Scientific Annals of Economics and Business
66 (4), 2019, 507-523
DOI: 10.2478/saeb-2019-0039

Interest Rate Reforms and Economic Growth in SADC Countries: The Savings and Investment Channel

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Abstract

The 2008/2009 global financial crisis has re-ignited the debate around financial reforms with contrasting views with regards to the impact of financial reforms on economic growth. This study examines the impact of interest rate reforms on economic growth through savings and investments in SADC countries for the period 1990-2015. Three specifications are used for the analysis; the first one determines the influence of interest rate reforms on savings, the second one analyses the effect of savings on investments while the third one examines whether investments have a positive impact on economic growth. The Pooled Mean Group (PMG) estimation technique is employed for analysis. The results show that interest rate reforms have a positive impact on economic growth through savings and investments. The study therefore recommends that market forces should be allowed to determine real interest rates and furthermore, real interest rates maintained at artificially low levels may harm economic growth.

Keywords: interest rate reforms; economic growth; SADC; savings; investments; PMG.

JEL classification: C50; E20; E62.

1. INTRODUCTION

The global financial crisis of 2008/2009 re-ignited the debate around the growth effects of financial reforms. Authorities worldwide have reduced interest rates to historically low levels in an attempt to boost aggregate demand and economic growth. Lower interest rates are also purported to increase investment levels by reducing borrowing costs and have been advocated by a number of economists (Blanchard *et al.*, 2010). The recovery from the global financial crisis has been slow despite the lowering of interest rates as investments and economic growth rates continue to be at low levels in most parts of the world. According to the advocates of the Austrian school, like Kates (2010) and Templeman (2010), maintaining low interest rates during a crisis slows the recovery process.

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African countries recorded high economic growth rates since the 1990s due to more prudent macroeconomic policies, financial reforms and the growth in commodity exports (Morris and Fessehaie, 2014). However, the global financial crisis coupled with the volatility of commodity prices has slowed economic growth in a number of countries (African Development Bank, 2018). This has increased calls for expansionary monetary policies which reduce interest rates to low levels, in order to boost investments and economic growth. However, these financially repressive policies are inflationary, reduces capital inflows and may hinder savings and investments which are drivers of economic growth (Hoffman, 2014).

The pioneers of the financial liberalization hypothesis, McKinnon (1973) and Shaw (1973) argued that financial reforms promote economic growth by encouraging savings and investments. Therefore, policies that keep interest rates at artificially low levels may have a negative impact on savings and investments which are one of the major determinants of long-term economic growth as suggested by growth models of Domar (1946); Harrod (1939); Romer (1986); Solow (1956); Swan (1956). The views of McKinnon (1973) and Shaw (1973) are supported by Fry (1980); Galbis (1977); Kapur (1976); Mathieson (1980), among others, who argued that interest rate reforms have a positive effect on the quantity and quality of investments which in turn boost economic growth.

Critics of the financial liberalisation hypothesis suggest that savings may not be responsive to higher interest rates and the rise in borrowing costs caused by interest rate reforms have a negative effect on investments (see Warman and Thirlwall, 1994; de Melo and Tybout, 1986). Furthermore, financial reforms increase the likelihood of financial crises (Ang and McKibbin, 2007). Other critics include the Neo-Structuralist school of thought and also the Keynesians, who argue that interest rate liberalisation affects economic growth negatively by reducing the availability of funds in the economy and reducing aggregate demand, which is a major component of gross domestic product.

The purpose of this study is to examine the long-term impact of interest rate reforms on economic growth through savings and investments in selected SADC countries. Most studies on financial reforms and growth in African countries (see Odhiambo and Akinboade, 2009; Odhiambo, 2010; Akinboade and Kinfack, 2013) focus on the link between interest rate reforms, financial development and economic growth. Furthermore, these studies utilise time series techniques which are associated with issues of collinearity and simultaneity. The study contributes to literature by investigating the impact of interest rates on economic growth through savings and investments unlike most studies which examine the direct link between the variables. Interest rates affect economic growth through different channels and therefore the direct relationship between the variables may not reflect the most accurate association between the variables. It is against this backdrop that the analysis involves the estimation of three specifications, the first of which analyses the impact of interest rate reforms on savings. The second specification investigates the link between savings and investments while the third surveys the effect of investments on economic growth. The period of the study is 1990-2015 and is selected to capture the period when most SADC countries had initiated financial reforms. The Pooled Mean Group (PMG) estimator proposed by Pesaran *et al.* (1999) is used for the empirical analysis.

The outline of the study is as follows: Section 2 provides an overview of interest rate reforms in SADC countries as well as the trends in savings and investments. Section 3 discusses the existing literature while Section 4 outlines the methodology of the study. Section 5 presents the empirical results and lastly, Section 6 concludes the study.

2. OVERVIEW OF INTEREST RATE REFORMS IN SADC COUNTRIES

SADC was established in 1980 as the Southern African Development Co-ordination Conference (SADCC) in order to curb the dependence of the other Southern African countries on South Africa. South Africa later joined the union in 1995 and to date there are 16 countries in SADC (Mowatt, 2001). In an attempt to form a customs union in 2018, the SADC region had set targets to be met by all the countries in the bloc. The targets included achieving 7% economic growth, Savings and investment ratios to GDP of 35% and 30% respectively, public-GDP ratio of 60% and an inflation rate of 3% (Bank of Botswana, 2013). However, due to inadequate economic performances the countries have not been able to achieve the targets.

SADC countries have a history of repressed financial systems, low economic growth and high poverty levels. As such, most of the countries in the SADC began a process of liberalising their financial sectors during the late 1980s and early '90s so as to boost investment and economic growth levels (Mowatt, 2001). Prior to this liberalisation, most of these countries had repressed financial sectors with interest rates kept at negative rates by the state, exchange controls being employed, and financial institutions subject to portfolio restrictions (Nyawata and Bird, 2004). Financial liberalisation in SADC involved increasing real interest rates to positive levels, allowing the market to allocate credit, strengthening prudential regulation and the supervision and restructuring of state-owned banks. As shown in Table no. 1 real interest rates rose into positive territory in most SADC countries despite the obstacles of high inflation.

Table no. 1 – Real interest rate trends in SADC countries

Country	1990-1999	2000-2009	2010-2015
Botswana	3.81	7.82	3.53
Lesotho	6.37	6.76	5.14
Madagascar	9.93	19.66	46.11
Malawi	4.01	14.76	13.23
Mauritius	11.34	12.65	6.06
Namibia	8.97	4.98	2.94
Seychelles	12.92	0.03	8.77
South Africa	6.98	5.04	3.25
Swaziland	3.97	4.22	0.25
Tanzania	6.75	5.24	6.86
Zambia	-1.16	11.76	5.03

Source: World Bank (2019)

In most countries, savings and investments increased after the period of reforms as indicated in Table no. 2, which indicates that there could be a link between interest rate reforms and investments. As shown in Table no. 3, the rise in savings and investments had a positive outcome on economic growth in most countries and in particular, Botswana and Mauritius. Due to a market-oriented economy, savings and investments have been high in Botswana, which has had a positive effect in increasing economic growth and propelling the country into middle-income territory with a high standard of living. Financial reforms initiated in Mauritius had a positive effect on real interest rates, savings, investments and

economic growth, so the economy had the highest GDP per capita in the SADC region for the period 2000-2009 (Gorlach and Le Roux, 2015).

Table no. 2 – Trends in savings and investments in SADC countries

Country	1990-1999		2000-2009		2010-2015	
	Savings	Investments	Savings	Investments	Savings	Investments
Botswana	39.64	29.69	39.02	30.73	39.74	33.92
Lesotho	27.97	61.20	39.69	29.23	23.64	33.10
Madagascar	4.84	12.53	17.41	24.89	12.55	17.85
Malawi	4.62	8.67	10.46	16.09	7.50	14.01
Mauritius	19.91	30.28	22.39	24.17	17.41	24.70
Namibia	24.37	21.82	26.53	21.70	21.16	26.99
Seychelles	23.74	29.45	12.66	25.80	17.74	36.39
South Africa	17.77	17.80	16.35	18.73	15.76	19.78
Swaziland	14.78	26.85	22.47	24.78	6.82	7.37
Tanzania	19.95	25.79	18.31	21.27	20.23	30.27
Zambia	8.20	14.72	23.12	28.21	35.74	33.14

Source: World Bank (2019)

Table no. 3 – Trends in economic growth in SADC countries

Country	1990-1999	2000-2009	2010-2015
Botswana	5.40	3.54	5.31
Lesotho	3.89	3.77	5.01
Madagascar	1.62	3.21	2.19
Malawi	4.13	4.29	4.58
Mauritius	5.16	4.28	3.59
Namibia	3.55	4.51	5.64
Seychelles	4.86	1.73	5.55
South Africa	1.39	3.60	2.25
Swaziland	3.09	2.27	2.18
Tanzania	3.27	6.51	6.77
Zambia	1.31	6.82	6.14

Source: World Bank (2019)

3. LITERATURE REVIEW

The more recent studies on the effect of interest rates on economic growth remain inconclusive. Kargbo (2010); Mottelle and Masengetse (2012); Shrestha and Chowdhury (2007) found evidence supporting the McKinnon and Shaw hypothesis in Nepal, Sierra Leone and Lesotho respectively. Bouzid (2012) found that McKinnon's complementary hypothesis holds for Algeria and not Morocco and Tunisia.

Osei-Assibey and Baah-Boateng (2012) showed that the interest rate has a negative net effect on investments in Ghana. The real deposit rate promotes financial savings, however, higher costs of lending cause a decline in bank credit which in turn has a negative effect on investments. Boadi *et al.* (2015) and Opuku and Ackah (2015) also reported that savings are responsive to interest rates in Ghana in both the short-run and the long-run. Orji *et al.* (2014) found that the real interest rate and savings have a positive

impact on investments in Nigeria. Odhiambo (2010) concluded that there is causality from interest rate reforms to savings, however, there is no causality from savings to economic growth in South Africa thus suggesting a breakdown of McKinnon's complementary hypothesis. Aizenman *et al.* (2017) concluded that the effect of the interest rate on savings is sensitive to different economic environments. The effect of interest rates on savings is negative if the dependency ratio, output volatility and the development of the financial sector are beyond a particular threshold.

Romero-Ávila (2009) concluded that the growth effects of interest rate liberalisation are 0.3% per year in EU-15 countries. Orji *et al.* (2015) as well as Obamuyi and Olorunfemi (2011) concluded that financial reforms including interest rate liberalisation have a positive impact on economic growth in Nigeria. However, Obamuyi and Olorunfemi (2011) suggest that savings have a negative impact on growth, implying that the positive influence of interest rate liberalisation on growth is through another channel. On the other hand, Akingunola *et al.* (2013) found that the real interest rate has an insignificant impact on economic growth while Gylych (2016) found that lower interest rates have a positive effect on economic growth in Nigeria. Owusu and Odhiambo (2015) concluded that financial reforms have an insignificant impact on economic growth in Ghana, however, capital accumulation is positively associated with economic growth. Similarly, Hye and Wizarat (2013) reported that the real interest rate together with financial liberalisation have a negative effect on economic growth in a study of the effect of financial liberalisation on economic growth in Pakistan. The results also suggest that investments have a positive effect on economic growth.

Lee and Werner (2018) examined the link between interest rates and nominal GDP growth in the United States, United Kingdom, Germany and Japan, and concluded that there is positive correlation between the variables. Furthermore, expansionary monetary policies may be growth retarding. Salami (2018) concluded that the deposit rate has a negative effect on economic growth in Swaziland.

The empirical literature presents contradicting results regarding the effect of interest rates and economic growth. There seems to be consensus on the positive influence of interest rates on savings. However, the link between savings and economic growth through investments is largely inconclusive. This study, therefore, examines the linkages between interest rates, savings, investments and economic growth in an attempt to outline the efficacy of interest rates reforms in SADC countries. The next section presents the data and methodology employed in the empirical analysis.

4. DATA AND METHODOLOGY

A description of all the variables used in the study is provided on Table no. 4. The data on the variables is obtained from the World Bank's world development indicators and the International Monetary Fund (IMF). The data covers the period 1990-2015. The authors would have preferred to include all the 16 SADC countries in the analysis, however, only 11 were selected due to the unavailability of data for Angola, Comoros, DRC, Mozambique and Zimbabwe. Lack of data for Angola, DRC and Mozambique could be possibly due to civil wars, while severe economic problems in Zimbabwe could be the major reason for lack of financial data.

Table no. 4 – Description of the data

Variable	Description
GDP	annual percentage growth rate of GDP at market prices
SAV	GDP less consumption expenditure as a percentage of GDP
INVS	gross fixed capital formation as a percentage of GDP
RINT	lending rate minus inflation (real interest rate)
RDEP	deposit rate minus inflation (real deposit rate)
CRED	domestic credit to the private sector as a percentage of GDP
GDPC	GDP per capita growth
TRA	sum of exports and imports as a percentage of GDP
GOV	current government purchases of goods and services as a percentage of GDP
AGE	ratio of people younger than 15 and older than 64 as a ratio of the working age population
INF	annual percentages of consumer prices
FDI	foreign direct investments net inflows as a percentage of GDP

Source: World Bank (2019) and International Monetary Fund (2019)

4.1 Descriptive statistics

Table no. 5 presents the descriptive statistics. Savings and investment ratios average 20.46% and 24.86% respectively, which are lower than the targets set by the SADC region. Savings and investments are crucial for higher economic growth and job creation and, as such, targets of 35% for savings and 30% for investments have been set. The averages for the savings and investment ratio in the SADC region are lower than in other emerging countries. According to the International Monetary Fund (2016), the savings ratio averaged close to 37% in emerging and developing countries in Asia, 28% in the ASEAN Five countries and just over 31% in the Middle East and North African countries between 1990 and 2015. The investment ratio in emerging and developing Asian countries averages close to 36%, while those in ASEAN and the Middle East and North African countries are 29% and 26% respectively.

Table no. 5 – Descriptive statistics

Variable	Mean	Maximum	Minimum	Std. Dev.	Observations
SAV	20.46	51.05	-3.14	11.40	286
INVS	24.86	69.03	4.56	10.84	286
RDEP	-0.82	15.54	-117.23	10.72	276
AGE	76.53	103.82	40.62	18.59	286
INF	12.59	183.31	-9.62	18.57	281
CRED	31.76	160.12	3.09	36.47	282
TRA	95.78	225.02	33.49	44.94	276
GOV	19.77	47.19	6.71	8.22	277
GDP	3.97	21.02	-12.67	3.61	285
GDPC	1.91	16.96	-15.28	3.60	285
RINT	7.99	52.10	-41.79	10.34	279
FDI	4.08	54.06	-6.90	5.84	285

Source: Researcher's own computations

The GDP growth rate averages just below 4%, which is lower than the target of 7%. The mean for the real deposit rate is -0.82%, which could be one of the reasons for the low savings ratio. The major reason for the negative real deposit rate is the long history of high inflation in SADC countries. Inflation averaged 12.49% over the period under consideration – higher than the mean value of the deposit rate. Income growth as measured by GDP per capita growth averages a low 1.91%. Developing countries have had a history of low incomes, which is one of the reasons for low savings rates, as a large proportion of the income is used for subsistence consumption. The mean value for trade as percentage of GDP is close to 96%, indicating high levels of trade openness among SADC countries. Government expenditure and credit to the private sector as a percentage of GDP average 19.77% and 31.76% respectively. The mean values for the age dependency rate and the real interest rate are 76.53% and 7.99% respectively, while FDI inflows as a percentage of GDP average 4.08%.

4.2 Unit root testing

Unit root tests are conducted in the study to determine whether there are any variables integrated of order two which are not ideal for ARDL estimations. The study utilises the Im *et al.* (2003) (IPS) and the Levin *et al.* (2002) (LLC) unit root tests. Tables no. 6 and no. 7 show the order of integration of the variables in the study. The results on Table no. 6 include an individual intercept only, while those on Table no. 7 contain an individual intercept and trend. The variables are either stationary in levels or at first difference and, due to the different orders of integration, the PMG model is appropriate for the analysis. There are also no variables integrated of order two which are not ideal for the PMG model.

Table no. 6 – Unit root tests, intercept only

	LLC		IPS	
Variable	**levels**	**1st difference**	**levels**	**1st difference**
CRED	-1.48*	-7.43**	-0.37	-7.24***
GDPC	-1.43*	-7.68***	-6.05***	-14.55***
AGE	-2.97***	-2.16**	1.30	-3.91***
SAV	-1.31*	-14.63***	-2.64***	-14.77***
TRA	-1.36*	-8.31***	-1.43*	-8.92***
GDP	-1.61*	-8.31***	-6.01***	-14.83***
INVS	-0.58	-4.16***	-0.43	-8.13***
GOV	-2.34***	-14.63***	-2.64***	-14.09***
INF	-5.96***	-16.15***	-4.82***	-15.32***
RDEP	-4.86***	-9.74***	-5.76***	-11.17***
FDI	-2.78***	-11.16***	-3.16***	-13.25***
RINT	-2.70***	-9.93***	-4.47***	-12.31***

Source: Researcher's own computations

Table no. 7 – Unit root tests, with trend and intercept

	LLC		IPS	
Variable	**levels**	**1st difference**	**levels**	**1st difference**
CRED	-3.13***	-6.84***	-1.21	-6.20***
GDPC	0.40	-4.87***	-4.42	-12.78***
AGE	-0.48	-3.81***	0.47	-1.78**
SAV	0.13	-12.39***	-0.95	-13.00***
TRA	-0.25	-6.86***	-0.94	-7.44***
GDP	0.12	-5.66***	-4.92***	-13.08***
INVS	1.37	-2.14**	0.26	-6.18***
GOV	0.41	-1.80**	-1.47*	-10.43***
INF	-7.04***	-14.11***	-5.71***	-13.64***
RDEP	-4.21***	-7.02***	-4.40***	-9.07***
FDI	-3.04***	-9.01***	-4.63***	-11.29***
RINT	-3.36***	-7.52***	-4.03***	-10.26***

Source: Researcher's own computation

4.3 Methodology

The study examines the link between interest rate reforms, savings, investments and economic growth. The analysis follows an approach similar to that of Achy (2003) and Shrestha and Chowdhury (2007). In particular this study uses three specifications, where the first equation surveys the relationship between interest rate liberalisation and gross domestic savings. The effect of interest rate liberalisation on investments through savings is examined by the second equation, while the third equation observes the effect of interest rate liberalisation on economic growth through investments. The study employs the PMG estimator developed by Pesaran *et al.* (1999). This technique involves pooling and averaging of individual estimates across groups so that the intercept and short-run slope coefficients and the error variance are assumed to differ across units while the long-run coefficients are constrained to be similar across groups. The test can be used irrespective of whether variables are purely I(1), I(0) or a mixture of variables of different orders of integration. However, the technique cannot be used in the presence of I(2) variables as mentioned above. Other techniques that can employed to estimate the model are the Generalised Method of Moments (GMM) estimator, the Mean Group (MG) and the Dynamic Fixed Effects. The GMM estimator is appropriate for panels where the number of cross-sectional units is greater than the time series components (Roodman, 2009). In this study the time series observations outnumber the cross-sectional units thus rendering the GMM estimator inappropriate. The MG and DFE estimators require a panel with large number of time series components and furthermore, the DFE estimator is subject to endogeneity problems in small samples (Samargandi *et al.*, 2015). The panel in this study only has 26 time series observations.

The PMG estimator for a dynamic panel data model can be specified by extending the single time series ARDL model as follows:

$$y_{it} = \sum_{j=1}^{p} \lambda_i y_{i,t-j} + \sum_{j=0}^{q} x_{i,t-j}\delta_{ij} + \alpha_i + \varepsilon_{it}, \quad t = 1, 2, \dots, T, \;\; i = 1, 2, \dots, N \tag{1}$$

where α_i represents the fixed effects, x_{it} is a vector of explanatory variables, λ_{ij} and δ_{ij} are vectors of parameters.

The error correction form of the above equation is:

$$\Delta y_{it} = \phi_i y_{i,t-1} + x_{it}\beta_i + \sum_{j=1}^{p-1} \lambda_{ij}^{*} \Delta y_{i,t-1} + \sum_{j=0}^{q-1} \Delta x_{i,t-j} \delta_{ij}^{*} + \mu_i + \varepsilon_{it} \quad (2)$$

where:

$$\phi_i = -(1 - \sum_{j=1}^{p} \lambda_{ij}) \ and \ \beta_i = \sum_{j=0}^{q} \delta_{ij}$$

The long-run relationship between savings, real deposit rate, age dependency and GDP per capita is specified in the form:

$$SAV_{it} = \beta_{0i} + \beta_{1i} RDEP_{it} + \beta_{2i} AGE_{it} + \beta_{3i} GDP_{it} + \mu_i + \varepsilon_{it} \quad (3)$$

where: μ_i is the country-specific effect and ε_{it} is the error term

The GDP per capita growth captures the effect of income on savings. According to the life-cycle hypothesis, higher income levels enhance savings as individuals in the labour force increase savings relative to those out of the labour force (Kargbo, 2010). However, the effect of income on savings would be insignificant if income levels are low and people spend most of their incomes on necessities (Opuku and Ackah, 2015). Age dependency ratio represents the effect of demographics on the saving rate and is expected to be negatively correlated with savings (Ang and Sen, 2011). In countries where age dependency ratios are high, the effect of income on savings would mostly likely be insignificant (Khan and Hasan, 1998; Achy, 2003).

The long-run relationship between investments, credit to the private sector, FDI and real lending rates and savings is specified as follows:

$$INV_{it} = \alpha_{0i} + \alpha_{1i} CRED_{it} + \alpha_{2i} RINT_{it} + \alpha_{3i} SAV_{it} + \alpha_{4i} FDI_{it} + \mu_i + \varepsilon_{it} \quad (4)$$

The real interest rate is expected to have a negative effect on investments due to higher borrowing costs that are associated with higher lending rates (Shrestha and Chowdhury, 2007). The availability of credit to the private sector encourages entrepreneurs to innovate and make investments that enable more production of goods and services (Bittencourt, 2010). Credit to the private sector is often used as an indicator of financial development. A developed financial sector has a positive effect on the quantity as well as the quality of investment (Levine, 2001).

The long-run relationship between interest rate liberalisation and economic growth is specified as follows:

$$GDPG_{it} = \gamma_{0i} + \gamma_{1i} GOV_{it} + \gamma_{2i} INV_{it} + \gamma_{3i} TR_{it} + \gamma_{4i} INF_{it} + \mu_i + \varepsilon_{it} \quad (5)$$

Government expenditures may crowd out private investments by increasing the interest rate (Bonfiglioli, 2005). However, government expenditures in the provision of public services to the economy can complement private investment and hence increase economic growth. As such, the variable can possess either a positive or a negative coefficient. The inflation rate is an indication of the level of macroeconomic instability in a country and is

expected to be negatively related to economic growth (Misati and Nyamongo, 2012). Trade openness may improve efficiency in an economy by promoting product specialisation, as specified by the theory of comparative advantage (Bonfiglioli, 2005). Trade also provides a larger market for domestic output, increases competition and provides producers with access to a variety of capital goods which may enhance productivity. However, as postulated by Ahmed and Suardi (2009) trade liberalisation has a positive influence on economic growth if an economy's export structure is diversified. Therefore, the effect of trade openness on economic growth is ambiguous.

5. EMPIRICAL RESULTS

This section discusses the empirical results of the study. The results are presented in three sections, one for each estimated model. The study uses a single lag, as proposed by Pesaran *et al*. (1999), who argue that the coefficients of a model estimated by the PMG estimator are robust to the choice of lag order when T is large. The PMG technique assumes that variables have long-run relationship. Thus, prior to estimating a model using the estimator, tests of cointegration are required. The study utilises the Kao (1999) cointegration test, and as shown in Table no. 8 cointegration is present in all three models which signals that the analysis may proceed to estimating the PMG model.

Table no. 8 – Cointegration test results

Cointegration Equation	F-statistic	P-value
Savings	-1.55	0.05
Investment	1.95	0.02
Economic growth	-3.03	0.00

Source: Researcher's own computations

In all the estimated models, the Hausman tests suggests that the PMG model is the most appropriate model and as a result forms the basis for the interpretations of the slope coefficients. Most of the short-run coefficients are insignificant and therefore, are omitted from the analysis. The MG and DFE models are shown for comparison purposes.

5.1 Interest rate reforms and savings

Table no. 9 reports the results of the PMG model together with those of the MG and DFE estimation techniques. The adjustment coefficients show the speed adjustment from the short run to the long run and, as expected, they are negative and statistically significant at the 1% level in all the models. The adjustment coefficients range from -0.36 in the DFE model to -0.52 in the MG model. Therefore, the results confirm *a priori* that the MG estimator error correction indicates faster adjustment compared with the PMG and DFE error correction estimates (Pesaran *et al.*, 1999). The adjustment coefficient of the PMG model suggests that 42% of the disequilibrium in the short-run is corrected in the long-run. The long-run slope coefficients are all positive and significant at the 1% level. The real deposit rate has a positive effect on savings. The result lends support to the McKinnon and Shaw hypothesis and squares well with those of Boadi *et al.* (2015); Kargbo (2010); Mottelle and Masengetse (2012); Opuku and Ackah (2015); Shrestha and Chowdhury (2007). As suggested by Tables no. 1 and no. 2, interest rates reforms had a positive effect on savings and investments in SADC countries.

Income captured by GDP per capita growth affects savings positively. The income coefficient is significant in all three models which confirms *a priori* expectations, as higher incomes are expected to increase savings. The result is in line with those of Bandiera *et al.* (2000), Kargbo (2010) and Ang and Sen (2011). Age dependency has a positive effect on savings in SADC countries. This is against *a priori* expectations, as higher age dependency rates are associated with lower savings rates (Achy, 2003; Ang and Sen, 2011). A close inspection of the data reveals that a number of countries achieved higher savings rates during the period when age dependency rates were at their highest. A study by Keho (2012) reported that age dependency has a positive and significant influence on savings in Cameroon, Zambia, Kenya, Sierra Leone and Niger. According to these results, income is the most important long-run determinant of savings in SADC countries.

Table no. 9 – Empirical results: PMG, MG and DFE. Dependent variable: Savings

Variable	PMG	MG	Hausman test	DFE
adjustment coefficient	-0.42***	-0.52***		-0.36***
	(0.06)	(0.06)		(0.05)
long-run coefficients			2.18	
			(0.53)	
GDP	1.55***	1.28*		1.50***
	(0.26)	(0.74)		(0.41)
AGE	0.36***	0.09		0.12
	(0.12)	(0.57)		(0.14)
RDEP	0.30***	-0.003		0.18
	(0.11)	(0.26)		(0.19)

Note: (*), (**) and (***) indicate 10%, 5% and 1% significance level, respectively. Figures in parentheses ( ) are standard errors, figures in parentheses [ ] are p-values.

Source: Researcher's own computations.

5.2 Savings and investments

The long-run and short-run results of the relationship between interest rate liberalisation and investments are shown in Table no. 10. The adjustment coefficients range from -0.18 for the DFE model to -0.48 for the MG estimator. The real interest rate has a negative but insignificant effect on investments. The result is consistent in all three models and confirms the findings of Shrestha and Chowdhury (2007), who report an insignificant influence of the real lending rate on investments in Nepal. Savings have a positive and statistically significant effect on investments in all three models, which confirms theoretical expectations, as savings increase the availability of funds for investment purposes. The result is in line with the findings of Shrestha and Chowdhury (2007) and Orji *et al.* (2014), who found that savings play a crucial role in determining investments.

The significant relationship between savings and investments provides further support for McKinnon's complementary hypothesis, as higher real interest rates (real deposit rates) have a positive effect on investments through higher savings. According to the results, the positive effect of higher deposit rates outweighs the negative effect of higher real lending rates on investments, which supports the findings of Shrestha and Chowdhury (2007).

Financial development has a positive and statistically significant influence on investments in the long run, a result which confirms *a priori* expectations. According to

McKinnon (1973) and Levine (1997, 2001) financial development is expected to have a positive effect on investments. FDI inflows have a positive but insignificant effect on investments in the long run, which suggests that foreign investments do not supplement domestic investments in the SADC region.

Table no. 10 – Empirical results: PMG, MG and DFE. Dependent variable: investments

Variable	PMG	MG	Hausman test	DFE
adjustment coefficient	-0.29***	-0.48***		-0.18***
	(-4.18)	(-4.58)		(-4.51)
long-run coefficients			1.58	
			(0.81)	
SAV	0.31***	0.31		0.60***
	(3.09)	(1.80)*		(2.84)
CRED	0.09***	0.60		0.08
	(3.38)	(1.40)		(0.52)
RINT	-0.001	1.18		-0.16
	(-0.01)	(0.94)		(-0.74)
FDI	0.01	-0.23		0.18
	(0.05)	(-0.51)		(0.53)

Note: (***) and (**) indicate 1% and 5% significance level, respectively. Figures in parentheses ( ) are T-statistics, figures in parentheses [ ] are p-values.

Source: Researcher's own computations

5.3 Investments and economic growth

Table no. 11 presents the results of the PMG, MG and DFE models. The long-run results suggest that investments have a positive effect on economic growth and the coefficient is significant at the 1% level. The result confirms *a priori* expectations, as investments are viewed as one of the main drivers of economic growth. The result provides support for the McKinnon and Shaw hypothesis, as higher real interest rates (real deposit rates) have a positive effect on savings, which in turn lead to higher investment levels. Higher investment levels are then translated to faster economic growth. The results are in line with those of Hye and Wizarat (2013) and Orji *et al.* (2015) who reported a positive relationship between investments and economic growth. The findings also support those by Lee and Werner (2018) who concluded that interest rates are positively correlated with nominal GDP growth and therefore expansionary monetary policies may be growth retarding. The results are in direct contrast to those of Gylych (2016) and Salami (2018) who suggest that lower interest rates are growth enhancing.

Trade has a negative long-run effect on economic growth and the coefficient is significant at the 1% level. The results square well with those of Moyo and Khobai (2018), Ahmed (2013) and Yanikkaya (2003), who report that trade openness is detrimental to economic growth in developing countries. According to Ahmed and Suardi (2009), trade has a positive effect on economic growth if the export structure is diversified. However, most SADC countries export mostly primary products and fewer manufactured goods (Hausmann *et al.*, 2007).

Table no. 11 – Empirical results: PMG, MG and DFE. Dependent variable: GDP growth

Variable	PMG	MG	Hausman test	DFE
adjustment coefficient	-0.80***	-1.09***		-1.05***
	(0.10)	(0.08)		(0.06)
long-run coefficients			1.75	
			(0.78)	
INVS	0.14***	0.09		0.07***
	(0.02)	(0.07)		(0.03)
TRA	-0.02***	0.02		0.0008
	(0.01)	(0.03)		(0.01)
GOV	-0.17***	-0.32***		-0.08
	(0.05)	(0.10)		(0.07)
INF	-0.02*	-0.10		-0.05***
	(0.01)	(0.07)		(0.01)

Note: (*), (**) and (***) indicate 10%, 5% and 1% significance level, respectively. Figures in parentheses ( ) are T-statistics, figures in parentheses [ ] are p-values.

Source: Researcher's own computations

Government expenditure has a negative and significant influence on economic growth. The results are in line with the findings of Misati and Nyamongo (2012), Gorlach and Le Roux (2015) and Le Roux and Moyo (2015). Government expenditures could crowd out investments, one of the main drivers of economic growth. Inflation has a negative effect on economic growth, as expected, and the coefficient is significant at 10% level. The result squares well with those of Ahmed (2013), Misati and Nyamongo (2012) and Owusu and Odhiambo (2015). SADC countries have had a history of high inflation, which has often hindered economic growth. Therefore, lower interest rates may be inflationary which is detrimental to economic growth.

6. CONCLUSION AND POLICY RECOMMENDATIONS

The study conducted an empirical analysis of the effect of interest rate liberalisation on economic growth in SADC countries for the period 1990-2015. The analysis sought to determine whether the effect of interest rate on economic growth is through savings and investments. The PMG was used for the analysis, involving three specifications. The study first examined the effect of higher real deposit rates on savings. This was followed by the analysis of the relationship between savings and investments, and lastly the effect of investments on economic growth.

The results reveal that higher real deposit rates have a positive and significant effect on savings, in line with the proposition by McKinnon (1973) and Shaw (1973). Savings are crucial for investments in both the long and short run while the real interest rate has an insignificant effect on investments in both the long and short run, signalling that the rise in borrowing costs does not play much of a role in determining investments. The result suggests that the effect of higher deposit rates outweighs the negative effect of higher borrowing costs. Investments are positively related correlated with economic growth in the long run, which confirms theoretical expectations that investments are one of the main drivers of economic growth. Inflation, government expenditure and trade openness have a negative effect on economic growth. The results therefore imply that interest rate

liberalisation has a positive effect on economic growth through savings and investments. Lower interest rates used to boost economic growth result in a decrease in savings and investments, which are the main drivers of long-term growth.

The conclusions drawn from the study have policy implications for the SADC region. The main driver of economic growth in the long run is investments, so policies that boost investments like savings are a necessity. High savings rates would also minimise the dependence of the region on the foreign capital inflows that are required alleviate the shortage of funds for investment purposes. Financial repression policies which maintain real interest rates at low or negative levels has a negative effect on economic growth through a reduction in savings and investments as well as the rise in inflation. Measures should be introduced to reduce inflation rates which are detrimental to economic growth. Government expenditure has to be confined to areas that will boost economic growth, for instance investment in infrastructure, instead of wasteful activities that reduce economic growth. Diversifying the export structure should be one of the goals of policy-makers. Trade openness has a positive effect on economic growth in economies with a diversified export structure. Furthermore, trade openness might be hurting domestic industries in the region, and so having a negative influence on economic growth.

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References

Achy, L., 2003. *Financial Liberalisation, Saving, Investment and Growth in MENA countries*. Retrieved from http://www.mafhoum.com/press7/206E11.pdf

African Development Bank, 2018. African economic outlook 2018. www.afdb.org.

Ahmed, A. D., 2013. Effects of Financial Liberalisation on Financial Market Development and Economic Growth of the Sub-Saharan African Region: An empirical Assessment. *Economic Modelling, 30*(1), 261-273. http://dx.doi.org/10.1016/j.econmod.2012.09.019

Ahmed, A. D., and Suardi, S., 2009. Macroeconomic Volatility, Trade and Financial Liberalisation in Africa. *World Development, 37*(10), 1623-1636. http://dx.doi.org/10.1016/j.worlddev.2009.03.009

Aizenman, J., Cheung, Y.-W., and Ito, H., 2017. The interest rate effect on private saving: Alternative perspectives. *ADBI Working Paper, 715*.

Akinboade, O. A., and Kinfack, E. C., 2013. Interest rate reforms, financial deepening and economic growth in Cameroon: An empirical evidence. *Applied Economics, 45*(25), 3574-3586. http://dx.doi.org/10.1080/00036846.2011.566200

Akingunola, R. O., Olusegun, A., and Oluwaseyi, B., 2013. The effect of the financial liberalisation on economic growth. *International Journal of Academic Research in Economics and Management Sciences, 2*(1), 123-155.

Ang, J. B., and McKibbin, W. J., 2007. Financial liberalisation, financial sector development and growth: Evidence from Malaysia. *Journal of Development Economics, 84*(1), 215-233.

Ang, J. B., and Sen, K., 2011. Private saving in India and Malaysia compared: The roles of financial liberalisation and expected pension benefits. *Empirical Economics, 41*(2), 247-267. http://dx.doi.org/10.1007/s00181-010-0386-3

Bandiera, O., Caprio, G., Honohan, P., and Schiantarelli, F., 2000. Does Financial Reform Raise or Reduce Saving? *The Review of Economics and Statistics, 82*(2), 239-263.

Bank of Botswana, 2013. *Integrated Paper on Recent Economic Developments in SADC*. Paper presented at the Committee of Central Bank Governors in SADC. http://bit.do/fkFg4.

Bittencourt, M., 2010. *Financial development and economic growth in Latin America: Is Schumpeter right?* University of Pretoria Working Paper no. 191.

Blanchard, O., Dell'Ariccia, G., and Mauro, P., 2010. Rethinking Macroeconomic Policy. *Journal of Money, Credit and Banking*, *42*(s1), 199-215. http://dx.doi.org/10.1111/j.1538-4616.2010.00334.x

Boadi, E. K., Li, Y., and Lartey, V. C., 2015. Determinants of bank deposits in Ghana: Does interest rate liberalisation matter? *Modern Economy*, *06*(6), 990-1000. http://dx.doi.org/10.4236/me.2015.69094

Bonfiglioli, A., 2005. How Does Financial Liberalisation Affect Economic Growth. http://bit.do/fkFmK.

Bouzid, A., 2012. McKinnon's complementary hypothesis: Empirical evidence for the Arab Maghrebean Countries. *Journal of Monetary and Economic Integration*, *XV*(44), 23-36.

de Melo, J., and Tybout, J., 1986. The effects of financial liberalisation on savings and investment in Uruguay. *Economic Development and Cultural Change*, *34*(3), 561-587. http://dx.doi.org/10.1086/451549

Domar, E., 1946. Capital Expansion, Rate of Growth, and Employment. *Econometrics*, *14*(2), 137-147. http://dx.doi.org/10.2307/1905364

Fry, M. J., 1980. Saving, investment, growth and the cost of financial repression. *World Development*, *8*(4), 317-327. http://dx.doi.org/10.1016/0305-750X(80)90030-3

Galbis, V., 1977. Financial Intermediaries and Economic Growth in Less-Developed Countries: A Theoretical Approach. *The Journal of Development Studies*, *13*(2), 58-72. http://dx.doi.org/10.1080/00220387708421622

Gorlach, V. I., and Le Roux, P., 2015. The Impact of Economic Freedom on Economic Growth in the SADC: An Individual Component Analysis. *Journal for Studies in Economics and Econometrics*, *39*(2), 41-61.

Gylych, J., 2016. The impact of interest rate on economic growth example of Nigeria. African. *Journal of Social Sciences*, *6*(2), 51-64.

Harrod, R. F., 1939. An Essay in Dynamic Theory. *Economic Journal (London)*, *49*(193), 14-33. http://dx.doi.org/10.2307/2225181

Hausmann, R., Hwang, J., and Rodrik, D., 2007. What You Export Matters. *Journal of Economic Growth*, *12*(1), 1-25. http://dx.doi.org/10.1007/s10887-006-9009-4

Hoffman, A., 2014. Zero-interest rate policy and the unintended consequences in emerging markets. *International Centre for Economic Research Working Paper, 2/2014*.

Hye, Q. M. A., and Wizarat, S., 2013. Impact of Financial Liberalisation on Economic Growth: A case study of Pakistan. *Asian Economic and Financial Review*, *3*(2), 270-282.

Im, K. S., Pesaran, M. H., and Shin, Y., 2003. Testing for Unit Roots in Heterogenous Panels. *Journal of Econometrics*, *115*(1), 53-74. http://dx.doi.org/10.1016/S0304-4076(03)00092-7

International Monetary Fund, 2016. World Economic Outlook Database. from http://www.imf.org

International Monetary Fund, 2019. World Economic Outlook Database. from http://www.imf.org

Kao, C., 1999. Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics*, *90*(1), 1-44. http://dx.doi.org/10.1016/S0304-4076(98)00023-2

Kapur, B. K., 1976. Alternative Stabilisation Policies for Less-Developed Economies. *Journal of Political Economy*, *84*(4), 777-795. http://dx.doi.org/10.1086/260476

Kargbo, S. M., 2010. Financial liberalisation and savings mobilisation in Sierra Leone: A test of McKinnon's complementary hypothesis. *Journal of Monetary and Economic Integration*, *10*(1), 131-170.

Kates, S., 2010. *Macroeconomic Theory and its Failings: Alternative Perspectives of the Global Financial Crisis*. UK: Edward Elgar. http://dx.doi.org/10.4337/9781849803397

Keho, Y., 2012. Does Dependency Rate Really Impede Savings? Some Sub-Saharan African Evidence. *Journal of African Studies and Development*, *4*(3), 69-80.

Khan, A. H., and Hasan, L., 1998. Financial liberalisation, savings and economic development in Pakistan. *Economic Development and Cultural Change, 46*(3), 581-597. http://dx.doi.org/10.1086/452359

Le Roux, P., and Moyo, C., 2015. Financial Liberalisation and Economic Growth in the SADC. *ERSA Working Paper, 516*.

Lee, K. S., and Werner, R. A., 2018. Reconsidering monetary policy: An empirical examination of the relationship between interest rates and nominal GDP growth in the U.S., U.K., Germany and Japan. *Ecological Economics, 146*, 26-34. http://dx.doi.org/10.1016/j.ecolecon.2017.08.013

Levin, A., Lin, C., and James Chu, C., 2002. Unit Root Test in Panel Data: Asymptotic and Finite Sample Properties. *Journal of Econometrics, 108*(1), 1-24. http://dx.doi.org/10.1016/S0304-4076(01)00098-7

Levine, R., 1997. Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature, 35*(2), 688-726.

Levine, R., 2001. International Financial Liberalisation and Economic Growth. *Review of International Economics, 9*(4), 688-702. http://dx.doi.org/10.1111/1467-9396.00307

Mathieson, D. J., 1980. Financial Reform and Stabilisation Policy in a Developing Economy. *Journal of Development Economics, 7*(3), 359-395. http://dx.doi.org/10.1016/0304-3878(80)90017-6

McKinnon, R., 1973. *Money and Capital in Economic Development*. Washington, DC: Brookings Institutions.

Misati, R. N., and Nyamongo, E. M., 2012. Financial Liberalisation, Financial Fragility and Economic Growth in Sub-Saharan Africa. *Journal of Financial Stability, 8*(3), 150-160. http://dx.doi.org/10.1016/j.jfs.2011.02.001

Morris, M., and Fessehaie, J., 2014. The industrialisation challenge for Africa: Towards a commodities based industrialisation path. *Journal of African Trade, 1*(1), 25-36. http://dx.doi.org/10.1016/j.joat.2014.10.001

Mottelle, S., and Masengetse, R., 2012. McKinnon-Shaw Complementary Hypothesis: Evidence from Lesotho. *African Finance Journal, 14*(1), 102-114.

Mowatt, R., 2001. Prospects for Financial Sector Reform in the Context of Regional Integration in SADC. from http://bit.do/fkFjv

Moyo, C., and Khobai, H., 2018. Trade openness and economic growth in SADC countries. *Munich Personal RePEc Archive, 84254*. http://bit.do/fkFkx.

Nyawata, O., and Bird, G., 2004. Financial Liberalisation in Southern Africa: An Assessment. *Development Policy Review, 22*(3), 287-307. http://dx.doi.org/10.1111/j.1467-7679.2004.00250.x

Obamuyi, T. M., and Olorunfemi, S., 2011. Financial Reforms, interest rate behaviour and economic growth in Nigeria. *Journal of Applied Finance & Banking, 1*(4), 39-55.

Odhiambo, N. M., 2010. Interest rate reforms, financial deepening and economic growth in Tanzania: A dynamic linkage. *Journal of Economic Policy Reform, 13*(2), 201-212. http://dx.doi.org/10.1080/17487871003700770

Odhiambo, N. M., and Akinboade, O. A., 2009. Interest rate reforms and financial deepening in Botswana: An empirical Investigation. *Economic Notes, 38*(1/2), 97-116. http://dx.doi.org/10.1111/j.1468-0300.2009.00211.x

Opuku, R. T., and Ackah, I., 2015. How responsive are private savings to changes in real interest rate in Ghana. *Munich Personal RePEc Archive, 65040*. http://bit.do/fkFkb.

Orji, A., Eigbirenmolen, G. O., and Ogbuabor, J. E., 2014. Impact of Financial Liberalisation on Private Investments: Empirical Evidence from Nigeria Data. *Review of Economics and Finance, 4*, 77-86.

Orji, A., Ogbuabor, J., and Anthony-Orji, O., 2015. Financial liberalisation and economic growth in Nigeria: An empirical evidence. *International Journal of Economics and Financial Issues, 5*(3), 663-672.

Osei-Assibey, E., and Baah-Boateng, W., 2012. Interest rate deregulation and private investment: Revisiting the McKinnon-Shaw hypothesis in Ghana. *IUP Journal of Applied Economics, XI*(2), 12-30.

Owusu, E., and Odhiambo, N. M., 2015. Financial sector reforms and economic growth in Ghana: A dynamic ARDL model. *Contemporary Economics, 9*(2), 181-192. http://dx.doi.org/10.5709/ce.1897-9254.166

Pesaran, M. H., Shin, Y., and Smith, R. P., 1999. Pooled Mean Group Estimation of Dynamic Heterogenous Panels. *Journal of the American Statistical Association, 94*(446), 621-634. http://dx.doi.org/10.1080/01621459.1999.10474156

Romer, P. M., 1986. Increasing Returns and Long-run Growth. *Journal of Political Economy, 94*(5), 1002-1037. http://dx.doi.org/10.1086/261420

Romero-Ávila, D., 2009. Liberalization of capital controls and interest rates restrictions in the EU-15: did it affect economic growth? *Applied Financial Economics, 19*(20), 1625-1648. http://dx.doi.org/10.1080/09603100802599571

Roodman, D., 2009. How to do Xtabond2: An Introduction to Difference and System GMM in Stata. *The Stata Journal, 9*(1), 86-136. http://dx.doi.org/10.1177/1536867X0900900106

Salami, F. K., 2018. Effect of interest rate on economic growth: Swaziland as a case study. *Journal of Business & Financial Affairs, 7*(3), 1-5.

Samargandi, N., Fidrmuc, J., and Ghosh, S., 2015. Is the relationship between financial development and economic growth monotonic? Evidence from a sample of Middle-income countries. *World Development, 68*, 66-81. http://dx.doi.org/10.1016/j.worlddev.2014.11.010

Shaw, E., 1973. *Financial Deepening in Economic Development*. New York: Oxford University Press.

Shrestha, M. B., and Chowdhury, K., 2007. Testing Financial Liberalisation Hypothesis with ARDL Modelling Approach. *Applied Financial Economics, 17*(18), 1529-1540. http://dx.doi.org/10.1080/09603100601007123

Solow, R. M., 1956. A Contribution to the Theory of Economic Growth. *Journal of Economics, 70*(1), 65-94.

Swan, T. W., 1956. Economic Growth and Capital Accumulation. *The Economic Record, 32*(2), 334-361. http://dx.doi.org/10.1111/j.1475-4932.1956.tb00434.x

Templeman, J. H., 2010. Austrian Business Cycle Theory and the Global Financial Crisis: Confessions of a Mainstream Economist. *Journal of Asian Economics, 13*(1), 3-15.

Warman, F., and Thirlwall, A. P., 1994. Interest rates, saving, investment and growth in Mexico 1960-90: Tests of the financial liberalisation hypothesis. *The Journal of Development Studies, 30*(3), 629-649. http://dx.doi.org/10.1080/00220389408422330

World Bank, 2019. World Development Indicators. from http://data.worldbank.org

Yanikkaya, H., 2003. Trade Openness and Economic Growth: A Cross-Country Empirical Investigation. *Journal of Development Economics, 72*(1), 57-89. http://dx.doi.org/10.1016/S0304-3878(03)00068-3

Note

List of SADC countries includes; Angola, Botswana, Comoros, DRC, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

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