THE DEVELOPMENT OF THE STOCK MARKET AND ITS EFFECT ON ECONOMIC GROWTH: THE CASE OF SADC.

A thesis submitted in partial fulfilment of the requirements for the degree of

MASTERS IN COMMERCE (IN FINANCIAL MARKETS)

of

RHODES UNIVERSITY

by

KEVIN ELLIOTT

November 2008

ABSTRACT

Using a pooled panel data set from nine developing countries within the SADC region from 1992 to 2004, this paper empirically examines; firstly, the relationship between stock market development and long-term economic growth, and secondly, the macroeconomic determinants of stock market development, particularly market capitalisation as a percentage of GDP. The results suggest that there is a strong link between stock market development and economic growth, particularly through the liquidity provided by the market. The evidence obtained lends support to the view that a well-developed and functioning stock market can boost economic growth by enhancing faster capital accumulation and allowing for 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 indicators of financial intermediary development, the value of shares traded as a percentage of GDP and the macroeconomic instability variable to be important determinants of stock market development.

ACKNOWLEDGEMENTS

Numerous people have helped me with the production of this dissertation. Firstly, I would like to thank Dr. M. Aziakpono, my supervisor, for his invaluable advise, patience and guidance throughout the year. Secondly, I would also like to extend my thanks to Prof. P. Faure for his supervision and valuable feedback in the development of this dissertation. Finally, I would like to thank my family and close friends for giving me both the financial assistance and the motivation to complete this dissertation.

THE DEVELOPMENT OF THE STOCK MARKET AND ITS EFFECT ON ECONOMIC GROWTH: THE CASE OF SADC

CONTENTS

CHAPTER FOUR
DATA AND METHODOLOGY

CHAPTER FIVE
EMPIRICAL RESULTS

CHAPTER SIX
CONCLUSION, LIMITATIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

REFERENCES

LIST OF TABLES

LIST OF APPENDICES

CHAPTER ONE

INTRODUCTION

1.1 CONTEXT OF THE STUDY

Since the early 1990s world stock markets have surged with emerging markets playing a significant role towards this boom. This unprecedented growth in emerging stock markets has led to the reform of both the financial structures of less developed countries, while also impacting on the capital movements from developed countries (Yartey, 2008:3). Yartey (2008:6) pointed out that market capitalisation within emerging markets has more than doubled over the previous decade, increasing from approximately USD$2 trillion in 1995 to approximately USD$5 trillion in 2005. Furthermore, from a global perspective, emerging markets account for more than 12% of world market capitalisation. Yartey (2008:6) further adds that market capitalisation as a percentage of GDP has risen from approximately 20% in 1990 to approximately 40% in 2004 for a sample of 42 emerging markets. In addition to their role in the domestic financial liberalisation programs in many emerging markets, stock markets play a pivotal influence in channelling foreign capital in emerging economies. As a result, net equity flows towards emerging markets has increased to roughly USD$200 billion per year, which provides a vital source of funds for growth and development (Yartey, 2008:9).

Economic literature over the years has established that a developed financial system, comprising both a developed banking system and a sophisticated stock market is a critical factor for long-run economic growth (Levine, 1997:689). On one hand the banking system may play a critical role in mobilising savings and allocating funds to the most profitable activities, while on the other hand the stock market may play an important complementary role to the banking sector, in the sense that it facilitates risk sharing, expands the scope of opportunities for raising capital and hence helps reduce the cost of capital (Pagano, 1993:614). However, most of the literature has been focused on explaining how the banking sector impacts on growth, while stock markets have taken a back seat. As such, there is very

little empirical evidence examining the influence of the stock market on long-run economic growth, particularly in developing nations.

In the available literature on the topic there is debate as to the impact stock markets have on economic growth. On one hand, stock markets are seen to promote economic growth. For example, Greenwood and Smith (1996) argue that stock markets help in mobilising saving into the most productive investment schemes, while Levine (1991) argued that the liquidity provided by the stock market plays an influential role towards economic growth. On the other hand, some authors have suggested that the stock market has a negative effect on economic growth. For example, Stiglitz (1985) argued that stock markets reveal vital information via price fluctuations, which may create a free-rider problem that could ultimately reduce investor's incentives to conduct costly research. Furthermore, Demirguc-Kunt and Levine (1996) noted that the liquidity provided by the stock market may in fact actually deter economic growth in the long run.

The above debate points out a need for further empirical research to be undertaken on the effect stock markets have on economic growth, particularly in developing countries such as that of the SADC region where studies on the subject are scarce.

1.2 GOALS OF THE RESEARCH

This paper empirically examines the relationship between stock market development and economic growth using pooled panel data from nine countries in the SADC region over the periods 1992-2004. As such this paper will look to provide empirical evidence on the major theoretical debates regarding the relationship between stock markets and economic growth in developing countries.

Secondly, this paper investigates the macroeconomic determinants of stock market development within the nine countries under study over the period 1992-2004. Specifically, this paper examines the effect of the investment rate, stock market liquidity, macroeconomic instability, financial intermediary development and the GDP growth rate on stock market development.

1.2 ORGANISATION OF THE STUDY

This study is organised into six chapters. Chapter Two provides a historical account and overview of the individual SADC stock exchanges and their developments over the years. Chapter Three comprises a detailed review of the literature surrounding both the theoretical and empirical views regarding the development of the stock market and its implications for long-term economic growth. Chapter Four presents the method employed in the study, while also highlighting the variables used in the paper. The results of the study are presented in Chapter Five. Chapter Six concludes the study while also highlighting its limitations and areas for further research.

CHAPTER TWO

OVERVIEW OF THE SADC STOCK MARKETS AND THEIR DEVELOPMENTS

2.1 INTRODUCTION

The South African Development Community (SADC), which has been in existence since 1992 comprises 14 member states. Of these, the members with established national stock exchanges include Botswana, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe (SADCREVIEW, 2007). Most of the exchanges in the SADC region were established recently, excluding that of Zimbabwe and South Africa, which were originally established over a century ago. What follows is a brief description of the background of these SADC exchanges, while also highlighting various factors that may be impacting on their development.

2.2 OVERVIEW OF THE SADC STOCK MARKETS

The first stock exchange in Botswana was established in 1989 when it was known as the Botswana share market (BSM), with only five listed companies and a single broking firm which facilitated trading on the exchange (BSE, 2008). However, in later years it became clear that there was a need for the establishment of an independent exchange that was separate from the broking firm. As such, the Botswana stock exchange (BSE) was established in November 1995 following the enactment of the BSE Act of 1994 (BSE, 2008). Listed companies grew from the original 5 in 1989 to 18 in 2004 and to 20 in 2007[1], which was partially due to the 2001 establishment of a venture capital board dedicated to companies looking for start up capital (BSE, 2008). In addition, total market capitalisation as a percentage of GDP has grown consistently from 8.34% in 1995 to 15.83% in 2000 and to a high of 37.24% in late 2006 (WDI, 2008). Stock market capitalisation as a percentage of GDP is used to show how developed the market is and as such may be used to determine whether a market is developed or underdeveloped. A ratio of 100% or greater is believed to illustrate that a market is well developed, while a ratio of below 100% is said to show an underdeveloped market (Investopedia, 2008). However, in recent years the determination of

[1] See Table 1 for the descriptive statistics of the SADC stock exchanges.

an adequate percentage level that represents an underdeveloped or well-developed market has been hotly debated. Given the ever-increasing ratio of market capitalisation in Botswana, it suggests that the Botswana stock market is growing in importance in terms of its contribution to the overall level of economic activity within Botswana. In an effort to develop the capital market, the BSE has implemented a central securities depository (CSD), which commenced in 2007. It is hoped that in future years the CSD will bring about prompt and efficient clearing and settlement of transactions while also helping to reduce the risks inherent in the process, in an effort to attract a greater number of investors both locally and internationally (BSE, 2008).

The Malawi stock exchange (MSE) was established in Blantyre in 1996, when it obtained its first listing. Since then 7 other stocks have been listed on the exchange, bringing the total number of listed companies to 8 (MSE, 2008). Market capitalisation as a percentage of GDP remained low in the 90's, however there was a relatively large increase from 8.07% in 2005 to 18.56% in 2006, thus showing a growing contribution of the MSE towards economic growth (WDI, 2008). The MSE is very similar to the BSE in the way it is run and operated and that it is managed via an agreement with Stockbrokers Malawi (Okeahalam, 2005:6). However, unlike the BSE where foreign investors may own up to a maximum of 55% of the share capital issued by a listed company, the regulation governing the MSE permits a 49% limit (Irving, 2005:30). Furthermore, in an effort to develop their domestic capital market, the Malawian government launched the National investment trust limited (NITL) to help widen the ownership by private individuals. As such, NITL loans out money to citizens who wish to invest in privatised state-owned businesses (Irving, 2005:30).

In March 1989 the stock exchange of Mauritius Ltd (SEM) was established. With Mauritius being an offshore financial centre, the SEM has shown positive growth with a large amount of its capital inflow coming from the Indian sub-continent as there are no restrictions on foreign investors (Okeahalam, 2005:6). Listed companies on the SEM have grown from 6 in 1989 to 41 in 2007, while total market capitalisation as a percentage of GDP has grown from 34.84% in 1995 to 56.96% in 2006 (WDI, 2008). This positive growth in the SEM is mostly due to the open market policy implemented in 1994. Also, in 1997 the SEM established a central depository system which promoted their clearing and settlement system, while also

helping to reduce the inherent risk involved (SEMDEX, 2008). Later in 2001, the SEM opened an automated trading system (SEMATS), which has contributed towards the exchange's efficiency and development, and thus economic growth.

Table 2.1: Overview of SADC stock exchanges

Name	Year established	Number of listed companies	Market capitalisation of listed companies (% of GDP)	Market mechanism structure
Botswana stock exchange (BSE)	1995	20	37.24	Open out-cry system
Malawi stock exchange (MSE)	1996	8	18.56	Single price auction system
Stock exchange of Mauritius (SEM)	1989	41	56.96	Open out-cry system.
Namibian stock exchange (NSE)	1992	13	8.25	Online electronic bid-ask quote – JET
Johannesburg stock exchange (JSE)	1887	403	280.23	Electronic bid-ask quote – JET
Swaziland stock exchange (SSX)	1989	6	7.55	Manual call over system
Dar es salaam stock exchange (DSE)	1998	10	4.23	Open out-cry system
Lusaka stock exchange (LUSE)	1994	20	11.04	Order driven – executed manually on a direct matching basis
Zimbabwe stock exchange (ZSE)	1946	79	70.26	Manual call over system

Source: The World Bank Development Indicators 2008 and the national stock exchanges (2008).
Notes: Table excludes Mozambique due to a lack of data and its trading activity being negligible. The number of listed companies data was obtained from the national stock exchanges (2008), while all the data for market capitalisation as a percentage of GDP is based on 2006 figures.

The Namibian stock exchange (NSX) 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 an end and the exchange closed shortly after (NSX, 2008). A second exchange opened its doors in 1992, which is the current stock exchange called the Namibian stock exchange. In 1992, the NSX had only 3 listed companies which grew to 13 by 2004, but its market capitalisation as a percentage of GDP has not shown consistent growth. In 1995, market capitalisation (% of GDP) was 5.4% and grew to 20.42% by 1999, however in 2000 it fell to 9.12% and further fell to 8.25% in 2006 (WDI, 2008). This fall may be attributed to the NSX adopting the Johannesburg equities

trading (JET) system in 1998. As a result, roughly 70% of the equities listed on the NSX have primary listings on the JSE due to the dual listing arrangement between the two exchanges. Therefore, the majority of the trading on the NSX is through these dual listed equities (Irving, 2005:32). Although market capitalisation (% of GDP) suffered as a result of this adoption of the JET system, the NSX more than doubled its liquidity within its first year, which has enhanced their domestic capital market (NSX, 2008).

The Swaziland stock market (SSM) was first established as an over-the-counter single broker market in 1989. However, it was not until 1999 when a fully operational exchange was developed which is now called the Swaziland stock exchange (SSX) (SSX, 2008). The SSX operates under the supervision and regulation of the capital markets development unit of the central bank. Its performance has shown a relatively low but consistent market capitalisation (% of GDP) as it increased slightly from 5.26% in 2000 to 7.55% in 2006 (WDI, 2008). Furthermore, the exchange has failed to attract new listings as the number of listed companies also remained constant at 6 over recent years (SSX, 2008). Therefore, although the SSX may be seen as a relatively open exchange with few restrictions on foreign investors, the stock market has not shown any significant signs to date in expanding its operations (Irving, 2005:33).

In 1996, the Dar es Salaam stock exchange (DSE) was established as a private enterprise following the enactment of the capital markets and securities Act of 1994 and the introduction of the capital markets and securities authority (CMSA), which is aimed at developing the capital, markets in Tanzania (DSE, 2008). However, trading on the DSE was delayed for a further two years, and trading only commenced in 1998 due to unforeseen delays. Total market capitalisation (% of GDP) has remained very low, ranging from 2.57% in 2000 to 4.23% in 2006, illustrating little significance towards economic growth (WDI, 2008). However, the number of listed companies has increased from 2 in 1998 to 6 in 2004 to 10 in 2007 (DSE, 2008). This is mostly due to the DSE allowing cross-listings by companies in the EAC partners; Kenya and Uganda. Furthermore, since the DSE has opened its doors to foreign investors, regulation permits foreigners to hold up to a maximum of 60% of the total number of securities of any single issuer (Irving, 2005:27).

In 1994, the Lusaka stock exchange (LUSE) was established, and is now seen as one of the most technologically developed exchanges in the SADC region (Okeahalam, 2005:6). With trade open to foreign investors, market capitalisation (% of GDP) has grown from 0.55% in 1995 to 11.04% in 2006, illustrating an ever-increasing significance of the stock market towards economic growth (WDI, 2008), while listings grew from 12 in 2004 to 20 in 2007 (LUSE, 2008). In 2000, the LUSE launched an "equity market project" in an effort to encourage the private sector to list their shares on the exchange. However, due to unforeseen delays in the privatisation process, the LUSE has not had the desired number of listings as yet (LUSE, 2008).

The first stock exchange in Zimbabwe was established in 1896 with the arrival of the pioneer column in Bulawayo. However, it ceased all its operations 6 years later (Mbendi, 2008). Further attempts were made in Gwelo (now Gweru) and Umtali (now Mutare), which both capitalised on the success of the mining industry at the time. However, these markets also failed and all stock exchange activity ceased to be in 1924. After the Second World War, another exchange was established in Bulawayo in 1946 now called the Zimbabwe stock exchange (ZSE) and by 1951 a second trading floor was inaugurated in Salisbury (now Harare) (Mapsofworld, 2008). In 1993, the Zimbabwe stock exchange (ZSE) opened its doors to foreign investment (Mbendi, 2008). Since then the ZSE was ranked as the best performing emerging market for 3 years on the run from 1999-2001. With the emergence of political instability, volatility within the ZSE became apparent in early 2004 (Irving, 2005:34). However, listed companies remained relatively constant and only declined from 81 in 2003 to 79 in 2004, while market capitalisation (% of GDP) increased from 32.87% in 2000 to 70.26% in 2006 (WDI, 2008). Although in monetary terms market capitalisation suffered and drastically fell from US$4.98 billion in 2003 to US$1.94 billion in 2004 (Mapsofworld, 2008). Furthermore, the ZSE has seen a decline in its foreign investment over the last five years. This may be due to the lack of foreign currency, making it difficult to repatriate any earnings as well as the increased political and economic unrest (Irving, 2005:35) (Mbendi, 2008).

Finally, the Johannesburg Stock Exchange (JSE) which was established in 1887 is not only the oldest exchange but is also the most developed, and overshadows all the other SADC exchanges (Irving, 2005:3). The JSE is ranked as the 14th largest equities exchange in the

world (JSE, 2008). With the end of the Apartheid era and the removal of sanctions, foreign investment in the JSE has increased considerably. However, while the JSE has benefited from opening its doors to foreigners, it has also become more susceptible to international shocks (Irving, 2005:27). Other developments include the introduction of automated trade via the establishment of the Johannesburg equities trading (JET) system in 1996, which was later offered to the other SADC exchanges in 1998 (JSE, 2008). In 2002, the JSE changed its trading system to the JSE SETS (stock exchange electronic trading service), which was adopted from the London Stock Exchange. This new trading platform allowed both exchanges access to cross border trade in the most liquid securities on each exchange (JSE, 2008). However, in recent years many companies have delisted from the JSE. For example, over a 5 year period ending in 2003 there were a total of 359 companies delisted versus 116 new listings. In 2006 403 companies were listed, down from 668 in 1998 (Irving, 2005:28). In addition, with the introduction of new listing requirements a number of smaller firms have been forced to de-list as they failed to meet these new listing requirements (Mbendi, 2008). However, total market capitalisation in monetary terms, on the other hand, has increased from US$ 455.5 billion in 2004 to US$ 711.2 billion in 2006 (JSE, 2008). Furthermore, market capitalisation (% of GDP) increased from 185.64% in 1995 to 280.23% in 2006, which is and indication that the JSE is a well developed market and hence may be seen to be one of the most developed and advanced emerging stock markets in the world (WDI, 2008).

The development of stock markets has been central to many domestic financial liberalisation programs of most emerging markets, with the SADC region being no exception (Yartey, 2008:9). Besides their role in domestic financial liberalisation, stock markets in the SADC region have also been shown to have influential effects in channelling foreign capital towards the region, which provides an important source of capital for development (SADCREVIEW, 2008). However, the establishment and rapid development of many stock markets in the SADC region does not mean that even the most advanced emerging stock markets are mature (Yartey, 2008:9). In most of the SADC stock exchanges', trading only occurs in a few shares that generally account for a considerable portion of the total market capitalisation. Apart from the actively traded stocks, there are numerous informational and disclosure deficiencies apparent in the other stocks (Yartey, 2008:9). Furthermore, development of the SADC stock markets has not always gone smoothly as many of the

member's economies suffer from weak economic fundamentals, poverty, a lack of public awareness, and a general reluctance of domestic firms to have less reliance on bank finance and issue securities (Irving, 2005:3). On a positive note, many of the SADC exchanges have begun to introduce new instruments such as collective investment vehicles, while also prompting their national governments to make use of the exchange in an effort to encourage further capital market developments (Okeahalam, 2005:4). Furthermore, the exchanges that still operate under a manual trading system have stressed their intention towards adopting an automated trading system. With this move there has been an increase in the number of educational programs in an effort to attract more local investors to the market (Munyukwi, 2008:2).

It is important to note that a trend that has been in and out of the spotlight for over a decade now is that of adopting exchange controls on inward portfolio investments that are to be liberalised in several countries within the SADC region. This development motivated cross border listings while also allowing for closer regional links between capital markets within the region (Irving, 2005:3). However this movement was not unified as many member states abolished exchange controls within their countries. For example, Botswana abolished their exchange controls in 1999. Also, cooperation and possible integration of the regions stock markets may offer them a new road to overcome some of the obstacles facing their development. In sum, the possible benefits range from that of increased diversification of risk, lower costs, higher returns, a more efficient and competitive market, as well as an increase in international capital flows (Irving, 2005:8). Therefore, by allowing these underdeveloped markets to pool their resources within the region, liquidity would be increased and hence their ability to mobilise capital for both local and regional development programs would be enhanced (Irving, 2005:8).

The committee of SADC stock exchanges (COSSE), which was initially formed in 1997 as a private initiative, is aimed at promoting economic development in SADC member states via "facilitating the raising of capital in compliance with acceptable listing requirements" (JSE, 2008). COSSE looked towards an integrated real-time network of national exchanges within the region whereby each exchange will be able to offer automated trading through a regional trading system. Later in 2003 the JSE proposed to set up a so-called pan-African board

whereby companies' shares could be traded on a virtual African exchange. This essentially allowed companies to list simultaneously on all participating exchanges. The motivation for this proposition of a pan-African board was to help attract foreign investment to Africa. However, critics have argued that it may lead to capital flight instead, in the sense that capital will all flow towards the JSE and leave the other exchanges with lower trading volumes and a reduction in growth (JSE, 2008).

2.3 CONCLUSION

In conclusion it can be said that SADC stock markets are generally characterised as being small with a generally low market capitalisation (% of GDP), thus indicating that the majority of the exchanges are under developed (see Table 1) with numerous infrastructural bottlenecks and a weak regulatory environment (Yartey and Adjasi, 2007:18). As such, there is limited evidence that highlights the broader economic benefits of how stock markets in the SADC region have actually promoted economic growth. 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. Finally, a large portion of academic and policy interest in how stock market development affects SADC countries has raised a number of questions such as: what quantifiable influence does the stock market have on economic growth and what are the determinants of stock market development (Yartey and Adjasi, 2007:4). These are the types of questions that will be addressed in the study.

CHAPTER THREE

LITERATURE REVIEW

3.1 INTRODUCTION

Previous research has emphasized the role of the banking sector and its contribution towards economic growth, however in recent years, world stock markets have surged with emerging markets gaining an ever increasing influence in the global market place (Demirguc-Kunt and Levine, 1996:224). As such, recent research has focused attention on examining the link between stock market development and economic growth. This chapter shall firstly highlight the theory underpinning the stock market development-growth nexus using the 'AK' model, while also focusing on the determinants of stock market development. Secondly, a review of existing empirical literature examining the relationship between stock market development and long-run economic growth is also conducted. The remainder of this chapter is organized as follows. Section 3.1 discusses the stock market development-growth nexus. Section 3.2 reviews the empirical literature surrounding the nexus. Finally 3.3 will conclude the chapter.

3.2 STOCK MARKET DEVELOPMENT AND ECONOMIC GROWTH: THE NEXUS

3.2.1 *Theory*

Traditional growth literature views economic growth as a positive function of exogenous technical progress (Caporale *et al.,* 2005:166). However, in recent times the traditional growth literature is no longer seen to be suitable to explain the relationship between financial development and economic growth as it generally focused on a steady-state level of capital stock per worker, and not on the rate of growth (which was attributed to exogenous technical progress) (Mohtadi and Agarwal, 2000:2). As such, there has been a growing interest in the relationship between financial development and growth through the use of endogenous growth models, whereby growth is self-sustaining and influenced by initial conditions. Furthermore, endogenous growth models suggest that economic growth is related to financial development, technology and income distribution (Caporale *et al.,*

2005:166). Greenwood and Jovanovic (1990) highlighted that income *per capita* helps establish a relationship with a information-processing intermediary which in turn boosts better investment decisions and hence promotes economic growth in the long-term. Furthermore, they introduced the role of financial factors into endogenous growth theory to formally illustrate the connection between financial markets and growth.

To illustrate the interactions between financial development (which includes the development of the stock market) and economic growth consider the simplest endogenous growth model, the 'AK' model, where aggregate output is a linear function of aggregate capital stock (Pagano, 1993:614):

$$Y_t = AK_t \quad \text{.....(3.0)}$$

where Y is output, A is a technological parameter (assumed to be greater than zero) and K is a broad measure of capital stock available in the economy. The production function above should be seen as a 'reduced form' function resulting from one of two underlying assumptions. The first one is a competitive economy with external economies, whereby each firm has technology with constant returns to scale, while productivity is an increasing function of aggregate capital stock 'K_t'. Secondly, the AK model may be based on the assumption that K_t is a combination of both physical and human capital, as seen in Lucas (1988:18) whereby the two forms of capital are reproducible with identical technologies (Pagano, 1993:614).

For simplicity, it is assumed that the population is constant and the economy produces a single good that may either be consumed or invested. If this good is invested, it shall depreciate at 'δ' per period (Pagano, 1993:614). Therefore, gross investment will be as follows:

$$I_t = K_{t+1} - (1 - \delta) K_t \quad \text{.....(3.1)}$$

In a closed economy with no government intervention, capital market equilibrium is determined by equating gross savings 'S_t' to gross investment 'I_t'. Furthermore, it shall be

assumed that a certain proportion (1 - Φ) of savings is lost within the financial intermediation process:

$$\Phi S_t = I_t \quad \text{.....(3.2)}$$

Therefore, using Equation (3.0) above, the growth rate at t+1 can be expressed as follows:

$$G_{t+1} = Y_{t+1}/Y_{t-1} = K_{t+1}/K_{t-1} \quad \text{.....(3.3)}$$

Now by integrating Equation (3.1) and dropping the time indices, one can obtain the steady-state growth rate as seen below:

$$G = A\frac{I}{Y} - \delta = A\Phi s - \delta \quad \text{.....(3.4)}$$

Here, Equation (3.4) reveals exactly how growth may be affected by financial development. For example, it may raise 'Φ', which is the proportion of savings funnelled to investment. It may also boost 'A' which is the marginal productivity of capital, and finally it may raise 's' which is the private savings rate. These parameters Φ, A and s in equation (3.4) above may be used to show the role of the financial system (and in this paper the stock market) in promoting growth. Section 3.2.2 will demonstrate the role played by stock markets in increasing the productivity of capital, A, the proportion of savings funnelled towards investment opportunities, Φ, as well as increasing the private savings rate, s.

3.2.2 *The role of stock markets*

The theory of financial development mainly focuses on financial intermediation. That is, the role financial intermediaries play in mobilising savings (s) and channelling these savings into productive investments (Φ and A). However, although financial intermediation plays a significant role, the development of the stock market should not be overlooked as it plays a key role in the financial system architecture (Garretsen *et al.,* 2000:6). It should be noted that stock market development may take place simultaneously and could complement the overall development of the financial market within an economy. The question is to what extent and under what circumstances do stock markets contribute to long-run economic growth

(Garretsen *et al.,* 2000:6). In principle, a well developed and efficient stock market should encourage savings and help channel these funds towards the most productive investments, thus boosting economic growth (Caporale *et al.,* 2004:34). Stock markets should also enhance the mobilisation of savings by providing investors with a variety of financial instruments in which they may diversify their portfolios, and hence provides a vital source of capital at a relatively low cost.

The savings mobilisation function of the stock market relates to the savings rate, s, in Equation 3.4 above. The literature is relatively uncertain as to how the development of the stock market affects the savings rate and hence economic growth (cf. Garrestsen, 2000:7; Mohtadi and Agarwal, 2000:3; Levine and Zervos, 1996:9; Demirguc-Kunt and Levine, 1996:291; Jappelli and Pagano, 1994:98). However, the vast majority of the literature (cf. Levine and Zervos, 1996:9; Mohtadi and Agarwal, 2000:3-4; and Caporale *et al.,* 2004:35) suggests that a developed stock market helps reduce the costs involved in mobilising savings while at the same time channels savings towards the most productive investments, hence promoting economic growth.

According to Levine and Zervos (1996:9) stock markets help to pool savings, which in turn helps widen the range of investment opportunities available to investors. As more and more investors are attracted to the stock market, liquidity in the market improves. Levine (1991) and Levine and Zervos (1996) suggest that liquidity plays an influential role in the development of the stock market as without this liquidity, investors will be less inclined to invest in high-return projects that require long-term commitment as they would be reluctant to lose control of their funds for these long periods (particularly in developing markets). Therefore, a liquid stock market provides savers with assets in the form of equity which may be easily liquidated at any point in time, while also providing firms with a reliable source of capital through equity issues, and hence promotes economic growth (Mohtadi and Agarwal, 2000:3). Stock markets are also said to provide liquidity insurance as shareholders in need of liquidity can sell their shares, while firms can permanently use the funds invested by the initial shareholders (Garrestsen, 2000:7). To add, stock market play an important role in stimulating economic growth through the efficient allocation of resources to investment

projects that provide the highest returns and hence enhances the productivity of capital and thus economic growth as more projects become economically viable (Garrestsen, 2000:7).

However, despite the benefits of stock markets the literature also suggests that the stock market may also have a negative impact on economic growth. For example, Demirguc-Kunt and Levine (1996:291) suggests that liquidity provided by the stock market may deter economic growth rather than promote it. In their analysis, they highlight three channels through which this situation may occur. Firstly, it may negatively affect the savings rate through income effect in the sense that individuals will tend to save less now as they already have money in the markets for future use. Besides the income effect, the stock market could also affect the savings rate and economic growth rate negatively though the easing of the liquidity constraints that investors face (Demirguc-Kunt and Levine, 1996:291). Where the financial system is underdeveloped, the demand for loanable funds is often greater than the supply, which in turn results in liquidity constraints. Jappelli and Pagano (1994) illustrate that these liquidity constraints motivate individuals to increase their savings. As seen in Equation 3.4 above, an increase in the savings rate promotes growth. However, it follows that a developed stock market that helps to reduce any liquidity constraints will also reduce the incentive for individuals to save. Therefore resulting in a decrease in national savings and thus economic growth. Secondly, by lowering uncertainty in terms of investments, increased liquidity within the stock market may decrease the savings rate due to the obscure effects of uncertainty on savings, and finally, liquidity encourages investors to become short-sighted which negatively affects corporate governance and growth of firms, which in turn will impact negatively on economic growth (Levine and Zervos, 1996:7).

Stock markets can also enhance the quantity of savings funnelled to investment, i.e. Φ in Equation 3.4 above. Stock markets play an influential role in transferring capital towards the corporate sector, which is, channelling funds to investment projects, which in turn will have a positive impact on economic growth (Caporale *et al.,* 2004:35). In a scenario with asymmetric information, the mobilisation of savings for investment becomes very costly to both the financial system and individual investors who try to mobilise savings directly from individual savers (Aziakpono, 2004:10). This is where stock markets play a significant role as they help to overcome problems associated with asymmetric information, especially when an

economy starts to liberalise their financial sector (Garrestsen, 2000:7). This is because equity markets do not suffer from moral hazard and adverse selection to the degree that banks do. Stock markets have the unique ability to acquire information about firms. By making this information available, investor confidence is enhanced thus encouraging trade to occur within the market (Levine and Zervos, 1996:8). This opportunity to earn profits from obtaining the right information motivates investors to research and monitor firms, which in turn improves the allocation of resources and hence stimulates economic growth (Levine and Zervos, 1996:8). However, not all the literature is in agreement. For example, Stiglitz (1985:20) questioned the role played by stock markets in improving information asymmetries, and highlighted that stock markets disclose information via rapid price changes which resulted in a free-rider problem and ultimately discouraged investors from carrying out costly research.

A proportion of savings $(1 - \Phi)$ is absorbed into the system as costs of intermediation through the stock market (Pagano, 1993:614). For example, this could come in the form of transaction costs or brokers fees. However, as the stock market develops so do the financial institutions that intermediate through the market, which in turn brings about increased competition for financial intermediary services within the stock market. This results in a reduction in the costs for these services (Garcia and Liu, 1999:40). Therefore, with these lower costs, a greater portion of the savings mobilised will find its way to productive investments, i.e. Φ will increase. Since growth is said to have a positive link to Φ, one would expect economic growth to increase also (Pagano, 1993:614).

Finally, stock markets can also enhance the quality of the allocation of savings by ensuring that funds are directed to investments with the highest marginal product of capital. This increases the marginal productivity of capital, i.e. A in Equation 3.4 above, which will also positively influence economic growth (Pagano, 1993:615; Levine and Zervos, 1996:9). Several mechanisms have been highlighted through which the stock markets can enhance the productivity of capital. Firstly, stock markets help to diversify risk (Obstfeld, 1994:1312). Devereux and Smith (1994:540) agree that stock markets allow investors to diversify risk. This ability of investors in achieving greater diversification through the stock market impacts on growth by shifting investments into higher-return projects. As these projects are usually

accompanied by an increase in the amount of risk, improved diversification helps promote investment towards these higher return projects (Levine and Zervos, 1996:8). However, Devereux and Smith (1994:540) also point out that reduced risk within the financial system may have the opposite effect and actually discourage savings through the income effect as investor confidence is boosted and thus could negatively affect growth and economic welfare. Secondly, an efficient and well-developed stock market may help reduce the principle-agent problem (Levine and Zervos, 1996:9). For example, efficient stock markets allow for the alignment of manager's compensation to equity performance. This motivates managers to try and maximise a firm's share price to prevent any takeover threats, while supporting the efficient allocation of resources to the most productive investments.

In conclusion it can be said that by increasing either the private savings rate, s, the proportion of savings funnelled to investment, Φ, and the marginal productivity of capital, A, stock markets may have a positive impact on economic growth.

3.2.3 *The determinants of stock market development*

Both institutional and macroeconomic factors are important when analysing stock market development (Garcia and Liu, 1999: 37). The institutional approach looks at property rights, inside information issues, clearing and settlement systems, and taxation and accounting practices. The macroeconomic approach on the other hand analyses features such as income levels, savings and investments, inflation and overall financial development (Garcia and Liu, 1999:38). Garcia and Liu (1999:38) also noted that institutional factors are generally reflected directly in the macroeconomic factors. Therefore, this section will focus primarily on the macroeconomic factors and their impact on stock market development.

Firstly, real income and its growth rate have been noted to play an influential role in stock market development. Yartey (2008:15) notes that an increased volume of intermediation through the stock market may result in an increase in income growth, hence illustrating the correlation between real income and the size of the stock market. Furthermore, as income rises it is usually accompanied by an improvement in property rights, education, and the business environment which positively affects the development of the stock market (Garcia and Liu, 1999:39). Furthermore, following the demand driven hypothesis, economic growth

will create new demand for financial services, which in turn will promote the establishment of larger and more sophisticated financial institutions in an effort to meet this new demand (Yartey, 2008:15).

Secondly, savings and investment have been shown to influence the development of the stock market. To illustrate this, one can take a look at the scenario where savings is increased, which leads to an increase in the amount of capital flowing to the stock market as investor's pool their savings into the market. Therefore, one would expect savings and investment to have a positive impact on market capitalisation, which in turn affects its development (Garcia and Liu, 1999:40).

Yet another factor to take note of is that of financial intermediary development. It is important to understand that both stock markets and banks intermediate savings towards investment, and hence they may be either complements or substitutes towards each other (Garcia and Liu, 1999:40). On one hand the banking system may be seen to play a critical role in mobilising savings and allocating funds to the most profitable activities, while on the other hand the capital market is said to play an important substitution role to the banking sector in the sense that it facilitates risk sharing, expands the scope of opportunities for raising capital and hence helps reduce the cost of capital (Pagano, 1993:614). In light of its complementary role, an efficient banking system would help facilitate the transaction procedures by improving the clearing and settlement process, thus reducing transactions costs and the time frame to settle. However, if the banking system had to be underdeveloped, sluggish trading activity may be experienced in the market. As such, investors who wish to diversify their funds in an effort to obtain a lower-risk portfolio may spread their savings between the banking sector and the stock market. Demirguc-Kunt and Levine (1996) support this view by suggesting that the level of stock market development across numerous countries is positively correlated with financial intermediary development.

Liquidity provided through stock markets as seen earlier is one of their most vital functions. While it plays a major part in enhancing economic growth, it also plays an influential and related role towards the development of the stock market (Mohtadi and Agarwal, 2000:3). Without liquidity, fewer investments would occur or be sort after, particularly in high return

and high-risk projects (Garcia and Liu, 1999:41). Liquid stock markets allow investors to quickly and cheaply liquidate their investments and hence encourage a larger portion of savings to be invested in the market. Yartey (2008:16) adds that liquid stock markets would enhance the ease of investment in the long-term and hence potentially allows for more profitable projects to be undertaken, which helps improve the allocation of capital and thus boost long-term growth. Therefore, liquidity can be said to have a positive correlation with market capitalisation and hence stock market development (Garcia and Liu, 1999:42).

Yartey (2008:17) shows the influence of private capital flows as a determinant of stock market development. He highlights the impact of foreign investors and how they have become major participants in emerging stock markets in the last few decades. Foreign investment has been noted to be associated with institutional and regulatory reform, while also providing for strict disclosure requirements and fair trading practices (Yartey, 2008:17). Overall, this increase in both informational and operational efficiency will boost confidence in the local markets, which in turn will result in an increase in the number of investors.

Macroeconomic stability is also said to have an impact on stock market development. One would generally expect that with instability, firms and investors would be discouraged from participating in the market (Garcia and Liu, 1999:42). This situation is particularly prone in developing countries where instability through either high or volatile inflation or badly structured monetary and fiscal policies results in a high level of uncertainty, thus making their stock markets less attractive. In such scenarios, macroeconomic instability will have a negative impact on stock market capitalisation and hence its development (Garcia and Liu, 1999:43). On the other hand, an improvement in macroeconomic stability provides firms and investors with an incentive to participate in the stock market in anticipation of earning higher returns (Yartey, 2008:16).

Although this study does not focus on the institutional perspective, it is important to mention that institutional quality does play a significant role as a determinant of stock market development. Yartey (2008:17) suggests that three broad measures of institutional quality are used in the literature. Firstly, the quality of governance - which generally covers corruption, the regulatory environment, and the public sector efficiency. Secondly, the legal

aspect - which covers the protection of private property and law enforcement. Finally, accountability and the restrictions placed on executive and political leaders may be seen as an element of institutional quality that determines stock market development. These institutional quality components have in recent years gained an ever increasing influence as a determinant of stock market development as it is generally believed that the strengthening of property rights will result in an increased appeal and confidence in stock market investment (Levine and Zervos, 1996:9) (Yartey, 2008:17). Hence, the development of good quality institutions and regulations may result in an increase in the attractiveness of equity investment and thus lead to stock market development (Yartey, 2008:3).

3.2.4 *Stock market integration*

Okeahalam (2005:76) suggests that while financial exchanges already exist in Africa, they are generally too small to harness and distributes capital effectively, thus not enabling the efficient transfer of savings into investments. Reasons behind this failure lie in the poor design and general lack of economies of scale and operational efficiency in African exchanges (Okeahalam, 2005:77). The question that arises is how can it increase or improve the efficiency and economies of scale of stock markets within a certain region? Okeahalam (2005:76) suggests that a greater level of efficiency and economies of scale may be achieved if a number of the smaller exchanges in a region merge into one. As such, there has been a general agreement towards the need for increased alliances in the development of stock markets within a region. However, although a number of countries have developed relationships such as dual listings, there has been limited region wide stock market integration (Okeahalam, 2005:77).

The integration of stock markets is a complex procedure and may be achieved through two complementary processes, namely by the explicit efforts of policy makers to shift towards a regional market base, as a result of market driven forces. While on the other hand, integration can occur from the arrangements and conventions put forward by the members of a regional economic community (Ndikumana, 2006:6). This is generally said to involve an array of agreements, which are focused on eliminating restrictions of financial intermediation

across borders, while being accompanied by an agreement to harmonise their regulatory environment[2].

In terms of the possible benefits which may arise from the integration of stock markets within Africa, it must be noted that financial reforms and efforts put forward to develop stock markets have been shown to have numerous limitations at the national level partly due to the small and undiversified characteristics present in the structure of most African economies (Ndikumana, 2006:13). As such, the literature including that of Singh (1999), Okeahalam (2005), and Yartey and Adjasi (2007) tend to support this view taken by Ndikumana (2006) in that it is suggested that a regional integration approach to stock market development and financial deepening is seen as the most sustainable way to improve the finance-growth nexus as well as allowing for the benefits of integrating into the global economy. Rousseau and Sylla (2001) show that financial development and stock market integration plays a substantial role in an economy's efforts to integrate at the regional level and internationally. In addition, Ndikumana (2006:13) states that with financial integration and its associated harmonisation of policies, comes the increase in the amount of financial instruments on offer, and hence competition for these instruments, further benefiting trade and therefore growth in the long-term.

In terms of the SADC region, Ndikumana (2006:14) suggested that the under-development of the SADC stock markets is a serious problem when attracting foreign direct investment (FDI). However, although many of these countries offer a vast range of natural resources, they still fail to meet their potential in terms of FDI (Ndikumana, 2006:14). The literature suggests that the under-performance of the financial system is one of the most influential factors contributing towards the low FDI in SADC countries. Therefore, the integration of stock markets in the SADC region will help in the efforts to move away from their small market constraints and hence attracting foreign investors into the region who wish to gain from and exploit economies of scale in investment opportunities.

[2] For a detailed review, see, Galindo *et al.* (2002).

Furthermore, the integration of SADC's stock markets will improve capital mobilisation both domestically and internationally through attracting both domestic savings and global capital into the region. Senbet (2001) suggests that Africa as a whole, accounts for a very small portion of global capitalisation and estimated it to be approximately 1% of the total globalisation seen in emerging markets. As such, if one is to take into context Africa's share in global economic activity, it would be expected that the evidence illustrates that African (and in particular SADC) markets are severely underweighted in optimal global portfolios (Ndikumana, 2006:15). Senbet (2001) supports this view in terms of African markets having a low price-earning ratio compared to that of other overseas markets, implying that African markets tend to offer higher returns while providing better potential to diversify risk.

In addition, through the process of risk-sharing, stock market integration will not only help reduce the cost of capital, thus attracting international investors, but will also contribute towards institutional and technological developments within an economy. This has an overlapping effect by applying pressure on other governments within the region to improve their regulatory environment through enforcing laws and regional standards of compliance (Ndikumana, 2006:16).

Indirect benefits may also result from stock market integration in terms of the regulatory environment and banking sector. The banking sector is put in a position whereby it now has to compete for resources due to their stock markets being opened up regionally (and globally). Overall it is important to note that by promoting stock market integration in any region, allows for the improvement in financial development while at the same time promoting a nation's regulatory and institutional environment which are both seen to be beneficial for economic growth (Ndikumana, 2006:16).

However, the development and integration of stock markets face numerous challenges that are vast and diversified, some of which include the following. Financial markets wishing to integrate would require the harmonisation and strict coordination of their macro-economic policies to suit those of member states in an effort set to achieve efficient and effective monetary and fiscal policies across the region (Yartey and Adjasi, 2007:22). If these macro-economic policies are not coordinated correctly across the region, it would ultimately lead to

an adverse effect on the expectations of investors, hence bringing about investor uncertainty. Furthermore, if additional disparities were found in macro-economic policies across the region, this would lead to differences in terms of an economy's reaction to external shocks. For example, certain external shocks will tend to have a larger effect on member states characterised by an unstable macro-economic policy. The literature highlights an additional challenge in this perspective, in that the convergence criteria is often too restrictive for all countries to achieve, thus slowing down the integration process and negatively affecting growth (Ndikumana, 2006:17).

An additional problem facing the integration of stock markets in Africa is that of nationalistic politics (Yartey and Adjasi, 2007:22). In line with this thought, many African governments tend to view their stock markets as national assets with a degree of pride, which will hinder the regional integration movement for fear of losing its national touch and market share. Furthermore, smaller economies also tend to be fearful of the larger and more dominant economies, as they are perceived as a threat for loss of market share in their own exchanges through capital being diverted away from them towards the bigger economies through integration (Yartey and Adjasi, 2007:22).

Recent literature has also highlighted that low technological developments across the various countries within the region may present itself as a major challenge to the integration of stock markets and their development. This is because transaction costs tend to increase with poor and outdated technology, while also limiting access to the financial system, both domestically and internationally. Ndikumana (2006:18) comments that with the required information, communication and financial technology present, countries (such as those in Africa) could promote "virtual regional markets" where the actual physical regional markets are not present.

In conclusion, although most of the theories and models suggest that the stock market plays a vital role towards economic growth within a country, many contrasting theories have been highlighted which support the view that the development of the stock market could adversely affect economic growth. Having analysed the theory of the development of the stock market and its influence on economic growth, as well as the determinant of stock

market development, the next section reviews the empirical literature on the stock market development-growth nexus as well as the macroeconomic and institutional determinants of stock market development.

3.3 EMPIRICAL EVIDENCE ON STOCK MARKET DEVELOPMENT AND ITS IMPACT ON GROWTH

It has been noted that indirect finance through financial intermediaries is of greater importance than direct finance in financial markets, especially in developing countries. As a result, the majority of the studies have focused on the contributions of financial intermediaries towards economic growth (Garcia and Liu, 1999:33). Various empirical tests have illustrated that financial variables have significant impacts on economic growth. However, the majority of this evidence is based on bank-based measures of financial development. As such, only recently has the focus shifted towards stock market indicators, due to their ever-increasing significance and role in financial markets and economic growth (Garcia and Liu, 1999:33).

Early work by Atje and Jovanovic (1993), who carried out a cross-country analysis of stock markets and their impact on economic growth found a positive correlation between growth and the value of stock market trading divided by GDP for 40 countries between 1980 and 1988. Furthermore, their study revealed that bank lending failed to bring about the same result, which may be surprising. Therefore, they noted that countries should transfer resources towards the development of their stock markets in an effort to achieve economic growth (Atje and Jovanovic, 1993:636).

A similar study conducted by Levine and Zervos (1996) focused on analysing the relationship between stock market development and economic growth using pooled cross-country and time-series regression. Their data covered 41 countries over the period 1976 – 1993. They regressed the growth rate of GDP *per capita* on numerous variables in an effort to control for initial conditions, political stability, investment in human capital and the general macro-economic environment. Finally, they constructed an aggregate index of stock market development in an effort to combine information on stock market size, trading and

integration (Levine and Zervos, 1996:3). Hence, their study determines whether there is a relationship between economic growth and the development of the stock market, independent of other factors associated with growth. Levine and Zervos (1996) followed Atje and Jovanovic's (1993) study, and built on it in two ways: firstly, they used the aggregate index of stock market development as mentioned earlier; and secondly, they controlled for initial conditions and other variables that may have an impact on economic growth as many cross-country regressions produce fragile results due to their conditioning information set changing (Levine and Zervos, 1996:4). Their results produce a strong positive correlation between stock market development and economic growth, which is consistent with economic theory. An interesting aspect of their study was a significant decline in the statistical significance of other financial variables after the stock market development index was introduced into the regression, thus illustrating the importance of stock market development over many other financial variables towards economic growth (Levine and Zervos, 1996:9). It is important to note that cross-country regressions are limited in many ways, and tend to suffer from measurement, statistical and conceptual problems, which may blur vital aspects and differences across countries. However, these inherent properties should not obscure the potential benefits that cross-country comparisons may produce. For example, they may be used to capture the empirical linkages between long-term growth and numerous macroeconomic variables across a range of countries (Levine and Zervos, 1996:5).

In addition, Levine (1996) analysed measures of stock market liquidity to illustrate that greater liquidity helps boost economic growth in the long-run. Levine (1996) covered three indicators of liquidity including: the total value of shares traded as a share of GDP; the value of traded shares as a percentage of total market capitalisation; and the value-traded-ratio divided by stock price volatility. His study covered 38 countries including both developed and developing countries over the period 1976 – 1993. Furthermore, his results illustrated that relatively liquid stock markets showed signs of higher growth potential than those of illiquid markets (Levine, 1996:8). In addition, Levine (1996) noted that stock market liquidity actually helps in terms of explaining economic growth even after accounting for various other non-financial and financial factors that may affect growth.

Another study worth noting is that of Arestis and Demetriades (1997), who augmented the relationship between economic growth and financial development for the United States and Germany, by incorporating indicators of stock market development and volatility. They analysed four variables for each country through the use of quarterly data over the period 1979 – 1991. Their model was estimated using Johansen cointegration. Their results revealed that there is a high possibility of differences in aspects of the financial system between countries, and the impact on economic growth (Arestis and Demetriades, 1997:785).

Later, Levine and Zervos (1998) studied various measures of stock market development: liquidity, size, volatility, and integration with world capital markets and the influence on economic growth. Their analysis covered 47 countries over the period 1976 – 1993. Levine and Zervos (1998) followed the same approach as that of Atje and Jovanovic (1993), however they improved their data analysis and their methodological approach in an effort to provide more robust and reliable empirical evidence on the relationship between stock markets and economic growth (Levine and Zervos, 1998:539). In doing so, they increased both the number of countries analysed and the period under study, while at the same time, they constructed additional measures of stock market liquidity, a measure of stock market volatility, and two measures of stock market integration with world capital markets. Furthermore, they incorporate four stock market variables: turnover, value added, capitalisation, and volatility, in their cross-country regression analysis in an effort to estimate the strength of the correlation between indicators of growth and stock market development (Levine and Zervos, 1998:543). Their results show that even after controlling for numerous other factors associated with economic growth, stock market liquidity is positively correlated with current and future rates of economic growth.

Tuncer and Alovsat (1998) focused on analysing causality relationships between stock markets and economic growth. Their study covered 20 countries over the period 1981 – 1994. Furthermore, they applied Sim's Causality testing techniques, while also utilising panel data for the entire period in an effort to determine the direction of causality. Finally, these causality relationships were analysed individually amongst the different countries using time-series data (Tuncer and Alovsat, 1998:129). Their results produced a positive relationship between the role played by stock markets towards economic growth and vice versa, hence

suggesting a two-way causal relationship. However, the time-series results proved to be inconclusive, as they tended to support a more positive link between stock market development and economic growth in developing countries, rather than in a developed country (Tuncer and Alovsat, 1998:130).

A related study on stock market development and its implications on growth is by Mohtadi and Agarwal (2000) that focused primarily on developing countries. Their approach follows that of Levine and Zervos (1998), however, it addressed the limitations of using a cross-sectional approach by introducing and adopting a dynamic panel data approach. Therefore, they tried to close the gap in the literature by re-examining the long-run impact of stock markets and the implications for growth through a panel data approach (Mohtadi and Agarwal, 2000:4). In their analysis, they examine 21 developing countries over the period 1977 – 1997. Their results support much of the theory in that they suggest stock market development has a significant positive effect on growth. Their paper further suggests that this may take either a direct or indirect channel (Mohtadi and Agarwal, 2000:13). From a 'direct' perspective, they show that stock market liquidity positively affects economic growth, while 'indirectly', they show that market size (the market capitalisation ratio) has an impact on investments, which then indirectly affects economic growth. Finally, their paper emphasised that the value of shares traded should not be seen as an effective indicator of market liquidity. This they attributed to the presence of high volatility found in many developing countries, which in turn made the value of shares traded to be misleading in terms of liquidity indicators (Mohtadi and Agarwal, 2000:13).

It has been noted in much of the empirical literature that growth regression analysis tends to favour developed as opposed to developing countries (Durham, 2002:215). For example, Grier and Tullock (1989) show that studies focused exclusively on lower income countries did not have the same explanatory powers as those studies focused on OECD member countries. As a result, many argue that growth tends to differ between developed and developing countries. Durham (2002) examined both the short-term and long-term transmission mechanisms in terms of lower income countries. The long-term view suggests that reform boosts development of the stock market, which then enhances economic growth, while the short-term view stresses that reform leads to an increase in stock prices

which then encourages private investment (Durham, 2002:212). Durham's (2002) paper addressed this issue by examining whether determinants of growth tend to differ across national income levels. This was done by testing for a positive correlation between stock markets and growth in emerging markets and comparing these results to that of higher income countries. Finally, Durham (2002) analyses the short-term view by testing how private investment responds to stock market valuation changes in both developed and developing countries. The study revealed that the stock market has different real economic effects, which are dependent on the income levels of the countries in question. It was also highlighted that higher income countries in comparison to lower income countries, tended to show a more robust positive correlation between stock markets and growth in the long-term (Durham, 2002:231).

In contrast to the vast majority of empirical research which has focused mainly on cross-section and panel data analysis, Caporale *et al.* (2004) follow the time-series approach which is based on a framework designed to provide vital evidence on the causality link between stock market development and economic growth. Their study is advantageous in comparison to many of the others in terms of it not having any estimation problems as seen in the majority of other methods (Caporale *et al.*, 2004:38). Furthermore, their study examined 7 selected countries including Argentina, Chile, Greece, Korea, Malaysia, Philippines, and Portugal over the period 1977 – 1998. They use two of the standard stock market development indicators; (1) the market capitalisation ratio (MCR); and (2) the value traded ratio (VTR) (Caporale *et al.*, 2004:41). From this data, they use a simple VAR estimation procedure that avoids the use of implausible assumptions within the data generation process (DGP) as seen in cross-sectional and panel data estimators. In a comparative analysis, they performed a causality test between commonly used proxies of financial development and economic growth, which resulted in little evidence of causality (only 2 out of 7 countries showed this link). However, strong evidence was found (5 out of 7 countries) when analysing the impact of stock market development on overall financial development, which was seen to positively affect growth in the long-term (Caporale *et al.*, 2004:48). This comparative study highlights the importance of stock market development towards economic growth as a whole.

In a later study, Caporale *et al.* (2005) re-examined the relationship between stock market development and economic growth. However, in this study, they provide a framework in an effort to establish the channels through which stock markets affect economic growth (Caporale *et al.*, 2005:167). Following their earlier study, they adopt a VAR procedure to test whether stock markets can enhance economic growth through changes in investment productivity. Their analysis, however, is restricted to a sample of only 4 countries: Chile, Korea, Malaysia and Philippines for the period 1979–1998. Their results proved to be consistent with theory in that they found stock markets boost economic development through their positive influence on investment productivity in the long-run (Caporale *et al.*, 2005:175).

While the question of whether stock markets enhance economic growth has gained much attention to date, there has been little empirical work on the determinants of stock market development in emerging markets (Yartey, 2008:5). Garcia and Liu (1999:29) empirically studied the determinants of stock market development, and in particular market capitalisation for the major stock markets in Latin America, East Asia and two industrial countries (United States and Japan). Their analysis used pooled data for fifteen countries over the period 1980-1995. Furthermore, they focused on the determinants of stock market capitalisation as a proxy for stock market development (Garcia and Liu, 1999:39). They investigated the possible effects of the savings rate, real income, financial intermediary development, stock market liquidity, and macroeconomic stability on stock market capitalisation. Their results revealed that the savings rate, the level of real income, financial intermediary development, and stock market liquidity all impacted on predicting stock market capitalisation to some degree, while the level of macroeconomic stability did not prove to have a significant impact (Garcia and Liu, 1999:54).

A similar study conducted by Naceur *et al.* (2007) focused on analysing the determinants of stock market development in the Middle-Eastern and North African (MENA) region. Their analysis used unbalanced panel data from twelve MENA region countries over the period 1990-2002. Like Garcia and Liu (1999), their paper also focused on the determinants of stock market capitalisation (Naceur *et al.,* 2007: 482). Their results show that the savings rate, financial intermediary development, stock market liquidity, and the stabilisation variable

(inflation change) proved to be significant as determinants of stock market development, while in contrast to Garcia and Liu (1999), real income and the investment rate was found to be insignificant (Naceur *et al.,* 2007: 486).

A later study by Yartey (2008) examined the institutional and macroeconomic determinants of stock market development in forty-two emerging countries. Yartey (2008:3) used a panel dataset approach over the period 1990-2004. Furthermore, his analysis like the others seen previously, focused on examining the impact of domestic investment, stock market liquidity, macroeconomic stability, banking sector development, while also adding in private capital flows and institutional quality variables (Yartey, 2008:27). The results revealed that real income, domestic investment, private capital flows, banking sector development, and stock market liquidity proved to be significant determinants of stock market development in emerging markets. Furthermore, a non-monotonic relationship was found between the development of the banking sector and the development of the stock market, suggesting that the two sectors serve as compliments in the early stages of development, then turning into substitutes later as they compete with each other (Yartey, 2008:28). Finally, the institutional elements including that of political risk, law and order, democratic and bureaucratic qualities were found to be important determinants of stock market development (Yartey, 2008:28).

3.4 SUMMARY AND CONCLUSION

This chapter examined the relationship between stock market development and economic growth. The theoretical section outlined the stock market development-growth nexus, while also shedding light on the determinants of stock market development. This section highlighted that the development of the stock market has attracted many theoretical views over the last decade, however although the literature suggests overwhelmingly that stock markets promote economic growth, there are some indications that stock markets could have the opposite effect and adversely affect economic growth.

From an empirical point of view the results are mixed. However, like in the theoretical section the majority of the empirical work found a strong correlation between stock markets and economic growth. In addition, Tuncer and Alovsat (1998) identified a two-way causation

relationship between stock markets development and economic growth. The empirical literature on the determinants of stock market development revealed conflicting results in terms of the significance of certain determinants of stock market capitalisation. Here the literature revealed consistently that stock market liquidity, financial intermediary development, and the savings rate proved to be significant determinants of stock market development, while real income and macroeconomic stability proved to have mixed results.

CHAPTER FOUR

DATA AND METHODOLOGY

4.1 DATA

One of the greatest challenges in this study was the availability of data for the SADC member countries. To efficiently model the effect that the stock market has on a country's growth one would ideally need to have both a long time-series as well as sufficient cross-sections of data. However, the SADC region presents difficulties in that many of the region's exchanges were only recently established, and that countries such as Mozambique who has only recently become a member of organisations such as the IMF, offer very little time-series data (Allen and Ndikumana, 2000:140).

The primary data source for this study is the IMF's International Financial Statistics, 2008, while other data was collected from the World Bank's World Development Indicators, 2008. Nine out of the ten SADC countries with stock exchanges have the relevant data. As such, data was obtained for the following countries: Botswana, Mauritius, Malawi, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. Mozambique was excluded from the regression sample due to a lack of data. The analysis covers the period from 1992 to 2004. This was grouped into four data points based on averages of the following sub periods: 1992-1995, 1996-1998, 1999-2001, and 2002-2004. The first sub period has four observations while the rest have three observations, which were in turn averaged to obtain the data for each sub period. However, because many of these exchanges were only recently established, many gaps were found within the data. Where less than four or three observations exist for a period, the available observations were averaged to obtain data for the period. For instance, in a country if two observations were found for a sub period say 1992-1995, the average of the two is used for that period. But if only one observation is available, the only observation is used for the period. Thus, following this process we obtained a panel data of four data points for each country.

This study will firstly focus on the stock market development and growth nexus, using the real GDP growth rate as a proxy for economic growth. This will be termed Model 1. Secondly, the study provides insight into the determinants of stock market development

using stock market capitalisation as a percentage of GDP as a proxy for its development. This will be termed Model 2. The other variables used in both models are described as follows:

GDP Growth Rate (GDP)

In Model 1, it is used as the dependent variable as a proxy for economic growth. It is expected that as the stock market develops it will have a positive effect on economic growth (Mohtadi and Agarwal, 2000:9). Secondly, it is used as an explanatory variable when modelling the determinants of stock market development in Model 2. It is expected that as the economy grows, it will produce a positive effect on the size of the stock market and as such it is also expected that the stock market will also grow (Naceur *et al.,* 2007:482). In addition, the growth of an economy should create new demand for financial services while also offering a better business environment, thus prompting the growth of the stock market and hence a positive effect on stock market development is expected (Yartey, 2008:15).

Market Capitalisation Ratio (MCR)

This is calculated by summing the value of all listed shares and dividing by GDP. It is assumed that the overall market size is positively correlated with the ability to mobilize capital and diversify risk (Agarwal, 2000:50). In Model 1, the MCR is used as an explanatory variable. Here it is expected to have a positive effect on economic growth. In Model 2, it is used as the dependent variable as a proxy for stock market development.

Liquidity

When analysing stock market liquidity, two different indicators were used. These are:

- *Total Value of Shares Traded Ratio (VTR):* This variable equals the value of shares traded on the exchange divided by GDP (Mohtadi and Agarwal, 2000:6). This ratio is used to measure the value of equity transactions relative to the size of an economy, and as such should positively reflect liquidity on an economy-wide basis. In Model 1, we expect a positive relationship between the values of shares traded ratio and economic growth. In Model 2, we expect a complementary and positive relationship to exist between the VTR and MCR (Garcia and Liu, 1999:42).

- *Turnover Ratio (TR):* This variable equals the value of total shares traded divided by market capitalisation. That is to say it measures the value of equity transactions relative to the size of the stock market (Mohtadi and Agarwal, 2000:7). Although the turnover ratio is a measure of liquidity, high turnover may also indicate the presence of low transaction costs. As such liquid stock markets allow investors to change their financial positions relatively quickly and cheaply, while also facilitating investment projects and making them less risky (Levine, 1991:1447). Hence we expect the turnover ratio to have a positive influence in both models, that is, towards economic growth and market capitalisation as larger portions of savings are channelled through the stock market (Naceur *et al.,* 2007:483).

Macroeconomic Instability

In an effort to take into account any macroeconomic instability and its effects on both economic growth (Model 1) and stock market development (Model 2), the change in price level is used as an explanatory variable in both models. It is expected that the higher the inflation variable, the less incentive investors or companies would have in investing in the stock market, and thus negatively affecting economic growth (Garcia and Liu, 1999:43). However, it has been noted that stock markets also provide some form of a hedge against inflation and hence one may expect a positive relationship between stock market development and inflation (Yartey, 2008:16). Therefore, it is not impossible to expect stock markets in countries with volatile macroeconomic conditions to also have volatile equity indexes and hence market capitalisation (Garcia and Liu, 1999:43).

Investment

Gross capital formation as a percentage of GDP is used in this study as a proxy for the investment rate, and it is used as an explanatory variable because it is believed that the investment rate plays an important role in economic growth (Agarwal, 2000:51). Furthermore, since stock markets are in retrospect financial intermediaries that intermediate savings to investment projects, it is logical to expect that the investment rate will be an important determinant of stock market development. As such, we expect the investment rate to have a positive impact in both models (Yartey, 2008:16).

Financial Intermediary Development

As both banks and stock markets intermediate savings towards investment, they can either be seen as substitutes or complements. Numerous authors including that of Boyd and Smith (1996) and Demirguc-Kunt and Levine (1996) have addressed this issue, with the vast majority concluding that they are generally seen as complements rather than substitutes and grow simultaneously (Garcia and Liu, 1999:40). In this study we use two indicators of financial intermediary development. The first one is the private credit by deposit money banks to GDP, or simply the credit to the private sector. It has been empirically shown by Demirguc-Kunt and Levine (1996) that stock market development and bank development are positively correlated. Secondly, liquid liabilities to GDP is used to show the effect the financial sector has on both growth (Model 1) and stock market development (Model 2). Liquid liabilities consist of demand deposits and interest bearing liabilities and non-bank financial intermediaries, and have been shown to have a positive impact on both economic growth and stock market development, thus we expect the same relationship to prevail (Garcia and Liu, 1999:41).

4.2 EMPIRICAL METHOD

A panel data approach is employed in this study that covers nine countries within the SADC region. Specifically, the study uses a fixed effects panel data model. The fixed effects approach is relatively simple and is defined according to the following regression:

$$Y_{it} = \alpha_i + \beta X_{it} + \varepsilon_{it}, \qquad i = 1,\ldots., N;\ t = 1,\ldots., T_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4.1)$$

where Y_{it} is the dependent variable, X_{it} is the vector of k explanatory variables, and α_i, i = 1,…, N, are the constant coefficients that are specific to individual countries. Therefore, it is assumed that their presence allows for differences across the countries under study via any variations in these constant terms. These individual country coefficients are estimated together with the vector of slope coefficients 'β' (Naceur *et al.,* 2007:483).

Hsiao (1986) also suggested that in the scenario whereby there are some individual attributes which have been omitted and which are correlated with the other variables in the model, the fixed effects model produced unbiased estimates. As such, a panel data approach generally

offers greater flexibility in the specification of the model rather than other single cross-country regressions, and hence will reduce misspecification of the model. Next we look at the two models separately.

4.2.1 Model 1

This model examines the stock market development and economic growth nexus directly. In this analysis, three regressions were estimated under different specifications in terms of their weightings. These are as follows:

$$Y_{it} = \alpha_i + \beta_1 LMCR_{it} + \beta_2 INF_{it} + \beta_3 LGCF_{it} + \beta_4 LPC_{it} + \beta_5 LLL_{it} + \beta_6 GDP_{it-1} + \varepsilon_{it} \quad \text{.....(4.2)}$$

$$Y_{it} = \alpha_i + \beta_1 LVTR_{it} + \beta_2 INF_{it} + \beta_3 LGCF_{it} + \beta_4 LPC_{it} + \beta_5 LLL_{it} + \beta_6 GDP_{it-1} + \varepsilon_{it} \quad \text{.....(4.3)}$$

$$Y_{it} = \alpha_i + \beta_1 LTR_{it} + \beta_2 INF_{it} + \beta_3 LGCF_{it} + \beta_4 LPC_{it} + \beta_5 LLL_{it} + \beta_6 GDP_{it-1} + \varepsilon_{it} \quad \text{.....(4.4)}$$

where Y is the real *per capita* GDP growth rate set as a proxy for economic growth, LMCR is the market capitalisation ratio, LVTR is the total value of shares traded ratio, and LTR is the turnover ratio. These ratios were run individually in the regressions, while also including other control variables that may have an impact on economic growth. Specifically, the control variables included are: the rate of inflation change (INF), the log of gross capital formation (LGCF) which was used as a proxy for the investment rate, two indicators of financial intermediary development (LPC and LLL), while also including the lag of GDP. Furthermore, these regressions were estimated under both cross-section weights and period weights to allow for country specific heteroskedasticity and period heteroskedasticity (Eviews manual, 2008:543).

This model was then repeated. However, this time South Africa (SA) was excluded from the analysis as it was assumed that SA could influence the estimations significantly enough to

produce misleading results given the relative size of South Africa vis-à-vis the other SADC countries.

4.2.2 Model 2

Following Garcia and Liu's (1999) study, the second model focuses on the determinants of stock market development. As mentioned earlier, stock market capitalisation as a percentage of GDP is used as the proxy for stock market development in an effort to capture the various factors that have been noted to impact on the development of the stock market. The regression below was estimated under different scenarios:

$$LMCR_{it} = \alpha_i + \beta_1 LVTR_{it-1} + \beta_2 LTR_{it-1} + \beta_3 INF_{it} + \beta_4 LGCF_{it-1} + \beta_5 LPC_{it} + \beta_6 LLL_{it} + \beta_7 GDP_{it-1} + \varepsilon_{it} \quad \text{(4.5)}$$

This regression was estimated under eight different scenarios in an effort to determine which control variables played the biggest role as a determinant of stock market development. For example, LPC and LLL were not included in the same regression at any one point in time in order to see which variable of financial intermediary development had the largest impact on the stock market and its development. In addition, we only included one stock market liquidity variable in a single regression (either LVTR or LTR), in an attempt to analyse which one has the most significant effect on the development of the stock market. This model was then repeated with the exclusion of South Africa, following the same reasoning as seen in Model 1.

4.3 CONCLUSION

This chapter discusses the data and the empirical model used for the analysis. The analysis cover the period 1992-2004 which was further divided into four sub periods: 1992-1995, 1996-1998, 1999-2001, 2002-2004. The average of each sub periods was then obtained in order to obtain the data point for each period. The chapter further specifies the models and describes the econometric techniques used for the estimation, namely a fixed effects panel data approach. Two sets of models were specified and explained. Model 1 focuses on the relationship between stock market development and growth, while Model 2 analyses the determinants of stock market development.

CHAPTER FIVE

EMPIRICAL RESULTS

5.1 INTRODUCTION

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, firstly to empirically examine the relationship between economic growth and stock market development as described in Model 1, and secondly to examine the macroeconomic determinants of stock market development in Model 2. The remainder of this chapter presents the results, as well as interpreting and evaluating them against theory and results from other studies.

5.2 DESCRIPTIVE STATISTICS

Table 1 in Appendix B presents the descriptive statistics in the form of common means and standard deviations for all the countries under study. As can been seen in Table 1, the GDP growth rate was on average highest in Mauritius, closely followed by Botswana and Tanzania, while countries like Zimbabwe and Zambia had the lowest GDP growth rate, with Zimbabwe even presenting on average a negative growth rate. In terms of inflation, on average Mauritius, Botswana and South Africa had the lowest inflation rates respectively, while Zimbabwe and Zambia again have the least attractive results, as their average inflation levels were roughly 95% and 47% respectively. When looking at the indicators of financial intermediary development, that is, LLL and LPC respectively, it can be seen that Mauritius and South Africa have the highest levels of intermediation, while Zambia, Malawi and Botswana tended to have on average the lowest. Finally, investment levels (LGCF), show that Botswana had the highest investment levels, which was closely followed by Mauritius, while Zimbabwe and Malawi had the lowest investment levels respectively. From this analysis, it is reasonable to assume that those countries with relatively high growth rates also attracted financial intermediary development and hence promoted investment, which helps boost the overall economic conditions of a country. However, on the other hand those countries that tended to suffer from low economic growth generally displayed unfavourable

economic conditions. A good example of this would be that of Zimbabwe which tended to be on average the lowest performer in the majority of the variables, which could be a result of the recent political and macroeconomic instability Zimbabwe has been faced with.

5.3 REGRESSION RESULTS

5.3.1 *Results of Model 1*

Tables 5.1 – 5.4 present the results for the stock market development and economic growth nexus regressions under four different fixed effects models. We run three regressions under different weightings, whereby each regression has only one variable of stock market development with the other five control variables. As such, regression one looks at the impact of the market capitalisation ratio on economic growth, regression two looks at the impact of the value of shares traded ratio on economic growth and finally, regression three looks at the effect of the turnover ratio on economic growth. In terms of the different models performances, the explanatory power of the model that applied cross-section fixed effects in an effort to allow for country-specific effects was seen to be the most robust as indicated by the high R^2 and low standard error of regression figures in comparison to the other models. This was also found to be the case with application of cross-section weights which had a notably higher R^2 and relatively low standard error of regression than when period weights were used.

Table 5.1 below reports the results of the relationship between stock market development and economic growth where no fixed effects were applied. Here regression 2 produced a positive and significant result for the value of shares traded to GDP ratio. All the other indicators of stock market development also produced a positive relationship between stock market development and growth, however, they were found to be insignificant. The control variables on the other hand produced some interesting results. Inflation was found to have a negative and highly significant relationship with economic growth. This is expected in all the regressions as an increase in the inflation rate is generally accompanied by an increase in financial disintermediation as people and companies are less inclined to invest their money in the financial system (Aziakpono, 2004:124). Furthermore, inflation has been noted to have a

strong negative relationship with capital accumulation and private savings rates, which in turn will impact negatively on economic growth (Levine and Zervos, 1998:546). The results also show a strong positive and highly significant result between investment (LGCF) and economic growth. This conforms to *a priori* 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. Furthermore, the investment rate is interlinked to the savings rate. Therefore, 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, 1999:40). These findings in terms of the inflation and investment as control variables are consistent throughout the study as can be seen in Tables 5.1-5.4 and conform with previous studies including that of Levine and Zervos (1996) (1998), Caporale *et al.* (2004) to mention a few.

In terms of financial intermediation, the results from Table 5.1 show that credit to the private sector has a negative and significant relationship with economic growth. This result is surprising, as one would expect a positive relationship to exist between the two. However, this result is supported by De Gregorio and Guidotti (1995) who also found a negative relationship between economic growth and measures of credit supply. 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, 2000:153). Furthermore, this result may be indicative of an inefficient credit allocation process and its accompanied legislation. Liquid liabilities on the other hand produced a positive and significant effect on economic growth. This is in accordance with our expectations, as one would expect that as financial intermediaries develop the finance generated through this intermediation would influence growth positively by stimulating real economic activity, particularly through investment and consumption[3].

[3] See Allen and Ndikumana (2000) for a more detailed explanation on this relationship.

Table 5.1: Stock market development and growth (With no fixed effects)

	Cross-section weights			Period weights		
	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
c	-15.822	-14.360	-14.908	-13.650	-13.598	-13.577
	[0.000]	[0.000]	[0.000]	[0.010]	[0.006]	[0.006]
LMCR	0.284			0.016		
	[0.251]			[0.972]		
LVTR		0.130			0.081	
		[0.052]			[0.638]	
LTR			0.077			0.034
			[0.353]			[0.857]
INF	-0.040	-0.041	-0.039	-0.042	-0.042	-0.042
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
LGCF	5.401	5.307	5.315	5.154	5.239	5.162
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
LPC	-1.973	-1.767	-1.624	-1.891	-1.986	-1.862
	[0.003]	[0.001]	[0.004]	[0.057]	[0.009]	[0.009]
LLL	2.953	2.680	2.663	2.787	2.789	2.730
	[0.002]	[0.002]	[0.004]	[0.055]	[0.036]	[0.043]
GDP(-1)	-0.432	-0.429	-0.430	-0.472	-0.470	-0.471
	[0.017]	[0.012]	[0.021]	[0.013]	[0.013]	[0.013]
R^2	0.928	0.938	0.926	0.808	0.810	0.808
S-E	1.329	1.343	1.385	1.461	1.455	1.461

Notes: The dependent variable is the annual GDP growth rate. P-values are in brackets. S-E stands for the standard error of the regression. LMCR is the log of the market capitalisation as a percentage of GDP, LVTR is the log of the value of shares traded to GDP ratio, LTR is the log of the turnover ratio, INF is the rate of inflation change (used to measure macroeconomic instability), LGCF is the log of gross capital formation (used as a proxy for investment), LPC is the log of the private sector credit to GDP, LLL is the log of liquid liabilities to GDP.
Source: Estimated by author

The last control variable, the lag of the GDP growth rate produced a negative and significant result. This is not in accordance with our *a priori* expectations. This result implies that as last years GDP growth rates increases, the current GDP growth rate will be declining. However, given the nature of many of the economies within the SADC region, this result may hold in the sense that, as incomes increase for both firms and individuals, they will tend to start putting their funds abroad resulting in an outflow of capital, which in essence would negatively affect economic growth.

Table 5.2: Stock market development and growth (With cross-section fixed effects)

	Cross-section weights			Period weights		
	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
c	-8.135	-5.248	-10.953	-9.635	-6.887	-7.472
	[0.248]	[0.429]	[0.077]	[0.247]	[0.413]	[0.379]
LMCR	0.583			0.404		
	[0.310]			[0.740]		
LVTR		0.164			0.207	
		[0.082]			[0.431]	
LTR			0.144			0.153
			[0.097]			[0.521]
INF	-0.029	-0.026	-0.025	-0.030	-0.029	-0.030
	[0.028]	[0.033]	[0.045]	[0.012]	[0.011]	[0.011]
LGCF	7.589	7.587	8.898	8.641	8.909	8.214
	[0.001]	[0.000]	[0.000]	[0.034]	[0.016]	[0.020]
LPC	1.140	1.848	3.055	1.828	2.754	2.983
	[0.554]	[0.289]	[0.148]	[0.523]	[0.357]	[0.372]
LLL	-4.229	-5.236	-5.644	-4.936	-6.413	-5.872
	[0.199]	[0.077]	[0.070]	[0.347]	[0.228]	[0.267]
GDP(-1)	-0.308	-0.250	-0.381	-0.512	-0.505	-0.531
	[0.165]	[0.216]	[0.110]	[0.026]	[0.024]	[0.023]
R^2	0.978	0.985	0.989	0.907	0.916	0.912
S-E	1.353	1.294	1.377	1.505	1.484	1.493

Notes: The dependent variable is the annual GDP growth rate. P-values are in brackets. S-E stands for the standard error of the regression. The variables are as defined in Table 5.1.
Source: Estimated by author

Table 5.2 above presents the results for the same regressions, however this time we include a cross-section fixed effect. Here regression 2 and 3 both produce a positive and significant result in terms of their stock market development indicator, notably the value of shares traded to GDP ratio and the turnover ratio at least at the 10% level of significance. The other indicators of stock market development, like in Table 5.1 suggest a positive relationship with economic growth, however they were found to be insignificant. The other control variables also showed some form of similarity when a cross-section fixed effect was added, especially in terms of the inflation and investment variables. That is to say that inflation produced a negative and significant coefficient, while the investment variable produced a very strong positive and significant coefficient. The lag of the GDP growth rate

also produced a negative and significant value, however, this time it was only found to be significant when period weights were used in the model.

It should be noted here that credit to the private sector produced a positive but insignificant correlation, while the liquid liabilities variable presented a negative but insignificant correlation with economic growth.

Table 5.3: Stock market development and growth (With period fixed effects)

	Cross-section weights			Period weights		
	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
c	-17.008	-13.726	-14.878	-11.436	-11.062	-11.017
	[0.000]	[0.000]	[0.001]	[0.037]	[0.033]	[0.034]
LMCR	0.257			0.036		
	[0.352]			[0.941]		
LVTR		0.151			0.089	
		[0.077]			[0.628]	
LTR			0.087			0.074
			[0.330]			[0.702]
INF	-0.040	-0.044	-0.039	-0.038	-0.039	-0.038
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
LGCF	5.735	5.153	5.286	4.403	4.427	4.342
	[0.000]	[0.000]	[0.000]	[0.005]	[0.004]	[0.005]
LPC	-2.079	-1.944	-1.754	-1.786	-1.850	-1.697
	[0.004]	[0.002]	[0.007]	[0.078]	[0.016]	[0.019]
LLL	3.171	2.815	2.774	2.497	2.451	2.332
	[0.004]	[0.005]	[0.009]	[0.087]	[0.068]	[0.088]
GDP(-1)	-0.498	-0.458	-0.441	-0.295	-0.291	-0.282
	[0.017]	[0.005]	[0.020]	[0.192]	[0.193]	[0.209]
R^2	0.903	0.938	0.910	0.823	0.826	0.826
S-E	1.427	1.441	1.490	1.507	1.500	1.503

Notes: The dependent variable is the annual GDP growth rate. P-values are in brackets. S-E stands for the standard error of the regression. The variables are as defined in Table 5.1.
Source: Estimated by author

Table 5.3 above presents the results for the regressions when we used a period fixed effects model instead of cross-section fixed effects model. The results were very similar to that found in Table 5.1, whereby the only stock market development indicator found to be

significant was the value of shares traded to GDP ratio in regression 2, while the others offered a positive correlation with economic growth, they were however found to be insignificant. All the other control variables were found to be significant with the expected signs.

Table 5.4: Stock market development and growth (With both cross-section and period fixed effects)

	Cross-section weights			Period weights		
	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
c	-16.816	-11.088	-11.310	-14.921	-9.536	-10.222
	[0.044]	[0.161]	[0.066]	[0.211]	[0.448]	[0.347]
LMCR	-1.195			-0.870		
	[0.459]			[0.691]		
LVTR		0.119			0.140	
		[0.504]			[0.690]	
LTR			0.113			0.132
			[0.109]			[0.608]
INF	-0.024	-0.032	-0.031	-0.020	-0.026	-0.025
	[0.095]	[0.010]	[0.006]	[0.260]	[0.071]	[0.066]
LGCF	6.830	7.928	7.781	8.100	8.936	8.630
	[0.019]	[0.004]	[0.004]	[0.070]	[0.039]	[0.040]
LPC	1.339	1.205	2.333	3.273	2.885	3.496
	[0.568]	[0.596]	[0.342]	[0.384]	[0.398]	[0.347]
LLL	0.561	-2.914	-3.705	-3.112	-5.799	-5.899
	[0.901]	[0.393]	[0.278]	[0.610]	[0.341]	[0.304]
GDP(-1)	-0.532	-0.597	-0.596	-0.424	-0.468	-0.469
	[0.029]	[0.009]	[0.008]	[0.146]	[0.104]	[0.101]
R^2	0.974	0.971	0.985	0.916	0.917	0.919
S-E	1.503	1.527	1.476	1.615	1.616	1.608

Notes: The dependent variable is the annual GDP growth rate. P-values are in brackets. S-E stands for the standard error of the regression. The variables are as defined in Table 5.1.
Source: Estimated by author

Table 5.4 above presents the results for the regressions with cross-section fixed effects and period fixed effects model. Here we found that the turnover ratio in regression 3 has a positive coefficient and was statistically significant at approximately the 10% level of significance. However the results also produced some conflicting views in terms of the market capitalisation ratio as they implied a negative relationship with economic growth. However, it must be noted that none of the other indicators of stock market development

were found to be significant. The inflation and investment control variables on the other hand produced the expected results, and were found to be consistent throughout all the models. The financial intermediary control variables also showed some conflicting results, however these proved to be insignificant. Finally, the lag of the GDP growth rate only produced significant results when we added cross-section weights to the model. However, these results were as expected as they implied a negative relationship with economic growth as seen in the previous Tables.

Overall, the results favour the value of shares traded to GDP ratio as the most prominent indicator of stock market development that is positively correlated with economic growth, while the turnover ratio was also found to have a positive and significant correlation in two of the models, it was not as prominent as the former. However, these two measures are indicative of stock market liquidity, and as such the results support the view that there is a positive relationship between stock market liquidity and economic growth. These results are consistent with other findings by Levine and Zervos (1998) and Rousseau and Wachtel (2000) and Caporale *et al.* (2004) in that they all found a significant positive relationship to exist between stock market development (measured by its liquidity) and economic growth.

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, particularly when comparing the size of the JSE to the other SADC stock exchanges[4]. The results provided very similar coefficients in terms of the control variables as seen earlier when South Africa was included. However, none of the indicators of stock market development were found to be statistically significant. Furthermore, many of the regression actually found a negative effect of stock market development on economic growth. An explanation for this may be that the rest of the SADC stock exchanges are either too small, inefficient, or not well developed to actually have a significant impact on economic growth. This is particularly the case in countries that are still very much reliant on the banking sector to channel their savings into investment schemes.

[4] See appendix C for the results of the estimations excluding South Africa.

5.3.2 *Results of Model 2*

Table 5.5 below summarizes the results for Model 2. In this model, 8 variant regressions were estimated on the determinants of stock market development using stock market capitalisation as a percentage of GDP as a proxy for its development. In these regressions, we include last years GDP growth rate (GDP) and last years investment rate (LGCF) in all 8 regressions, while the two measures of financial intermediary development (LPC and LLL) and stock market liquidity (LVTR and LTR) were used in turn. For example, no single regression had both measures of financial intermediary development or both stock market liquidity measures in it. Finally, we include a variable to take into account the impact of macroeconomic instability on market capitalisation. These regressions were estimated under a cross-section fixed effects and period fixed effects model, while using cross-section weights. The model proved to perform exceptionally well, which may be seen by the extremely high R^2 values and relatively low standard errors of regression. This is notably visible in regression 5.

Table 5.5: Regressions on the determinants of market capitalisation from pooled data

	1	2	3	4	5	6	7	8
GDP(-1)	0.0227	-0.0078	-0.0345	-0.0259	0.0317	0.0519	0.0360	0.0680
	[0.0048]	[0.8145]	[0.3971]	[0.4722]	[0.0070]	[0.1405]	[0.3233]	[0.0775]
LGCF(-1)	-0.3361	-1.0551	-0.1462	-0.7378	-0.1215	-0.1538	0.3377	0.0034
	[0.2224]	[0.0211]	[0.7529]	[0.0737]	[0.0670]	[0.7109]	[0.4183]	[0.9925]
LPC	1.6743		1.0964		1.9159		1.4185	
	[0.0000]		[0.0185]		[0.0000]		[0.0001]	
LLL		2.1797		1.8561		1.8111		1.7251
		[0.0003]		[0.0075]		[0.0004]		[0.0008]
LVTR(-1)	0.2546	0.2209			0.2995	0.1186		
	[0.0037]	[0.0801]			[0.0000]	[0.2338]		
LTR(-1)			-0.0721	-0.0548			-0.0414	-0.0401
			[0.2278]	[0.2441]			[0.4739]	[0.3145]
INF					0.0060	0.0058	0.0071	0.0064
					[0.0000]	[0.0073]	[0.0003]	[0.0032]
R^2	0.9998	0.9970	0.9955	0.9994	0.9999	0.9978	0.9954	0.9995
S-E	0.2259	0.3045	0.3109	0.3093	0.1524	0.2502	0.2235	0.2577

Note: The dependent variable is the market capitalisation to GDP ratio. Both cross-section and period fixed effects were applied to the regressions. The P-values are in brackets. The variables are as defined in Table 5.1.
Source: Estimated by author.

From Table 5.5 we find some interesting results in terms of the lag of the GDP growth rate. Out of the 8 regressions estimated only 3 were found to be statistically significant, of which all 3 produced a positive coefficient. As such, it is plausible to assume that, as last years GDP growth rate increases, it will positively affect the growth of the market capitalisation as a percentage of GDP. Hence, suggesting that last years GDP growth rate is an important determinant of stock market capitalisation. These results are in line with those of Garcia and Liu (1999) and Yartey (2008) in that they also found a positive and significant coefficient between last years GDP growth rate and stock market development as represented by is capitalisation ratio.

Another variable that enters all the regressions was investment rate (LGCF) in an effort to analyse its effects on stock market capitalisation. This variable produces some surprising results in that it was found to have a negative and significant coefficient with market capitalisation in regressions 2, 4 and 5. 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 last years investment rate and stock market capitalisation, and concluded that this result was inconsistent and found it not to be a good predictor of stock market capitalisation. Their result is very similar to that found in this study as we only find this negative coefficient to exist significantly in 3 out of the 8 regression. As such, we also find that last years investment rate is not a good indicator of stock market capitalisation in the SADC region.

To test the effects of financial intermediary development on market capitalisation we use two different measures. Firstly, we use last years credit to the private sector divided by GDP (LPC). From Table 5.5, it can be seen that this LPC variable has a positive and highly statistically significant impact on stock market capitalisation. For example, in regression 1, if last years credit to the private sector increases by one percentage point, market capitalisation as a percentage of GDP will increase by 1.674 percentage points. The second measure of financial intermediary development is that of last year's liquid liabilities to GDP ratio (LLL), which is used alternatively to LPC in the regression. This variable was found to also have a positive and highly significant impact on market capitalisation. For example, in regression 2, when the last years liquid liabilities to GDP ratio increases by one percentage point the

market capitalisation to GDP ratio increases by 2.179 percentage points. From these two variables it is clear that financial intermediary development has a positive effect on market capitalisation and hence stock market development which is consistent with our expectations and other authors including Garcia and Liu (1999) and Naceur *et al.* (2007). As such, this result implies that the development of financial intermediaries acts as a complement to the development of the stock market, and hence suggests that SADC member states should foster the growth of their financial intermediaries in an effort to further boost the development of their stock markets.

In terms of stock market liquidity, only one of the liquidity variables proved to have statistically significant results. The value of shares traded to GDP ratio produced a positive and statistically significant result in regressions 1, 2 and 5, while also presenting a positive but insignificant result in regression 6. As such, this result suggests that stock market liquidity does influence its development. For example, in regression 1 a one percentage point increase in the value of shares traded ratio would imply that the market capitalisation ratio would increase by 0.255 percentage points, thus presenting the positive correlation. On the other hand, the other measure of stock market liquidity, the turnover ratio, produced a negative coefficient with the market capitalisation ratio. However, the results for the turnover ratio were all found to be insignificant. Therefore, in comparing the two measures the results suggest that the value of shares traded ratio performed better as a measure of stock market liquidity, and actually plays a more influential role in determining stock market capitalisation than the turnover ratio.

Finally, in regressions 5-8 we introduce a variable to control for the impact of macroeconomic instability. This variable represents the change in price level (INF), and produced rather surprising results as it was found to have a positive and statistically significant impact on market capitalisation. This is contrary to our *a priori* expectations, as one would expect a negative correlation to exist. However, one explanation could be that as the inflation rate increases, investors seek to use the stock market to try and obtain higher returns on their savings than that offered by alternative institutions. Garcia and Liu (1999) found similar results, which lead then to question the significance of macroeconomic instability as a valuable determinant of stock market capitalisation.

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 as 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 results of this are reported in Appendix D. As can be seen in Table 1 of Appendix D, the results are very similar to those found when South Africa was included. That is, we find a positive and statistically significant coefficient for the lag of the GDP growth rate, last years credit to the private sector divided by GDP (LPC), last year's liquid liabilities to GDP ratio (LLL), the value of shares traded to GDP ratio and the macroeconomic instability variable (INF). Also, like when South Africa was included, we find a statistically negative coefficient to exist for the investment rate variable (LGCF). 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.

5.4 CONCLUSION

In sum, the results from Model 1 show us that the stock market does have a positive impact on economic growth through the liquidity channels. In particular, the value of shares traded to GDP ratio was found to have a positive and significant coefficient in three out of the four different fixed effects models run, while the turnover ratio was only found to have this same relationship in two out of the four. This empirical relationship found between stock market development and economic growth remained strong even after controlling for last years GDP growth rate, macroeconomic instability, investment, and two indicators of financial intermediary development. The control variables also provided some interesting results where their coefficients were found to be statistically significant in that; inflation, credit to the private sector and last years GDP growth rate were all found to have a consistent and negative effect on economic growth, while investment and liquid liabilities were found to have a consistent and positive coefficient. As such, it can be concluded that stock market development contributes to economic growth directly through stock market liquidity as seen by the positive influence of the value of shares traded ratio and turnover ratio towards economic growth. The results also suggest that the market capitalisation ratio, although

positive, does not significantly affect economic growth. The results from Model 2 indicate that financial intermediary development (measured by both the credit to the private sector and liquid liabilities), last years GDP growth rate, macroeconomic instability and last years value of shares traded ratio are all positively correlated to the market capitalisation ratio, and hence stock market development. However, an interesting point to take note of here is that last years turnover ratio, which is the other indicator of stock market liquidity, although found to be insignificant produced a negative relationship with market capitalisation. Thus we can conclude that last years value of shares traded to GDP ratio provides a better indicator and predictor of stock market development as measured by market capitalisation.

CHAPTER SIX

CONCLUSION, LIMITATIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

6.1 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 capitalisation 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 seven macroeconomic determinants of stock market development. Both models were estimated using a fixed effects approach within a pooled panel data framework over the period 1992-2004.

The results from the first model found that stock market development is indeed positively associated with economic growth, particularly through the liquidity provided by the market. The results from the second model which explored the determinants of stock market development found that the two indicators of financial intermediary development (LPC and LLL), the value of shares traded as a percentage of GDP (LVTR) and the macroeconomic instability variable (INF) are all important determinants of stock market development, while last years GDP growth rate and last years investment variable (LGCF) provided mixed results in addition to being found insignificant in many of the regressions. These results also suggest that financial intermediaries are complements rather than substitutes for the development of the stock market.

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, which as seen above serves as a complement for the stock market. 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.

6.2 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 Mozambique had to be omitted from the study due to a lack of available data for their stock exchange. 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. Furthermore, it enabled the study to take into account both the unobservable country-specific and period effects when analysing growth dynamics in the area under study.

6.3 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 analyse 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 cointegration model[5], and focusing on a selected range of emerging markets where data is available.

[5] See Holtz-Eakin *et al.* (1989) for a detailed study.

REFERENCES

AGARWAL, S., 2000. *Stock Market Development and Economic Growth: Preliminary Evidence from African Countries.* [Online]. Available:www.jsd-africa.com/Jsda/spring2001.pdf. [Accessed 15 June 2008].

ALLEN, D., and NDIKUMANA, L., 2000. Financial Intermediation and Economic Growth in Southern Africa. *Journal of African Economics.* 9(2): 132-160.

ARESTIS, P., and DEMETRIADES, P., 1997. Financial Development and Economic Growth: Assessing the Evidence. *The Economic Journal.* 107: 783-799.

ATJE, R., and JOVANOVIC, B., 1993. Stock Markets and Development. *European Economic Review.* 37 (2/3): 632-640.

AZIAKPONO, M., 2004. Determinants of Financial Intermediation in SACU Countries: Preliminary Evidence from a Panel Data Analysis. *Journal of Studies in Economics and Econometrics.* 28(3): 113-132.

BALTAGI, H., 2001. Econometric Analysis of Panel Data, Second Edition, New York: John Wiley and Sons LTD.

BOYD, J., and SMITH, B., 1996. The Co-evolution of the Real and Financial Sectors in the Growth Process. *World Bank Economic Review.* 10: 371-96.

BSE, 2008. *MarketStatistics.* [Online]. Available: http://www.bse.co.bw/market_n_statistics/market_statistics.php. [Accessed 20 July 2008].

CAPORALE, G., HOWELLS, P., and SOLIMAN, A., 2004. Stock Market development and Economic Growth: The Casual Linkage. *Journal of Economic Development.* 29 (1): 33-50.

CAPORALE, G., HOWELLS, P., and SOLIMAN, A., 2005. Endogenous Growth Models and Stock Market Development: Evidence from Four Countries. *Review of Development Economics.* 9 (2): 166-176.

DE GREGORIO, J., and GUIDOTTI, P., 1995. Financial Development and Economic Growth. *World Development.* 23(3): 433-48

DEMIRGUC-KUNT, A., and LEVINE, R., 1996. Stock Market Development and Financial Intermediaries: Stylised Facts. *The World Bank Economic Review.* 10: 291-321.

DEMIRGUC-KUNT, A., and MAKSIMOVIC, V., 1996. Stock Market Development and Corporate Finance Decisions. *Finance and Development.* 1:47-49.

DEVEREUX, M., and SMITH, G., 1994. International Risk Sharing and Economic Growth. *International Economic Review.* 35 (4): 535-550.

DSE, 2008. *History of the Dar es Salaam Stock Exchange.* [Online]. Available: www.darstockexchange.com/history.asp. [Accessed 24 August 2008].

DURHAM, J., 2000. Which Anomalies are Robust in Emerging and Developed Markets? *Emerging Markets Review.* 4: 50-67.

DURHAM, J., 2002. The Effects of Stock market Development on Growth and Private Investment in Lower-income Countries. *Emerging Markets Review.* 3: 211-232.

GALINDO, A., MICCO, A., and SERRA, C., 2002. "Beyond Borders: The New Regionalism in Latin America." *Economic and Social Progress in Latin America 2002 Report.* Chapter 5. New York: IADB.

GARCIA, V., and LIU, L., 1999. Macroeconomic Determinants of Stock Market Development. *Journal of Applied Economics.* 2 (1): 29-59.

GARRETSEN, H., LENSINK, R., and STERKEN, E., 2000. *Development of Stock Markets, Societal Norms and Legal Institutions.* [Online]. Available: http://ccso.eldoc.ub.rug.nl/FILES/root/2000/200002/200002.pdf. [Accessed 20 August 2008].

GREEN, C., MURINDE., V., and NGUGI, R., 2000. Key Microstructure and Policy Issues for Emerging Stock Markets: What Have We Learned? *Finance and Development Research Program Working Paper.*

GREENWOOD, J., and JOVANOVIC, B., 1990. Financial Development, Growth, and the Distribution of Income. *Journal of Political Economy.* 98: 1076-1107.

GREENWOOD, J., and SMITH, B., 1996. Financial Markets in Development and the Development of Financial Markets. *Journal of Economic Dynamics and Control.* 21: 145-81.

GRIER, K., and TULLOCK, G., 1989. An Empirical Analysis of Cross-National Economic Growth. *Journal of Monetary Economics.* 24: 259-276.

HICKS, J., 1969. *The Theory of Economic History.* Oxford: Clarendon Press.

HOLSTROM, B., and TIROLE, J., 1993. Market Liquidity and Performance Monitoring. *Journal of Political Economy.* 101: 678-709.

HOLTZ-EAKIN, D., NEWEY, W., and ROSEN, H., 1989. Estimating Vector Autoregression with Panel Data. *Econometrica.* 56:1371-1395.

HSIAO, C., 1986. *Analysis of Panel Data.* Cambridge: Cambridge University Press.

IMF, 2005. *Why are Sound Financial Systems Important?*. [Online]. Available: www.imf.org/external/np/exr/fax/banking.htm. [Accessed 15 May 2008].

IMF, 2005. *International Financial Statistics.* Washington, DC: International Monetary Fund, various issues.

INVETOPEDIA, 2008. *Stock Market Capitalisation to GDP Ratio.* [Online]. Available: http://www.investopedia.com/terms/m/marketcapgdp.asp. [Accessed 24 July 2008].

IRVING, J., 2005. *Regional Integration of Stock Exchanges in Eastern and Southern Africa: Progress and Prospects.* [Online]. Available: http://www.imf.org/external/pubs/ft/wp/2005/wp05122.pdf. [Accessed 24 August 2008].

ISLAM, N., 1995. Growth Empirics: A Panel Data Approach. *Quarterly Journal of Economics*. 110(4): 1127-70.

JAPPELLI, T., and PAGANO, M., 1994. Savings, Growth, and Liquidity Constraints. *Quarterly Journal of Economics*. 109(1): 93-109.

JSE, 2008. *The Johannesburg Securities Exchange*. [Online]. Available: http://www.jse.co.za/our_history.jsp. [Accessed 24 August 2008].

LEVINE, R., 1991. Stock Markets, Growth and Tax Policy. *Journal of Finance*. 46(4): 1445-1465.

LEVINE, R., and KING, R., 1993. Finance and Growth: Schumpeter might be right. *Quarterly Journal of Economics*. 108: 717-737.

LEVINE, R., 1996. Stock Markets: A Spur to Economic Growth. *Finance and Development*. 33(1): 7-10.

LEVINE, R., and ZERVOS, S., 1996. Stock Market Development and Long-run Growth. *The World Bank Economic Review*. 10(2).

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

LEVINE, R., and ZERVOS, S., 1998. Stock Markets, Banks, and Economic Growth. *American Economic review*. 88(3): 537-558.

LUCAS, R., 1988. On the Mechanics of Economic Development. *Journal of Monetary Economics*. 22(1): 3-42.

LUSE, 2008. *Background of the Lusaka Stock Exchange*. [Online]. Available: http://www.luse.co.zm/Background.html. [Accessed 24 August 2008].

MAPSOFWORLD, 2008. *The Zimbabwe Stock Exchange*. [Online]. Available: http://finance.mapsofworld.com/stock-market/zimbabwe-stock-exchange.html. [Accessed 24 August 2008].

MBENDI, 2008. *Zimbabwe Stock Exchange: General Information.* [Online]. Available: http://www.mbendi.co.za/exch/11/p0005.htm. [Accessed 24 August 2008].

MCKINNON, R., 1988. Financial Liberalisation in Retrospect: Interest Rate Policies in LDCs. *The State of Development Economics.* New York: Blackwell.

MOHTADI, H., and AGARWAL, S., 2000. Stock Market development and Economic Growth: Evidence from Developing Countries. *African Development Review.*18(1): 123-143.

MUNYUKWI, 2008. *SADC's Infant Stock Exchanges Show Potential.* [Online]. Available: http://www.sardc.net/Editorial/sadctoday/v4-2-12-2000/v4-2-11-2000-5.htm. [Accessed 18 August 2008].

MSE, 2008. *Market Information.* [Online]. Available: http://www.mse.co.mw/marketinformation. [Accessed 24 July 2008].

NACEUR, S., GHAZOUANI, S., and OMRAN, M., 2007. The Determinants of Stock Market Development in the Middle-Eastern and North African Region. *Managerial Finance.* 33(7): 477-489.

NDIKUMANA, L., 2006. Potential for Regional Market Development and Integration in Africa: Issues and Challenges. *Draft for UNECA.* 1: 1-32.

NSX, 2008. *History of the Namibian stock exchange.* [Online]. Available: http://www.nsx.com.na/about.php. [Accessed 24 August 2008].

OBSTFELD, M., 1994. Risk-Taking, Global Diversification, and Growth. *American Economic Review.* 84:1310-1329.

OKEAHALAM, C., 2005. Strategic Alliances and Mergers of Financial Exchanges: The Case of the SADC. *Journal of Southern African Studies.* 31 (1): 75-93.

PAGANO, M., 1993. Financial Markets and Growth: An Overview. *European Economic Review.* 37 (2-3): 613-622.

ROBINSON, J., 1952. The Generalisation of the General Theory. *The Rate of Interest and Other Essays*. London: Macmillan.

ROUSSEAU, P., and WACHTEL, P., 2000. Equity Markets and Growth: Cross Country Evidence on Timing and Outcomes. *Journal of Banking and Finance*. 24:1933-57.

ROUSSEAU, P., and SYLLA, R., 2001. Financial Systems, Economic Growth and Globalisation. *NBER working paper 8323*.

SADCREVIEW, 2007. *SADC Corporate profile*. [Online]. Available: www.sadcreview.com/sadc/sadc_profile.htm. [Accessed 16 April 2007].

SCHUMPETER, J., 1912. *The Theory of Economic Development*. Leipzig, Germany: Dunker & Humblot.

SEMDEX, 2008. *History and Origin of the Stock Exchange of Mauritius*. [Online]. Available: www.semdex.com/index.htm. [Accessed 18 August 2008].

SENBET, L., 2001. "Global Financial Crisis: Implications for Africa." *Journal of African Economies*. 10: 104-140.

SINGH, A., 1997. Stock Markets, Financial Liberalisation and Economic Development. *Economic Journal*. 107: 771-782.

SINGH, A., 1999. Should Africa Promote Stock Market Capitalism? *Journal of International Development*. 11: 343-365.

SSX, 2008. *Background of the Swaziland Stock Exchange*. [Online]. Available: http://www.ssx.org.sz/index.php?option=com_content&task=view&id=5&Itemid [Accessed 24 August 2008].

STIGLITZ, J., 1985. Credit Markets and the Control of Capital. *Journal of Money Credit and Banking*. 17(2): 133-152.

STIGLITZ, J., 1993. The Role of the State in Financial Markets. *Proceedings of the Annual Bank Conference on Development Economics*. pp.19-52.

TUNCER, G., and ALOVSAT, M., 1998. Stock Markets and Economic Growth: A Causality Test. *Dogus University Journal.* 2: 124-132.

WORLD BANK, 2008. *World Development Indicators.* [Online]. Available: http://publications.worldbank.org/ecommerce/catalog/product?item_id=631625. [Accessed 20 July 2008].

YARTEY, C., and ADJASI, 2007. *Stock Market Development in Sub-Saharan Africa: Critical Issues and Challenges.* [Online]. Available: http://www.imf.org/external/pubs/ft/wp/2007/wp07209.pdf. [Accessed 15 May 2008].

YARTEY, C., 2008. *The Determinants of Stock Market Development in Emerging Economies: Is South Africa Different?* [Online]. Available: http://www.imf.org/external/pubs/ft/wp/2008/wp0832.pdf. [Accessed 15 May 2008].

Appendix A: Summary of empirical studies on the relationship between stock market development and economic growth.

Author and year	Countries covered	Year of cover	Method and data used	Measure of stock market used	Summary of findings
Levine and Zervos (1996)	41 Countries	1976-1993	Pooled, cross-country, and time-series regressions	Stock market capitalisation ratio (MCR)	Found a strong correlation between stock market development and economic growth. And that stock market development played a more influential role towards growth than other financial variables. However stressed the need for additional work on this relationship.
Arestis and Demetriades (1997)	USA and Germany	1979-1991	Time-series regressions and Johansen cointegration	MCR, log of real GDP per capita, an index of stock market volatility, and the log of M2 to GDP ratio	Their results revealed that there is a high possibility of differences in aspects of the financial system between countries, and the impact on economic growth
Levine and Zervos (1998)	47 Countries	1976-1993	Cross-country regressions	Turnover, value added, MCR, volatility	Found that after controlling for other factors which may affect growth, the stock market and its development plays a positive role towards economic growth.
Levine and Zervos (1998)	24 Countries	1976-1993	Pooled, cross-sectional, time-series regressions	MCR	Found a strong positive correlation between international capital market integration and economic growth.
Tuncer and Alovsat (1998)	20 Countries	1981-1994	Time series data, panel data and causal relations, sim's causality test	MCR	Results showed a two-way causation relationship between stock market development and economic growth, while producing inconclusive evidence on country-specific analysis. However, their findings supported a stronger relationship between stock market development and economic growth in developing countries.
Levine (1996)	38 Countries	1976-1993	OLS regression analysis	Stock market liquidity indicators	Found stock market liquidity to be vital for economic growth even after controlling for other factors that may affect growth.
Mohtadi and Agarwal (2000)	21 Countries	1977-1997	Dynamic panel data approach	Stock market liquidity indicators, MCR, & value of shares traded	Found a positive relationship between numerous indicators of stock market development and economic growth, both directly and indirectly.
Durham (2002)	64 Countries	1981-1998	Cross-country regression analysis	Stock market development indicators and MCR	Found stock market development to have a positive impact on growth for greater levels of *per capita* GDP in the long-term, while in the short-term, a boost in private investment illustrated similar results.
Caporale *et al.* (2004)	7 Countries	1977-1998	VAR causality tests and time-series analysis	MCR and value added ratio	Found that well-developed stock markets boost economic growth in the long-run. Also noted the importance of stock markets towards overall financial development.
Caporale *et al.* (2005)	4 Countries	1979-1998	VAR causality tests	MCR	Found that investment productivity is a major channel through which stock markets enhance economic growth.

Garcia and Liu (1999)	15 Countries	1980-1995	Pooled data analysis	Focused on the determinants of stock market capitalisation	Their results revealed that the savings rate, the level of real income, financial intermediary development, and stock market liquidity all impacted on predicting stock market capitalisation to some degree, while the level of macroeconomic stability did not prove to have a significant impact
Naceur *et al.* (2007)	12 Countries	1990-2002	Unbalanced panel data	Focused on the determinants of stock market capitalisation	Their results illustrated that the savings rate, financial intermediary development, stock market liquidity, and the stabilisation variable (inflation change) proved to be significant as determinants of stock market development, while real income and the investment rate was found to be insignificant
Yartey (2008)	42 emerging countries	1990-2004	Panel dataset approach	Focused on the macroeconomic and institutional determinants of stock market capitalisation	Revealed that real income, domestic investment, private capital flows, banking sector development, and stock market liquidity proved to be significant determinants of stock market development in emerging markets. Furthermore, the institutional elements including that of political risk, law and order, democratic and bureaucratic quality were found to be important determinants of stock market development

Note: MCR stands for the stock market capitalisation ratio, GDP is the gross domestic product, OLS is ordinary least squares and VAR refers to vector auto regressions.

Appendix B: Country-specific descriptive statistics from 1992-2004

Table 1: Country-specific descriptive statistics

	GDP		INF		LGCF		LLL		LPC		LMCR		LVTR		LTR	
	Mean	Std.D.	Mean	Std.D.	Mean	Std.D.	Mean	Std.D.	Mean	Std.D.	Mean	Std.D.	Mean	Std.D.	Mean	Std.D.
Botswana	4.9550	1.6131	8.0846	4.0455	3.4691	0.1834	2.7983	0.3865	2.1146	0.3895	2.5817	0.5750	-0.2170	0.3903	1.8065	0.5060
Malawi	2.4750	7.3980	33.0162	21.8280	2.7842	0.2463	2.9172	0.1599	1.6519	0.3371	2.1300	0.0966	-0.5128	0.5601	1.9623	0.6024
Mauritius	5.0425	1.0199	6.0162	1.5850	3.2625	0.1131	4.2719	0.0548	3.8495	0.1483	3.4092	0.3583	0.5077	0.5523	1.7037	0.3176
Namibia	3.5683	2.3707	9.3638	5.4208	3.1039	0.1506	3.6483	0.1455	3.4959	0.1331	1.9566	0.8448	-1.2976	1.2040	1.1598	1.0167
South Africa	2.2317	1.7156	8.9131	2.7414	2.7950	0.0693	3.7014	0.0662	4.0953	0.0976	4.9777	0.1867	3.3805	0.8885	3.0080	0.8408
Swaziland	2.9825	0.9206	11.7508	3.4384	3.0114	0.1030	3.2261	0.1253	2.7882	0.1804	2.8639	0.5920	-1.4420	3.4577	-0.0631	3.6182
Tanzania	3.9933	2.1901	16.1623	8.8590	2.9424	0.1913	3.0453	0.1324	1.6815	0.4594	0.9762	0.2082	-1.9784	1.0045	1.6509	1.1503
Zambia	1.7583	4.6297	47.4523	49.3561	2.8418	0.2668	2.6970	0.2074	1.7935	0.2273	2.0869	0.5430	-1.4022	0.9595	1.1160	1.1719
Zimbabwe	-0.9700	6.6716	95.3269	129.8898	2.7614	0.3319	3.5335	0.1210	2.9540	0.1031	3.4230	0.4565	1.1470	1.1539	2.2716	0.7251

Notes: GDP – gross domestic product growth rate, LGCF – is the log of gross capital formation which is used as a proxy for investment, LLL – is the log of liquid liabilities, LPC – is the log of private sector credit, LMCR – is the log of the market capitalisation to GDP ratio, LVTR – is the log of the value of shares traded to GDP ratio and LTR – is the log of the turnover ratio.
Source: Estimated by author.

Appendix C: Model 1 regressions run without South Africa

Table 1: Stock market development and growth (With no fixed effects)

	Cross-section weights			Period weights		
	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
c	-18.9519	-18.98262	-19.11221	-18.48132	-20.70099	-20.03974
	[0.000]	[0.000]	[0.000]	[0.0023]	[0.0014]	[0.0013]
LMCR	-0.010313			-0.492944		
	[0.9683]			[0.3632]		
LVTR		0.026088			-0.139081	
		[0.7829]			[0.5453]	
LTR			-0.030935			-0.148552
			[0.737]			[0.4962]
INF	-0.038236	-0.03848	-0.036822	-0.035452	-0.037485	-0.038703
	[0.000]	[0.0001]	[0.0001]	[0.0011]	[0.0008]	[0.0002]
LGCF	6.301316	6.362505	6.272637	6.544566	6.742235	6.68273
	[0.000]	[0.000]	[0.000]	[0.0001]	[0.0001]	[0.0001]
LPC	-2.583158	-2.548744	-2.582293	-2.316001	-2.858061	-2.983944
	[0.0005]	[0.0007]	[0.0004]	[0.0322]	[0.005]	[0.005]
LLL	3.84859	3.765498	3.857425	3.650644	4.209191	4.256279
	[0.0004]	[0.0011]	[0.0005]	[0.0256]	[0.0125]	[0.0124]
GDP(-1)	-0.494465	-0.493065	-0.446334	-0.499764	-0.530949	-0.523114
	[0.006]	[0.0058]	[0.0105]	[0.0127]	[0.0078]	[0.0085]
R^2	0.942228	0.952464	0.953154	0.842135	0.837087	0.836535
S-E	1.333824	1.360528	1.38239	1.465587	1.4779	1.474746

Notes: The dependent variable is the annual GDP growth rate. P-values are in brackets. S-E stands for the standard error of the regression. The variables are as defined in Table 5.1.
Source: Estimated by author.

Appendix C continued:

Table 2: Stock market development and growth (With cross-section fixed effects)

	Cross-section weights			Period weights		
	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
c	-8.474196	-5.897403	-9.332711	-7.606499	-4.969743	-5.942891
	[0.2646]	[0.4205]	[0.1723]	[0.3658]	[0.5758]	[0.5132]
LMCR	0.838928			0.936729		
	[0.1906]			[0.482]		
LVTR		0.167041			0.220753	
		[0.1443]			[0.4191]	
LTR			0.158951			0.154113
			[0.1374]			[0.5455]
INF	-0.030911	-0.027461	-0.027101	-0.030045	-0.02842	-0.029093
	[0.0244]	[0.0338]	[0.037]	[0.0149]	[0.0176]	[0.0184]
LGCF	8.505492	8.057745	9.033347	10.41002	9.726855	8.960121
	[0.005]	[0.0019]	[0.0006]	[0.0242]	[0.0168]	[0.0219]
LPC	0.67518	1.907259	3.181632	2.339175	3.169707	3.281009
	[0.7514]	[0.3547]	[0.1876]	[0.4256]	[0.3138]	[0.3563]
LLL	-4.648468	-5.391599	-6.215804	-7.913644	-7.990343	-7.164902
	[0.219]	[0.1166]	[0.0848]	[0.1861]	[0.1702]	[0.2189]
GDP(-1)	-0.403472	-0.324265	-0.438441	-0.52222	-0.509937	-0.541164
	[0.0954]	[0.1514]	[0.0872]	[0.0317]	[0.0322]	[0.031]
R^2	0.964074	0.977083	0.984599	0.919641	0.923778	0.917299
S-E	1.386703	1.372261	1.422006	1.549268	1.54791	1.566063

Notes: The dependent variable is the annual GDP growth rate. P-values are in brackets. S-E stands for the standard error of the regression. The variables are as defined in Table 5.1.
Source: Estimated by author.

Appendix C continued:

Table 3: Stock market development and growth (With period fixed effects)

	Cross-section weights			Period weights		
	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
c	-19.26788	-21.39724	-19.27054	-17.18769	-22.36246	-18.51254
	[0.000]	[0.0003]	[0.0002]	[0.0077]	[0.0039]	[0.0086]
LMCR	-0.251818			-0.756459		
	[0.4534]			[0.2127]		
LVTR		-0.110095			-0.311345	
		[0.5269]			[0.2919]	
LTR			-0.03562			-0.14932
			[0.788]			[0.5467]
INF	-0.034416	-0.034385	-0.038047	-0.027497	-0.027947	-0.033732
	[0.0004]	[0.0005]	[0.000]	[0.0176]	[0.0328]	[0.0031]
LGCF	6.613084	6.870361	6.420252	6.156268	6.807041	6.158837
	[0.000]	[0.000]	[0.000]	[0.0009]	[0.0005]	[0.0014]
LPC	-2.484709	-2.790566	-2.575732	-2.031283	-2.953908	-2.870597
	[0.0017]	[0.0014]	[0.0012]	[0.0554]	[0.006]	[0.0131]
LLL	3.781072	4.183944	3.813092	3.356112	4.453886	3.973242
	[0.0012]	[0.0027]	[0.0022]	[0.0405]	[0.0146]	[0.0302]
GDP(-1)	-0.520551	-0.515537	-0.49387	-0.30756	-0.359372	-0.351042
	[0.0096]	[0.0028]	[0.0018]	[0.1934]	[0.1324]	[0.1412]
R^2	0.945605	0.95064	0.95693	0.857469	0.850071	0.840653
S-E	1.378719	1.369934	1.457029	1.490168	1.4908	1.527916

Notes: The dependent variable is the annual GDP growth rate. P-values are in brackets. S-E stands for the standard error of the regression. The variables are as defined in Table 5.1.
Source: Estimated by author.

Appendix C continued:

Table 4: Stock market development and growth (With both cross-section and period fixed effects)

	Cross-section weights			Period weights		
	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
c	-17.79947	-15.48013	-12.96863	-14.14052	-11.08046	-10.04944
	[0.0529]	[0.0921]	[0.1023]	[0.2546]	[0.4007]	[0.3676]
LMCR	-0.746412			-0.665873		
	[0.6903]			[0.7744]		
LVTR		0.018244			0.054854	
		[0.94]			[0.8797]	
LTR			0.100857			0.114403
			[0.4188]			[0.6688]
INF	-0.02333	-0.027724	-0.029665	-0.016744	-0.021351	-0.0212
	[0.1529]	[0.0443]	[0.0212]	[0.3661]	[0.1579]	[0.127]
LGCF	9.508741	9.859238	9.503972	9.935459	10.46211	10.25501
	[0.0327]	[0.016]	[0.0167]	[0.0505]	[0.0344]	[0.0336]
LPC	1.531738	1.098725	2.273343	4.348764	3.88754	4.523736
	[0.6279]	[0.7079]	[0.4784]	[0.2802]	[0.2889]	[0.2479]
LLL	-2.030907	-3.243656	-4.598177	-5.990119	-7.484841	-8.155861
	[0.7006]	[0.4328]	[0.2945]	[0.3786]	[0.2504]	[0.1937]
GDP(-1)	-0.590321	-0.613854	-0.640549	-0.41427	-0.44839	-0.457601
	[0.0381]	[0.0193]	[0.0208]	[0.1737]	[0.1359]	[0.1251]
R^2	0.964863	0.963172	0.958913	0.934063	0.931696	0.935987
S-E	1.560802	1.559831	1.560545	1.662227	1.662766	1.652755

Notes: The dependent variable is the annual GDP growth rate. P-values are in brackets. S-E stands for the standard error of the regression. The variables are as defined in Table 5.1.
Source: Estimated by author.

Appendix D: Model 2 regressions run without South Africa

Table 1: Regressions on the determinants of market capitalisation from pooled data (excluding SA)

	1	2	3	4	5	6	7	8
GDP(-1)	-0.0149	0.0301	-0.0581	-0.0227	0.0249	0.0641	0.0251	0.0609
	[0.3219]	[0.3197]	[0.2315]	[0.6260]	[0.0712]	[0.1042]	[0.5309]	[0.1544]
LGCF(-1)	-0.4512	-1.1627	-0.0127	-1.0954	-0.1111	-0.4941	0.4579	-0.0552
	[0.2101]	[0.0254]	[0.9820]	[0.0962]	[0.3644]	[0.3340]	[0.3397]	[0.9128]
LPC	1.7827		1.0808		1.9046		1.4016	
	[0.0000]		[0.0348]		[0.0000]		[0.0005]	
LLL		2.3023		1.7382		2.0084		1.5949
		[0.0011]		[0.0397]		[0.0014]		[0.0066]
LVTR(-1)	0.3056	0.3476			0.2996	0.2626		
	[0.0075]	[0.0208]			[0.0000]	[0.0980]		
LTR(-1)			-0.0871	-0.0858			-0.0467	-0.0581
			[0.1746]	[0.1853]			[0.4321]	[0.2579]
INF					0.0058	0.0044	0.0072	0.0065
					[0.0002]	[0.0500]	[0.0009]	[0.0073]
R^2	0.9988	0.9992	0.9552	0.9894	0.9997	0.9965	0.9913	0.9950
S-E	0.2424	0.3147	0.3406	0.3472	0.1642	0.2772	0.2393	0.2940

Note: The dependent variable is the market capitalisation to GDP ratio. Both cross-section and period fixed effects were applied to the regressions. The P-values are in brackets. The variables are as defined in Table 5.1.
Source: Estimated by author.