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Abstract
The study examines the long run and the short run relationship between bank and stock market developments and economic growth in Botswana using annual data over the period 1980-2014. Simple indices for bank development and for stock market development were constructed to proxy financial development in these sectors. The study used the ARDL approach is applied to test for the existence of the long run relationship. Granger causality was also used to test the direction of the relationship and E-views 8.0 to run the ARDL model. The results indicate the existence of a positive and statistically significant long run and the short run relationship between stock market development and growth which is consistent with other studies. On the other hand, bank developments were found to have a negative but statistically insignificant long-run relationship while in the short run the relationship remained negative but statistically significant. These results are interesting for a low income country like Botswana where banks are expected to have a sizable effect on growth than stock markets. The weak association between bank developments and growth may be a confirmation of inefficient credit allocation by the banks pointing to a poor regulatory environment and lack of supervision by the Central Bank. Investment and government expenditure was also found to contribute positively to economic growth while causality was found to be bidirectional. All in all, results seem to suggest that a stable economic environment coupled with strong institutions is critical for growth in Botswana.

Key terms: Financial Development (Bank development & Stock market Index), Economic Growth

1.0 Introduction
The importance of financial development in promoting economic growth has been a major concern in development economics. Generally, there exists an overwhelming unanimity that well-functioning financial intermediaries have played a significant role in economic growth (King and Levine, 1993a,b; Levine and Zervos, 1998; Levine et al., 2000a,b; Wachtel 2003, Seetanah, 2007 in Seetanah, Ramessur and Rojid, 2009). The critical role played by the financial sector is when it is able to effectively direct financial resources toward the sectors that demand those most. A developed financial sector promotes a better allocation of the financial resources into productive use and contributes positively to the economic growth (Grassa and Gazdar, 2013).

The Nexus is also empirically investigated by identifying the causal relationship between financial development and economic development as done by several authors (King and Levine,1993a,b;Toda and Yamamoto,1995; Khan and Senhadji, 2000; Levine et al., 2000) and Giri (2015). The authors involved generally accepted that financial sector plays a critical role in expediting economic growth by mobilizing savings, facilitating payments, trading of goods and services and promoting the efficient allocation of resources. By mobilization of savings, financial intermediaries also increase the availability of funds in the market for lending for both large and small businesses which in turn create employment for the citizens. It is also found that financial development reduces information asymmetry and price risk and it is crucial for economic growth (Murinde, 2012).

According to Eita (2007), Botswana was initially an underdeveloped economy which used South African currencies before and after its independence. This is because the country was a member of the Rand Monetary Area (RMA) and this membership did not give the government any monetary independence because monetary policy was conducted by the South African Reserve Bank. Botswana terminated its membership of the RMA in 1976 and established its own central bank and currency, the Pula (Ahmed, 2006). There were only two commercial banks which were foreign-owned namely Standard Chartered and Barclays. These banks were incorporated locally after the establishment of the central bank, but they were free to make their own decisions. As Akinboade (1998) stated, the economy of Botswana recorded a high growth rate of more than 10 percent per year for most of the 1980s because of the increase in diamond revenue. This rapid increase in economic growth led to a rapid expansion of the financial system and the two commercial banks expanded to more than thirty branches or agencies.
To accommodate other players in the market, the Botswana Stock Market (BSE) established in 1989 with the mandate to oversee portfolio investment institutions which were allowed to buy shares on generous terms. However, local institutions were subjected to exchange control regulations for investing up to 50 percent of their assets abroad. According to Ahmed (2006), the exchange control measures penalized local savers because foreign financial assets generally offer a higher real rate of return than those denominated in Pula. Local investors were denied the opportunity to increase their wealth and diversify their risks.

Despite the fact that Botswana experienced rapid economic growth, financial institutions did not expand as expected. According to Jefferis (1995) and Ahmed (2006), since independence, the financial sector has been dominated by two major commercial banks which concentrated on short-term segments of the market. These banks did not offer much development to enhance long-term investment for a considerable period. Also, there was a limited range of financial instruments and capital market for equities and long-term, and short-term debt instruments did not exist before the establishment of the Botswana Stock Market. The government recognized that although excess liquidity existed, there was a demand for long-term financing which was not satisfied. This constituted a structural weakness in the financial system. Since then, the financial system of Botswana has grown by leaps and bounds. To investigate the backdrop of these investment activities, very few studies on bank and stock market developments and economic growth in Botswana have been carried out. Hence this prompted this research to establish the impact of this development on the rate of growth of the economy.

2.0 Theoretical literature review.
2.1.1 Exogenous Growth theories

In the traditional neoclassical growth models independently developed by Solow (1956) and Swan (1956), the output of an economy grows in response to larger inputs of physical capital and labor. Other economic variables such as human capital and financial institutions are excluded in these models. The standard Solow Cobb-Douglas production function is thus written as;

\[ Y(t) = AK^\alpha L^\beta \]

Where \( K(t) \) is capital and \( L(t) \) is labour. \( A \) refers to labour-augmenting technology or “knowledge”, thus \( AL \) represents total production. All factors of production are fully employed and initial values. \( A(o), K(o), \) and \( L(o) \) are given. The number of workers, ie labour as we,,ll as the level of technology grow exogenously at rates \( n \) and \( g \), respectively.

However, the Mankiw, Romer, and Weil (1992) model marked an important contribution to the debate on the nature of economic growth. In particular, it was argued that the observed empirical shortcomings of the neoclassical Solow growth model 1 - in particular a large underestimate of the difference in incomes between advanced and developing countries unless capital is assumed to have a far larger impact on output than its income share implies - were due to the omission of human capital. Effectively, Mankiw et al. (1992) argued that the traditional Cobb-Douglas formulation should include human capital variable and should be rephrased as;

\[ Y_t = K_t^\alpha H_t^\beta (A_t L_t)^{1-\alpha-\beta} \]

The output may either be consumed or transformed into K-type or H-type capital:

\[ Y_t = C_t + K_t + \delta K_t + \delta H_t \]

Where \( \delta \) is the transformation rate of H-type capital.
where $C_t$ is consumption and the overdot indicates a time derivative. $K$-type and $H$-type capital depreciate at rates $\delta K$ and $\delta H$ respectively. $Z$-type capital does not use up output, but is accumulated according to some yet unspecified relationship that links changes in $A$ to the current state of the economy.

$$
\dot{A}_t = A(A_t, K_t, \dot{K}_t, H_t, \dot{H}_t, L_t, \dot{L}_t) \quad \ldots \quad (iv)
$$

Behavioral or technological parameters (such as the parameter that links the rate of learning-by-doing to the level of production) may be implicit in $\dot{A}$.

### 2.1.2 Endogenous Growth theories

In the neoclassical growth model, long-run growth results from an exogenously determined variable - technology. On the other hand, endogenous growth theory, as put forward by Romer (1986), for example, treats technological progress as endogenous. According to endogenous growth theory, there are a number of endogenous variables that drive technological progress and hence spur economic growth. Romer’s model, for example, includes human capital as a driver of growth and thus growth can be expressed as:

$$
Y = A(K, L, H) \quad \ldots \quad (v)
$$

where $H$ is human capital and $A, K$ and $L$ are defined as before. Endogenous growth theory allows for the inclusion of many endogenous variables as independent factors. This means for example financial variables can also enter as endogenous variables that promote capital accumulation and productivity leading to growth.

According to Patrick (1966), the causality between financial development and economic growth can either be supply-leading or demand-following. The supply-leading hypothesis postulates that financial development has a positive impact on growth and causality runs from financial development to growth. The growth in financial institutions allows for the mobilization of resources and the transfer of such resources from traditional low productive sectors to modern high productive sectors where there are innovative entrepreneurs. The result is an increase in capital productivity and accumulation leading to growth. This happens because financial institutions transfer scarce capital resources from savers to investors in the modern sector according to the highest rate of return on capital. Thus the supply-leading hypothesis leads to an efficient allocation of capital among many alternative uses. This view was also supported by Gurley and Shaw (1967), Goldsmith (1969) and Jung (1986) and Robinson (1952) whose view is that where enterprise leads finance follows.

McKinnon’s Outside-Money Model and Shaw’s Inside-Money Model supports Patrick’s supply-leading argument. McKinnon (1973) argues that financial markets in developing countries are underdeveloped. As a result, firms rely on self-finance since opportunities for external finance are limited. Potential investors must, therefore, accumulate huge savings to allow them to undertake lumpy investment expenditures. On the other hand, Shaw (1973) in his Inside-Money model argues that investors need not necessarily save before they can invest but can borrow from financial institutions (debt intermediation view). With financial institutions offering high interest rates, this will attract saving. As savings increase, the supply of credit rises allowing financial institutions to promote investment and hence growth through lending and borrowing.

### 2.2 Empirical Literature review

#### 2.2.1 An Overview of the Bank Sector Development in Botswana

In 1966, when Botswana attained independence, only two British origin banks namely, Barclays and Standard Chartered dominated its commercial banking sector. Until April 1975, these institutions remained liable to the respective head offices in South Africa, subject to the policy regulations enacted by the South African Reserve Bank (SARB). Botswana's membership of the Rand Monetary Area (RMA) also meant that in cases of transactions with non-member countries of the RMA, commercial banks applied South African foreign exchange regulations (Brownbridge & Harvey, 1998). The discovery of diamonds in the early 1970s gave Botswana’s government impetus to implement a number of financial policies aimed at ensuring that export
earnings were properly managed in accordance with economic objectives. Both Barclays and Standard Bank became locally incorporated firms in 1975, following the establishment of both the Bank of Botswana (BoB) and the Pula currency in 1976.

Unlike many other countries, there has never been a government-owned commercial bank in Botswana. However, the government has been an extensive provider of finance in the economy, through these two institutions and also through the Public Debt Service Fund (PDSF), which lent directly from government funds to state-owned (parastatal) enterprises, and for many years the PDSF was the largest lending entity in Botswana. During the 1980s, Botswana boasted a banking sector that was sound and reasonably well-run in narrow banking terms but which was unadventurous and not actively developing financial intermediation in the economy. The complacency that resulted from the lack of effective competition was reinforced by rising levels of liquidity in the economy, as mineral revenues rose sharply and the government budget moved into surplus, (Botswana Financial Sector Overview, 2009/10).

Concerned with the lack of banking competition and long-established oligopolistic features of commercial banking in Botswana, the government enacted a number of financial laws and regulations to promote competition and enhance the efficiency of intermediation. In 1982, a subsidiary of the Bank of Credit and Commercial International (BCCI), the Bank of Credit and Commerce Botswana Limited (BCCB) opened its doors to the public in Botswana. Following the collapse of the BCCI, the BoB temporarily managed the BCCB until its take-over by First National Bank in 1991. After the BCCB, Zimbank Botswana Limited (ZBL) became the first foreign bank to apply for a banking license and was incorporated in Botswana in 1990. Owing to loss-making operations and accumulation of substantial bad debts, ZBL was eventually taken over by First National Bank Botswana (FNBB) in September 1994.

Between 1991 and 1992, three more foreign-owned commercial banks began operations in Botswana. The first two, First National Bank (FNB) and Union Bank were wholly South African owned. FNB was incorporated in Botswana and became FNBB before it acquired BCCB. The third new bank, ANZ Grindlays, had it's Africa wide operations purchased by Standard Bank of South Africa and was merged with Union Bank in 1992 to form Stanbic Bank. At present, the banking sector in Botswana consists of 10 commercial banks and other investment banks (Investec and African Banking Corporation).

2.2.2 Financial Development and Economic Growth

Levine (1997) observed that economists hold shockingly different opinions regarding the importance of the financial system for economic growth. Bagehot (1873) and Hicks (1969) argue that financial development played a critical role in exploding industrialization especially in England by facilitating the mobilization of capital for immense works. Schumpeter (1912) contends that well-functioning banks spur technological innovation by identifying and finding those entrepreneurs with the best chances of successfully implementing innovative products and production process. It was also noted in Levine (1997) that, in contrast, Robinson (1952) declares that “where enterprise leads finance follows.” Based on this view, economic development creates demands for particular types of financial arrangements, and the financial system responds automatically to these demands. Moreover, some economists just do not believe that the finance-growth nexus is important. Lucas (1988) asserts that economists “badly over-stress” the role of financial factors in economic growth, while development economists frequently express their scepticism about the role of the financial system by ignoring it, (Chandavarkar, 1992). For example, a collection of essays by the pioneers of development economics”, including the three Nobel Laureates does not mention finance, (Meir and Seers, 1984).

In addition, contemporary researchers such as Gregorio (1995), examined the empirical relationship between long-run growth and financial development, reflected by the ratio between bank credit to the private sector and GDP. The results show that the proxy is positively correlated with growth in a large cross-country sample, but its impact changes across countries. Nyasha (2015), using 1980 - 2012 annual data, the study empirically investigates the dynamic relationship between financial development and economic growth in three developing countries (South Africa, Brazil, and Kenya) and three developed countries (United States of America, United Kingdom, and Australia). The results tend to differ from country to country based on the proxies used.
3. Methodology

The research used of the unrestricted Autoregressive Distributed Lag (ARDL) to establish the long run and the short run relationships between economic growth and financial development indicators. There are basically four (4) reasons for adopting the ARDL model. Firstly, the test is simple as opposed to other multivariate co-integration technique such as Johansen and Juselius (1990). It allows the co-integrating relationship to be estimated by ordinary least squares (OLS) once the lag order is selected. Secondly, the bound test procedure does not require the pre-testing of the variables included in the model for unit root unlike other techniques such as Engle and Granger (1987) and Johansen and Juselius (1990). Their methods require that all the variables be integrated of the same order I(1). Otherwise, the predictive power will be lost (Kim et al., 2004; Perron, 1989, 1997). However, ARDL technique is applicable irrespective of whether regressor in the model is I(0) or I(1). The procedure will, however, crash in the presence of I(2) series. Thirdly, the test is relatively more efficient in small sample data sizes. Fourthly, the error correction method integrates the short-run dynamics with long-run equilibrium without losing long-run information. The ARDL was specified as follows:

\[ \Delta \ln GDP_t = \alpha_0 + \alpha_1 \ln GDP_{t-1} + \alpha_2 \Delta \ln BCPS_{t-1} + \alpha_3 \ln SMC_{t-1} + \alpha_4 \ln RIR_{t-1} + \alpha_5 \ln SMT_{t-1} + \sum_{i=1}^{n} \beta_i \Delta \ln GDP_{t-i} + \sum_{i=1}^{n} \beta_2 \Delta \ln BCPS_{t-i} + \sum_{i=1}^{n} \beta_i \Delta \ln SMC_{t-i} + \sum_{i=1}^{n} \beta_i \Delta \ln RIR_{t-i} + \sum_{i=1}^{n} \beta_i \Delta \ln SMT_{t-i} + \epsilon_t \]

Where;

\[ GDP = Gross \ Domestic \ Product \]
\[ BCPS = Bank \ Credit \ to \ Private \ Sector \ (% \ of \ GDP) \]
\[ SMC = Stock \ Market \ Capitalisation \ (% \ of \ GDP) \]
\[ RIR = Real \ Interest \ Rate \]
\[ SMT = Stock \ Market \ Turnover \ Ratio \ (% ) \]

From the first part of the equation (vi) above, \( \alpha_1, \alpha_2, \alpha_3, \alpha_4, \) and \( \alpha_5 \) refers to the long run coefficients and the second part of \( \beta_1, \beta_1, \beta_1, \beta_1, \) and \( \beta_1 \) refers to the short run coefficients and \( \epsilon_t \) is the error term. \( \Delta \) is the first difference operator.

3.1 Augmented Dicky-Fuller (DF) Unit Root Tests

The testing procedure for the ADF test is expressed as follows;

\[ \Delta Y_t = \alpha + \beta T + \gamma Y_{t-1} + \delta_t \sum_{i=1}^{n} \Delta Y_{t-i} + \epsilon_t \]

Where \( Y_t \) the dependent variable under consideration, \( \alpha \) is a constant, \( \beta \) the coefficient on a trend, \( T \) is the lag order of the autoregressive process. The null hypothesis in this case is that \( \gamma = 0 \) (meaning that a unit root exist) at the 5% significance level. The alternative hypothesis rejecting the null hypothesis is that the time series does not contain a unit root and is stationary. The null hypothesis is rejected against one-sided alternative if the t-statistic is less than the critical value. If the test statistic is less than the critical value, then the null hypothesis of \( \gamma = 0 \) is rejected and no, unit root is present.

\[ H_0: \rho = 1 \quad 0 \quad \gamma = 0 \]
\[ H_1: \rho \neq 1 \quad 0 \quad \gamma \neq 0 \]

3.2 The Phillip-Perron (PP) Test

Is a unit root test also used in time series analysis to test the null hypothesis that a time series is integrated of order 1? It builds on the Dickey-Fuller test of the null hypothesis \( \rho = 1 \). Like the Augmented Dickey–Fuller (ADF) test, the PP test involves regressing the data on a constant and a trend.

\[ \Delta Y_t = \alpha + \beta T + \gamma Y_{t-1} + \delta_t \sum_{i=1}^{n} \Delta Y_{t-i} + \epsilon_t \]

Where \( Y_t \) the dependent variable under consideration, \( \alpha \) is a constant, \( \beta \) the coefficient on a trend, \( T \) is the lag order of the autoregressive process. The null hypothesis in this case is that \( \gamma = 0 \) (meaning that a unit root exist) at the 5% significance level. The alternative hypothesis rejecting the null hypothesis is that the time series does not contain a unit root and is stationary. The null hypothesis is rejected against one-sided alternative if the t-statistic is less than the critical value. If the test statistic is less than the critical value, then the null hypothesis of \( \gamma = 0 \) is rejected and no, unit root is present.
Fuller test, the Phillips–Perron test addresses the issue that the process generating data for $Y_t$ might have a higher order of autocorrelation than is admitted in the test equation—making $Y_{t-1}$ endogenous and thus invalidating the Dickey–Fuller $t$-test. Whilst the augmented Dickey-Fuller tests address this issue by introducing lags $\Delta Y_t$ as regressors in the test equation. Instead, the Phillips-Perron test makes a non-parametric correction to test the $t$-test statistic. The test is robust with respect to unspecified autocorrelation and heteroscedasticity in the disturbance process of the test equation. Davidson and MacKinnon (2004) report that the Phillips–Perron test performs worse in finite samples than the augmented Dickey–Fuller test.

4. DATA ANALYSIS

4.1: Unit Root Test Results

One of the advantages of the bounds testing technique is that pre-testing the variables to establish their order of integration is not required since it can be carried out whether the order of integration is the same or not. Nevertheless, the Augmented Dickey-Fuller (ADF) unit root tests were carried out to make sure that no variable was integrated of any order higher than 1. According to Pesaran et al., (2001) when variables are integrated of order two or I(2) the ARDL process breaks down, and results will be spurious.

Table 4.1: Unit Root Test Results. Variable Augmented Dickey Fuller (ADF) Test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Critical Value @ 1%</th>
<th>Level</th>
<th>Prob</th>
<th>1st Diff</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnBCPS</td>
<td>0.758876</td>
<td>2,644302</td>
<td>0.8728</td>
<td>-4.205762</td>
<td>0.0001</td>
</tr>
<tr>
<td>lnDCP</td>
<td>0.758876</td>
<td>2,644302</td>
<td>0.8728</td>
<td>-4.205762</td>
<td>0.0001</td>
</tr>
<tr>
<td>lnTP</td>
<td>-1.092383</td>
<td>2,644302</td>
<td>0.2428</td>
<td>-5.675776</td>
<td>0.0000</td>
</tr>
<tr>
<td>lnRIR</td>
<td>-1.614380</td>
<td>2,644302</td>
<td>0.0974</td>
<td>-3.686364</td>
<td>0.0061</td>
</tr>
<tr>
<td>lnSMC</td>
<td>1.268949</td>
<td>2,644302</td>
<td>0.9419</td>
<td>-2.635014</td>
<td>0.0116</td>
</tr>
<tr>
<td>lnSMTR</td>
<td>-0.686364</td>
<td>2,644302</td>
<td>0.4061</td>
<td>-4.516075</td>
<td>0.0001</td>
</tr>
<tr>
<td>lnSMT</td>
<td>-2.665114</td>
<td>2,644302</td>
<td>0.8931</td>
<td>-4.516075</td>
<td>0.0001</td>
</tr>
<tr>
<td>lnGC</td>
<td>-0.096561</td>
<td>2,644302</td>
<td>0.6416</td>
<td>-2.913297</td>
<td>0.0051</td>
</tr>
<tr>
<td>LnPG</td>
<td>-1.570771</td>
<td>2,644302</td>
<td>0.1077</td>
<td>-1.162134</td>
<td>0.2176</td>
</tr>
<tr>
<td>LINGX</td>
<td>3.718081</td>
<td>2,644302</td>
<td>0.9997</td>
<td>-2.905840</td>
<td>0.0091</td>
</tr>
</tbody>
</table>

Source: Eviews 8.0

As shown in Table 4.1 above the ADF unit root test results show that all are stationary at first difference. The null hypothesis of a unit root is thus rejected. The use of the ARDL approach is thus justified since the order of integration of the variables is different and is also not more than 1.
4.3: Causality Test Results

Pairwise Granger causality is used for testing the long-run relationship between financial development and economic growth. The Granger procedure is selected because it consists the more powerful and simpler way of testing causal relationship (Granger, 1986). So, establishing a long run relationship sometimes is not sufficient without probing the direction of that relationship. Pairwise Granger Causality tests were done in this case to establish whether bank and stock market developments individual indicators follow growth or it is growth which follows bank and stock market developments individual indicators. Table 4.3 below reports the Granger Causality test results.

Table 4.3: Pairwise Granger Causality Tests Results. (Sample 1980-2014)

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>InBCPS does not Granger Cause InRGDPPC</td>
<td>30</td>
<td>0.10051</td>
<td>0.9047</td>
</tr>
<tr>
<td>lnRGDPPC does not Granger Cause InBCPS</td>
<td>30</td>
<td>3.37849</td>
<td>0.0503</td>
</tr>
<tr>
<td>lnSMTVT does not Granger Cause lnRGDPPC</td>
<td>18</td>
<td>0.85006</td>
<td>0.4498</td>
</tr>
<tr>
<td>lnRGDPPC does not Granger Cause lnSMTVT</td>
<td>18</td>
<td>0.51583</td>
<td>0.6087</td>
</tr>
<tr>
<td>lnGFCF does not Granger Cause lnRGDPPC</td>
<td>30</td>
<td>4.82331</td>
<td>0.0169</td>
</tr>
<tr>
<td>lnRGDPPC does not Granger Cause lnGFCF</td>
<td>30</td>
<td>1.39164</td>
<td>0.2673</td>
</tr>
<tr>
<td>lnGVTEX does not Granger Cause lnPOPG</td>
<td>20</td>
<td>9.86170</td>
<td>0.0018</td>
</tr>
<tr>
<td>lnPOPG does not Granger Cause lnGVTEX</td>
<td>20</td>
<td>2.35800</td>
<td>0.1287</td>
</tr>
<tr>
<td>lnGVTEX does not Granger Cause lnTOP</td>
<td>20</td>
<td>4.21980</td>
<td>0.0352</td>
</tr>
<tr>
<td>lnTOP does not Granger Cause lnGVTEX</td>
<td>20</td>
<td>0.57018</td>
<td>0.5772</td>
</tr>
</tbody>
</table>

The results in the table above show that with a p-value of 0.9047 the null hypothesis that bank credit to private sector (% of GDP) does not Granger Cause growth is rejected. We can also reject the null hypothesis that growth does not Granger cause bank credit to private sector. What this means is that there is evidence of a bidirectional relationship even though it is strongly in favor of growth causing bank credit to private sector. However, it has shown that growth does somehow cause bank credit to the private sector with a p-value of 0.0503.

Focusing now on the null hypothesis that stock market developments indicators such as Stock Market turnover do not Granger Cause growth or that growth does not Granger Cause stock market developments are easily rejected since the p-values are 0.4498 and 0.6087 respectively in reverse causality. Gross fixed capital formation does cause growth as reflected by a p-value of 0.0169 being a unidirectional effect. This is because Economic growth proved not to cause Gross fixed capital formation in Botswana with a p-value greater than 0.1.

4.4: Analysis of Co-integration Results

The empirical model expressed in chapter 3 as

\[
\Delta \ln GDP_t = \alpha_0 + \alpha_1 \ln GDP_{t-1} + \alpha_2 \Delta \ln BCPS_{t-1} + \alpha_3 \Delta \ln SMG_{t-1} + \alpha_4 \ln RIR_{t-1} + \alpha_5 \ln SMT_{t-1} + \sum_{i=1}^{n} \beta_i \Delta \ln GDP_{t-i} + \sum_{i=1}^{\pi} \beta_\pi \Delta \ln BCPS_{t-i} + \sum_{i=1}^{\pi} \beta_\pi \Delta \ln SMG_{t-i} + \sum_{i=1}^{\pi} \beta_\pi \Delta \ln RIR_{t-i} + \sum_{i=1}^{\pi} \beta_\pi \Delta \ln SMT_{t-i} + \epsilon_t
\]

The results of short-run dynamics are shown in table 4.4 below. The expression includes an error term. The coefficient of the error term shows an adjustment coefficient capturing the proportion of disequilibrium in
economic growth in one period which is corrected in the next period. Giri and Sehrawat (2015) noted that the larger the error term, the earlier the economy’s return to the equilibrium rate of growth, following a shock. The value of the error term should lie between 0 ≤ −1. If the error term is −1, it means that 100 percent of the disequilibrium in the growth will be corrected in the following year. In the estimation of the Impact of Financial Development and Economic Growth in Botswana, the estimated error term is −0.1815. This means that 18 percent of the disequilibrium in the growth will be corrected in the next period. The results are illustrated in the next table 4.4.

Table 4.4: Short run relationship

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>t – ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔlnGDP</td>
<td>0.1035**(1.5989)</td>
<td>0.104</td>
</tr>
<tr>
<td>ΔlnBPC</td>
<td>0.0336*** (3.2337)</td>
<td>0.003</td>
</tr>
<tr>
<td>ΔlnSMC</td>
<td>−0.0063(−0.61283)</td>
<td>0.493</td>
</tr>
<tr>
<td>ΔlnRR</td>
<td>−0.09644*(1.8360)</td>
<td>0.048</td>
</tr>
<tr>
<td>ΔlnSMT</td>
<td>0.6590*(1.9426)</td>
<td>0.065</td>
</tr>
<tr>
<td>Δα</td>
<td>−0.1815*(−2.4642)</td>
<td>0.0147</td>
</tr>
</tbody>
</table>

***/** denotes significance at the 1/5% level of significance

Table 4.4: Long run relationship

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t – statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnGDP</td>
<td>0.019106</td>
<td>0.2175157</td>
<td>−4.56</td>
<td>0.006***</td>
</tr>
<tr>
<td>lnBCPS</td>
<td>−4.313067</td>
<td>0.1741689</td>
<td>−1.29</td>
<td>0.014**</td>
</tr>
<tr>
<td>lnSMC</td>
<td>1.4803210</td>
<td>0.1068736</td>
<td>−3.82</td>
<td>0.005**</td>
</tr>
<tr>
<td>lnRIR</td>
<td>0.1824904</td>
<td>0.111524</td>
<td>−2.56</td>
<td>0.001***</td>
</tr>
<tr>
<td>lnSMT</td>
<td>−5.611008</td>
<td>0.1752574</td>
<td>−3.82</td>
<td>0.012**</td>
</tr>
<tr>
<td>α</td>
<td>6.477</td>
<td>6.902796</td>
<td>4.90</td>
<td>0.004</td>
</tr>
</tbody>
</table>

***/** denotes significance at the 1/5% level of significance

5. Findings

The long-run results show a positive impact of stock market developments indicator SMC on growth with a unit increase in SMC leading to approximately 1.5% change in growth. These results are supported by Beck and Levine (2004) who found that stock markets lead to greater physical capital accumulation, productivity, and income growth. Stock markets play a vital role in raising medium and long-term finance. For Botswana, however, the results show that stock market contribution to growth is positive even though it is marginal. This could be because of a relatively weak and infant equity market and low capacity utilization in the industry and dominated by the retail sector. Due to a small population in Botswana other macroeconomic fundamentals might also be certainly keeping investors away. These findings are however in sharp contrast to Rioja and Valev (2011) who found that stock markets contribute nothing towards capital accumulation or productivity growth in low income countries.

The results also show that a 1% increase in bank credit to private sector (% of GDP) leads to approximately a decline of 0.4% in economic growth in Botswana. These results contradict the findings by Kargbo and Adam (2009) as well as Hamdi, Hakimi, and Sbia (2013) who conclude that investment is the main engine of income
growth both in the short run and long run. In fact, these results are supported by Naceur and Ghazouani (2006) who found out that for the MENA region, there is no statistically significant relationship between growth, banks and stock markets. The authors found out that the relationship between banks and growth was always negative even after controlling for developments in the stock market.

The weak association of banks and growth it may be attributed to the current global economic downturn. While liberalization of the financial sector should have led to significant gains in terms of growth, effects on growth were weighed down heavily by the 2007 global financial crisis seemingly the liquidity problem the economy is experiencing. Deposits have also been transitory in nature with bank lending largely short-term rather than long-term. Allocation of credit has also been largely skewed in favor of consumption rather than productive sectors with the result that banks now hold about 15.02% of nonperforming loans due to seemingly never-ending job losses both in public and private sector of the economy. Besides the Granger causality tests have shown that there is stronger evidence of bank developments following growth. The unstable and declining trend in growth may thus also partly explain this weak association. The weak association may also be due to lack of a strong regulatory environment and supervision by the Central Bank.

These results for Botswana are in contrast with Khan et al. (2005) who found out that the relationship between financial development, real deposit rate, and economic growth was only significant in the long run and not the short run. Sanusi and Sallah (2007) also found a positive and statistically significant long-run relationship between bank system development and economic growth. A statistically positive significant relationship between stock markets and growth in both the short run and long run show the potential role that equity markets can play in Botswana.

However, Hondroyiannis, Lolos, and Papapetrou (2004) found out the same in Greece, for the period 1986-1999. Banks and stock markets financing promoted growth in the short run in Greece, even though their effect observed was small. This was in sharp contrast to Hamdi, Hakimi, and Sbia (2013) in Tunisia for the period 1961-2010, where short-run finance estimates did not lead to growth in the short run but in the long run.

The results of this study also show that the contribution by stock markets to growth is positive while that for banks is negative. In the long run, the stock market contribution is positive and significant while that for banks is negative and insignificant. Thus one can conclude that stock markets contribute more to growth in the long run than banks while in the short run banks subtract more from growth than what stock markets add. The possible explanation is that bank developments are a necessary but not sufficient condition for growth. Their main role is to mobilize resources for investment and thus feed into growth indirectly through the investment channel. However, their absence (poor performance) will have a negative effect on growth. Once a certain threshold of bank development and growth is reached, their contribution becomes insignificant, and equity markets begin to play a more active role. The results, however, are in sharp contrast to a study by Rioja and Valev (2011) who found banks to have a sizable effect on capital accumulation in low income countries while stock markets contributed nothing towards capital accumulation and productivity growth. Rioja and Valev (2011) however found stock markets to play a significant role in high-income countries than banks. Choe and Moosa (1999) also found financial intermediaries playing a more important role than capital markets in promoting growth in Korea. Hondroyiannis, Lolos, and Papaetrou (2004) also found that the contribution of stock market finance on growth was substantially smaller compared to that of bank financing.

The Granger causality test results show a bidirectional relationship between bank developments and growth even though it is in favor of growth causing bank developments. This lends support to the demand-following hypothesis. This result is supported by Zang and Kim (2007) who found causality to run from economic growth to development of financial markets. A bidirectional relationship is also found between stock market developments and growth though in favor of stock market developments causing growth, which points to a supply leading-hypothesis. This result is supported by Jung (1986) who found a bidirectional relationship with causality running from finance to growth.

5. Conclusions
It can be safely concluded generally that stock market development indicators have a positive long-run relationship with economic growth in Botswana. Thus, stock markets contribute positively and significantly to growth while contribution by banks is adverse the causal relationship is unidirectional. This conquered with

REFERENCES


