The Relationship between Banks, Stock Market and Economic Growth: Evidence from South Africa

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Abstract: This paper explores the relationship between financial development and economic growth in South Africa. It employs an Auto Regressive Distributed Lag bounds testing approach and the Vector Error Correction Model to examine this relationship. The starting point of the analysis emanates from the works of Goldsmith (1969) who set out to chart the evolution of financial structures as economies grow and develop and to establish the impact financial development has on growth. The Auto Regressive Distributed Lag results show the existence of a steady relationship between financial development indicators and economic growth and the existence of a long-run relationship among the variables. The Vector Error Correction Model approach has shown a long-run bidirectional relationship from financial development to economic growth, and the banking sector is the main driver for economic growth. The study indicates that the South African financial system plays an important role in the growth of the economy and the variables under study boosts the growth of the economy. The paper thus, contributes to the discussion on the linkages between financial development and economic growth in a growing economy such as South Africa, which is the most developed country with the most advanced financial sector in sub-Saharan Africa.

Keywords: auto regressive distributed lag; vector error correction model; bidirectional

JEL Classification: G32

1. Introduction

The relationship between financial development and economic growth has received much attention ever since Bagehot (1873) who emphasized the important role played by financial systems in stimulating industrialization in England through facilitating the mobilization of capital. Schumpeter (1912) argued that a financial system that functions well facilitates technological change by funding entrepreneurs who promote innovation. In contrast, Robinson (1952) and Lucas

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(1988) argued that financial systems do not play a significant long term role in economic growth; rather, they follow economic development. Nonetheless, it is important to understand the determinants of financial development, because financial systems yield better quality information, and an improved allocation of resources, and promote savings and investment, all of which result in increased growth. While there are costs involved in participating in financial systems, growth makes it more affordable for individuals to do so; this, in turn, improves the quality of information produced by financial intermediaries. Furthermore, over the past few decades world capital markets have benefitted from significant contributions from emerging markets. In Africa, the financial landscape has changed with the growth of stock markets and private equity markets. The number of stock markets in Africa has risen from five in 1990 to twenty. Similarly, bank credit to the private sector and bank assets has increased significantly since 1990 and bank assets have surpassed GDP, reaching 112% of GDP in 2010. As a result of the mining boom of the late 1800s, South Africa developed a sophisticated financial system that comprises a well-developed banking sector and a very deep stock market. The Johannesburg Securities Exchange (JSE) was established in 1887 and was used to raise funds from financiers for the expansion of the mining industry. Since its establishment to the present, the JSE has played an important role in the development of South Africa's economy; indeed, it is the engine room of the economy. Companies listed on the JSE raise capital for business expansion and in so doing create new services, products, jobs and economic opportunities (JSE, 2005). One would therefore expect South Africa to exhibit robust economic growth because of its sophisticated financial system, unlike other middle-income nations with similar financial systems and economic histories.

2. Background of the Study

South Africa is the economic powerhouse of Africa, leading the continent in industrial output and mineral production (International Monetary Fund [IMF], 2011). While South Africa is a well-developed country, average Gross Domestic Product (GDP) growth is very low at 2.7 percent (World Bank 2011) compared with other Southern African Development Community (SADC) countries. Nonetheless, South Africa has the highest stock market capitalization to GDP ratio of 172 percent compared with other SADC countries. The World Economic Forum (2011) compares the JSE favourably with other BRIC (Brazil, Russia, India, and China) exchanges in terms of market capitalization. However, the JSE is more developed than certain exchanges within this alliance, as it is much older. The average GDP growth rate of the BRICS countries is more than 8 percent, while the South African economy has grown at an average rate of 2.7 percent and is also regarded as a market oriented economy (Davis et al 2003) in line with the United

Kingdom (UK) and United States of America (USA). Given its seemingly well-developed stock market capitalization ratio and banking sector ratio, it could be argued that the country's economy does not benefit from the spill-over effects of development as shown by the low average GDP growth rate. While financial development is on an upward trend, economic development has taken a different path. Thus there is need to address this situation where there seems to be no correlation between financial development (market capitalization and bank credit to private sector) and future rates of economic growth. The literature has acknowledged that well-developed financial systems contribute positively to the growth of an economy. Given this background, this study uses econometric techniques to ascertain the relationship between bank credit to private sector, stock market capitalization and economic growth in order to determine whether or not financial sector development contributes positively to economic growth and to make policy formulation recommendations to national government and contribute to the economic literature.

2.1. An Analysis of South Africa's Financial Sector

The financial sector plays an important role in people's lives and enables job creation, economic growth and sustainable development (South African Reserve Bank [SARB], 2008). The South African Reserve Bank (2009) notes that the financial sector is the biggest contributor to the country's economy and its contribution to GDP grew steadily in the first 10 years of democracy. The data show that the sector contributed approximately 20 percent of economic growth. The first quarter of 2009 marked a contraction in growth as the country experienced an economic recession; this continued up until the fourth quarter of 2009, when the sector grew by about 2.9 percent (Banking Association of South Africa [BASA], 2010). In 2010, the financial sector contributed 21.2 percent of GDP, making it the biggest contributor to the economy (BASA, 2010). These figures illustrate the crucial role played by the financial sector in economic growth. Levine's studies (1996, 2002, and 2004) have shown that economies grow more rapidly if they have both banks and a liquid stock market that facilitates the issuing and trading of securities. Commercial banks dominate the South African financial system, with total assets of 120 percent of GDP, representing the biggest segment of the market (IMF, 2008). Financial supervision is highly developed and sophisticated. A brief examination of the South African stock market shows that it is well-developed, as reflected by market capitalization as a percentage of GDP (IMF, 2008). In terms of market capitalization, it was ranked 20th out of 52 in the world in May 2011, and number 21 in terms of market turnover. The performance of the JSE from 2001 to 2003 was seriously damaged by the financial crisis which resulted in a 35 percent decrease in market capitalization (JSE, 2010) as shown in Figure 1 below. An analysis of Figure 1 suggests the existence of the relationship between the variables and that the financial sector variables seem to be influencing

growth in a positive direction. While this suggests a positive relationship between financial development and economic growth, tests need to be performed to further analyze these figures; this is discussed in section 4 of this study.

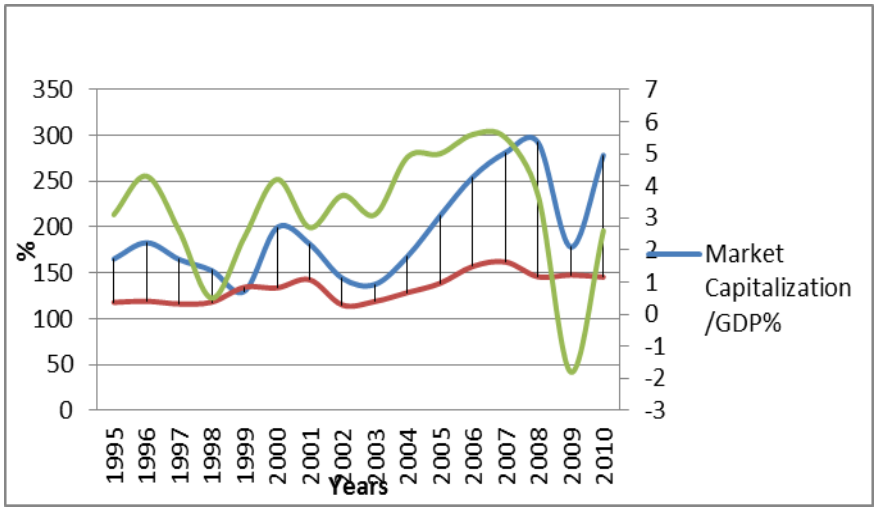

Figure 1. Financial Sector Development Indicators and Economic Growth (1995-2010)

Source: IMF World Economic Outlook Database (2011)

3. Literature Review

The literature acknowledges that financial systems that function more effectively and are well-developed influence the growth of the economy. Financial development contributes positively to economic growth through resource allocation and mobilization. The literature has shown that a reduction in transactional and informational costs is achieved because of financial instruments availability, and this tends to influence investment decisions and savings rate. Financial development can either be bank-based type or stock-market based type (Blackburn & Capasso, 2005). A crucial policy question is which type of development the government should actively promote. The significance of bank based or market based financial structures in the growth of the economy has been debated by Stiglitz (1985); and Allen and Gale (1993) for more than a century. Proponents of bank-based structures argue that developing the banking sector contributes significantly to economic growth and can also avoid the shortcomings of financial systems that are market based. The agency problem due to asymmetric information between the actors in the bank system is less severe than in the market system. The stock market view contents that a well-functioning stock market stimulates growth and income, and helps in risk management more easily as compared to banks (Levine, 2000; Beck & Levine, 2004).

Rousseau and Wachtel (2000) used panel data to analyze the relationship between banks, stock market and growth using annual data. Bank development was measured by money supply (M3/GDP) ratio, and for the stock market they used Levine and Zervos (1998) measures which they deflected by price index so as to eliminate priced changes. Rousseau and Wachtel (2000) used the difference panel estimator which was established with the assistance of Arellano et al. (1991). It involved two important steps, which were: (i) differencing of the regression growth measurement so as to eliminate any biases that are caused by unobserved country-specific effects, and (ii) removal of parameter consistency that arises from simultaneity bias by using lagged values. Their results showed that improvement in banks and the stock market results in subsequent growth. In addition, they found that as inflation increases financial development affects growth negatively. The initial positive effects that financial development has on growth, will slowly turn into negative effects. Furthermore, Loayza and Ranciere (2002) expanded this empirical work by distinguishing the short-term and long-term relationship of financial systems and economic growth. Their argument was that financial development effects should take into account mutually short-term and long-term effects. They observed that short-term effects alone will fuel bank lending, which will in turn result in financial crises and economic decline. Loayza and Ranciere (2002) used private credit as a variable to financial intermediary development and found that financial development and growth co-exist in an inverse relationship.

4. Data and Measurement

This study used quarterly data from 1996 to 2011 (64 observations) consisting of three variables Economic Growth, Stock Market Development and Banking Sector Development. The main sources of data were obtained from the International Monetary Fund (IMF). In addition the South African Reserve Bank (SARB) and McGregor BFA were also used so as to reinforce the data.

4.1. Model Specification and Variable Selection

Following existing theoretical and empirical works on the finance and growth nexus, (Dritsaki & Dritsaki-Bargiota, 2005; Mhareb & Fayoumi, 2011), economic growth in South Africa is a function of the level of banking development and stock market development. The generic regression is specified as follows:

$$Y_t = f(BD_t, SMD_t) \quad (1)$$

Where Y_t is economic growth defined as real GDP per capita, *BD* refers to the measure of banking indicator and *SMD* represents stock market development indicators, value traded, turnover ratio and market capitalization. The model is expressed in a linear relation in natural log form as follows:

$$LnY_t = \alpha_0 + \alpha_1 LnBCP_t + \alpha_2 LnMC_t + \alpha_3 VT_t + \alpha_4 TR_t + \mu_t \quad (2)$$

4.2. Econometric Methodology

Following the studies of Odhiambo (2008), Jalil et al., (2010) and Osman (2005), this study uses the Auto Regressive Distributed Lag (ARDL) Bound Testing Approach which was introduced by Perasan and Shin (2001) and the Vector Error Correction Model (VECM). The ARDL co-integration was employed in this study because it has numerous advantages over other co-integration methods. Firstly, the traditionally co-integration approach when modeling the long-run relationship requires variables under study to have the same order of integration, whereas, the ARDL does not impose the restrictive assumption that the underlying regressors can be of order one [1(1)] or order zero [1(0)] Pesaran et al. 2001. Secondly, ARDL is not sensitive to sample Long and Samreth, 2008; Pesaran et al., 2001. Lastly, ARDL does not provide biased estimates even when the regressors are endogenous.

4.2.1. Auto Regressive Distributed Lag

In this study we employ the following ARDL model listed below which is performed in two stages. The first stage tests the null hypothesis of no co-integration against the alternative of a long-run relationship. The ARDL model is estimated as follows:

$$\Delta \ln Y_{t-1} = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta \ln Y_{t-i} + \sum_{i=1}^{n} \alpha_{2i} \Delta \ln BCP_{t-i} + \sum_{i=1}^{n} \alpha_{3i} \Delta \ln MC_{t-1} + \sum_{i=1}^{n} \alpha_{4i} \Delta VT_{t-1}$$

$$+ \sum_{i-1}^{n} \alpha_{5i} \Delta TR_{t-1} + \alpha_6 \ln Y_{t-1} + \alpha_7 \ln BCP_{t-1} + \alpha_8 \ln MC_{t-1} + \alpha_9 VT_{t-1} + \alpha_{10} TR_{t-1} + \mu_t \quad (3)$$

The null hypothesis of no co-integration will be tested against alternative hypothesis

$$H_0 : \alpha_6 = \alpha_7 = \alpha_8 = \alpha_9 = \alpha_{10} = 0$$

$$H_1 : \alpha_6 \neq \alpha_7 \neq \alpha_8 \neq \alpha_9 \neq \alpha_{10} \neq 0$$

Following Pesaran et al. (2001) for every significance level they came up with two sets of critical values. One set assumes the critical values are of order I (0) and the other assumes they are of order I (1). In this study we reject the null hypothesis if the computed F-Static (Wald Statistic) exceeds the upper critical bounds value. If the computed F-Static falls between the bounds the test becomes inconclusive, Pesaran et al (2001, p.290) elaborated that knowledge of the underlying variables order is required to make conclusive inference. Accept the null hypothesis of no co-integration if the F-Statistic falls below the lower critical bounds value. Once the test approves the entity of co-integration, the second stage of obtaining the

long-run and short-run dynamics of the error correction estimates is performed. The ARDL associated error correction model in Eq. (4.3) can be formulated as follows:

$$\Delta LnY_t = \alpha_0 + \sum_{i=1}^{n} \alpha_1 \Delta LnY_{t-1} + \sum_{i=1}^{n} \alpha_2 \Delta LnBCP_{t-1} + \sum_{i=1}^{n} \alpha_3 \Delta LnMC_{t-1} + \sum_{i=1}^{n} \alpha_4 \Delta VT_{t-1}$$

$$+ \sum_{t=1}^{n} \alpha_5 \Delta TR_{t-1} + \psi ECT_{t-1} + \mu_t \quad (4)$$

4.2.2. Vector Error Correction Model

The vector error correction model involves testing for co-integration and analysis of short-run and long-run interaction. To examine the dynamic causal relationship between financial development and economic growth in South Africa this study employs the vector error correction model (VECM) based on the Granger causality test. Following Ghirmay (2004) the VECM in this study is expressed as follows:

$$\Delta LnY_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta \ln Y_{t-1} + \sum_{j=1}^{p} \alpha_{2j} \Delta \ln FD_{t-j} + \alpha_3 ECT_{t-1} + \varepsilon_t \quad (5)$$

$$\Delta LnFD_t = \beta_0 + \sum_{j=1}^{n} \beta_{1j} \Delta \ln FD_{t-j} + \sum_{i=1}^{p} \beta_{2i} \Delta \ln Y_{t-1} + \beta_3 ECT_{t-1} + \varepsilon_t \quad (6)$$

We reject the null hypothesis (H_0) that Y_t (economic growth) does not Granger cause FD_t (financial development) in equation 5 if α_3 is significantly different from zero. Likewise we reject H_0 that FD_t does not cause Y_t in equation 4.6 if β_3 is significantly different from zero.

5. Empirical Results

5.1. Stationarity Test Results

To examine the existence of unit roots on the individual time series (variables) in this study we employed the Augmented Dickey Fuller (ADF), the Phillips-Perron test and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS). Table 1 shows the stationary results based on the 1%, 5% and 10% level. The table shows that the series are integrated of order 1(1), thus they are non-stationary at level (they have unit roots); we do not reject the null hypothesis. Having established non-stationarity on the series we performed first difference on the variables. The results are presented in Table 2 and they show stationarity on all the series after the first

difference. The hypothesis of non-stationarity is rejected by both the ADF and the PP tests, thus this study concludes that the series are integrated of the same order. Having established the stationarity of the individual time series, we move to the next test of co-integration.

Table 1. Unit Root Test Results

	ADF	PP	KPSS	Decision
variable	none constant constant + trend	none constant constant +trend	constant constant + trend	
LGDP	2.652577 -0.163362 -2.536412	6.120081 -0.093555 -1.803635	1.009735* 0.122955	1(1)
LBCP	4.117669 -0.988603 -1.059830	6.790675 -0.966602 -1.115603	1.010141 0.105558	1(1)
LMC	2.228455 -0.265247 -2.140301	2.189774 -0.265247 -2.202833	0.957339 0.129063	1(1)
VT	1.733893 0.099004 -1.807824	0.158077 -1.631931 -4.769422*	0.950280 0.176800	1(1)
TR	1.699640 -0.712205 -3.475619	0.762358 -3.559319** -5.824321**	0.998404 0.130327**	1(1)

(*), (**) and (***) represent 1%, 5% and 10% significance level respectively

Table 2. Unit Root Test Results at First Difference

	ADF	PP	KPSS	Decision
variable	none constant constant + trend	none constant constant + trend	constant constant + trend	
LGDP	-1.977023* -3.369271* -6.908407	-8.760603 -8.645595 -8.500505	0.127425*** 0.123325	1(0)
LBCP	-1.973131* -5.304231 -5.360357	-2.55862* -5.361520 -5.421666	0.183581 0.152781	1(0)
LMC	-7.017433 -7.464358 -7.429758	-7.011478 -7.465559 -7.431068	0.093184 0.071577****	1(0)
VT	-3.506109 -4.338336 -4.371670	-13.00429 -18.58264 -18.93796	0.120870 0.121406	1(0)
TR	-3.661850 -5.08151 -5.031477	-15.01331 -19.34670 -18.84034	0.189597 0.128775	1(0)

(*), (**) and (***) represent 1%, 5% and 10% significance level respective5.2. ARDL Co-integration Test Results

We estimated our computed model in equation 3 using the ARDL approach to co-integration. The results are presented in Table 3. We performed the Wald test to test the null hypothesis of no co-integration against the alternative hypothesis of

co-integration. We reject the null hypothesis of no co-integration since our computed F-Static (Wald Statistic) exceeds the upper critical bounds at 5% and 10% level, and the results show a steady relationship between financial development indicators and economic growth. Bank credit to private sector, turnover ratio and value traded show a unidirectional relationship between financial development and economic growth in the long term. However, when market capitalization is used, economic growth predominates over financial development. Thus, when it comes to the stock market the direction of causality is dependent on the proxy used. The next stage of the ARDL test was to obtain the long-run and short-run dynamics of the error correction estimates as discussed in equation 4. The results show the existence of a long-run co-integration relationship among the variables; thus, a change in the dependent variable will result in a shift in the independent variable. Lastly, we examined which causes the other, financial development or economic growth, which results in this shift in the variables. The results showed overwhelmingly that financial development does lead to economic growth, concurring with Mhareb (2011); Kularante (2010) and Osman (2005).

Table 3. ARDL Results

Variable	Coefficient	Std. Error	t-Statistic
LOG(GDP(-1))	-0.174316	0.059489	-2.930240
LOG(BCP(-1))	0.003249	0.014529	0.223625
LOG(MC(-1))	0.0084***	0.004579	1.830246
LOG(VT(-1))	0.0063***	0.003539	1.782071
LOG(TR(-1))	-0.007611	0.003146	-2.419058
DLOG(GDP(-1))	0.555365	0.124820	4.449316
DLOG(BCP(-1))	0.03643**	0.026484	1.375631
DLOG(MC(-1))	0.003948	0.006417	0.615264
DLOG(VT(-1))	-0.006247	0.003631	-1.720614
DLOG(TR(-1))	0.0034***	0.002963	1.158911
C	2.312724	0.704802	3.281381

***denotes 1% denotes significance level, ** 5% significance level and *denotes10% significance level

5.2. VECM Causality Test Results

The VECM approach results of the study show that the banking sector is the main vehicle for economic growth as shown by the bidirectional relationship that exists from bank credit to private sector to economic growth, both in the short-run and long-run causality. It validates the hypothesis that banking sector development promotes economic growth using South African data. For the stock market, a long-run unidirectional causality was established running from turnover ratio to economic growth, and this was consistent with the results of Mishall (2011). However, this study does not strongly agree that stock market is the main driver of

economic growth although a unidirectional relationship was established from stock market to economic growth. The results of the study reject the null hypothesis that financial development does not cause economic growth. Rather, they suggest that financial development leads to economic growth in South Africa and that the variables under study boost the growth of the economy.

Table 5. VECM Results

Variables	Short Term	Direction of Causality	Long Term	Direction of Causality
BCP/GDP	0.9197 (0.8583)	FD→Y	0.0074*** (0.3344)	Y→FD
MC/GDP	0.9182 (0.0215)**	FD→Y	0.0136 (0.1940)	Y →FD
VT/GDP	0.2676 (0.1523)	FD →Y	0.2234 (0.0170)**	FD →Y
TR/GDP	0.5329 (0.5837)	FD →Y	0.0049*** (O.6516)	Y →GDP

***denotes 1% denotes significance level, ** 5% significance level and *denotes10% significance level

6. Conclusion

The objective of this study was to examine the relationship between financial development and economic growth in South Africa. The results of the study show that financial development predominates over economic growth, therefore greater importance need to be attached to the development of the sector. The results of this study have policy implications for South Africa and other countries with similarly structured economies; therefore, it is of greater importance to promote the development of financial systems further in emerging market economies by implementing appropriate policies in order to boost economic growth. The positive relationship between financial development and economic growth means that development of the sector promotes economic growth in South Africa. Therefore, there is need for further research so as to continuously identify if any constraints and bottlenecks exist which hinder growth.

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