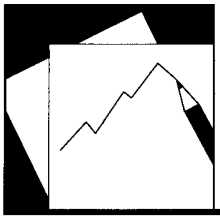
WP/08/32



IMF Working Paper

The Determinants of Stock Market Development in Emerging Economies: Is South Africa Different?

Charles Amo Yartey

INTERNATIONAL MONETARY FUND

© 2008 International Monetary Fund WP/08/32

IMF Working Paper

African Department

The Determinants of Stock Market Development in Emerging Economies: Is South Africa Different?

Prepared by Charles Amo Yartey [1]

Authorized for distribution by George Tsibouris

February 2008

Abstract

This Working Paper should not be reported as representing the views of the IMF.
The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

This paper examines the institutional and macroeconomic determinants of stock market development using a panel data of 42 emerging economies for the period 1990 to 2004. The paper finds that macroeconomic factors such as income level, gross domestic investment, banking sector development, private capital flows, and stock market liquidity are important determinants of stock market development in emerging market countries. The results also show that political risk, law and order, and bureaucratic quality are important determinants of stock market development because they enhance the viability of external finance. This result suggests that the resolution of political risk can be an important factor in the development of emerging stock markets. The analysis also shows the factors identified above as determining stock market development in emerging economies can also explain the development of the stock market in South Africa.

JEL Classification Numbers: G20 G28 O55
Keywords: Stock markets, Emerging markets, Political risk, South Africa
Authors E-Mail Address: Cyartey@imf.org

[1] I would like to thank Jerome Vacher, Kadima Kalonji, and Rainer Koehler for useful comments and suggestions. The usual caveat for responsibility still applies.

Contents Page

I. Introduction 3

II. Stock Markets and Economic Growth: Theoretical and Analytical Issues 4

III. Stock Market Development in Emerging Markets 6

IV. The Stock Market in South Africa 10
A. Market Development 10
B. Structure, Operations, and Regulation 11
C. Main Characteristics 11
Market Size 11
Market Depth 13

V. Methodology and Data 13
A. The Calderon-Rossell Model 13
B. The Modified Calderon-Rossell Model 14
C. The Data 15
Dependent Variable: Stock Market Development 15
Income Level 15
Banking Sector Development 15
Savings and Investment 16
Stock Market Liquidity 16
Macroeconomic Stability 16
Private Capital Flows 17
Institutional Quality 17
D. Estimation Method 19

VI. Results and Discussion 20
A. Macroeconomic Determinants of Stock Market Development 20
B. Institutional Quality and Stock Market Development 22
C. Explaining Stock Market Development in Emerging Markets: Is South Africa Different? 25
D. Summary and Conclusion 27
References 29

Tables
1. Indicators of Stock Market Development, 1990–2004 8
2. Macroeconomic Factors and Stock Market Development 21
3. Institutional Determinants of Stock Market Development 24
4. South Africa: The Determinants of Stock Market Development 26

Figures
1. Stock Market Development in Emerging Markets, 1990–2004 6
3. South Africa: Indicators of Stock Market Development, 1990–2004 13

I. INTRODUCTION

Over the past few decades, the world stock markets have surged, and emerging markets have accounted for a large amount of this boom. The speed and extent of stock market development in developing countries have been unprecedented and have led to fundamental shift both in the financial structures of less developed countries and in the capital flows from developed nations. A key indicator of stock market development, the capitalization ratio (market capitalization as a proportion of GDP) rose at an unprecedented rate in leading developing economies during the 1980s and the 1990s climbing from 10 to over 84 percent of GDP in countries such as Chile in the course of two decades decade.

New theoretical research works show that stock market development might boost economic growth and empirical evidence tends to provide some support to this assertion. Levine and Zervos (1998), for instance, find that stock market development plays an important role in predicting future economic growth.

This paper studies the macroeconomic and institutional determinants of stock market development in emerging economies using a panel dataset of 42 countries for the period 1990 to 2004. Specifically, the paper examines the impact of domestic savings, investment, stock market liquidity, macroeconomic stability, private capital flows, banking sector development, and institutional quality on stock market development.

Demirguc-Kunt and Levine (1996) have found that most stock market indicators are highly correlated with banking sector development. Countries with well-developed stock markets tend to have well-developed banking sector. We investigate if this positive relationship between banking sector development and stock market development could be observed in emerging economies. We use market capitalization as a percentage of GDP to measure stock market development because we believe it is a good proxy and less arbitrary than other individual measures of stock market development.[2]

The paper looks at the impact of institutional quality on stock market development because it widely believed that the strengthening of property rights could broaden appeal and confidence in stock market investment. Equity investment thus becomes gradually more attractive as political risk is resolved over time (Perotti and Van Oijen, 2001). Therefore, the development of good quality institutions can affect the attractiveness of equity investment and lead to stock market development. The analysis on the impact of institutional quality on stock market development is related to the recent literature on the link between the legal institutional framework and corporate finance. Laporta et al (1997) find that countries with lower quality of legal rules and law enforcement have smaller and narrower capital markets and that the listed firms on their stock markets are characterized by more concentrated ownership. Demirguc-Kunt and Maksimovic (1998) show that firms in countries with high ratings for the effectiveness of

[2] Other indicators of stock market development that has been used in the literature include the number of listed companies, changes in the stock market index, and an index of stock market size and liquidity.

their legal systems are able to grow faster by relying more on external finance. The analysis in this paper contributes to this literature by looking at the relationship between stock market development and political risk, a measure of the institutional framework that supports the viability of external finance.

The results show that political risk and institutional quality are strongly associated with growth in stock market capitalization. These results suggest that the development of good quality institutions (resolution of political risk) can be an important factor in the development of stock markets in emerging markets. This result also has implication for the analysis of financial market integration, of which political risk is one of the main barriers. Erb et al (1996), for instance, show that expected returns are related to the magnitude of political risk. They find that in both developing and developed countries, the lower the level of political risk, the lower is required returns.[3] Our result, in addition to Erb's finding suggests that political risk is an important factor in investment decisions and that it strongly affects the local cost of equity, which may have important implications for stock market development.

The remainder of the paper is organized as follows. Section II discusses the literature on stock markets and economic growth. Section III examines the main characteristics of stock markets in emerging market countries. Section IV describes the development of the stock market in South Africa. Section V explains the methodology and discusses the indicators of macroeconomic and institutional determinants of stock market development. Section VI describes the empirical results. Section VII concludes the paper.

II. Stock Markets and Economic Growth: Theoretical and Analytical Issues

In principle, stock markets are expected to accelerate economic growth by providing a boost to domestic savings and increasing the quantity and the quality of investment. In particular, stock markets can encourage economic growth by providing an avenue for growing companies to raise capital at lower cost. In addition, companies in countries with developed stock markets are less dependent on bank financing, which can reduce the risk of a credit crunch. The stock market is also expected to perform an 'act of magic' by permitting long term investment to be financed by funds provided by individuals, many of whom wish to make them available for only a very limited period, or who wish to be able to withdraw them at will (Baumol, 1965).[4] Better savings mobilization may increase the savings rate. If efficient stock markets enable savings to be allocated to investment projects with higher returns, the rate of return to savers increases, making savings more attractive. As a result, more savings are channelled to the corporate sector. The stock market is also expected to ensure through the takeover mechanism that past investments are also most efficiently used. Theoretically, a free market in corporate control, by providing financial discipline, is expected to provide the best guarantee of efficiency in the use

[3] De Santis and Imrohoroglu (1997) report that emerging financial markets exhibit a higher conditional probability of large price changes than developed stock markets. There may be a role for political risk in explaining this difference in magnitude, as policy changes tend to have a large systemic effect.

[4] For an excellent exposition of the stock market and economic efficiency see Baumol, 1965.

of assets. The presumption is that, if management does not maximize firm value, another economic agent may take control of the firm, replace management, and reap the gains from a more efficient firm.

Critics of the stock market, however, argue that the actual operation of the pricing and takeover mechanism even in well functioning stock markets lead to short termism and lower rates of long term investment particularly in firm specific human capital. It also generates perverse incentives, rewarding managers for their success in financial engineering rather than creating new wealth through organic growth (Singh, 1997). In addition, empirical evidence shows that the takeover mechanism does not perform a disciplinary function and that competitive selection in the market for corporate control takes place much more on the basis of size rather than performance (Singh, 1971). Therefore, a large inefficient firm has a higher chance of survival than a small relatively efficient firm.

Critics further argue that stock market liquidity may negatively influence corporate governance because very liquid stock market may encourage investor myopia. Since investors can easily sell their shares, more liquid stock markets may weaken investors' commitment and incentive to exert corporate control (Bhide, 1994). These problems are further magnified in emerging market countries with their weaker regulatory institutions and greater macroeconomic volatility. These serious limitations of the stock market have had led many analysts to question the importance of the system in promoting economic growth in emerging markets.

Empirical evidence linking stock market development to economic growth has been inconclusive even though the balance of evidence is in favor of a positive relationship between stock markets and economic growth. Levine and Zervos (1998) find that various measures of stock market activity are positively correlated with measures of real economic growth across countries, and that the association is particularly strong for developing countries. Their results also show that after controlling for initial conditions and economic and political factors, the measures of banking and stock market development are robustly correlated with current and future rates of economic growth and productivity improvement. Durham (2002), on the other hand, finds that the positive impact of stock market development is largely dependent on the inclusion of higher income countries in the regression samples, which limits the relevance for lower income countries. He provides evidence that indicates that stock market development has a more positive impact on growth for greater levels of GDP per capita, lower levels of country credit risk, and higher levels of legal development.

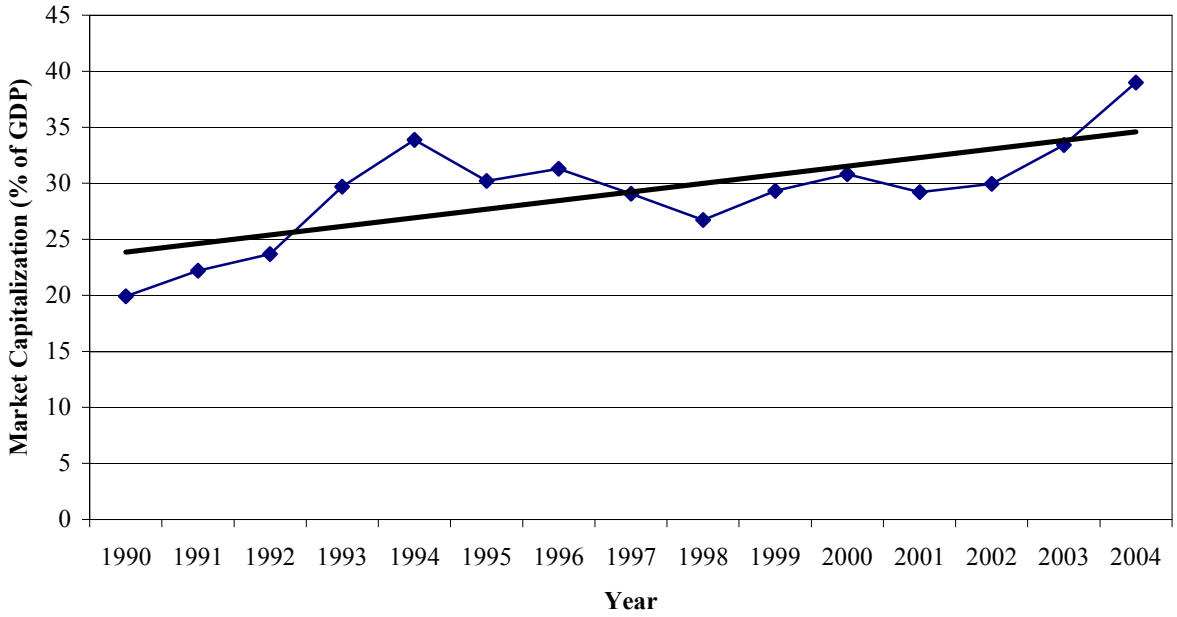
While the question of whether stock markets promote growth has gained considerable attention in academic and policy discussions, there is little theoretical and empirical work on the determinants of stock market development in emerging markets. Calderon-Rossell (1991) developed a partial equilibrium model of stock market growth. This model, to date model represents the most comprehensive attempt to develop the foundation of a financial theory of stock market development. Recent works tend to focus on the role of financial liberalization in promoting stock market development. Mishkin (2001) argued that financial liberalization promotes transparency and accountability, reducing adverse selection and moral hazard. These improvements tend to reduce the cost of borrowing in stock markets which eventually increase the liquidity and the size of the stock market.

Garcia and Liu (1999) examined the macroeconomic determinants of stock market development in a sample of Latin American and Asian countries. The results show that GDP growth, domestic investment, and financial intermediary sector development are important factors. Yartey (2007) finds that a percentage point increase in financial intermediary sector development tends to increase stock market development in Africa by 0.6 points controlling for macroeconomic stability, economic development, and the quality of legal and political institutions. El-Wassal (2005) investigates the relationship between stock market growth and economic growth, financial liberalization, and foreign portfolio investment in 40 emerging markets between 1980 and 2000. The result shows that economic growth, financial liberalization policies, and foreign portfolio investments were the leading factors of the emerging stock markets growth.

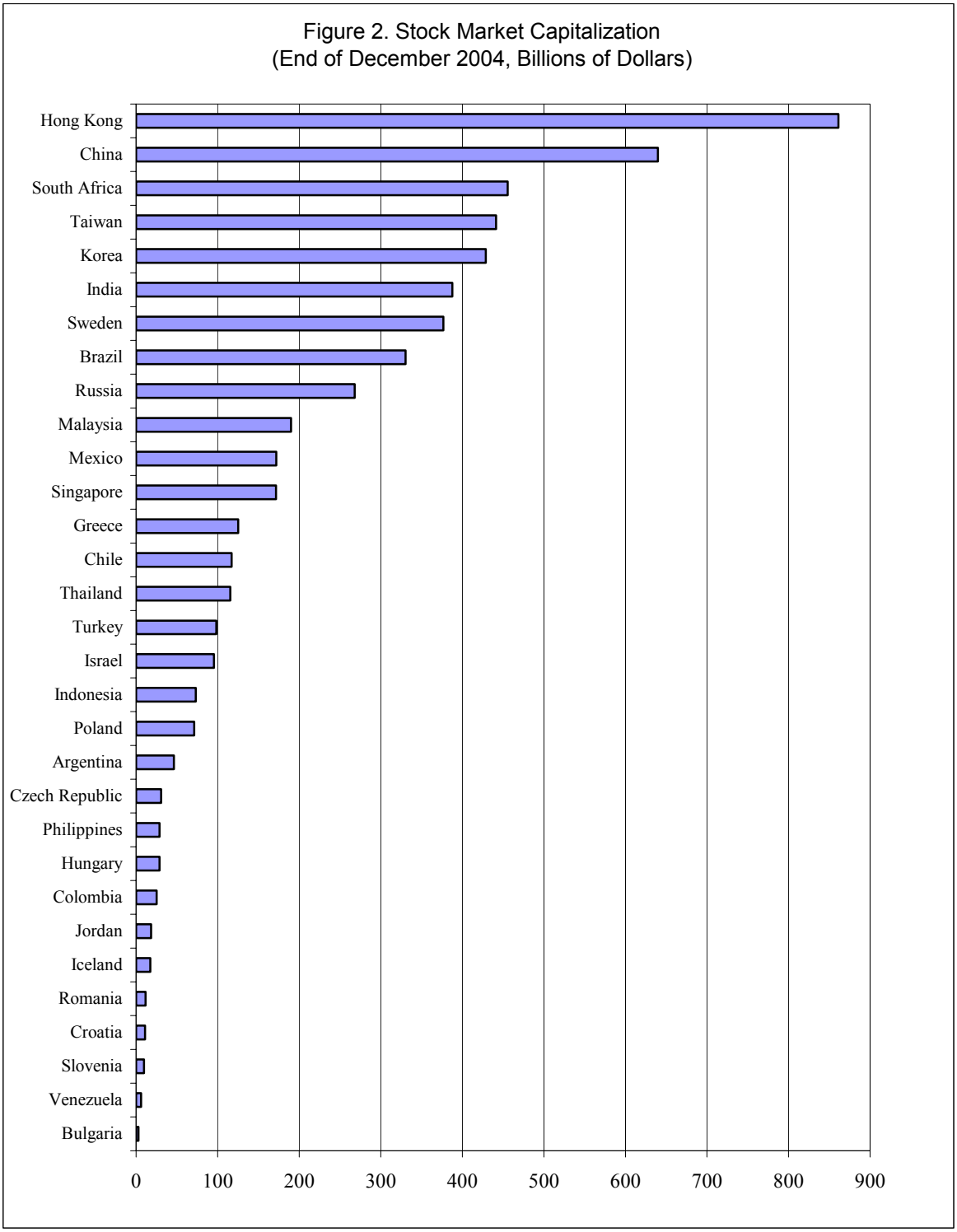
III. Stock Market Development in Emerging Markets

The stock markets in emerging markets have seen considerable development since the early 1990s. The market capitalization of emerging market countries has more than doubled over the past decade growing from less than $2 trillion in 1995 to about $5 trillion in 2005. As a percentage of world market capitalization, emerging markets are now more than 12 percent and steadily growing (Standard and Poor, 2005)**.** Figure 1 shows the growth of stock market in our sample of emerging market. As we can see market capitalization as a percentage of GDP has increased from about 20 percent in 1990 to about 40 percent in 2004.

Figure 1. Stock Market Development in Emerging Markets, 1990–2004



Notes: Based on averages of a sample of 42 emerging market countries. See Table 1 for the full list of countries.



Source: IMD World Competitiveness Database.

Note: We include Sweden in order to provide a developed country comparison to the market capitalization of emerging markets.

Table 1. Indicators of Stock Market Development, 1990–2004

Country	Number of Listed Companies	Market Capitalization (% of GDP)	Value Traded (% of GDP)	Turnover Ratio (%)	GDP Per Capita ($)
Argentina	139	31	4	23	7193
Bangladesh	194	3	1	44	327
Bolivia	19	10	0.1	1	967
Botswana	14	14	1	3	2739
Brazil	497	27	13	46	3324
Bulgaria	349	4	0.6	15	1585
Chile	259	84	8	9	4443
China	723	20	25	156	793
Colombia	127	14	1	8	2002
Costa Rica	70	12	1	7	3735
Czech	488	20	9	46	5228
Ecuador	53	8	0.4	7	1344
Egypt	817	20	4	24	1375
Ghana	20	15	1	3	240
Hungary	45	17	11	53	4236
India	4811	30	34	81	406
Indonesia	250	20	8	49	791
Jamaica	45	46	3	4	3150
Jordan	131	71	3	4	3150
Kenya	55	15	1	3	423
Malaysia	636	170	81	41	3538
Mexico	185	27	10	35	5433
Morocco	55	22	3	14	1189
Nigeria	179	9	1	5	363
Pakistan	698	15	23	168	514
Panama	21	19	1	2	3642
Paraguay	45	3	0.2	6	1462
Peru	238	18	4	22	1936
Philippines	206	46	13	25	958
Poland	136	10	4	69	3764
Romania	3251	4	1	36	1749
S. Arabia	69	41	25	59	8908
Slovak	450	7	5	96	3557
Slovenia	41	12	3	24	8666
South Africa	604	147	35	31	3039
Sri Lanka	222	14	2	13	757
Thailand	383	50	40	85	1944
Tunisia	33	11	2	9	1854
Turkey	230	22	32	134	2777
Uruguay	19	1	0.1	1.05	5774
Venezuela	80	10	2	19	4901
Zimbabwe	67	38	5	12	596

Sources: World Development indicators; and author's calculations.

Figure 2 shows a ranking of stock market capitalization in emerging markets countries. As we cam see, stock market capitalization has very little to do with the size of a country. China, which has the largest economy by far among these countries, has a smaller market capitalization than Hong Kong. South Africa and Taiwan approach China in terms of stock market capitalization despite vastly smaller population and GDP. These numbers are, however, dwarfed by the United States, which has a total stock market capitalization of around $20 trillion, or 30 times greater than that of South Korea. One company, General Electric, has a market capitalization closer to that of Taiwan and Mexico.

To understand the economic importance of the stock market in our sample, we examine the capitalization ratio. The capitalization ratio is defined as the value of domestic equities traded on the stock market relative to GDP. As we can observe from Table 1, stock market development indicators exhibit a considerable variability across countries, according to the capitalization ratio. The top five countries are Malaysia, South Africa, Chile, Jordan, and Thailand. The lowest ratios occur in countries such as Bulgaria and Venezuela.

Stock market development has been central to the domestic financial liberalization programs of most emerging markets. Apart from their role in domestic financial liberalization, the stock markets have also been very important in recent years as a major channel for foreign capital flows to emerging economies. Net equity flows to the emerging markets have grown to roughly $200 billion per year, providing an important source of capital for development. The share of foreign direct investment and portfolio equity in the finance mix of many developing countries has grown in recent years. Equity flows accounted for 80 percent of total external financing to developing nations during 1999–2003, compared with just 60 percent during 1993–98 (Global Development Finance, 2005).

The rapid development of stock markets in emerging market does not mean that even the most advanced emerging stock markets are mature. In most stock markets, trading occurs in only a few stocks which account for a considerable part of the total market capitalization. Beyond these actively traded shares, there are serious informational and disclosure deficiencies for other stocks. There are serious weaknesses in the transparency of transactions on these markets. The less developed of the stock markets suffer from a far wider range of such deficits.

Compared with the highly organized and properly regulated stock market activity in the US and the UK, most emerging markets do not have such a well functioning market. Not only are there inadequate government regulation, private information gathering and dissemination firms as found in more developed stock markets are inadequate. Moreover, young firms in emerging stock markets do not have a long enough track record to form a reputation. As a result, one expects share prices in emerging markets to be arbitrary and volatile (Tirole, 1991). Empirical evidence indicates that share prices in emerging markets are considerably more volatile than in advanced markets (El-Erian and Kumar, 1995).

Despite this volatility, large corporations have made considerable use of the stock market. For example, the Indian stock market has more than 8,000 listed firms, one of the highest in the World. Singh (1995), looking at the corporate financing pattern in emerging markets found that contrary to expectation, emerging market corporations rely heavily on external finance and new

equity issues to finance long term investment. This result indicates that stock markets have been successful in providing considerable funds to the top 100 corporations in emerging markets.

IV. THE STOCK MARKET IN SOUTH AFRICA

A. Market Development

The Johannesburg Stock Exchange (JSE) was founded in 1887 to enable the new mines and their financiers to raise funds for the development of the fledgling mining industry. However, the majority of the companies listed today are non-mining organizations. In 2004, the JSE had an estimated 472 listed companies and a market capitalization of US$182,6 billion as well as an average monthly traded value of US$ 6,399 million. JSE Limited is by far the largest exchange in Africa and the 17th largest in the world in terms of market capitalization.

A number of initiatives were introduced in the late 1990s to improve the efficient functioning of the exchange. The first major change occurred in November 1995, when the Stock Exchanges Control Act changed the way in which stocks were traded in South Africa, opening the door to non-South Africans, and allowing brokers to buy and sell stock for their own account. The trading system is now automated through an electronic clearing and settlement system, STRATE (Share Transactions Totally Electronic).

The bond market has been separated from the JSE to the Bond Exchange of South Africa and is licensed as a financial market in terms of the Financial Markets Control Act. A real-time stock exchange news service was launched in 1997 in an attempt to enhance market transparency and investor confidence. JSE listing requirements require listed companies to disseminate any corporate news or price sensitive information on the service prior to using any other media or outlet.

In 2001, the JSE merged with the South African Futures Exchange (SAFEX) and thereby become the leader in both equities and futures and options trading in South Africa. New capital adequacy requirements, which have major financial implications for broking firms has also been developed. These are based on European Union requirements and involve the separation of clients' funds from those of brokers.

.

The JSE's trading and information systems were replaced with that of the London Stock Exchange. The trading engine and information dissemination feed-handler is hosted in London and connected remotely to the JSE. More than 1,500 traders and information users access the system via a sophisticated Application Service Provider with sub-second response time. The JSE also aligned their equities trading model with that of Europe, and reclassified their instruments in line with the FTSE Global Classification system. This has led to the introduction of the FTSE/JSE Africa Index Series that makes the South African Indices comparable to similar indices worldwide. Trade information of instruments listed on the JSE can now be disseminated by the LSE to more than 104,000 trading terminals around the world, raising the profile of the JSE among the international investor community.

B. Structure, Operations, and Regulation

The JSE is licensed as a stock exchange (for equities) and as a financial market (for financial and agricultural derivatives) in terms of these Acts, but, in common with international practice, a philosophy of self-regulation by the markets is practiced and applies to the JSE. The JSE members and their clients (investors), must comply with trading and other rules set by the JSE from time to time. The JSE acts as regulator of its members and ensures that markets operate in a transparent and fair manner ensuring investor protection. Similarly, issuers of securities must comply with the JSE Listings Requirements which are aimed at ensuring sufficient disclosure in the public interest of all information relevant to investors.

The JSE performs the role of regulating applications for listing, the continuing obligations of listed companies and the interpretation of JSE listings requirements. In addition, the JSE regulates applications for the alteration of an existing listing and any corporate actions arising from this and scrutinizing company documentation with a view of disclosure to the public.

The exchange was demutualized in July 2005 after 118 years of existence as a mutual entity. JSE Limited, therefore, joins the world's most prominent international exchanges in operating as a fully fledged corporate. JSE Limited is a public, unlisted company and as a result, any person is now entitled to purchase and hold shares in the JSE subject to a statutory prudential limitation of a 15 percent shareholding by any shareholder. Ownership of a JSE share is no longer a requirement for membership of the exchange.

C. Main Characteristics

Market Size

This paper uses the capitalization ratio and the number of listed companies to measure the size of Johannesburg Securities Exchange. The capitalization ratio is defined as the value of domestic equities traded on the stock exchange relative to GDP. As Figure 3 shows, the capitalization ratio increased from 120 percent of GDP in 1990 to about 180 percent of GDP in 2004. The high growth of the capitalization ratio coincided with a reduction of the number of listed companies. The number of listed companies on the JSE decline from 732 in 1990 to 403 in 2004, a reduction of more than 300 corporations as a large number of South Africa's biggest listed companies moved their primary listings to London to be more attractive to international investors. This loss caused concern in the South African market and resulted in decreased trade on the JSE. The number of listed companies is expected to fall further with the mergers and acquisitions wave and the development of private equity funds in the country.

Figure 3. South Africa: Indicators of Stock Market Development,1990–2004

Sources: World Development Indicators; and IMF staff estimates.

Market Depth

Market depth refers to liquidity or the ability to buy and sell shares. This paper measure the activity of the stock market using total value traded as a share of GDP, which gives the value of stock transactions relative to the size of the economy. This measure is also used to gauge market liquidity because it measures trading relative to economic activity (Levine and Zervos, 1998). Figure 3 shows, value traded as a percentage of GDP increased from about 10 percent of GDP in 1990 to roughly 80 percent of GDP.

To clearly understand the liquidity picture, we examine the turnover ratio. The turnover ratio is defined as the ratio of the value of total shares traded and market capitalization. It measures the activity of the stock market relative to its size. Many analysts use the turnover as measure of transaction costs. High turnover ratio implies low transaction and consequently high efficiency. The turnover ratio increased from under 10 percent in 1993 to about 80 percent in 2001. It has since fallen to about 50 percent in 2004.

V. METHODOLOGY AND DATA

A. The Calderon-Rossell Model

Cadeleron-Rossell developed a behavioural structural model of stock market development. In this model economic growth and stock market liquidity are considered the main determinants of stock market development. Market capitalization is defined as follows:

$$Y = PV \tag{1}$$

Where:
Y is market capitalization in local currency;
P is the number of listed companies in the stock market; and
V is the local currency average price of listed companies.

The model can be presented formally as follows:

$$Y = PV = Y(G,T) \tag{2}$$

$$V = V(G,P), \quad P = P(T,V) \tag{3}$$

The exogenous variable G represents per capita GNP in local currency and variable T represents the turnover ratio. The endogenous variables are V, P, and M. The structural equations are then expressed in the following reduced behavioural model:

$$LogY = \theta_1 LogG + \theta_2 LogT \tag{4}$$

The component of the reduced form model is expressed as follows:

$$LogV = \alpha_1 LogG + \alpha_2 LogT \tag{5}$$

$$LogP = \varpi_1 LogG + \varpi_2 LogT \tag{6}$$

Equation 4 can be written as:

$$LogY = Log(PV) = \alpha_1 \log G + \alpha_2 \log T + \varpi_1 \log G + \varpi_2 \log T \tag{7}$$

Factorizing we have:

$$LogY = (\alpha_1 + \varpi_1)\log G + (\alpha_2 + \varpi_2)\log T \quad (8)$$

Where:

$$\theta_1 = \alpha_1 + \varpi_1 \quad (9)$$

and

$$\theta_2 = \alpha_2 + \varpi_2 \quad (10)$$

Equation 8 shows the impact of economic growth, G, and stock market liquidity, T on stock market development, Y. The model shows that stock market development is the result of the combined effect of economic growth and liquidity on both stock prices and the number of listings.

To examine the validity of this model, Calderon-Rossell used data from 42 countries from the main active stock markets in the world with annual observations from 1980–87. The analysis shows that stock market liquidity and economic growth are important determinants of stock market growth.

B. The Modified Calderon-Rossell Model

This paper looks at the institutional and macroeconomic determinants of stock market development in emerging markets. As we know both institutional and macroeconomic factors are important in stock market development. Garcia and Liu (1999) showed that macroeconomic factors such as real income, savings rate, financial intermediary development, and stock market liquidity are important determinants of stock market development. Pagano (1993) shows that regulatory and institutional factors may influence the efficient functioning of stock markets. For example, mandatory disclosure of reliable information about firms may enhance investor participation, and regulations that instil investor's confidence in brokers should encourage investment and trading in the stock market. La Porta et al (1996) also find that institutional variables such as rule of law, anti-director rights, and one share one vote are important predictors of stock market development.

We modify the Calderon-Rossell model to incorporate other financial, economic, and institutional variables that might affect stock market development. In particular, we examine the role of banking sector development, political risk, and private capital flows in explaining stock market development in emerging markets. We estimate the following regression:

$$Y_{it} = \alpha_i + \delta Y_{it-1} + \beta M_{it} + \varpi P_{it} + \varepsilon_{it} \quad (11)$$

Where Y is stock market capitalization relative to GDP, α_i is the unobserved country specific fixed effect, and ε_{it} is the usual white noise. M is a matrix of macroeconomic variables made up of GDP per capita, credit to the private sector as a percentage of GDP and its square, gross domestic investment as a percentage of GDP, stock market value traded as a percentage of GDP, private capital flows as a percentage of GDP, foreign direct investment as a percentage of GDP, macroeconomic stability (measured by current inflation and the real interest rate), and gross domestic savings. The P variables are measures of institutional quality and include political risk, corruption, law and order, democratic accountability, and bureaucratic quality. We

also include one lag of the dependent variable as one of the right hand side variables because we believe that stock market development is a dynamic concept.[5]

C. The Data

The approach taken in this paper is to model the impact of macroeconomic and institutional factors on stock market development in emerging markets. Macroeconomic factors include income level, savings and investment, stock market liquidity, macroeconomic stability and private capital flows. Institutional factors include political risk, bureaucratic quality, law and order, corruption, and democratic accountability. The logic behind the inclusion of relevant variables is discussed below.

Dependent Variable: Stock Market Development

The dependent variable of interest is stock market development. We measure stock market development using market capitalization as a proportion of GDP.[6] This measure equals the value of listed shares divided by GDP. The assumption behind this measure is that overall market size is positively correlated with the ability to mobilize capital and diversify risk on an economy-wide basis.

Income Level

Real income has been found to be highly correlated with the size of the stock market. We use the log GDP per capita in US dollars to measure the income level. According to demand driven hypothesis, the expansion of an economy will create new demand for financial services. Such increase in demand will exert pressure to establish larger and more sophisticated financial institutions to satisfy the new demand for their services.

Banking Sector Development

To determine whether stock market development is significantly correlated with banking sector development, we include a measure of banking sector development in the regression. Most studies use M2 relative to GDP as a measure of financial depth. However, according to King and Levine (1993), this measure does not tell us whether the liabilities are those of the central bank, commercial banks or other depository institutions. As a result, this paper uses the value of domestic credit provided by the banking system to the private sector relative to GDP as a measure of banking sector development. Private credit is the most comprehensive indicator of the activity of commercial banks. It captures the amount of external resources channelled

---

[5] The above equation can be written using the growth as the dependent variable as follows: $Y_{it} - Y_{it-1} = growth = \alpha_i + (\delta - 1)Y_{it-1} + \beta M_{it} + \varpi P_{it} + \varepsilon_{it}$

[6] Other indicators of stock market development that has been used in the literature include the number of listed companies, changes in the stock market index etc. We focus on market capitalization as a percentage of GDP because it is less arbitrary than the other measures. In addition, Demiguc-Kunt and Levine (1996) have shown that different measures of stock market development are highly correlated.

through the banking sector to private firms. This measure isolate credit issued to the private sector as opposed to credit issued to governments and public enterprises. In addition, it measures the activity of the banking system in one of its main function: channelling savings to investors. To understand the nature of the relationship between banking sector development and stock market development, we include the square of bank credit to the private sector as a percentage of GDP in the regression. We expect credit to the private sector to be positively correlated with stock market capitalization. However, very high levels of banking sector development can lead to substitutability between debt and equity making the coefficient of the square of bank credit negative.

Savings and Investment

Stock markets, like financial intermediaries, intermediate savings to investment projects. Usually the larger the savings, the higher the amount of capital flows through the stock market. However, savings and investment may not be highly correlated with income in our sample. Thus, we expect savings and investment to be important determinants of stock market development. We use gross domestic savings as percentage of GDP and gross domestic investment as a percentage of GDP.

Stock Market Liquidity

Liquidity is the ease and speed at which economic agents can buy and sell securities. With a liquid market, the initial investors do not lose access to their savings for the duration of the investment project because they can easily, quickly, and cheaply, sell their stake in the company. Thus, more liquid markets could ease investment in long term, potentially more profitable projects, thereby improving the allocation of capital and enhancing prospects for long term growth. The more liquid the stock market, the larger the amount of savings that are channelled through the stock market. Therefore, we expect a more liquid stock market to lead to higher stock market development. We measure stock market liquidity using value traded as a percentage of GDP. This ratio measures the value of equity transactions relative to the size of the economy. This measure does not directly measure how easily investors can buy and sell shares at posted prices. However, it does measure the degree of trading relative to the size of the economy. It, therefore, reflects stock market liquidity on an economy wide (Levine and Zervos, 1998).

Macroeconomic Stability

Macroeconomic stability may be an important factor for the development of the stock market. We expect that the higher the macroeconomic stability the more incentive firms and investors have to participate in the stock market. Furthermore, corporate profitability can be affected by changes in monetary, fiscal, and exchange rate policies. Therefore, we expect the stock market in countries with stable macroeconomic environment to be more developed. To determine the impact of macroeconomic stability on market capitalization, we use two measures of macroeconomic stability: real interest rate and current inflation mainly because of their importance in previous studies (for instance, Garcia and Liu, 1999). Regarding inflation, the conventional wisdom about the role of stocks is that they provide a hedge against inflation or

that the nominal equity returns should be positively related to inflation (the Fisherian hypothesis). McCarthy et al (1990), however, suggest a negative relationship between stock returns and inflation.

Private Capital Flows

In the last few decades, foreign investors have emerged as major participants in emerging stock markets. Errunza (1982) argued that the long term impact of foreign capital inflows on the development of the stock market is broader than the benefits from initial flows and increased investor participation. Foreign investment is associated with institutional and regulatory reform, adequate disclosure and listing requirements and fair trading practices. The increase in informational and operational efficiency is expected to inspire greater confidence in domestic markets. This increases the investor's base and participation and leads to more capital flows. Capital flows is measured in this paper using foreign direct investment as a percentage of GDP and net private capital flows as a percentage of GDP.

Institutional Quality

The recent increase in foreign capital inflows in emerging markets raises the issue of political risk. When foreign investors decide to invest in emerging markets, they face three different types of risk: economic risk, financial risk, and political risk. This paper focuses on political risk and stock market development. Low political risk demonstrates the existence of good quality institutions.

Three broad measures of institutional quality are used in the literature. The first is the quality of governance, including, corruption, political rights, public sector efficiency, and regulatory burdens. The second is the legal protection of private property and law enforcement. The third is accountability and the limits placed on the executive and political leaders (Edison, 2003)[7].

All of these measures share one common aspect—they are constructed using country experts rather than count data. The benefit is that it allows for a more nuanced interpretation of institutional related issues. However, country experts are deriving their scores with the international investor in mind, rather than domestic agents. In this sense, it may give a slightly distorted view of the institutional quality within a country if the problems faced by domestic agents are not the same types of problems encountered by foreign investors.

[7] The aggregate governance index is the average of six measures of institutions developed in 1999 by Daniel Kaufman, Art Kraay, and Pablo Zoido-Lobaton. The major components are voice and accountability, political stability and absence of violence, government effectiveness, regulatory burden, and freedom from graft. Other measures of institutions focus on property rights and constraints on the executive. Our measure of institutional quality is very similar to that of Kaufman et al (1999).

This paper uses political risk, a composite index from the International Country Risk Guide as a measure of institutional quality.[8] The ICRG Risk Rating System assigns a numerical value to a predetermined range of risk components, according to a preset weighted scale, for each country covered by the system. Each scale is designed to award the highest value to the lowest risk and the lowest value to the highest risk. All countries are assessed on the same basis to allow for comparability. The advantage with the ICRG indicators is that it has been used extensively in the literature (see Knack and Keifer, 1995; and Yartey, 2004) and has distinct categories of political risk which allows researchers to be reasonably specific in what they are measuring.

The composite political risk index is 100 point scale. The highest overall rating (theoretically, 100) indicates the lowest risk, and the lowest score (theoretically, 0) indicates the highest risk. Political risk is a priced factor for which investors are rewarded and that it strongly affects the local cost of equity, which may have implication for growth. We expect countries with good quality institutions and therefore low political risk to have well-developed stock markets[9].

The problem with the political risk indicator is that it gives us very little on which aspects of institutions should policy be directed towards. To avert this problem, the paper studies the impact of four of the components of political risk on stock market development: law and order, bureaucratic quality, democratic accountability, and corruption.[10] Law and Order is an assessment of the strength and impartiality of the legal system as well as the popular observance of law. It ranges from 0 to 6. Bureaucratic quality measures the institutional strength and quality of bureaucracy. This measure is expected to be a shock absorber that minimises reversions of policy when government changes. High points are given to countries where the bureaucracy is autonomous from political pressure and have an established mechanism for recruitment and training. The variable ranges from 0 to 4. Democratic accountability measures how responsive the government is to its people, on the basis that the less responsive it is, the more likely it is that the government will fall. It ranges from 0 to 6.[11] Corruption refers to corruption in the political system. The value ranges from 0 to 6. The higher the value of the corruption index the lower the level of corruption. In other words, countries that have low levels of corruption have high values of the index and vice versa.

---

[8] The definition of the component of the institutional index is from the International Country Risk Guide. See The International Country Risk Guide for a detailed explanation and the computations of the various components of our index of institutional quality.

[9] Erb et al (1996b) and Diamonte et al (1996) find that changes in political risks are related contemporaneously to stock returns, using several quantitative indicators that proxy for the notion of political risk.

[10] The four measures are chosen because of their importance in past results. Yartey (2007a) find that law and order, democratic accountability and bureaucratic quality are important for stock market development in Africa.

[11] The points are awarded on the basis of the type of governance enjoyed by the country in question. The International Country Risk Guide defined three types of governance: alternating democracy, dominated democracy, de-facto one-party state, de jure one-party state, and autarchy. In general, the highest number of risk points (lowest risk) is assigned to alternating democracies, while the lowest number of risk points (highest risk) is assigned to autarchies.

D. Estimation Method

Given the panel nature of our dataset this paper uses paper data techniques in estimating the regression models. All the relationships to be studied can be characterized by the joint endogeneity of most variables involved. That is, most explanatory variables in our model are either simultaneously determined with the dependent variable or have a two-way causal relationship with it. There is also the potential of the presence of unobserved country specific effects. Ignoring them may produce inconsistent estimates given that country specific effects are likely to be correlated with the explanatory variables. In the presence of any correlation between the right hand side variables and the country specific effect estimation methods such as ordinary least squares will not be consistent. This is because of the violation of the assumption of strict exogeneity of the explanatory variables. In addition, the orthogonality condition between the error term and the regressors is not likely to be met for either the Generalized Least Squares or the Fixed Effects estimator to produce consistent estimates. One can achieve the orthogonality condition through appropriate differencing of the data. However, because the equation contains endogenous regressors as well as the effects of lagged endogenous variables, the error term in the differenced equation is correlated with the lagged dependent variable through contemporaneous error terms. Therefore, neither the fixed effect nor the GLS estimator will produce consistent estimates under these conditions.

Arellano and Bond (1991) propose using a dynamic panel data estimator based on Generalized Method of Moments (GMM) methodology that optimally exploits the linear moment restrictions implied by the dynamic panel growth model. The dynamic GMM estimator is an instrumental variable estimator that uses lagged values of all endogenous regressors as well as lagged and current values of all strictly exogenous regressors as instruments. Equations can be estimated using the levels or the first differences of the variables. For the difference estimator, the variables are measured as first differences and the lagged value of the levels of the variables are used as appropriate instruments. The dynamic GMM estimator is given as:

$$\hat{\theta} = (\bar{X}'ZA_N Z'\bar{X})^{-1}\bar{X}'ZA_N Z'\bar{y} \qquad (12)$$

Where $\hat{\theta}$ is the vector of coefficient estimates on both the endogenous and exogenous regressors, $\bar{X}$ and $\bar{y}$ are the vectors of the first differences of all the explanatory variables, Z is the vector of instruments and A_N is a vector used to weight the instruments. This GMM instrumental variable estimator is equivalent to an efficient three stage least squares estimator.

Arellano and Bond proposed two estimators—one step and two step estimators—with the two step being the optimal estimator. The one step estimator is obtained when the weighting matrix is the average covariance matrix of Z_{vi} given by $A_N = (N^{-1}\sum_i Z_i'HZ_i)^{-1}$ where H is a T-2 square matrix with 2s in the main diagonal, -1s in the first subdiagonal, and 0s everywhere else. The optimal two step estimator replaces the H matrix with an estimated variance-covariance matrix formed from the residuals of a preliminary consistent estimate of θ. The optimal choice of A_N for the two step is given as:

$$A_N = \hat{V} = N^{-1}\sum_i Z_i'\hat{\bar{v}}_i\hat{\bar{v}}_i Z_i \qquad (13)$$

Where $\hat{v}_i$ are the residuals obtained from a preliminary consistent estimate of θ. The one and two step estimators will be asymptotically equivalent if the error terms are spherical. There is a tendency for the two step estimator to underestimate the standard errors of estimates hence provide a false sense of precision under some circumstances. The usual practice is to estimate with the two step estimator but base hypothesis tests on the one step estimator's statistics. We employ this practice in this paper.

However, before proceeding with the Generalized Method of Moments the following identifying assumption is necessary. We assume that there is no second order serial correlation in the first differences of the error term. The consistency of the Generalized Method of Moments (GMM) estimator requires that this condition be satisfied. Given the construction of the instruments as lagged variables the presence of second order serial correlation will render such instruments invalid. The specification tests for the GMM estimator are the Sargan test of over identifying restrictions and the test of lack of residual serial correlation. The Sargan test is based on the sample analog of the moment conditions used in the estimation process and evaluates the validity of the set of instruments and, therefore, determines the validity of the assumptions of predeterminacy, endogeneity, and exogeneity. Since in this case the residuals examined are those of the regressions in differences, first order serial correlation is expected by construction and thus only second and higher order serial correlation is a sign of misspecification.

VI. Results and Discussions

A. Macroeconomic Determinants of Stock Market Development

This section presents the results of the macroeconomic determinants of stock market development. Stock market development is measured by market capitalization as a percentage of GDP. Since market capitalization is measured at the end of the year, and GDP is measured over the year, there is a stock flow problem in this measure. To solve this problem, we use the average of two consecutive end of year market capitalization to estimate the mid year value.

Table 2 presents the results of the dynamic panel data estimation. In Model 1, we have our baseline regression model, which includes variables such as GDP per capita, bank credit, the square of bank credit, stock market liquidity, current inflation, and gross domestic investment. The results show that bank credit, stock market liquidity, gross domestic investment, GDP per capita, and the lagged dependent variable are significant and have positive effects on stock market development. The square of bank credit is negative and significant indicating that a higher level of banking sector development is associated with lower growth of stock market since domestic agents substitute debt for equity. Inflation has a positive sign even though it is not statistically significant. Income level is an important determinant of stock market development. In particular, a percentage point increase in GDP per capita increases stock market development by 7.23 percentage points.

Table 2. Macroeconomic Determinants of Stock Market Development
GMM Estimation
Dependent Variable: Stock Market Capitalization/GDP

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Lagged dependent	0.477 (13.16)***	0.430 (9.99)***	0.487 (13.08)***	0.488 (13.07)***	0.548 (15.51)***
Private Credit	0.197 (2.32)**	0.326 (3.34)***	0.332 (3.35)***	0.335 (3.37)***	0.123 (1.30)***
Value traded	0.466 (16.66) ***	0.479 (12.79)***	0.508 (13.76)***	0.505 (13.62) ***	0.464 (13.77)***
Log GDP per capita	7.231 (3.67) ***	7.043 (3.55)***	7.075 (2.79)***	6.701 (2.72)***	6.537 (1.97)**
Credit2	-0.002 (-4.87) ***	-0.002 (-4.32)***	-0.002 (-4.80)***	-0.002 (-4.78)***	-0.0004 (-4.39)
Investment	0.441 (2.24)**	0.653 (2.63) ***			
Real interest rate		-0.014 (-0.90)	-0.041 (-0.63)	-0.041 (-0.65)	0/017 (0.29)
Inflation	0.006 (1.61)				
Savings			0.026 (0.13)		
FDI				0.059 (0.20)	
Capital flows					0.245 (3.50) ***
Constant	0.960 (3.73)***	1.411 (4.37)***	0.978 (3.49)***	0.962 (3.43) ***	0.794 (2.77)***
Sargan test of over-identifying restrictions	393 [0.000] ***	335.10 [0.000]***	332.34 [0.000]***	328.95 [0.000]***	363.68 [0.000] ***
1st order autocorrelation	-5.44 [0.000] ***	-6.46 [0.000]***	-6.98 [0.000]***	-6.99 [0.000]***	-5.52 [0.000]***
2nd order autocorrelation	-0.04 [0.971]	0.07 [0.942]	0.47 [0.634]	0.47 [0.637]	0.57 [0.0.571]

Notes: T-statistics are in parentheses and P values in squared bracket. ***, ** and * indicate significant at 1, 5, and 10 percent level respectively. Credit2 is the square of credit to the private sector relative to GDP.

In addition, banking sector development promotes stock market development. In particular, a percentage point increase in bank credit as a percentage of GDP increases stock market development by 0.197 percentage points. However, very high levels of bank sector development have a negative impact on the growth of stock markets because stock markets and banks tend to substitute each other as financing vehicles. When value traded as a percentage of GDP increases by 1 percentage point, stock market capitalization increases by 0.47 percentage points. Finally, a percentage point increase in gross domestic investment as a percentage of GDP increases stock market development by 0.44 percentage points. The Sargan and autocorrelation tests tend to support the model estimated with the GMM procedure.

To examine the effect of real interest rate on stock market development we use real interest rate instead of inflation in Model 2. The results show that lagged capitalization ratio, GDP per capita, bank credit, gross domestic investment, and stock market value traded are all significant and positive. The square of bank credit is again negative and statistically significant. Investment is now not significant even though it has the expected positive sign. Real interest rate has the expected negative sign even though it is not statistically significant.

In Model 3, we look at the effect of gross domestic savings on stock market development. We use gross domestic savings as a percentage of GDP instead of gross domestic investment. The results show that GDP per capita, bank credit, and value traded are all positive and statistically significant. Savings is positive but statistically insignificant in explaining stock market development. The square of private credit is again negative confirming the quadratic relationship between banking sector development and stock market development. The Sargan and autocorrelation tests support the model estimated with the GMM procedure.

In Model 4, we examine the impact of foreign direct investment on stock market development. We use FDI as a percentage of GDP instead of gross domestic investment. The result shows that FDI is positive but statistically insignificant in explaining the growth of emerging stock markets. Again, lagged capitalization ratio, bank credit, stock market liquidity, and the log of GDP per capita are all positive and significant. The square of private credit is negative and statistically significant. The Sargan and autocorrelation tests support the model estimated with the GMM procedure.

In Model 5, the effect of private capital flows on stock market development is investigated. Private capital flows as percentage of GDP replaces FDI in the equation. The result shows that private capital flows is positive and significant. In particular, a percentage point increase in capital inflows induces a 0.25 percentage points increase in stock market development. Again, lagged capitalization ratio, GDP per capita, private credit and stock market liquidity are all positive and statistically significant. The square of bank credit is negative confirming the non-monotonic relationship between banking sector development and stock market development.

B. Institutional Quality and Stock Market Development

The next exercise we conduct in this paper is to examine the impact of political risk on stock market development using the GMM estimation procedure. The result of the GMM estimation is presented in Table 3. Model 1 is our baseline model with the log of GDP per capita, bank credit and its square, gross domestic investment, stock market liquidity, inflation, and political

risk as the explaining variables. As we can see, GDP per capita, bank credit, domestic investment, value traded, and political risk are significant and positive. In particular, the economic impact of political risk on stock market development appears very large. The result suggests that the resolution of political risk is important for stock market development in emerging markets.

GDP per capita is positive and significant. A percentage point increase in GDP per capita increases stock market development by 6.4 percentage points. Banking sector development has a positive and significant effect on stock market development in emerging markets even after controlling for political risk. However, a higher level of banking sector development is associated with lower stock market development. Stock market liquidity is also significant in explaining stock market development. A percentage point increase in value traded as a percentage of GDP increases stock market development by 0.47 percentage points. We also find domestic investment to be statistically significant and positively associated with stock market development. When last year's investment rate increases by 1 percentage points, stock market development increases by 0.41 percentage points. Inflation has wrong positive sign and it is marginally insignificant.

As mentioned earlier, the problem with the concept of political risk is that it tells us very little about which aspect of institutions policy should be directed towards. To remedy this deficiency, the paper studies the impacts of some of the components of the index of political risk on stock market development.[12] This exercise is done in models 2 to 5. We start with model 2 in which we examine the impact of law and order on stock market development. The results show that law and order is positive and statistically significant in explaining stock market development. This result implies that the development of a good legal system is an important determinant of stock market development in emerging markets. We also find GDP per capita, bank credit, stock market liquidity, and domestic investment to be positive and significant. The square of bank credit is negative and statistically significant. The Sargan test supports the model estimated with the GMM procedure.

In Model 3, we look at the effect of bureaucratic quality on stock market development. Good quality bureaucracy enhances the regulatory capacity of countries and therefore should be positively associated stock market development. The result shows that bureaucratic quality is significant and positive.

[12] The components are selected because of their importance in past results. Yartey (2007), for instance, find that law and order, bureaucratic quality, democratic accountability are important for stock market development in African countries.

Table 3. Institutional Determinants of Stock Market Development
GMM Estimation
Dependent Variable: Stock Market Capitalization/GDP

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Lagged dependent	0.467 (12.69)***	0.451 (12.22)***	0.482 (13.20)***	0.472 (13.00)***	0.476 (13.11)***
Private Credit	0.176 (2.05)**	0.149 (1.73)*	0.214 (2.49)**	0.217 (2.53)**	0.197 (2.31)**
Value traded	0.470 (16.71)***	0.467 (16.80)***	0.473 (16.63)***	0.467 (16.68) ***	0.467 (16.66)***
Log GDP per capita	6.421 (4.09)***	6.273 (3.55)***	6.554 (3.90)***	6.390 (4.00)***	6.145 (3.64)**
Credit2	-0.002 (-4.76)***	-0.002 (-4.74)***	-0.002 (-4.99)***	-0.002 (-4.91)***	-0.002 (-4.82)
Investment	0.413 (2.09)**	0.420 (2.15)***	0.415 (2.09)**	0.431 (2.19))**	0.441 (2.22))**
Inflation	0.007 (1.67)*	0.007 (1.82)*	0.006 (1.61)	-0.006 (1.49)	0.006 (1.60)
Political risk	0.239 (2.22)**				
Law and order		3.742 (3.38)***			
Bureaucratic quality			2.143 (1.68))*		
Demo. accountability				1.465 (2.00)***	
Corruption					-0.194 (-0.22)
Constant	1.025 (3.93)***	1.25 (4.64)***	0.978 (3.49)***	0.990 (3.84)***	0.939 (3.42)***
Sargan test of over-identifying restrictions	383.51 [0.000] ***	386.61 [0.000]***	386.34 [0.000]***	388.62 [0.000]***	391.53 [0.000]***
1st order autocorrelation	-5.41 [0.000] ***	-5.08 [0.000]***	-5.36 [0.000]***	-5.36 [0.000]***	-5.41 [0.000]***
2nd order autocorrelation	-0.06 [0.949]	-0.22 [0.826]	-0.10 [0.920]	-0.02 [0.986]	-0.03 [0.977]

Notes: T-statistics are in parentheses and P values in squared bracket. ***, ** and * indicate significant at 1, 5, and 10 percent level respectively. Credit2 is the square of credit to the private sector relative to GDP.

Again, GDP per capita, bank credit, value traded, and domestic investment are all positive and significant in explaining stock market development. The square of bank credit is negative and significant. Inflation again has a positive sign even though it is not significant. The result from the Sargan and autocorrelations tests supports the model estimated with the GMM procedure. In model 4, we examine the impact of democratic accountability on stock market development. We find that it is positive and statistically significant. Again, GDP per capita, bank credit, stock market liquidity, and investment rate are all significant and positive. In model 5, we examine the impact of corruption on stock market development. We find that corruption is negative and statistically insignificant. GDP per capita, bank credit, value traded, and investment are all positive and statistically significant. The square of bank credit is negative confirming the non monotonic relationship between banking sector development and stock market development.

The evidence in this paper suggests that private capital flows, banking sector development, domestic investment, GDP per capita, and stock market liquidity are important determinants of stock market development in emerging market.[13] The results also show that good quality institutions such as law and order, democratic accountability, bureaucratic quality are important for stock market development because they tend to reduce political risk, enhance regulatory capacity, and support the viability of external finance.

C. Explaining Stock Market Development in Emerging Markets: Is South Africa Different?

Our empirical results show that the main determinants of stock market development in emerging markets are banking sector development, private capital flows, income level, and political risk. We investigate if these factors can explain the development of the stock market in South Africa. In particular, we examine the impact of banking sector development, private capital flows, and political risk in determining the development of the stock market in South Africa.

A basic method in applied econometric research is to introduce a dummy variable for South Africa (call it SAdummy) in the regression and then interact the South African dummy with the variables we are interested in (political risk, banking sector development, the square of banking sector development, and private capital flows). These interactions give us four new variables (SAcredit, SAcredit2, SAPolitical and SAflows). We estimate the four new models in turns with each regression having an interaction of the SA dummy and one of the four variables under consideration. [14] We then conduct a T-test on the coefficient of the new variables.

---

[13] Other likely determinant of stock market development in emerging markets is the degree of privatization. However, since data on privatization is difficult to we do not include it in the empirical analysis. In like manner, pension reforms and the creation of pension funds is likely to have had an impact on stock market development in countries like Chile.

[14] We include both the South African dummy and the interacted variables in the regression to be sure that any rejection of the null hypothesis would not be due to the fact that the South African dummy is excluded.

Table 4. South Africa: The Determinants of Stock Market Development
GMM Estimation,
Dependent Variable: Stock Market Capitalization/GDP

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Lagged dependent	0.552	0.545	0.546	0.521	0.597
	(16.74)***	(16.62)***	(16.54)***	(15.46)***	(18.52)***
Private Credit	0.233	0.112	0.2326	0.224	0.216
	(3.07)**	(3.12)***	(3.09)**	(2.96)**	(2.73)**
Value traded	0.476	0.475	0.474	0.488	0.466
	(16.51)***	(16.62)***	(16.60)***	(16.97) ***	(16.63)***
Log GDP per capita	4.108	5.390	5.233	4.424	4.23
	(3.05)***	(3.08)***	(3.04)***	(3.64)***	(2.67)**
Credit2	-0.002	-0.002	-0.002	-0.002	-0.002
	(-4.80)***	(-4.81)***	(-4.79)***	(-4.79)***	(-4.60)
Investment	0.154	0.181	0.177	0.171	
	(0.82)	(0.97)	(0.94)	(0.91)**	
Inflation	0.006	0.007	0.007	-0.007	0.006
	(0.69)	(1.19)	(1.51)	(1.49)	(1.54)
Political risk				0.133	
				(1.91) *	
Capital flows					0.180
	.				(2.68)**
SAdummy	2.454	2.005	0.500	1.77	1.878
	(1.45)	(0.89)	(0.25)	(0.70)	(0.4)
SAcredit		1.847			
		(2.00)* *			
Sacredit 2			-0.008		
			(-1.70) *		
SApolrisk				2.630	
				(4.42) ***	
SAflows					1.347
					(3.48)***
Constant	0.778	1.25	0.784	0.912	0.593
	(3.04)***	(4.64)***	(3.09)***	(3.56)***	(2.54)***
Sargan test of over-identifying restrictions	380.26	383.52	385.35	359.59	360.96
	[0.000] ***	[0.000]***	[0.000]***	[0.000]***	[0.000]***
1st order autocorrelation	-5.73	-5.58	-5.56	-5.93	-5.70
	[0.000] ***	[0.000]***	[0.000]***	[0.000]***	[0.000]***
2nd order autocorrelation	-0.17	-0.31	-0.34	-0.49	-0.23
	[0.862]	[0.826]	[0.920]	[0.623]	[0.814]

Notes: T-statistics are in parentheses and P values in squared bracket. ***, ** and * indicate significant at 1, 5, and 10 percent level respectively. SAcredit is the interaction of SA dummy and bank credit; SAcredit2 is the interaction of SA dummy and the square of bank credit; SAflows is the interaction of SAdummy and private capital flows; and SApolrisk is the interaction of SA dummy and political risk.

Table 4 summarizes the result of the South African regression. Model 1 is our baseline model with lagged dependent, bank credit, valued traded, the square of bank credit, investment, inflation, and the South African dummy as the explaining variables. The result shows that the South African dummy is positive and statistically insignificant. This result implies that the main factors identified in the previous section as determining the development of the stock market in emerging market countries also apply to the specific case of South Africa.

In model 2, we examine the impact of banking sector credit on stock market development in South Africa. We find that it is positive and significant. Again, income level, value traded, bank credit, the square of bank credit, and the lagged dependent variable are significant. In model 3, we estimate the impact of the square of bank credit on stock market development in South Africa. The analysis shows that the variable is significant and negative confirming the quadratic relationship between banking sector development and stock market development. This results suggests that very high levels of banking sector development tends to have a negative impact on stock market development as banks and stock markets substitute each other as vehicles for financing investments.

Model 4 looks at the impact of political risk on stock market development in South Africa. We find that the coefficient of political risk in South Africa is positive and significant. High level of the index (low political) risk is positively associated with stock market development, as measured by market capitalization. This result suggests that the resolution of political risk can broaden appeal in equity investment in South Africa and lead to the development of the stock market.

In model 5, we examine the role of private capital flows in determining the development of the stock market in South Africa. The result shows that private capital flows is positive and statistically significant in explaining the development of the stock market in South Africa. Again, lagged capitalization ratio, income level, value traded, domestic investment, and private capital flows are all significant.[15]

D. Summary and Conclusion

This paper has examined empirically the institutional and macroeconomic determinants of stock market development using a panel data of 42 emerging market countries for the period 1990 to 2004. The paper also analyzed whether the main factors explaining the development of the stock market in emerging market countries can also help us understand the specific case of South Africa.

The empirical analysis found four interesting results. First, income level, domestic investment, banking sector development, private capital flows, and stock market liquidity are important determinants of stock market development in emerging markets. Second, the relationship

[15] In the case of South Africa, the early development of the pension fund and insurance industries played a great role in developing a large institutional investor base, which probably explains the high level of stock market development.

between banking sector development and stock market development in emerging market countries to be non-monotonic. This finding suggests that at early stages of its development, the banking sector is a compliment to the stock market in financing investment. However, as they both develop, banks and the stock market begin to compete with each other as vehicles for financing investment. Third, institutional factors such as political risk, law and order, democratic accountability and bureaucratic quality are important determinants of stock market development in emerging markets. This result suggests that the resolution of political risk can encourage investor confidence and propel the growth of the stock markets in emerging markets. Last, the main factors explaining the development of the stock market in emerging market countries can also help us to understand the determinants of stock market development in South Africa.

This result is generally in agreement with the theoretical and empirical literature. For instance, Garcia and Liu (1999) found that income level and financial intermediary development have positive impacts on stock market development in a sample of Latin American and Asian countries. Demirguc-Kunt and Levine (1996) examined the relationship between stock market development and financial intermediary development in developing countries and found that most stock market indicators are highly correlated with financial intermediary development. Countries with well-developed stock markets tend to have well-developed financial intermediaries.

The findings of this paper have important policy implications for emerging market countries. First, economic growth plays an important role in stock market development. It is important to initiate policies to foster growth and development as countries liberalize their financial systems. Second, the development of well-developed banking sector is important for stock market development in emerging markets. At the early stages of its establishment the stock market is a complement rather than substitute for the banking sector. Developing the banking sector can promote stock market development as demonstrated by the experiences of many East Asian countries. Support services from the banking system contribute significantly to the development of the stock market. However, when stock markets are sufficiently developed they tend to compete with the banking sector as shown by our findings.

Third, domestic investment is an important determinant of stock market development in emerging markets. To promote stock market development emerging markets countries can encourage investment by appropriate policies**.**

Fourth, stock market liquidity has a positive effect on stock market development. Improving stock market liquidity in emerging markets can be another approach of promoting stock market development.

Finally, good quality institutions are important determinants of stock market development. Well established institutions reduce political risk, an important factor in investment decisions. The development of good quality institutions such as law and order, efficient bureaucracy, and democratic accountability is therefore crucial for stock market development in emerging economies.

References

Arrelano, Manuel and Stephen Bond, 1991, "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations, "*The Review of Economic Studies,* Vol. 58, (2), pp. 277–297.

Baumol, J. William, 1960*, The Stock Market and Economic Efficiency*, (New York: Furham University Press).

Bekaert, Geert, 1996, "Market Integration and Investment Barriers in Emerging Stock Markets," *The World Bank Economic Review*, Vol. 9, pp. 75–107.

Bhide, Amar, 1994, "The Hidden Cost of Stock Market Liquidity," *Journal of Financial Economics,* Vol. 34, pp. 31–51.

Binswanger, Mathias, 1999, *Stock Markets, Speculative Bubbles and Economic Growth*, (Cheltenham: Edward Elgar Publishing)**.**

Bonin, John and Paul Wachtel, 2003, "Financial Sector Development in Transition Economies: Lessons from the first Decade," *Financial Markets, Institutions and Instruments*, Vol. 12, pp. 1–66.

Calderon-Rossell, R. Jorge, 1990, "The Structure and Evolution of World Stock Markets," in S.Ghon Rhee and Rosita P. Chang (eds.), Pacific Basin Capital Markets Research Proceeding of the First Annual Pacific Basin Finance Conference, Taipei, China, 13-15 March 1989, (Amsterdam: North Holland).

_____1991, "The Determinants of Stock Market Growth," in S. Ghon Rhee and Rosita P. Chang (eds.), Pacific Basin Capital Markets Research Proceeding of the Second Annual Pacific Basin Finance Conference, Vol. II, Bangkok, Thailand, 4–6 June, (Amsterdam: North Holland).

Demirguc-Kunt, Asli, and Ross Levine, 1996, "Stock Markets, Corporate Finance and Economic Growth: An Overview," *The World Bank Economic Review*, Vol. 10 (2), pp. 223–239.

Demirguc-Kunt, Asli, and Vojislav Maksimovic, 1998, "Law, Finance, and Firm Growth," *Journal of Finance*, Vol. 53, pp. 2107–2137

De Santis, Giorgio and Selahattin. Imrohoroglu, 1997, "Stock Returns and Volatility in Emerging Financial Markets," *Journal of International Money and Finance*, Vol. 16, pp. 561–579.

Diamonte, Robin L., John M. Liew, and Ross L. Stevens, 1996, "Political Risk in Emerging and Developed Markets," *Financial Analysts Journal*, Vol. 52 (3), pp. 71–76.

Durham, J. Benson, 2002, "The Effects of Stock Market Development on Growth and Private Investment in Low Income Countries," *Emerging Markets Review*, Vol. 3 (3), pp. 211–232.

Edison, Hali, 2003, "Testing the Links: How Strong Are the Links between Institutional Quality and Economic Performance?" *Finance and Development*, Vol. 40, pp. 35–37.

El-Erian, Mohamed and Manmohan S. Kumar, 1995, "Emerging Stock Markets in Middle Eastern Countries," Paper presented at the World Bank Conference on Stock Markets, Corporate Finance and Economic Growth, Washington DC, February 16–17.

Erb Claude B., Campbell R. Harvey, and Tadase E. Viskanta, 1996a, "Expected Returns and Volatility in 135 Countries," Journal of Portfolio Management, Spring, pp. 32–48.

_____1996b, "Political Risk, Economic Risk and Financial Risk", *Financial Analysts Journal*, Vol. 52 (6), pp. 29–46.

El-Wassal, A. Kamal, 2005, "Understanding the Growth in Emerging Stock Markets," Journal of Emerging Market Finance, Vol. 4 (3), pp. 227–261.

Frankel, A. Jeffrey, 1993, "The Internationalisation of Stock Markets,"*NBER Working Paper 4590*, Cambridge: National Bureau of Economic Research.

Garcia, F. Valeriano, and Lin Liu, 1999, "Macroeconomic Determinants of Stock Market Development," *Journal of Applied Economics*, Vol. 2 (1), pp. 29–59.

Kaufman, Daniel, Aart Kraay, and Pablo Zoido-Lobaton, 1999, "Aggregating Governance Indicators," World *Bank Policy Research Working Paper 2196*, Washington DC: World Bank.

King, G. Robert and Ross Levine, 1993, "Finance and Growth: Schumpeter Might be Right," *The Quarterly Journal of Economics,* Vol., 108 (3), pp. 717–737.

Knack, Stephen and Peter Keifer, 1995, "Institutions and Economic Performance: Cross Country Tests using Alternative Institutional Measures," *Economics and Politics*, Vol. 7, pp. 207–287.

Kumar, S. Mamohan, 1984, *Growth, Acquisition, and Investment*, (Cambridge: Cambridge University Press)**.**

La Porta Rafael, Florencio Lopez-de-Silanes, and Andrei Shleifer, 1997 "Legal Determinants of External Finance," *Journal of Finance*, Vol. 52, pp. 113–150.

Levine, Ross and Sara Zervos, 1998, "Stock Markets, Banks, and Economic Growth," *American Economic Review*, Vol. 88, pp. 536–558.

Mboweni, Tito, 2006, "Deepening Capital Markets: The Case of South Africa," *Presented at a Seminar on Deepening Financial Sectors in Africa: Experiences and Policy Options*, Johannesburg.

McCarthy, J., M. Najand, and B. Seifert, 1990, "Empirical Tests of the Proxy Hypothesis," *The Financial Review*, Vol. 35, pp. 59–78.

Mishkin, Frederic, 2001, "Financial Policies and the Prevention of Financial Crises in Emerging Market Countries," NBER Working Paper No. 8087, (Cambridge: NBER).

Mullins, John, 1993, "Emerging Stock Markets in the Global Economy," *Federal Reserve Bank of New York* Quarterly Review, summer, 54–83.

Obstfeld, Maurice, 1994, "Risk Taking, Global Diversification, and Growth," *American Economic Review*, 84 (5), pp. 1310–29.

Perotti, C. Enrico and Peter Van Oijen, 2001, "Privatization, Political Risk and Stock Market Development in Emerging Economies," *Journal of International Money and Finance*, Vol. 20 (1), pp. 43–69.

Political Risk Services, International Country Risk Guide (various issues).

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

Singh, Ajit, 1971, *Takeovers: Their Relevance to the Stock Market and the Theory of the Firm*, (Cambridge: Cambridge University Press).

_____1997, "Financial Liberalization, Stock Markets, and Economic Development," *The Economic Journal*, Vol. 107, May, pp. 771–782.

Standard and Poor, 2005, *Global Stock Market Factbook 2005,* New York: Stand and Poor

Tirole, Jean, 1991, "Privatization in Eastern Europe: Incentives and the Economics of Transition," In Blanchard, O. J. and Fisher, S. S. (eds) NBER Macroeconomics Annual 1991, (Cambridge, MA: The MIT Press).

Wachtel, Paul, 2003, "How Much Do We Really Know about Growth and Finance?" *Federal Reserve Bank of Atlanta Economic Review*, First Quarter.

World Bank, 2005, *Global Development Finance,* (Washington DC: The World Bank).

Yartey, Charles Amo, 2004, "The Economics of Civil War in Sub-Saharan Africa," in Jean Clement, ed., *Post Conflict Economics in Sub-Saharan Africa,* (Washington: International Monetary Fund).

_____2005, "Stock Market Development, Corporate Finance and Economic Growth in Africa," *PhD Thesis,* (Cambridge, UK: Faculty of Economics, University of Cambridge).

_____2007, "Macroeconomic and Institutional Determinants of Stock Market Development in Africa," in Okpara, John, ed.," *Management and Economic Development in Sub-Saharan Africa: Theoretical and Applied Perspectives,*" (London: Adonis and Abbey Publishers).