Effects of Stock Market Development on Economic Growth: The Case of SADC Countries

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Abstract

Using a pooled panel data set from nine developing countries within the SADC region from 1980 to 2011, this paper examines; firstly, the relationship between stock market development and economic growth, and secondly, the macroeconomic determinants of stock market development through the random effect model. The results suggest that there is a strong link between stock market development and economic growth. The evidences obtained support the view that a well-developed and functioning stock market can boost economic growth through enhanced capital accumulation and better resource allocation, particularly in developing countries. In terms of the macroeconomic determinants of stock market development, the results support those of Garcia and Liu (1999), in that we found the indicator of banking sector development, to be an important determinant of stock market development.

Key words: Stock Market, Economic Growth, SADC, Africa
1. Introduction

A new path of research came into the literature of financial development and economic growth, where the main focus is on the effects of stock market development. The stock market, an important pillar of an economy, plays an essential role in the growth of the industry and commerce. To further stock market development worldwide, the World Bank and IFC technically assist countries. The prerequisites for stock market development is made up of renowned industrial firms, adequate funding, robust regulatory and accounting infrastructure as well as well-established financial institutions.

A developed financial system, constituting both of a developed banking system and a sophisticated stock market is a critical factor for long-run economic growth (Levine 1997). There is confusion in theories about whether stock markets and banks acts as substitutes, complements, or whether one is more conducive to growth than the other. Boyd and Prescott (1986) model the critical role played by banks in easing frictions in information and therefore in improving the allocation of resources, while Stiglitz (1985) and Bhide (1993) are of opinions that stock markets will not have the same effect in resource allocation and corporate governance as banks. On the other hand, some models laid emphasis on the inefficient monopoly power of markets exercised mainly by banks and stressed that the competitive nature of markets encourages innovative growth-enhancing activities as opposed to the excessively conservative approach taken by banks (Allen and Gale 2000).

Stock markets do promote economic growth (Demirguc-Kunt, 1996; and Filer et al, 2000.) Levine and Zervos (1996) argue that well developed stock markets offer different kinds of services than the banking system, thus providing different kinds of incentive for investment and growth. Adjasi and Biekpe (2005) and Adamopoulos (2010) witnessed a significant positive impact of stock market development on economic growth in developed countries. Some studies, including Atje and Jovanovic (1998), showed a large impact of stock markets on economic growth but did not witness a significant link for banking development on economic growth. Nevertheless, some authors (Rousseau and Wachtel, 2000 and Beck and Levine, 2003) noted that both stock market and the banking sector boost economic growth.

However, Bencivenga and Smith (1996), Naceur and Ghazouani (2005) and Adjasi and Biekpe (2005), did not find the role of stock markets being significant to economic growth. Stiglitz (1985) and Bhide (1993) even viewed stock markets as being harmful to economic growth (they may create a free-rider problem which could lead to a reduced incentives to conduct costly research by investors, through the revelation of vital information via price fluctuation.) Furthermore, it was noted that liquidity from stock market may deter economic growth in the long run (Demirguc-Kunt and Levine, 1996.)
This paper examines the relationship between stock market development and economic growth using pooled panel data from nine countries in the SADC region over the periods 1980-2011, taking into consideration the banking sector development, where studies on the subject is scarce. Secondly, this paper will also investigate the macroeconomic determinants of stock market development within the nine countries under study.

2. Prior Research

The increasing focus on stock markets worldwide came up with a new path of research into the literature of financial development and economic growth, focusing mainly on the effects of stock market development. As a result, till now there are still a lot of debates around it. Financial intermediaries were the only causative channel to economic growth in the past. Stock market development is a multi dimensional concept which takes into consideration the ever-increasing size of markets for equities and bonds in a country-wise or internationally over the years.

Levine and Zervos (1996) argued that well developed stock markets offer different kinds of services than the banking system, thus providing different kinds of incentives for investment and growth. Obviously, a healthy and dynamic stock market plays an elementary part in triggering economic growth. However, till now the effect of this relationship still remains debatable since some models find a positive link between them while others established a negative one. Five factors, namely liquidity, risk diversification, information acquisition about firms, corporate control and savings mobilization are considered to demonstrate this correlation.

One way stock markets may affect economic activity is through their liquidity. Levine (1991) and Bencivenga, Smith and Starr (1996) pointed out that liquid financial markets help savers reduce the risks and cost of investing in long unprofitable projects. Hence, liquid equity markets permit savers to buy financial assets which can be liquidated when need to be while simultaneously, enabling firms to get permanent access to capital. Countries with well-organized liquid markets tend to have larger portfolio flows. Thus, the existence of liquid equity markets facilitates capital inflow and the ability to finance current account deficits. Furthermore, Levine and Zervos (1993) uncovered the strong correlation between stock market development and real GDP growth rate and real physical capital. From this investigation, they perceived that both liquidity in stock markets and banking developments do predict the future growth rate.

Risk diversification is the second factor through which stock market may affect economic growth. It is commonly associated with the dealing, hedging and pooling of risk associated with informational and transactional costs in internationally integrated stock markets. Saint Paul (1992), Obstfeld (1994) and Devereux and Smith (1994) fairly argued that opportunities
to manage risks by diversifying globally make high-risk, high-return transactions more feasible. According to Atje and Jovanovic (1993) stock markets give better chances for the pooling and spreading of risks in the long-run. Since high-return projects are riskier than lower return ones and that investors are assumed to be risk averse to these kinds of investments, equity markets will tend to ease risk diversification through internationally integrated stock markets which tend towards these types of assets. Conclusively, this will accelerate the process of economic growth.

Carosso (1970) explained that it is difficult and costly to assess firms, managers and market conditions. Individual savers may not have the time, capacity or means to collect and process these data, and they would hesitate to invest in activities about which there is little authentic information. Consequently, costly information may prevent capital from flowing to its highest value use. Atje and Jovanovic (1993) suggest that a stock market positively influence the availability of firms’ information to investors, thereby improving the efficiency of financial intermediation. Grossman and Stiglitz (1980), Kyle (1984) and Holmstrom and Tirole (1993) do argue that stock markets promote the acquisition and dissemination of information about firms. The ability to profit from information will induce investors to research and monitor firms, hence improving resource allocation and spurring economic growth. Peres (2010) indicated that stock markets do furnish the necessary resources to share private information and that stock prices do help in capital allocation by combining isolated information and by identifying the most meriting investment opportunities. It is through published prices that stock markets aggregate and disclose information. Even agents, who do not undertake the costly evaluation process, can observe stock prices reflecting information obtained by others. Stiglitz (1985) argue that well-functioning stock markets quickly reveal information through changes in price. This rapid public revelation will reduce incentives to spend in private resources, in order to acquire costly information. Thus, this may have “l’effet-contre” on resource allocation and growth.

Stock market development may also influence corporate control of firms. Meckling (1976), Diamond and Verrecchia (1982) and Jensen and Murphy (1990) are among the first researchers to talk about the efficiency of stock markets to ease the principle-agent problem. Furthermore, in well-developed equity markets, it is not complicated for larger firms to takeover smaller non-performing ones, therefore, as per Laffont and Tirole (1988) and Scharfstein (1988) threats of being taken over by larger firms induce managers to maximize the firm’s equity price. Consequently, the exertion of corporate control and supervision of managers through better stock markets, facilitate the takeover of underperforming firms and lessen the principal agent problems, hence leading to efficient allocation of resources and growth of the economy.
Lastly, there is expectation that stock exchanges will increase the savings rate directed to the financial sector. The works of Greenwood and Smith (1996) are proof demonstrating that large, liquid and well-developed equity markets can help in mobilizing savings through the creation of small variable instruments which gives households the chance to hold diversified portfolios of assets and this can profoundly affect economic development.

Thus, with respect to Stirr and Tufano (1995), savings mobilization will lead to better resource allocation, enhance technological progress and stimulate economic growth, by improving liquidity, risk diversification and the size of firms. Agglomerations of savings through stock markets enlarge the set of feasible investment projects. Stock markets also facilitate mobilization of resources from projects that gain from economies of scale to those that need huge capital injections.

The interest in the compilation of historical data on stock market development and its effect on the rate of economic growth seems to be stronger than ever. Various vehicles for analysis have been used in the different studies. Levine and Zervos (1996) have attempted to canvass the link between stock market development and long run economic growth, using pooled cross-country for 41 countries for the period 1976 to 1993. They constructed a time-series growth regression model with real per capita growth rate as the dependent variable. The main aim of this regression was to judge the effect of “independent partial correlation” on equity market development and growth. After analyzing the data through various tests, it could be concluded that stock markets development was positively correlated with economic growth. Moreover, some influential variables did suggest a strong link between the elements of stock market development and long run growth.

Using data for 44 industrial and developing countries for the period 1986-1993, Demiguc-Kunt and Levine (1996) conclude that countries with well-developed stock markets tend to have better financial intermediaries, while countries with weak stock markets tend to have weak banks and financial intermediaries. Thus, the existence of a developed stock market leads to the expansion of the financial sector which helps to accelerate economic growth.

Seetanah, Sawkut and Sannasee (2009) investigated on the banking sector development, stock market development and economic growth in developing countries using the Panel VAR model. The paper studied 27 developing countries from 1991 to 2007 and it was based mainly on past studies like that of Levine and Zervos (1998), Christopoulos and Tsionas (2004) among others. Following the various test for VAR model in the different developing countries, it could be argued that stock market development is an important factor for growth even though the importance of banking development is relatively higher. However, it was also found that both stock market development and banking development are complements to each other and that they impact on growth via the “investment channel.”
Many researchers have analyzed the causal relationship between stock market development and economic growth. Deb and Mukherjee (2008) evaluated the relationship for the Indian Economy taking quarterly data from 1996 to 2007. Using the stock market volatility, market capitalization ratio and real value traded ratio as proxies for stock market development and real GDP growth rate, they tested for causality using the Toda and Yamamoto (1995) test. The results indicated clearly that there was bi-directional causality between real GDP growth rate and MCR and secondly both SMV and VTR were related to real GDP growth rate in a unidirectional causality. Thus, the findings suggested that stock market development lead to economic growth during the period the study was made.

Recent studies have used vector models, however, most are country specific studies including research in Ghana (NZué 2006), Pakistan (Shahbaz, Ahmed and Ali 2008), India (Agrawalla and Tuteja 2007), and Mauritius (Nowbutsing, 2009), and they found that stock markets predict the future growth of an economy. The theoretical and empirical works of Bencivenga and Smith (1991); Ram (1999); Adjasi and Biekpe (2006) and Ghazouani (2007), are among the few studies which could not establish any relevant link in the stock market-growth nexus. Conversely, Odedokun (1996) found mixed results.

3. Overview of SADC Stock Markets

The SADC which has been in existence since 1992 comprises 15 member states. There are 11 SADC stock exchanges forming part of the COSSE formed in 1997. The members with established national stock exchanges comprise of Botswana, Malawi, Mauritius, Mozambique, Namibia, South Africa, Seychelles, Swaziland, Tanzania, Zambia and Zimbabwe.

The first stock exchange in Botswana was established in 1989 and was known as the Botswana Share Market. Later, the Botswana stock exchange was established in 1995 following the enactment of the BSE Act 1994. It regulates the equities and fixed interest securities market, and is the third biggest stock exchange based on market capitalization in Southern Africa.

The Malawi Stock Exchange was established in Blantyre in 1996. The capital market is also boosted with the help of NITL. The MSE operates under the Capital Market Development Act 1990 and the Companies Act 1984.

The Namibian Stock Exchange was first established at the start of the century in the early nineteen hundreds as the diamond rush attracted hundreds of prospectors. However, within a couple of years the rush came to termination and the exchange was shut down shortly after. A second exchange opened its doors in 1992, which is the current stock exchange called the Namibian Stock Exchange. The NSX is governed by the Stock Exchanges Control Act (1985, amended 1992) and supervised by the Registrar of Financial Institutions.
The first stock exchange in Zimbabwe was established in 1896 in Bulawayo. However, it discontinued all its operations 6 years later. Further attempts were made in Gwela (Gwenu) and Umtali (Mutane). However, these markets also failed and all stock exchange activity ceased to be in 1924. After the Second World War, another exchange was founded in Bulawayo in 1946 now known as the Zimbabwe Stock Exchange and by 1951 a second trading floor was inaugurated in Salisbury (Harare).

The Lusaka Stock Exchange of Zambia was established in 1994, with preparatory technical assistance from the IFC and the World Bank. The LUSE is incorporated as a non-profit limited liability company, and is seen as one of the most technologically developed exchanges in the SADC region.

The Dar es Salaam Stock Exchange was incorporated in 1996 in Tanzania as a company limited by guarantee without a share capital, following the enactment of the capital markets and securities act of 1994 and the introduction of the CMSA. Trading is automatically conducted at the DSE Trading Floor. The DSE has two market segments: The MIMS meant for big companies and the EGMS, for medium growth oriented companies.

The Stock Exchange of Mauritius Ltd was incorporated on 1989 under the Stock Exchange Act 1988, as a private limited company responsible for the operation and promotion of an efficient and regulated securities market in Mauritius. The SEM operates two markets: the Official Market, and the DEM. The CDS was successfully implemented in 1997. SEMATS was launched in 2001, putting an end to traditional trading patterns. In September 2012, SEM was rewarded for the second consecutive year the “Most Innovative African Stock Exchange of the Year Award” at the Africa Investor prestigious annual Index Series Awards held at the New York Stock Exchange.

Mozambique Stock Exchange was incorporated in 1999. Mozambique Stock Exchange is the management entity of the securities market endowed with necessary means to ensure continuity in an open and free market, and also has competence to regulate operational matter. The trading, clearing and settlement was always executed by an electronic system.

The Swaziland Stock Market is a small but booming stock exchange. The share market was launched as an over-the-counter single broker market in 1989. All listings are included in the sole index, the SSM Index, which is un-weighted. Now called the Swaziland Stock Exchange it operates under the supervision and regulation of the capital markets development unit of the central bank.

Seychelles securities exchange has recently been set-up in November 2012. It is a fully electronic exchange, in an off-shore environment, committed to develop and increase the activity of economic and financial sector of Seychelles.

The Bolsa de Valores e Derivativos de Angola set up in 2011 is likely to become the third largest bourse in Sub-Saharan Africa after the South African and Nigerian Stock Exchanges.
Finally, the Johannesburg Stock Exchange which was established in 1887 is not only the oldest exchange but is also the most developed and overshadows all the other SADC exchanges. JSE is licensed as an exchange under the Securities Act 2004 and Africa’s premier exchange for nearly 125 years. However, while the JSE has benefited from opening its doors to foreigners, it has also become more susceptible to international shocks. Other developments include the introduction of automated trade via the establishment of the JET system in 1996, which was later furnished to the other SADC exchanges in 1998. In 2002, the JSE changed its trading system to the JSE SETS which was adopted from the London Stock Exchange.

Three countries namely, the Democratic Republic of Congo, Lesotho and Madagascar do not have a stock market.

Stock markets in the SADC region are important source of capital for development. Most exchanges are adopting an automated trading system. It can be said that SADC stock markets are generally characterized as being small with a generally low market capitalization, thus indicating that the majority of the exchanges are under developed with numerous infrastructural bottlenecks and a weak regulatory environment (Yartey and Adjasi, 2007). Despite the weaknesses, these stock markets have helped in establishing and developing many large corporations within the region, which have helped in boosting economic growth in the long-term.

4. Research Methodology

Both a long time-series and adequate cross-sections of data are ideally needed to model precisely the effect of stock market on a country’s growth. However, the SADC region presents difficulties in that many of the region’s exchanges were only recently established, and offer very little time-series data (Allen and Ndikumana, 2000).

The primary data source for this study is the World Bank. By being able to draw data from a single source we surmount the consistency and measurement problems associated with Levine and Zervos’s (1998) use of two different data source. Nine out of the eleven SADC countries with stock exchanges have the relevant data. The analysis covers the period from 1980 to 2011. So there are nine cross-sectional units and 32 time periods. In all there are 288 observations. The variables used in the stock market development and growth nexus are: GDP Growth rate as a proxy for economic growth and inflation.

The stock market development index comprises of two measures, namely SIZE and LIQUIDITY. These measures of the index have been widely used in previous studies including (Levine 1996; Rousseau and Wachtel 2000). SIZE comprises of the concentration ratio, also known as the market capitalization ratio. The second measure LIQUIDITY includes trading value ratio or the total value of shares traded ratio and the turnover ratio.
As both banks and stock markets intermediate savings towards investment, they can either be seen as substitutes or complements (Boyd and Smith 1996; Garcia and Liu 1999). In this study we use two indicators of banking development, namely the domestic credit and the liquid liabilities.

Gross capital formation as a percentage of GDP is used in this study as a proxy for the investment rate. In all estimated models, we add to the set of regressors the lagged dependent variable in order to capture the dynamic effect in the stock market development and to get rid of a possible autocorrelation. In our case, the lagged dependent variable is known as GDPLAG.

A panel data approach is employed in this study that covers nine countries within the SADC region for the period 1980 to 2011. Two models have been considered. Model 1 examines the stock market development and economic growth nexus: while Model 2 assessses the impact of the various factors that have been noted to impact on the development of the stock market. In addition, both models exclude the South African Stock Exchange.

Based on the principles of various studies (King and Levine 1993; Ram 1999; and Seetanah 2008), the following model is used to examine the stock market development and economic growth nexus (Model 1):

$$y_{it} = \beta_0 + \beta_1 smdex_{it} + \beta_2 bank_{it} + \beta_3 inf_{it} + \beta_4 inv_{it} + \beta_5 gdplag_{it} + \epsilon_{it}$$ (1)

The following regression below was estimated to assess the impact of the various factors that have been noted to impact on the development of the stock market (Model 2):

$$smdex_{it} = \beta_0 + \beta_1 bank_{it} + \beta_2 inf_{it} + \beta_3 inv_{it} + \beta_4 gdplag_{it} + \epsilon_{it}$$ (2)

This regression was estimated in an effort to determine which control variables played the biggest role as a determinant of stock market development.

Where i stand for the different countries in the sample, t denotes the time dimension and \( \epsilon_{it} \) is the error term. The small letters denotes the natural logarithm of the variables. The model used in this paper is a linear-logarithmic one and the available panel data for the nine countries is balanced. The variables are: the log of real per capita GDP growth rate (\( y \)) set as a proxy for economic growth; the log of stock market development (smdex) which consists of the market capitalization ratio, the total value of shares traded ratio and the turnover ratio; two indicators of banking development (bank) namely domestic credit and liquid liabilities; the log of inflation (inf); the log of gross capital formation which was measured as a proxy for the investment rate (inv) and finally, the lag of gdp (gdplag).

Data was pooled and an ordinary least squares regression model (POLS) was run, where space and time dimensions of the pooled data was disregarded. Following the Hausman specification test, the Robust Random Effects model was used for both Model 1 and Model 2.
Based on the model used after the Hausman Test, the same model was repeated again. However, this time South Africa was excluded from the analysis as it was assumed that South Africa could influence the estimations significantly enough to produce misleading results given the relative size of South Africa vis-à-vis the other SADC countries.

5. Analysis of Data

While the previous chapter discussed the analytical framework of the study and the panel data procedures, this chapter employs the panel data methodology. This is done using pooled data, to empirically examine the relationship between economic growth and stock market development, for nine countries. The remainder of this chapter presents the results as well as interprets and evaluates them against theory and results from other studies. The use of Stata version 11 has been made to generate the results in the analysis part. The Hausman test favored the random effects model over the fixed effects model.

5.1 Summary Statistics

<table>
<thead>
<tr>
<th></th>
<th>GDP</th>
<th>SMDEX</th>
<th>INF</th>
<th>INV</th>
<th>BANK</th>
<th>GDPLAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.879</td>
<td>37.961</td>
<td>1.023</td>
<td>1.298</td>
<td>51.863</td>
<td>3.843</td>
</tr>
<tr>
<td>Std. Dev</td>
<td>4.762</td>
<td>85.334</td>
<td>0.379</td>
<td>0.170</td>
<td>53.305</td>
<td>4.821</td>
</tr>
<tr>
<td>Minimum</td>
<td>-17.7</td>
<td>0.000</td>
<td>-0.523</td>
<td>0.301</td>
<td>0.000</td>
<td>-17.7</td>
</tr>
<tr>
<td>Maximum</td>
<td>21</td>
<td>510.5</td>
<td>2.219</td>
<td>1.633</td>
<td>275.2</td>
<td>21</td>
</tr>
<tr>
<td>Coefficients</td>
<td>0.212</td>
<td>0.006</td>
<td>-0.669</td>
<td>10.894</td>
<td>-0.019</td>
<td>0.202</td>
</tr>
<tr>
<td>Std. Error</td>
<td>0.056</td>
<td>0.004</td>
<td>0.743</td>
<td>1.797</td>
<td>0.004</td>
<td>0.060</td>
</tr>
<tr>
<td>Observations</td>
<td>276</td>
<td>288</td>
<td>260</td>
<td>277</td>
<td>288</td>
<td>267</td>
</tr>
</tbody>
</table>

Table 5.1 reports some descriptive statistics in terms of mean, standard deviation, minimum, maximum, coefficient of variation, standard error and number of observations for each variable used in this study. The mean level is highest for BANK at 51.863 while the lowest mean is INF of 1.023. It is also found that for a minimum of 0.000, a maximum of 510.5 and 288 observations, the standard deviation of SMDEX is 85.334. The mean of GDP is 3.879 while its standard deviation is estimated to be 4.762. Two variables were found to have negative coefficients, namely inflation and banking development, -0.669 and -0.019 respectively.

To determine whether to use the FE model or the RE model, the Hausman test may be performed. The Hausman specification test is used to test the null hypothesis of no correlation between the individual specific effects and the regressors. Under this hypothesis the RE model is valid but if it is not fully respected, the estimators of the RE model are inconsistent and we have to use the FE model. In both models, the Hausman Test favors the RE model; since the Prob>Chi2 is insignificant at 5% level of significance.
5.2 Robust random effects estimates

The rationale behind RE model is that, unlike the FE model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model:

“…the crucial distinction between FE and RE is whether the unobserved individual effect embodies elements that are correlated with the regressors in the model, not whether these effects are stochastic or not,” (Green 2008 p.183).

Based on the Hausman specification observations, the RE model has been applied and its results are shown in Table 5.2. The term “vce (robust)” has been added to control for heteroskedasticity.

Table 5.2: Robust RE estimates

| VARIABLES | COEFFICIENT | ROBUST STD. ERROR | z  | P>|z|  |      |
|-----------|-------------|------------------|----|------|------|
| SMDEX     | 0.006       | 0.003            | 2.01| 0.045| Significant |
| INF       | -0.669      | 1.116            | -0.60| 0.549| Insignificant |
| INV       | 10.894      | 3.331            | 3.27| 0.001| Significant |
| BANK      | -0.019      | 0.005            | -4.13| 0.000| Significant |
| GDPLAG    | 0.202       | 0.102            | 1.97| 0.049| Significant |

Inflation and banking development had negative coefficients of 0.669 and 0.019 respectively. In addition, inflation showed an insignificant relationship with GDP growth at p=0.549. The remaining indicators on the other hand were found to have significant relationship with economic growth. The $R^2$ showed a variance of 0.2709 between economic growth and the other indicators. When considering the Wald Chi2 (5) = 239.17, we observed that it is greater than 0.05, indicating that our RE model is not good. This is a test (F) to see whether all the coefficients in the model are different from zero.

The regression produces a positive and significant result in terms of stock market development indicator, notably the market capitalization ratio, the total value of shares traded ratio and the turnover ratio at the 5% level of significance. However, the coefficient was found to be very low. An explanation for this may be that the SADC stock exchanges are either too small, inefficient, or not well developed to actually have a big impact on economic growth. The positive significant relationship between stock market development and

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1 If the error terms do not have constant variance, they are said to be heteroskedastic. The presence of heteroskedasticity in regression analysis will produce results that lead us to make erroneous inferences with our hypothesis tests. In order to control for heteroskedasticity, the term “vce (robust)” is used in the regression.
economic growth is consistent with other findings by Levine and Zervos (1998) and Rousseau and Wachtel (2000) and Caporale et al. (2004).

Inflation was found to have a negative and highly insignificant relationship with economic growth. In fact, it is expected to have a negative and highly significant relationship with economic growth in the regression, as an increase in the inflation rate is generally accompanied by an increase in financial intermediation as people and companies are less inclined to invest their money in the financial system (Aziakpono 2004). However, this low rate of inflation is more likely to contribute to stock market development and economic growth (Allen and Ndikumana 2000). Both domestic and foreign investors will be unwilling to invest in the stock markets where there are expectations of high inflation.

The regression also shows a strong positive and highly significant result between investment and economic growth. This conforms to expectations, as the higher the rate of investment, the greater the supply of funds flowing through the financial system, which in turn opens up opportunities for growth. It is expected that as savings increases the amount of capital flowing through the stock markets also increases as these funds are put towards profitable investment schemes (Garcia and Liu 1999).

In terms of financial intermediaries, the results from Table 4 show that the banking sector development has a negative and significant relationship with economic growth. This result is surprising as one would expect a positive and significant relationship to exist. An explanation for this could be that the results are indicative of distortions within the credit supply process which in turn results in lax credit to unproductive business opportunities, thus negatively affecting economic growth (Allen and Ndikumana, 2000). It is expected that as the banking sectors develop, the finance generated through this intermediation would influence growth positively by stimulating real economic activity, particularly through investment and consumption. Quite fully proofs of the literature, De Gregorio and Guidotti (1995) and Ram (1999) showed that financial development and economic growth are negatively correlated. Support services from the banking system can contribute significantly to the development of the stock market. Conversely, a weak banking system can constrain the development of stock market.

As explained earlier the lagged growth rates capture the autoregressive nature of growth, and their inclusion follow the recent contribution in this area, including the work of Islam (1995)². The last control variable, the lag of the GDP growth rate produced a positive and significant result. This result concludes that lagged growth of the country contributes

² As pointed out by Lee, Pesaran, and Smith (1997) and Islam (1995), the inclusion of the lagged dependent growth variable in the regression analysis basically derives the deterministic version of the Solow growth model, where the coefficient on the lagged dependent growth variable is a function of the speed of convergence λ.
positively towards the current level of economic growth. It is consistent with studies done by Li and Liu (2005) and Seetanah (2007).

**5.3 Pooled OLS regression with robust standard errors**

The Breusch-Pagan Lagrange Multiplier Test helps in the decision between a RE regression and a simple OLS regression. Since there is no evidence of significant difference across countries, a simple OLS regression can be run.

**Table 5.3: Robust POLS**

<table>
<thead>
<tr>
<th></th>
<th>SMDEX</th>
<th>INF</th>
<th>INV</th>
<th>BANK</th>
<th>GDPLAG</th>
<th>CONSTANT</th>
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</thead>
<tbody>
<tr>
<td>Coefficients</td>
<td>0.006</td>
<td>-0.669</td>
<td>10.894</td>
<td>-0.019</td>
<td>0.202</td>
<td>-9.523</td>
</tr>
<tr>
<td>Std. Errors</td>
<td>0.003</td>
<td>1.086</td>
<td>2.384</td>
<td>0.006</td>
<td>0.096</td>
<td>3.624</td>
</tr>
<tr>
<td>t-values</td>
<td>2.07</td>
<td>-0.62</td>
<td>4.57</td>
<td>-3.43</td>
<td>2.11</td>
<td>-2.63</td>
</tr>
<tr>
<td>P&gt;</td>
<td>t</td>
<td></td>
<td>0.039</td>
<td>0.538</td>
<td>0.000</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Table 5.3 reports the estimation results of POLS regression with robust standard errors. The POLS model does not take into account the special features of the panel data, and it runs a simple linear regression. In the POLS model, space and time dimensions of pooled data are ignored, data is pooled and an OLS regression model is run. All the variables are believed to have an impact on economic growth. It is crystal clear that all variables except for inflation all have a significant relationship with economic growth (p-value less than 5%). Stock market development, investment and gdplag are found to be positively correlated with economic growth (coefficients equal to 0.006, 10.894 and 0.202 respectively.) However, the banking sector development rate seems to have a negative impact on growth (coefficient = -0.019.) In addition, the R² and Root MSE are estimated to be 0.2709 and 4.0032 respectively for a confidence interval of 95%. The p-value of the model indicates the reliability of Xs to predict Y. Since our p-value equals to 0.000, it shows a statistically significant relationship between the five independent variables and the dependent GDP.

**5.4 Regression Excluding South Africa**

This model was then re-estimated; however, this time we excluded South Africa. The reason for the exclusion of South Africa was due to the thought that its inclusion may produce misleading results for the rest of the SADC countries. Table 5.4 presents the results for the regression when South Africa was eliminated. The stock market development indicator offered a negative correlation with economic growth; it was found to be insignificant with the highest p-value of 0.565. This may be due to the small size of SADC markets. Inflation
produced a negative and insignificant coefficient, while the investment variable produced a very strong positive and significant coefficient. The lag of the GDP growth rate also produced a positive and insignificant value. It should be noted here that banking sector development again presented a negative and significant correlation with economic growth. We notice a slight fall in $R^2$ (0.2703) as compared to $R^2 = 0.2709$ when South Africa was included.

Table 5.4: Robust RE estimates excluding South Africa

| VARIABLES | COEFFICIENT | ROBUST STD. ERROR | z     | P>|z| | Remarks  |
|-----------|-------------|-------------------|-------|------|----------|
| SMDEX     | -0.004      | 0.008             | -0.58 | 0.565| Insignificant |
| INF       | -0.680      | 1.151             | -0.59 | 0.554| Insignificant |
| INV       | 10.886      | 3.264             | 3.34  | 0.001| Significant  |
| BANK      | -0.017      | 0.006             | -2.74 | 0.006| Significant  |
| GDPLAG    | 0.193       | 0.103             | 1.87  | 0.061| Insignificant |

5.5 Determinants of SMDEX

Table 5.5: Determinants of SMDEX

| VARIABLES | COEFFICIENT | ROBUST STD. ERROR | z     | P>|z| | Remarks  |
|-----------|-------------|-------------------|-------|------|----------|
| INF       | -10.807     | 9.673             | -1.12 | 0.264| Insignificant |
| INV       | -29.739     | 22.667            | -1.31 | 0.190| Insignificant |
| BANK      | 0.853       | 0.184             | 4.65  | 0.000| Significant  |
| GDPLAG    | -0.127      | 0.613             | -0.21 | 0.835| Insignificant |

Table 5.5 above summarizes the results for the determinants of stock market development, based on the model (3).

$$\text{smdex}_t = \beta_0 + \beta_1 \text{bank}_t + \beta_2 \text{inf}_t + \beta_3 \text{inv}_t + \beta_4 \text{gdplag}_t + \epsilon_t$$  \hspace{1cm} (3)

The model proved to perform exceptionally well, which may be seen by the high $R^2$ value ($R^2 = 0.5139$; greater than 5%). In addition, the “rho” (the intra-class correlation), indicates a 32.2% variance which resulted from differences across panels.

From Table 5.5, we find some interesting results in terms of the lag of GDP growth rate. It was found to be statistically insignificant, and with a negative coefficient of 10.807. It is normally assumed that as last year GDP growth rate increases, it will positively affect stock market development. The result is against that of Garcia and Liu (1999) and Yartey (2008), in that they found a positive but significant coefficient between last year’s GDP growth rate and stock market development.

Another variable that enters the regression was investment rate (INV) in an effort to analyze its effects on stock market development. This variable produces a surprising result in
that it was found to have a negative and insignificant coefficient with market development in the regression. This result is not consistent with theory, as one would normally expect a positive relationship to develop. However, Naceur et al. (2007) also found a negative relationship to exist between investment rate and stock market, and concluded that this result was inconsistent and found it not to be a good predictor of stock market development. As such, we find that investment rate is not a good indicator of stock market development in the SADC region. This is explained by the fact that stock markets are relatively young and small in size; hence their trading volumes are very low.

From Table 5.5, it can be seen that banking development (measured by private sector credit divided by GDP and liquid liabilities), has a positive and significant relationship with stock market development. This is consistent with our expectations and other authors including Garcia and Liu (1999) and Naceur et al. (2007), of a positive effect of financial intermediary development on stock market development. SADC member states should foster the growth of their banking sector in an effort to further boost their stock market development.

The variable inflation is used to control for the impact of macroeconomic instability in the regression. It produced rather surprising result, as it was found to have a negative and statistically insignificant impact on stock market. This is contrary to our expectation, as one would expect a negatively significant correlation to exist between the two variables.

5.6 Determinants of SMDEX excluding South Africa

Table 5.6: Determinants of SMDEX excluding South Africa

| VARIABLES | COEFFICIENT | ROBUST STD. ERROR | z     | P>|z|   |
|-----------|-------------|-------------------|-------|-------|
| INF       | -5.508      | 5.938             | -0.93 | 0.354 | Insignificant |
| INV       | -10.425     | 13.900            | -0.75 | 0.453 | Insignificant |
| BANK      | 0.331       | 0.116             | 2.87  | 0.004 | Significant   |
| GDPLAG    | -0.535      | 0.341             | -1.57 | 0.117 | Insignificant |

This model was then also re-estimated with the exclusion of South Africa from the data set. The reason for the exclusion of South Africa was to determine whether South Africa had an over-riding impact on the results of the model. This is also supported by the belief that South Africa’s stock market is considerably larger than the others in the SADC region; its inclusion may present misleading results for the region as a whole. The “rho” indicated a variance of 25.5% across the panels. The $R^2$ was 24.8% of the variance in smdex. However, the test (F); Wald Chi2 (4) = 233.25 greater than 0.05) indicates that the model is not ok. As can be seen in Table 5.6 above, the results are very similar to those found when South Africa
was included. That is, we find a negative and statistically insignificant coefficient for the investment and inflation.

This time, the banking development (BANK) showed a positive and significant relationship with the stock market development (SMDEX). This proves the assumption of Demirguc-Kunt and Levine (1996) who said “stock market development and banking development are positively correlated, as they are expected to grow simultaneously.” As such, this result proves that banking sector development acts as a complement to stock market development. Hence, SADC members are encouraged by the World Bank and the IFC throughout technical assistance to boost the development of their banking system and stock markets. The reasons for these results have already been explained earlier. However, we can conclude that by excluding South Africa from the model has little or no effect on the outcome of the results.

6. Conclusion

This study empirically explored how the development of the stock markets in nine SADC countries affected economic growth through the use of three stock market indicators, namely: market capitalization as a percentage of GDP, the value of shares traded as a percentage of GDP and the turnover ratio, while also controlling for a number of variables which are said to have an impact on economic growth. Secondly, this study empirically explored the macroeconomic determinants of stock market development. Both models were estimated using a random effects approach within a pooled panel data framework over the period 1980-2011.

The results from the first model found that stock market development is indeed positively associated with economic growth. Moreover, the impact of bank development on growth is tested and a significant impact on the growth is reported. The results from the second model which explored the determinants of stock market development found all the indicators with the exception of banking development of being insignificant determinants of stock market development.

A more developed stock market may provide liquidity to lower the cost of foreign capital essential for development, especially in countries that cannot generate sufficient domestic savings (Bencivenga et al. (1996) and Neusser and Kugler (1998)). In addition, the stock markets provide portfolio diversification, enabling individual firms to engage in specialized production, with resulting efficiency gains (Acemoglu and Zilibotti (1997)). It is clear that an active stock market is an important engine of economic growth. Public policy and international aid directed toward introducing and fostering such markets while creating an institutional framework that is free of corruption and excessive government control should
have a large impact in increasing long-term growth rates and economic well-being in much of the world (Perotti and van Oijen (1999)).

Overall, it can be said that the empirical results found in this paper support the theoretical literature in that they suggest that the development of the stock market promotes economic growth because it is said to reduce both the liquidity and productivity shocks. In view of the results presented above, the findings of this paper have some important policy implications for emerging countries such as those in the SADC region. Firstly, the vast majority of the governments of emerging countries tend to focus their attention primarily on the banking sector. As such this paper suggests that governments should play a more active role in fostering stock market development so as to help develop the financial system as a whole and not just the banking sector. Secondly, policy makers should look to promote good quality financial intermediaries and other financial institutions that are seen to complement the development of the stock market and thus economic growth. The study calls for new policies to be implemented in the SADC countries to encourage more participants to increase the dynamism of the local stock markets. In particular, the policies should be geared towards more local and foreign investors’ participation as well as the increase in the number of listing companies. Moreover, governments should promote stock market liquidity by for instance propagating knowledge to the public of the benefits of investing in stock markets (NZue 2006). These incentives would promote both domestic and foreign investments to penetrate the domestic economies, and thus help draw immense benefits from these sources of capital.

6.1 Limitations of the study

This study is not without its flaws. As such it is important to note that firstly we encountered data limitations in the sense that not all the countries under study had the relevant time-series data. This is partially due to the fact that many of the stock exchanges are in their early existence and as such a complete panel dataset could not be obtained for the desired years. Secondly, it is of importance to note that the data required for such a study is hard to come by for many of the countries and as a result Seychelles and Mozambique had to be omitted from the study due to a lack of available data for their stock exchanges. Finally, the method employed has some serious limitations in that pooled panel data techniques give all countries, whether small or large an equal weighting and thus assumed to be homogeneous. Furthermore, pooling data with the same parameters over time and across countries, which is seen to be common in most panel data methods, is based on the assumption that there is independence across regression. This is seen to be a very restrictive assumption that may only hold in extreme scenarios (Baltagi, 2001:51). Despite these limitations, the method employed in this study was the best suited to the available dataset in an effort to obtain a meaningful result.
6.2 Areas for further research

Much work remains to be done in an effort to better understand the relationship between stock market development and economic growth. For example, although this paper sheds light on the role of the stock market towards economic growth, it does not analyze the individual exchanges separately, nor examine the state of the country in terms of its readiness for stock market development. Furthermore, one could possibly gain a better understanding of this relationship shared between stock markets and economic growth by adopting a more complex panel co-integration model, and focusing on a selected range of emerging markets where data is available.

References


BSE: Botswana Stock Exchange


For information on specific country experience with stock market development, see El-Erian and Kumar (1995); Classens (1995) and Morgenstern (1995)

For a detailed study of VAR with Panel, see Holtz-Eakin et al. (1989) for a detailed study and Seetanah et al. (2008)
GUSTAVO SANCHEZ (2012), “Fitting Panel Data Linear Models in Stata”


JSE: Johannesburg Stock Exchange


LUSE: Zambia Stock Exchange


MSE: Malawi Stock Exchange


NSX: Namibia Stock Exchange

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SADC: Southern African Development Community


SEM: Stock Exchange of Mauritius

SSE: Swaziland Stock Exchange
Available from: http://www.sadc.int/member-states/swaziland/ [15 Dec 2012]


STOCK MARKETS VS GDP GROWTH: A COMPLICATED MIXTURE (2012)


TSE: Tanzania Stock Exchange


WORLD BANK

ZSE: Zimbabwe Stock Exchange