economic growth in Nigeria.

Zivengwa *et al.* (2011) evaluated the causality between stock market development and economic growth in Zimbabwe for the period 1980-2008. The study adopted the Vector Autoregressive (VAR) and Granger Causality Tests to explore the relationships among the variables. The study found evidence of uni-directional causality running from stock market development to economic growth. The study also established evidence of an indirect

transmission mechanism through the effect of stock market development on investment.

## Research Methodology

The methodology of the study is presented in this section. This consists of study data, model specification and justification of the variables employed.

### Study Data

The study relied on secondary data which was compiled from different sources such as World Bank Development Indicators, African Security Exchange Association (ASEA) and Global Financial Development. The study covered 11 SADC countries; Mozambique, Swaziland, Seychelles, South Africa, Zambia, Zimbabwe, Botswana, Mauritius, Malawi, Tanzania and Namibia. The remaining four nations were dropped due to data unavailability.

### Model Specification and Methodology

The study specifies the following general model to capture the relationships among stock market development, economic growth, investment and trade openness:

$$GDP_{it} = f[SMD_{it}, INV_{it}, TRADE_{it}] \quad (1)$$

The current study adopts the approach which were used by other studies (Ruwaydah and Ushad, 2015; Seetanah *et al.*, 2008). The econometric model adopted is specified as:

$$\Delta GDP_{it} = \alpha_0 + \alpha_1 GDP_{t-1,i} + \alpha_2 SMD_{t-1,i} + \alpha_3 INV_{t-1,i} + \alpha_4 TRADE_{t-1,i} + \sum_{i=1}^p \gamma_i \Delta GDP_{t-1} + \sum_{i=0}^p \vartheta_i \Delta SMD_{t-1} + \sum_{i=0}^p \mu_i \Delta INV_{t-1} + \sum_{i=0}^p \tau_i \Delta TRADE_{t-1} + \varepsilon_{it} \quad (3)$$

$$\Delta SMD_{it} = \alpha_0 + \alpha_1 SMD_{t-1,i} + \alpha_2 GDP_{t-1,i} + \alpha_3 INV_{t-1,i} + \alpha_4 TRADE_{t-1,i} + \sum_{i=1}^p \gamma_i \Delta SMD_{t-1} + \sum_{i=0}^p \vartheta_i \Delta GDP_{t-1} + \sum_{i=0}^p \mu_i \Delta INV_{t-1} + \sum_{i=0}^p \tau_i \Delta TRADE_{t-1} + \varepsilon_{it} \quad (4)$$

$$\Delta INV_{it} = \alpha_0 + \alpha_1 INV_{t-1,i} + \alpha_2 SMD_{t-1,i} + \alpha_3 GDP_{t-1,i} + \alpha_4 TRADE_{t-1,i} + \sum_{i=1}^p \gamma_i \Delta INV_{t-1} + \sum_{i=0}^p \vartheta_i \Delta SMD_{t-1} + \sum_{i=0}^p \mu_i \Delta GDP_{t-1} + \sum_{i=0}^p \tau_i \Delta TRADE_{t-1} + \varepsilon_{it} \quad (5)$$

$$\Delta TRADE_{it} = \alpha_0 + \alpha_1 TRADE_{t-1,i} + \alpha_2 SMD_{t-1,i} + \alpha_3 INV_{t-1,i} + \alpha_4 GDP_{t-1,i} + \sum_{i=1}^p \gamma_i \Delta TRADE_{t-1} + \sum_{i=0}^p \vartheta_i \Delta SMD_{t-1} + \sum_{i=0}^p \mu_i \Delta INV_{t-1} + \sum_{i=0}^p \tau_i \Delta GDP_{t-1} + \varepsilon_{it} \quad (6)$$

$$GDP_{it} = \beta_0 + \beta_1 STMD_{it} + \beta_2 INV_{it} + \beta_3 TRADE_{it} + \varepsilon_{it} \quad (2)$$

The Autoregressive Distribute Lag model (ARDL) as expounded (Pesaran *et al.*, 2001) is adopted. The ARDL model is founded on an Ordinary Least Square (OLS) method which can be used in situations of non-stationary series as well as in cases of mixed order of integration (Shrestha and Bhatta, 2018).

The ARDL approach is perceived to be smarter than other methods in its class. The ARDL method has the following characteristics. It can be applied in cases of small or finite samples consisting of 30 or more observations (Ghatak and Siddiki, 2001). The method can be used in cases where the variables are stationery at different levels as long there are not integrated of order greater than one. It caters for serial correlation and the indigeneity problem when modelled with appropriate lags (Pesaran *et al.*, 2001). Both the long run and short run cointegration relations can be estimated using the ARDL method (Pesaran *et al.*, 2001).

The study uses four variables of interest and these are Stock Market Development (SMD), economic Growth (GDP), Trade openness (TRADE) and total Investment (INV). Trade openness and total investment are included in the model as control variables and are important in defining growth imperatives as discussed in Table 2. In the study the ARDL model in Eq. (3) is specified. The analysis conceptualizes four models/equations with the dependent variables; GDP, SMD, INV and TRADE:

**Table 2:** Data Sources and justification

Variable	Definition and Justification	Measurement unit	Source
Gross Domestic Product growth (GDP)	Generally speaking, the stock market reflects the economic conditions of an economy. In times of economic boom, output increases and most companies experience increased profitability. The increased profit makes the firms shares attractive. Companies can declare large dividends to shareholders. A long period of economic growth benefits corporates as their shares continue to increase.	Percentage	Word bank development indicators
Stock Market Development (SMD)	Stock market development can be measured in two ways using size or liquidity (Rousseau and Wachtel, 2000). Size incorporates the concentration ratio that is the market capitalization ratio whilst liquidity involves the total value of shares ratio, trading value ratio and turnover ratio. The current study adopts the size definition	Ratio	African Security Exchange Association (ASEA)
Trade openness	Openness of the economy enhances stock market development. Openness of an economy attracts foreign and domestic investment into the financial system. This is measured as total exports and imports (% of GDP).	Percentage	Word bank development indicators
Investment (INV)	The rate of investment is regarded as the degree of domestic investment in an economy, (Mbuka, 1993) and gross capital formation is used as a proxy for the investment rate. There is a positive relationship between investment and economic growth as espoused by (Solow, 1956) hence the expected sign is positive.	US dollars	Word bank development indicators

where,  $\alpha_o$  is a constant element and  $\varepsilon_{it}$  is the process that is white noise. In this method, the ARDL estimates  $(p + 1)^k$  number of regressions to obtain optimal lag length. The current study follows a certain order: investigation of the integrational properties of the variables, followed by an ARDL cointegration analysis which is succeeded by causality analysis.

## Results Presentation

This section presents the results of the study. It looks at the ARDL long run and error correction mechanism results. Before looking at the main results, this section will present the descriptive statistics of the variables, correlation matrix and the unit root test results.

The descriptive statistics of the dependent and explanatory variable are summarised in Table 3. These include the statistical mean, minimum, maximum and standard deviation and the number of observations. The total number of observations considered in the study are 275 covering 25 years for the 11 countries.

The data under consideration is balance panel data. There are four variables under consideration; SMD, INV, TRADE and GDP. The data shows that there is less variability on INV and GDP as compared with SMD and TRADE. This is shown by the lower standard deviation for INV and GDP. Table 3 shows that the average SMD value was 23.59 and ranged between -22.85 and 117.01. Economic growth rates in the 11 countries over the study period was 2.21% with the maximum growth rate and minimum growth rate experienced over the period of 23.03 and -19.06% respectively.

Multicollinearity refers to the availability of one or more linear relationships among some or all explanatory

variables of a regression model. Multicollinearity leads to unbiased estimates while evaluation of the relative strength of the explanatory variables and their joint effect are not reliable. The challenge of multicollinearity manifests if the correlation between independent variables is above 0.8 (Abel and Le Roux, 2016). Table 4 shows that there is moderate correlation among the GDP, INV, SMD and TRADE. The result suggests that all the variables can be used in regression analysis without facing the problem of multicollinearity.

The Levin, Lin, Chu test and the Im, Pesaran, Shin test are applied to identify the order of integration of the variables. The application of the two methods was meant to ensure that the variables are not integrated of order greater than one which is a prerequisite of the ARDL method. The results of the unit root test are presented in Table 5. The variables GDP and Openness are found to be stationary in their levels hence they are integrated of order zero. On the other hand, SMD and INV are integrated of order one.

The results of the unit root test allow the study to proceed to empirically analyse the long run relationship and short run dynamic interaction among the variables using the ARDL model. The method requires that the variables should be integrated of order zero, one or mixture of the two but should not be integrated of order 2 and above.

Based on automatic lag selection, the best model had 4 lags in independent and 4 lags in the dependent variable, hence we have the ARDL long run model and the short run ECM ARDL (4, 4, 4, 4) for both economic growth and stock market development as shown in Table 6. The lag

length of the ARDL ECM was automatically set with 4 lags for the dependent variable and 4 lags for independent variables.

The short run error correction term for the GDP and SMD models are significant and has the correct sign signifying cointegration. This implies that there is a long run relationship among the variables. The existence of the long run relationship between the variables GDP, SMD, TRADE and INV suggests that there must be granger causality in at least one direction (Odhiambo, 2010).

The coefficients of lagged error correction term measures how the dependent variable adjusts to the previous period's deviation from long-run equilibrium. Table 6 confirms that the estimated lagged error correction term in the GDP equation has the expected negative sign and it is statistically significant at one percent level. The speed of convergence to equilibrium of 91%, implies that the stock market development influences economic growth in the long-term. This implies that 91% of the shocks experienced in the current period are corrected in the next period. The results are in support of the (Zivengwa *et al.*, 2011). The results are buttressed by the significant coefficient of the SMD. A 1% increase in stock market leads to a 0.07% increase in economic growth.

On the other hand, the error correction coefficient of stock market development equation is found to be statistically significant at one percent level, suggesting economic growth influences the stock market development in the long-term. The coefficient has the expected negative sign which is significant. The speed of adjustment is 114%, implying that 114% of the shocks experienced in the current period are corrected in the next period. The long run results also show that an increase in economic growth leads to a decline of the stock market. A 1% increase in economic growth leads to a 1.32% decline in stock market development.

The results further show that trade openness and investment significantly determine stock market development and economic growth. Both trade openness and investment have a negative significant influence on economic growth. In other words, a 1% increase in trade openness and investment leads to a decline of economic growth of 0.16 and 0.09% respectively. The results are

counter intuitive since the two variables are supposed to be growth imperatives. On the other hand, trade openness has a positive significance on stock market development while investment has a negative and significant impact on growth.

Table 7 shows the results of the ARDL regression results with Trade and INV as the dependent variables. Both models have maximum lags of 4 for the dependent and independent variables hence we have ECM ARDL (4, 4, 4, 4). The TRADE regression model shows that there is no cointegration among the variables as the t-statistic for the error correction term is insignificant implying no long run relationship among the variables. On the other hand, the error correction term for the INV regression equation confirms that there is long run relationship among the variables. The results show that investment, stock market development and GDP significantly determine trade openness hence their coefficients are significant.

Having established long run causal relation, the study further presents the short run Granger causality results for the short run relationship between all macroeconomic variables. Short-term Granger causality test is employed on ECM so as to identify the short-run causal relationship among the variables. The Wald-statistics of short-run test for causality are summarized in Table 8.

**Table 3:** Descriptive statistics

	SMD	INV	TRADE	GDP
Mean	23.59	23.04	86.94	2.21
Median	16.65	22.09	79.66	2.33
Maximum	117.01	55.36	225.02	23.03
Minimum	-22.85	1.53	23.98	-19.06
Std. Dev.	25.32	8.82	38.88	4.32
Observations	275.00	275.00	275.00	275.00

Source: Own computation

**Table 4:** Correlation matrix

	SMD	INV	TRADE	GDP
SMD	1			
INV	-0.1818	1.0000		
TRADE	0.3540	0.2566	1.000	
GDP	0.2281	0.2273	0.098	1

Source: Own computation

**Table 5:** Panel unit root test

Variable	Test	Levin, Lin, Chu	Im, Pesaran, Shin		Level of Integration	
			-----	-----	-----	-----
GDP	level	-5.9891	0.0000	6.3262	0.0000	I(0)
	1st difference	9.4204	0.0000	13.3188	0.0000	
SMD	level	0.9239	0.1777	1.4733	0.0703	I(1)
	1st difference	6.0726	0.0000	9.6465	0.0000	
INV	level	1.5912	0.0558	1.3549	0.0877	I(1)
	1st difference	4.2023	0.0000	6.9399	0.0000	
TRADE	level	2.0879	0.0018	2.3489	0.0094	I(0)
	1st difference	5.5768	0.0000	7.2585	0.0000	

Source: Own computation

**Table 6:** ARDL long run and short run results (GDP and SMD)

Variable	Long run equation			
	Dependent variable: GDP coefficient	Dependent variable: SMD t-statistic	Coefficient	t-statistic
INV	-0.164370	-2.0987	-0.059805	-1.216165
SMD	0.070921	5.31324		
TRADE	-0.098949	-6.9833	0.137752	3.302162
GDP			-1.322216	-12.11590
Short Run Equation				
ECT(-1)	-0.913823	-2.805807	-1.136667	-4.429375
D(GDP)			0.427132	0.481606
D(GDP(-1))	0.009660	0.056738	0.696919	1.381826
D(GDP(-2))	-0.196655	-1.725140	-0.555517	-0.503980
D(GDP(-3))			0.002852	0.005582
D(INV)	0.144733	0.780211	-1.152339	-1.017392
D(INV(-1))	0.000770	0.002887	-0.813124	-0.696871
D(INV(-2))	-0.031892	-0.183626	-1.103319	-0.836793
D(INV(-3))	-0.003763	-0.023276	0.255468	0.502310
D(SMD)	-0.236757	-2.616798		
D(SMD(-1))	-0.241862	-2.437348	0.078778	0.305164
D(SMD(-2))	-0.312872	-3.541195	0.332421	1.460983
D(SMD(-3))	-0.089072	-2.544093	0.155852	1.055489
D(TRADE)	0.034692	0.485483	-0.420662	-1.059219
D(TRADE(-1))	0.055246	1.232356	-0.096839	-0.382000
D(TRADE(-2))	-0.012659	-0.294764	-0.459941	-1.367527
D(TRADE(-3))	0.012379	0.286823	0.078100	0.614544

**Table 7:** ARDL long run and short run results (Trade and INV)

Variable	Long run equation			
	Dependent variable: TRADE Coefficient	Dependent variable: INV t-statistic	Coefficient	t-statistic
INV	1.571696	4.88742		
SMD		3.185795	-0.282663	-7.913424
TRADE	0.361868		0.287667	11.22967
GDP	1.630241	4.238177	0.634723	6.380416
Short Run Equation				
ECT(-1)	-0.372827	-2.494793	-0.398267	0.07777
D(GDP)	-0.387429	-0.795738	-0.194114	-0.643561
D(GDP(-1))	-0.462573	-1.274139	-0.066648	-0.273700
D(GDP(-2))	-0.375552	-0.767685	-0.020117	-0.086275
D(GDP(-3))	0.298958	0.648330	-0.022616	-0.139405
D(INV)	-0.912002	-2.389163		
D(INV(-1))	-0.818389	-1.718220	-0.157723	-0.986400
D(INV(-2))	-0.651967	-1.488880		
D(INV(-3))	-0.520974	-2.400946		
D(SMD)	-0.376746	-1.019113	0.125281	0.619402
D(SMD(-1))	-0.443099	-1.100839	0.124888	0.844162
D(SMD(-2))	-0.123276	-0.282998	0.266413	1.819386
D(SMD(-3))	-0.034017	-0.263514	0.299039	2.771175
D(TRADE)	0.032754	0.176721	-0.036945	-0.394019
D(TRADE(-1))	-	-	-0.014320	-0.244434
D(TRADE(-2))	-	-	-0.121844	-3.367366
D(TRADE(-3))	-	-	-0.085484	-1.247584

Source: Own computation

**Table 8:** Wald test results

Null hypothesis	Chi-square	P-value
SMD-does-not-cause-GDP	11.04**	0.0261
GDP-does-not-cause-SMD	15.49**	0.0380
INV-does-not-cause-GDP	3.30	0.5076
TRADE-does-not-cause-GDP	4.41	0.3528
INV-does-not-cause-SMD	4.87	0.3006
TRADE-does-not-cause-SMD	6.62	0.1574

The Wald test statistics show that the null hypothesis of the absence of causality from stock market development to GDP is rejected at 5% level of significance (Table 8). In the same way the causal relationship from GDP to stock market development is also rejected at 5% level of significance. The results therefore confirm that there is bidirectional causality between stock market development and economic growth in the short run.

## Discussion

The study investigated the causality relationship between stock market development and economic growth. The study found that there is evidence of long run relationship between stock market development and economic growth. In other words, there is cointegration between the two variables. The results established that there is bidirectional causality between stock market development and economic growth in the long-run. The results are supported by prior studies (Qamruzzaman and Wei, 2018; Auckbarally and Subadar 2015; Ishioro 2013; Alajekwu and Achugbu, 2012) which also found bidirectional causality between stock market development and economic growth.

The short run dynamics between stock market development and economic growth also found evidence of causal relationship between the two variables. This means that there is feedback effect between stock market development and economic growth in the short. This reveals that stock market development increases economic growth while economic growth positively influences stock market development. This then establishes the need for the government to put in place policies that have positive impact on both economic growth and stock market development.

On the other hand, the results show that investment and trade openness do not granger cause economic growth and stock market development in the short run. This then implies economic growth granger causes stock market development and stock market development granger cause economic growth, nothing more or less.

## Conclusion

The study investigated the relationship between stock market development and economic growth in the SADC region. The study established short run and long cointegration between stock market development and economic growth. The study further established that trade openness and investment significantly determine stock market development and economic growth. This implies that economic growth causes stock market development and vice versa both in the short and long run. The results have policy implications in that governments should enact policies that are pro stock market development as well as pro economic growth given the feedback effect among the variables.

## Author's Contributions

**Sanderson Abel:** Contributed in the conception, design, drafting, acquisition of data, analysis and interpretation of data, reviewing and final approval of the submitted manuscript.

**Nzwirashé Rejoyce Magomana:** The author contributed in the conception, design, drafting, acquisition of data, analysis and interpretation of data, reviewing and final approval of the submitted manuscript.

**Makamba Biatrice Simbisai:** Contributed in the conception, design, drafting, acquisition of data, analysis and interpretation of data, reviewing and final approval of the submitted manuscript.

**Pierre Le Roux:** Contributed to conception, design, drafting, acquisition of data, analysis and interpretation of data, reviewing and final approval of the submitted manuscript.

## Ethics

This article is original and contains unpublished material. The corresponding author confirms that all of the other authors have read and approved the manuscript and no ethical issues involved.

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