



## **Stock Market Efficiency Promotes Economic Development: Empirical Evidence from Africa**

**Christie Dike\***

Department of Finance, College of Business Administration, Prince Sultan University, Riyadh, Kingdom of Saudi Arabia.

\*Email: [cdike@psu.edu.sa](mailto:cdike@psu.edu.sa), [onwujubac@aol.com](mailto:onwujubac@aol.com)

### **ABSTRACT**

The stock market plays an essential role in the growth of commerce and industry which ultimately affects the economy of the country to a large extent. This is the rationale that the industrial bodies, government advisors and even the central bank of the country keep a close eye on the activities of the stock market. With the ever-growing importance of stock markets, an overwhelming number of studies have been carried out worldwide to investigate the link which exists between stock market development and economic growth. However, most of these studies focused on developed countries. Since studies analyzing this link are scant in the African region, this paper endeavours to scrutinize the relationship between equity market development and economic growth in a sample of African countries. To this end, this paper analyzes the relationship between stock market development, banking development and economic growth in a unified framework using annual panel data for the period 1990-2015, through a dynamic panel vector error correction model. The results seem to suggest that stock market development plays an important role in generating gains in terms of economic growth.

**Keywords:** Economic Growth, Stock Market Development, Panel Vector Error Correction Model, Co-integration

**JEL Classifications:** E40, G20, O16, E44, O43

### **1. INTRODUCTION**

One of the most enticing and long lasting debates in economics revolves around the relationship between financial development and economic growth. Its root can be traced back to as early as Schumpeter (1912), who vehemently argued that financial services are of paramount importance for enhancing economic growth. The financial sector can in fact be roughly split into two systems: the bank-based system and the market-based system. Historically, research has been confined solely to the role of banking sector on economic growth. Indeed, Bagehot (1873) and Schumpeter (1912) lay emphasis on the importance of the banking system in promoting economic growth. They illustrate that by identifying and funding productive investments, banks can dynamically lead to innovation and economic growth. On the contrary, Lucas (1988) argues that economists tend to badly “over-stress” the role of financial development. Empirically many studies (King and Levine, 1993 and 1994; Rousseau and Wachtel, 1998; Levine and Zervos, 1998; Arestis et al., 2001; Beck and Levine, 2002) demonstrate that financial systems actually do accelerate the long run economic growth.

In the recent past, however, with the phenomenal growth of equity markets, a burgeoning number of policy makers and researchers began to query about the possible impact that equity market development might have on economic growth. This has duly shifted the focus towards the link between stock market development and economic development. Although research about the specific contributions of stock markets to economic development is increasing extensively, arguments and evidence, both theoretical and empirical, have been diverse.

Researches revolve around two interesting questions: Is there any relationship between equity market development and economic expansion? And is there is one, then, what are the nature and the direction of this relationship? Analysts share different views regarding these questions. On one hand, some believe that stock market development is highly positively correlated to economic growth (Pagano, 1993; Atje and Jovanovich, 1993; Demirgüç-Kunt and Levine, 1996; Levine and Zervos, 1996 and 1998; Rousseau and Wachel, 2000; Beck and Levine, 2003), while on the other hand, some claim that stock market development affects the economy adversely (Stiglitz, 1994; Bencivenga and Smith,

1991; Naceur and Ghazouani, 2007; Devereux and Smith, 1994). Moreover, traditional growth theorists strongly believed that no such link exists between equity market development and economic expansion, so much so that some even viewed the stock market as an instrument that can damage economic development due to their volatile nature (Stiglitz, 1994; Bencivenga and Smith, 1991; Naceur and Ghazouani, 2007; Devereux and Smith, 1994).

Theoretically, researchers who are in favor of positive relationships between stock market development and economic growth hinged their arguments on the fact that the stock markets promote economic development mainly through the specific direct or indirect services they perform, namely, mobilization and allocation of savings, liquidity, risk diversification and management, facilitating the exchange of goods and services, and ensuring good corporate governance and control, and, improved dissemination and acquisition of information (Levine, 2004). However, these perceived benefits have been often criticized, to the extent that they are even believed to cause damage to the economy (Tullio and Pagano, 1994; Devereux and Smith, 1994).

Having generated strong controversy, the debate concerning the link between financial development and economic growth is still difficult to solve and causality hard to pin down. Some growth analysts advocate the “supply leading” hypothesis, which argues that economic growth appears as a consequence of stock market development (McKinnon, 1973; Shaw, 1973; Patrick, 1966; Fry, 1977; Levine and Zervos, 1996 and 1998; Demirgüç-Kunt and Levine, 1996; Atje and Jovanovic, 1993; King and Levine, 1993; Levine and Zervos, 1998; Demirgüç-Kunt and Maksimovic, 1996; Agrwalla and Tuteji, 2007), while others postulate the inverse, that is, the “demand following” approach, which claims that the development in the economic sector precedes financial development since an increase in real income enables the growth of costly and increasingly sophisticated financial services (Robinson, 1952). Yet another view argues that stock market development and economic growth simultaneously influence each other, thus favoring a bi-directional causal relationship between them (Arestis and Demetriades, 1993; Arestis et al., 2001; Demetriades and Hussein, 1996; Luintel and Khan, 1999). So far, the exact direction of causality between stock market development and economic growth remains rather controversial.

Overall, it is by now widely recognized that a well-functioning financial system is crucial to economic growth. Indeed, new theoretical and empirical research works provide support to the growing assertion that stock markets, being part of the financial system, play important roles as well in economic growth. However, causality direction between them has generated a lot of controversy, while dynamics and endogeneity issues have been tackled obliquely. Yet another weakness of previous empirical works is the failure to scrutinize the individual contribution of banking and stock market development on economic growth in a single framework. Besides, despite the rapidly escalating interest in the role and importance of stock market development on economic growth, literature on equity markets abounds mostly for developed countries only, while analysis of the link relatively scant in developing regions, more specifically, African countries.

Since it is unclear whether African countries respond similarly, the study will analyze the impact of stock market development on economic growth in a selected set of countries in the African region. This paper is believed to depart from and contribute to the existing literature in several ways. A dynamic panel analysis will be employed for this analysis. Indeed, a panel vector error correction model (PVECM) is used intensively to determine the relationship between stock market development and economic growth while simultaneously allowing identification of any bi-directional and/or uni-directional causality between the variables of interest. Moreover, this particular model divulges both the direct and the indirect impacts, if any, which stock market development might have on economic growth. Possible determinants of stock market development and the effect of stock market development on the control variables can also be analyzed through the PVAR model. Additionally, this study analyses stock market development, economic growth as well as banking development in a unified framework, thus simultaneously allowing the complementary or substitutability element of bank and stock market to be determined. The use of extracted information is maximized by using several measures of stock market development instead of a composite measure, thus enabling us to better identify the potential links between the stock market and economic expansion.

The rest of this paper is organized as follows: A brief overview of the existing theoretical and empirical literature is provided in Section 2. Next, Section 3 provides a brief overview of the evolution of stock exchanges in the African region, while Section 4 describes the main stock market development and economic growth proxies which will be used in this study. Moreover, it introduces the VEC model and provides empirical evidence to the stationary tests and the co-integration tests. Section 5 eventually constructs the PVECM for the purpose of this study in Mauritius and provides a detailed interpretation of the results.

## 2. LITERATURE REVIEW

### 2.1. Theoretical Evidence: Stock Market Development and Economic Growth

Theoretical literature has revealed diverging views with regards to the link between stock market development and economic growth. Indeed, while a rapidly increasing number of theoretical literature support the view that well-functioning stock markets can give a vital boost to economic expansion through the financial services they provide either directly or indirectly (facilitating liquidity, risk diversification, savings mobilization, aggregating and disseminating information about firms, and promoting corporate control), there are still other studies which stress out the harm that stock markets can cause to economic growth.

Liquidity is one of the channels through which stock markets can have an impact on economic growth. Liquid equity markets facilitate and increase long term and possibly more profitable investments by reducing the associated risk and improving profitability: Assets can be easily and cheaply sold if savers want access to their savings or if they want to alter and diversify their portfolios, while firms still have permanent access to the capital invested by the initial investors. As a result, savers become more

comfortable with long-term investments, which eventually become viewed as being more attractive and less risky. Thus, more liquid stock markets facilitate investments in long-term and potentially more lucrative projects, thereby enhancing prospects for long-term growth (Levine, 1991). Moreover, liquidity also increases investor incentive to acquire information on firms and improve corporate governance, thereby promoting growth (Holmstrom and Tirole, 1993).

Yet another important contribution of stock markets to economic growth is through the global risk diversification opportunities they offer. Stock markets serve as a tool for trading, pooling and diversifying risks. The ability of stock markets to provide risk diversification services may prompt long run growth via changes in savings rates and resource allocation (Levine, 2004; Gurley and Shaw, 1955; Patrick, 1966; Greenwood and Jovanic, 1990; Greenwood and Smith, 1999; St. Paul, 1992; Devereux and Smith, 1994; Obstfeld, 1994). However, greater risk sharing and liquidity simultaneously have ambiguous theoretical impacts on saving rates. Indeed, they can cause saving rates can fall so low that they lead to slower economic growth (Devereux and Smith, 1994; Levine, 2004).

Mobilization of savings is also recognized as another channel of transmission between stock market development and economic growth. Acemoglu and Zilibotti (1997) demonstrate how savings mobilization can be linked to economic expansion. Financial intermediaries that mobilize savings from many investors and inject the resources in a diversified portfolio of risky projects enable a shift towards higher return activities, thus leading to an improvement in economic growth. Moreover, savings mobilization has a direct impact on capital accumulation and it can also enhance resource allocation and technological innovation (Levine, 1997). Thus since stock markets help improve the effective mobilization of resources, they enable better technologies to be adopted, thereby encouraging growth (Greenwood and Smith, 1996; Sirri and Tufano, 1995).

Additionally, stock markets may also stimulate the acquisition and dissemination of information on firms, thereby accelerating economic growth. In fact high information costs may prevent investors from injecting capital in the most profitable firms. Fortunately, stock markets play an important role in overcoming information frictions as stressed by Boyd and Prescott (1986). They argue that financial intermediaries provide information about investment projects. This reduces the costs of collecting and analyzing information, thereby improving resource allocation (Diamond, 1984). Had it not been for the financial intermediaries, each investor would have had to pay a large fixed cost for the evaluation (Levine, 2004).

Well-functioning stock markets also foster corporate. As the effectiveness of corporate governance increases, the firm's performance is improved, thereby promoting economic growth. For instance, Holmstrom and Tirole (1993) state that "it seems equally clear that the stock market today performs an important role as a monitor of management, both directly by assessing past contributions to value and indirectly as a market for corporate

control." Moreover, Dow and Gorton (1997) also argue that to improve investment decisions, stock prices can be used to evaluate previous management decisions, thus ensuring that stock markets provide greater incentives for better corporate control. Knight (1998), further states that this improves the efficiency of the global allocation of savings and investment, which in turn enhances economic growth.

In contradiction to the above, theoretical disagreements concede that the services provided by the stock markets can also influence economic growth negatively (Sing, 1997; Sing and Weiss, 1998). Despite the positive impact that stock market liquidity is believed to have on economic growth, it can also deter growth as pointed out by Demirgüç-Kunt and Levine (1996): Firstly, despite fostering an increased return on investment, it simultaneously reduces saving rates through income and substitution effects (Devereux and Smith, 1994), thus hindering economic growth. Secondly, economists claim that the ambiguous effect which the reduced investment risk causes on saving rates may curb economic expansion. Lastly, economic development is also thwarted when dissatisfied participants find it easy and quick to sell in a liquid equity market.

The risk diversification advantage of stock markets can also hinder growth. Indeed, theoretically, greater risk sharing and more efficient capital allocation have ambiguous effects on savings rates. Levine (2004) maintains that if the savings rates fall enough so that, when coupled with an externality-based or linear growth model, greater risk diversification can cause the overall economic growth to fall as well. This is also discussed by Devereux and Smith (1994).

The ability of stock markets to boost growth through enhance corporate control has also been questioned. In 2008, Singh and Deakin vehemently argued that contrary to conventional wisdom, "an active stock market for corporate control is not an essential ingredient of either company law reform or financial and economic development." They observe that despite the previous lack of an active market for corporate control in some countries like Japan, Germany, and France, their long term economic record have been relatively superior. Transaction costs were avoided and managers were still disciplined. They explain that hostile takeovers may actually be harmful to growth prospects due to the economic and social costs linked to restructuring.

## 2.2. Empirical Evidence: Stock Market Development and Economic Growth

Following the works of Schumpeter (1911), Robinson (1952), Goldsmith (1969), McKinnon (1973) and Shaw (1973), the relationship between financial development and growth has been extensively investigated empirically. Although most of these studies used bank based measures of financial development, the recent past has seen a shift towards examining the impact of stock market development on economic growth as well. This has resulted in quite a substantial amount of empirical literature. Be it on a country specific basis, or panels of countries, or even a regional block, results have been mixed. Most, however, concede to a positive relation between stock market development and economic growth as mentioned hereunder:



On the empirical front, Atje and Jovanovic (1993) test the hypothesis that stock markets have a positive link with economic growth. They present a cross-country study of 40 countries over the period 1980-1988 and find a significant correlation between growth and the stock market trading relative to gross domestic product (GDP) using an OLS regression. King and Levine (1993) also carried out a cross sectional analysis for 77 countries over the period 1960-1989 and documented a robust relationship between initial financial development and subsequent economic growth. Moreover, Levine and Zervos (1996) used pooled cross country time series regression of 41 countries from 1979-1993 and carried out a similar study, but, focused mainly on the role of stock market development. Findings of the study indicated a strong correlation between the stock market development and long run economic growth. Rajan and Zingales (1998) also employ cross-country regressions during the period 1980-1990 on a large sample of countries to examine whether financial development facilitates economic growth. Their results suggest that financial development has an impact on the rate of economic growth and they also find that market capitalization is seen to have a lower impact than credit. Results from yet another study by Levine and Zervos (1998) across 48 countries, for the period 1976-1993 again suggested a strong statistically significant relationship between initial stock market development, banking development and subsequent economic growth. The study also indicated that both are good predictors of growth. Furthermore, Levine (2002) employs a broad, cross-country examination across 48 countries over the period of 1980-1995 and find that the overall financial development is closely linked to economic growth.

Shifting to panel data to cater for previous weaknesses, Rousseau and Wachtel (2000) used a panel vector auto regression with generalized method of moment (GMM) technique to examine simultaneously the relationship between stock markets, banks and economic growth. After examining the relationship on 47 countries during 1980-1995, their results indicated that both banks and stock markets promote economic growth. Beck and Levine (2002) investigate the impact of stock markets and banks on economic growth over the period 1976-1998. They use GMM techniques for dynamic panel and find that both the stock market development and bank development are important for economic growth. On the other hand, Mohtadi and Agarwal (2004) use random effects model to examine the relationship between stock market development and economic growth using sample data from 21 emerging markets (including a few markets from the African region) over 21 years. They find that this link can be both a direct one as well as an indirect one, with the latter occurring through a boost in investment. It is noteworthy to mention that it is turnover ratio (TR) which directly influences economic growth, while it is market capitalization ratio (MCR) which indirectly influences growth. As for Arestis et al. (2001), they employ quarterly data in a VAR framework for Germany during 1973-1997, the United States for 1972-1998, Japan for 1974-1998, the United Kingdom for 1968-1997, and France for 1974-1998. Their empirical results indicate that while stock markets do contribute to economic growth, their influence is, at best, only a small percentage of that of the banking system.

Several country specific studies have also been carried out. Empirically examining the causal relationship among financial development, credit market and economic growth during 1988-2002 in Greece, Dritsaki and Dritsaki-Bargiota (2006) employ a VECM. Results indicate that there is a unidirectional causal relationship between economic growth and stock market development, with direction running from economic growth to stock market development. Moreover, the presence of a bi directional causal relationship between economic growth and bank sector development is also observed. Moreover, in order to analyze the relationship between stock market development and economic growth in India, Agrawalla and Tuteja (2007) also resort to a VECM using monthly time series data during 1990-2002. The findings reveal that stock market development acts as a stimulus to the Indian economic growth, especially in the long run. Moreover, strong evidence in support of a bi directional causality between banking sector development and long run economic growth is also provided. Similarly, Deb and Mukherjee (2008) explore the causal relationship between stock market development and economic growth in the Indian economy. They estimate a VAR model find that there exists a bi directional causality between MCR and real GDP growth rate. On the other hand, between value traded ratio and real GDP growth rate, the results indicate the presence of a uni-directional causality, running from the real economic sector to the stock market development proxy. Using a somewhat different approach (ARDL), Shahbaz et al. (2008) try to determine whether there is a relationship between stock market development and economic growth for the case of a developing economy like Pakistan during the period 1971-2006. Their findings suggest that there exist a very strong relationship between stock market development and economic growth. While in the long run a bi-directional causality is detected, in the short run only a one way causality is detected, running from stock market development to economic growth. On the other hand, Chakraborty (2010) examines the impact of the developments in the financial sector on economic growth in India in the post-reform period (1993-2005) using quarterly data using a VECM. Results show that stock market development does not play an important role in enhancing economic growth in India.

As far as the African region is concerned, a few studies have been carried out. [Adjasi and Biekpe \(2006\)](#) use a dynamic panel data modeling setting to study the effect of stock market development on economic growth in 14 African countries. The study thus adopts the Arellano and Bond (1991) GMM approach and the results indicate a positive relationship between stock market development and economic growth in the group of African countries. This significant role is only evident in an improvement in the total value of shares traded, thus hinting the importance of liquidity and active trading to economic growth. On the other hand, Naceur and Ghazouani (2007) make use of an unbalanced, dynamic panel model with GMM estimators across 11 MENA region countries. Empirical results suggest that there is no significant relationship between banking and stock market development, and economic growth. As far as the West African monetary union is concerned, the impact of equity market development on growth in the region over the period 1995-2006 is investigated by Tachiwou (2010). The empirical results indicate

AQI

a bi-directional causal relationship between the two proxies of financial sector development (bank sector development and stock market development), both in the short run and the long run and concludes that the development of the financial sector in South Africa is largely driven by the stock market activities (Table 1, which provides a summary of other studies analyzing the impact of stock market development on economic growth in the Appendix).

### 3. OVERVIEW OF STOCK EXCHANGES IN THE AFRICAN REGION

Traditionally, most African countries depended solely on the banking system. However, in the last decade, Africa, particularly Sub-Saharan Africa, has witnessed a remarkable growth in the number of financial markets coupled with a boom in stock market capitalization. Indeed, the number of capital markets in the African region has sky-rocketed from a mere 5 in 1989 across the whole of Sub-Saharan Africa to around 29 exchanges covering capital markets of 38 nations in 2013. Indeed, apart from the older and much larger stock exchanges in South Africa and Egypt, stock markets are now present in countries like Botswana, Côte d'Ivoire, Ghana, Kenya, Malawi, Mauritius, Morocco, Mozambique, Namibia, Nigeria, South Africa, Swaziland, Tanzania, Tunisia, Uganda, Zambia and Zimbabwe. This includes including one of the only regional stock exchanges in the world, linking eight French-speaking countries in West Africa. Furthermore, necessary steps are being taken in countries where stock exchanges have not yet been set up to fill the gap (For instance, Angola, Somalia and South Sudan are also expressing interest in setting up a stock market). According to Nkontchou, the combined African equity markets now account for about 12% of global emerging markets, with less than 2000 listed companies across all African markets (compared with 3500 for India alone, and 1700 for China). Moreover, Nkontchou also mentioned that the market capitalization of the 10 largest markets grew from USD 222 billion to over USD 700 billion between 2002 and 2008, a compound annual growth rate of 18%.

This ever increasing growth of stock markets in the African region has several positive implications. Indeed, it is expected that the growth of stock markets can stimulate economic growth in Africa. Stock markets induce an upsurge in domestic savings,

leading to an increase in both domestic and foreign investments, while simultaneously improving the quality of such investments. The integration of Africa in the global financial market place is thus eased. Moreover, Nkontchou (2010) points out those financial markets are critical in providing capital for the private sector in Sub-Saharan Africa (especially in the financial services and telecommunication sectors). High potential companies with limited funds are still able to grow by exploiting the services of stock markets, which enable them to raise money at a relatively low cost. He further argues that capital markets lead to the emergence of alternative investment opportunities for local savings. For instance, in Nigeria, the bulk of the re-capitalization of the banking sector was achieved by channeling local savings into the stock market (Nkontchou, 2010). The importance of stock markets in African countries with poorly developed financial systems is magnified since the latter have limited bank-lending opportunities.

Despite being relatively new, the stock exchanges in the African region have nonetheless succeeded in drawing the attention of international investors, thus providing an imperative opportunity to attract global capital and integrating Africa into the global financial market place. Indeed, owing to their attractive Price/Earnings ratios and portfolio diversification opportunities that they offer with their superior risk/return profile, African exchanges have provided alluring returns in the last few years (UNDP, 2003). In fact, as far as the African Market is concerned, Zimbabwe was first included in the S&P Emerging Market indices in 1975. This series subsequently expanded its coverage to include 11 additional African markets by 1998. With the launch of the S&P Africa Index Series, S&P Indices provides investors with unique investable indices for this region. The series include the S&P Africa Frontier Shariah, S&P Africa 40, S&P Africa Frontier, and S&P Pan Africa indices as shown in Table 1.

The various roles that stock markets play in Africa, especially in the private sector are becoming more and more important. Indeed, African stock markets have now proved to be a major source of finance for investments: African stock exchanges have even managed to raise about USD 10 billion during 2007-2009. In Sub-Saharan Africa, stock markets have become an increasingly important source of capital for the private sector (especially in the financial services and telecommunication sectors). In Nigeria on the other hand, stock markets now provide an alternative investment opportunity for local savings. This enabled the recapitalization of the banking sector during 2005-2008 attracted over USD 4 billion of new investment through the stock market- mainly from local investors (Nkontchou 2010).

The past few years has witnessed acceleration in the number of African companies going public in the capital markets to fund their growth. Indeed, Nkontchou's research showed that the listing of about 170 new companies raised over USD 10 billion across 18 stock exchanges during 2007-2009. As a strong aftermarket performance of initial public offerings (IPOs) in Africa, even more investors were drawn into pre-IPO investments. However, despite recent successes, the African stock market development is

**Table 1: African market indices (In percent)**

Index performance (years)	S&P Africa Frontier Shariah index	S&P Africa 40	S&P Africa Frontier	S&P Pan Africa
Annualized returns				
1	85.59	-6.95	55.26	0.91
3	19.75	-0.37	13.31	4.47
5	5.10	2.32	-5.52	3.35
Annualized risk (SD)				
1	12.98	17.34	11.64	16.91
3	11.45	21.19	12.34	20.54
5	14.58	26.04	347.05	24.89

Source: S&P Dow Jones

still unfortunately hindered by a lack of accurate data, preventing the implementation of adequate policies.

Yartey and Adjasi (2007) caution that the rapid development of stock markets in the African region is not tantamount to their maturity. While there is ample evidence that African stock exchanges can perform well and develop, the recognition that they have to face some serious challenges also persists. One is that the market capitalization in African stock exchanges is relatively low. Still relatively smaller than other emerging stock markets, African stock markets are usually dominated by a few firms that account for a high proportion of the total market capitalization. Andrianaivo and Yartey (2009) also highlight a few plights of the African stock exchanges. Firstly, they argue that exchanges fail to be used in an effective and efficient manner because institutional investors and governments with minority stockholdings are not active traders in secondary markets and lack of experience and resources for issuing shares. Another common setback of African stock markets is that shares are rarely traded and there are huge gaps between buy and sell orders, causing the markets to be thin and illiquid (except for established markets in South Africa and to a limited extent, North Africa). Africa's most well-established stock markets also lack maturity. Yartey and Adjasi (2007) clarified that trading is usually limited to only a select handful of stocks (those that represent the majority of market capitalization). This implies that the larger listings often affect the performance of exchanges disproportionately. Indeed, most African markets are described as "frontier markets" owing to their relatively small capitalization and liquidity levels. Low liquidity implies more difficulty in supporting a local market with its own trading systems, market analysis, and brokers because business volume is too low (Andrianaivo and Yartey, 2009). Moreover, serious informational and disclosure deficiencies occur for less actively traded stocks.

Nevertheless, despite these problems, African stock markets have continued to perform remarkably well with regards to return on investment. The Ghana Stock Exchange was even nominated the world's best-performing market at end of 2004. Compared to 30% return by Morgan Stanley Capital International Global Index, the Ghana Stock Exchange experienced a year return of 144% in US dollar terms (Databank Group, 2004). Moreover, within the continent itself, five other bourses – Uganda, Kenya, Egypt, Mauritius and Nigeria apart from Ghana – were amongst the best performers in the year.

## 4. METHODOLOGY AND DATA ANALYSIS

### 4.1. Data Description and Measurement

To analyse the relationship between stock market development and economic growth in the set of African countries under consideration (Egypt, Arab Rep., Iran, Islamic Rep., Jordan, Lebanon, Morocco, Tunisia, West Bank and Gaza, Botswana, Cote d'Ivoire, Ghana, Kenya, Malawi, Mauritius, Namibia, South Africa, Swaziland, Nigeria, Tanzania, Uganda, Zimbabwe, Zambia) with panel data spanning over a period of 24 years (1988-2011) is considered. This section describes the model adopted and the empirical indicators of stock market development, banking development, and, other control variables used in the model.

The basic specification of the model is based on the principles of growth models developed by earlier studies carried out by King and Levine (1993), Levine and Zervos (1998), Levine et al. (2000), Bekaert et al. (2001), Wachtel (2001), (Tang, 2006), and Seetanah (2008) and takes the following functional form:

$$Y = f(\text{MCR}, \text{TR}, \text{TVTSR}, \text{DCTPS}, \text{GFCF}, \text{FDI}, \text{OPNS}, \text{SER}) \quad (1)$$

The dependent variable is proxied by gross domestic product growth (GDPG). Three stock market development indicators are used, namely, MCR, which is the value of listed shares in the stock exchange divided by GDP (MCR), TR, which is the value of total traded shares expressed as a percentage of total market capitalization (TR), and, total value traded share ratio (TVTSR), which is the total value of shares traded on a country's stock exchanges expressed as a percentage of GDP (TVTSR). To measure banking development, we follow, Levine and Zervos (1998), Rousseau and Wachtel (2000), Mazur and Alexander (2001), and, Beck and Levine (2002), and use domestic credit to private sector, which is the value of credits by financial intermediaries to the private sector divided by, since it improves on other measures of banking sector size. Other control variables used in the model include trade openness (OPNS), which is the sum of exports and imports divided by GDP (Dollar, 1992; Edwards, 1993; Barro et al., 1995; Sachs and Warner, 1995; Frankel and Romer, 1999). We also follow Tang (2006), and Naceur and Ghazouani (2007) and include two measures of investment: Gross fixed capital formation (GFCF), which is the country's gross fixed capital formation divided by its GDP (investment ratio), FDI, which is the foreign direct investment expressed as the percentage of GDP. Lastly, drawing from Seetanah et al. (2008), the secondary enrolment ratio (SER), a human capital measure, is also added as a control variable in the model which to account for the quality of labor.

This particular study draws from Pagano (1993), Demirgüç-Kunt and Levine (1996), Levine and Zervos (1998), Rousseau and Wachtel (2000), Mazur and Alexander (2001), Beck and Levine (2003), and, Mohtadi and Agarwal (2004) and uses three different indicators of stock market development: MCR, TR, and TVTSR. Indeed, there is no single measurement that can capture all the aspects of Stock market development. Here, this study uses several different measures of stock market development to maximize the use of information extracted from data and to provide a more comprehensive picture of stock market development as opposed to information provided by only one indicator. MCR is the index which most widely used by analysts as a measure of stock market size. It measures the extent to which the stock market allocates capital to investment projects, as well as the opportunities for risk diversification that investors have.

Stock market liquidity indicators used are turnover ratio (TVTSR) and (TR). The former indicator measures the investors' ability to trade economically significant positions on a stock market and complements the MCR as even if a market is large, there might be little trading. The latter indicator, (TR), is often used as an indicator of transactions costs (Levine and Zervos, 1998). High turnover implies low transactions costs. It measures the stock trading



relative to the size of stock market whereas TVTSR measures the stock trading relative to the economy size. Accordingly, this makes TR a more objective indicator for stock market liquidity than TVTSR, regardless of the size of the economy.

Note that the source of our time series data is the World Development Indicator database from the World Bank.

The specification used in this model is a linear-log one. Taking logs on the right hand side of the equation (1) above results in the following:

$$Y_{it} = \alpha_0 + \alpha_1 MCR_{it} + \alpha_2 TRI_{it} + \alpha_3 TVTSR_{it} + \alpha_4 DCTPS_{it} + \alpha_5 GFCF_{it} + \alpha_6 FDI_{it} + \alpha_7 OPNS_{it} + \alpha_8 SER_{it} + \epsilon \quad (2)$$

Where  $i$  denotes the different countries in the sample and  $t$  denotes the time dimension (From here onwards, the small letters denote the natural logarithm of the variables).

#### 4.2. Panel Unit Root Tests

Before proceeding with the estimation of the model to investigate the statistical relationship between stock market development and economic growth, it is important to determine whether the time series are have a unit root, that is, if they are non-stationary. Indeed, financial and economic time series data such as the ones used in this study tend to inherently exhibit either a deterministic and/or stochastic time trend given their dynamic nature, and are therefore non stationary (that is, the variables have, means, variances and covariance's that are not time invariant). Given the unpredictability of non-stationary data, modeling and forecasting become difficult and generate spurious results. Hence, it is crucial to check whether a time series is stationary or not. If the series are non-stationary, a process called differencing is used to transform the non-stationary data to a stationary. Usually, differencing non-stationary series one or more times they usually leads to stationary. Depending on how many times the series have been differenced, the order of integration of the series is obtained (The need to differencing a series  $d$  times to make it stationary implies that the series is integrated of order  $d$ ,  $I(d)$ ). To this end, we make use of panel unit root tests to find the order of integration of the various variables under consideration. Im et al. (1995) panel unit root tests are used and results of test applied on our time series in levels reject stationary in favor of a unit root for all the variables. In this study, it turns out that stationary is achieved after differencing each variable once, which means that each of the variables is integrated of order one. The results are also confirmed by the ADF-fisher, PP-fisher and Levin, Lin and Chu panel unit root tests at the 5% significance level for each variable.

#### 4.3. Panel Co-integration Test

Having determined that all the variables are integrated of order 1, an interesting question arises: Is there a long run equilibrium relationship among the underlying variables. In other words, although non stationary variables may deviate from each other in the short run, economic forces may act in response to the deviations from equilibrium, thus bringing back their association in the long run. This implies that even though each variable is integrated, there

exists a linear combination of the variables which is stationary. However this can only be achieved provided that these economic variables are co-integrated. As such, the next step is to investigate the matter through panel co-integration tests. Both Johansen Fisher panel co-integration test and Kao Residual co-integration Test indicate the presence of a cointegrating relationship among the variables. Having established the presence of a long run relationship, the study opts for a PVECM, and proceeds with its estimation.

## 5. ESTIMATION AND ANALYSIS

### 5.1. PVECM

The PVECM, as an econometric model, caters for the dynamic nature of the panel data under consideration. It can be viewed as a hybrid of the traditional VAR/VECM approach and panel data approach. As such, in addition to treating all the variables as endogenous and accommodating for the non-stationary features of the data to offer a convenient way to parameterize and specify any co-integration present, it also allows for unobserved heterogeneity. This framework, through which the dynamics feedbacks are captured, also permits the detection of any indirect effects which might be present among the variables. Interestingly, the PVECM specification forces the long run behavior of the endogenous variables to converge to their co-integrated relationships, while simultaneously accommodating for the short run dynamics as well. Moreover, given the possibility of endogeneity and causality issues, the PVECM proves to be also particularly helpful in scrutinizing the link between stock market development and economic growth. The  $p^{\text{th}}$  order PVECM is specified as follows:

$$\Delta y_{it} = \Pi y_{i,t-1} + r_{i1} \Delta y_{i,t-1} + \dots + r_{i,p-1} \Delta y_{i,t-1,p+1} + \mu_{it} \quad (3)$$

Where  $y_{it}$  is a vector comprising of 8 variables used in the model as defined above (GDPG, mcr, tr, tvtsr, dctps, opns, invs, fdi, ser),  $i$  denotes the different countries in the sample and  $t$  denotes the time dimension, and  $\mu_{it}$  is a standard white noise process. In this study, an optimal lag length of 1 is chosen based on the Akaike information criterion, Schwarz information criterion, and Hannan-Quinn Information Criterion. The PVECM is then estimated. The results of the model are reported in Tables 2 and 3.

### 5.2. The Long Run Equation

The long run equation yields very interesting results. All variables except banking development and human capital have a significant impact on economic growth within this set of African countries. Regrettably though, TVTSR and trade OPNS seem to hamper long run growth rather than boosting it, as indicated by their negative coefficients.

Of prime importance to this study, we first focus on the impact of stock market development indicators on economic growth. Out of the three stock market development proxies, only TR and TVTSR have a significant impact on economic growth in the long run. While TR brings a significantly positive impact on economic development (as indicated by its positive and significant coefficient of 0.46871), TVTSR's influence on growth is detected as being negative and significant (as revealed by the negative and significant coefficient of -0.060736). Taken as a whole however,

the total influence of stock market development on economic growth in the long run is argued to be positive and significant. Indeed, the negative influence of TVTSR is negligible as opposed to the positive boost brought forward by TR. The specification being a linear-log one implies that a 1% increase in TR generates (0.01×0.46871) unit increase in economic growth, and, a 1% increase in TVTSR which causes a (0.01×-0.060736) unit increase in growth. Coupled together, they account for 0.0041 unit increase in economic development ([0.01×0.46871] [0.01×-0.060736]). This positive impact is in line with previous studies such as that of Levine and Zervos (1998), Rousseau and Wachtel (2000), Beck and Levine (2004), Tang (2006), Seetanah (2010), and, Wong and Zhou (2011).

**Table 2: The long run equation**

Variables	Coefficient
Economic growth (GDPG)	1
Market capitalization ratio (mcr)	-0.16 [-0.63]
Turnover ratio (tr)	0.46** [2.07]
Total value traded share ratio (tvtsr)	-0.06* [-2.58]
Banking development (dctps)	-0.23 [-0.64]
Foreign direct investment (fdi)	0.89*** [6.83]
Gross fixed capital formation (gfcf)	5.17*** [9.46]
Openness (opns)	-1.16** [-1.94]
Human capital (ser)	0.03 [0.05]

\*Indicates significance at 1% level, \*\*at 5% and \*\*\*at 10% respectively. The small letters denotes variables in natural logarithmic and t values are in brackets

Shifting our focus on the banking development indicator, DCTPS, it is seen to have interestingly no significant impact on economic growth in the long run. The failure to find a link between banking development and economic growth contrasts with much of the theory that insists that such a relationship does exist. The result is contrary to that of Rousseau and Wachtel (2000), Arestis et al. (2001), Beck and Levine (2002), and, Liang and Reichert (2007), who all find that banking development plays an important role on economic growth. One of the possible reasons that could explain this phenomenon is that banks tend to monitor more carefully when lending in an environment with good creditor protection, thus causing it to become far too conservative, but nevertheless further research is required to better understand this issue). This lack of relationship can also be linked either to underdeveloped financial systems or to the unstable growth rates in the region that affect the quality of the association between finance and growth as pointed out by Naceur and Ghazouani (2007). Moreover, a higher degree of corruption among the sample of African countries under study may also account for this negative link that the long run results detect between banking development and economic growth. The root of the negative relationship can also be the banking and currency crises in some of the counties under consideration. Indeed, poor regulation, inadequate supervision and bad practice are not foreign to certain African countries. Nonetheless, similar results are obtained by Mazur and Alexander (2001), who put the blame mostly on bank crises. On the other hand, some studies even detected a negatively significant relationship between banking development and economic growth. For instance, Kassimatis and Spyrou (2001) detect a negative link between these two variables in Chile and Mexico. Additionally Shen and Lee (2006) also obtain empirical results that suggest an unfavorable impact of banking development on growth. Naceur and Ghazouani (2007) also find such negative and significant links. They argue that the significant

**Table 3: Short run estimates of PVECM**

Variables	D (GDPG)	D (LMCR)	D (LTR)	D (LTVTSR)	D (LDCTPS)	D (LFDI)	D (LGFCF)	D (LOPNS)	D (LSER)
C	0.12 [0.63]	0.08 [2.97]***	0.07 [1.77]**	0.15 [3.10]***	0.02 [3.20]***	0.09 [1.47]*	-0.01 [-0.97]	0.01 [2.13]**	0.02 [3.22]***
D (GDPG(-1))	-0.09 [-1.48]*	0.00 [0.23]	0.004 [0.12]	0.00 [0.08]	-0.00 [-0.28]	-0.04 [-1.88]**	-0.00 [-2.14]**	0.00 [3.11]***	0.00 [0.03]
D (LMCR(-1))	2.32 [4.19]***	-0.10 [-1.29]*	-0.170 [-1.37]*	0.22 [1.62]*	0.06 [2.66]***	-0.08 [-0.48]	0.06 [1.81]**	-0.00 [-0.08]	0.02 [1.00]
D (LTR(-1))	2.13 [3.41]***	0.1453 [1.63]*	0.03 [0.27]	0.20 [1.26]	0.035 [1.25]	0.32 [1.59]*	-0.02 [-0.65]	0.00 [0.12]	0.01 [0.69]
D (LTVTSR(-1))	-2.42 [-3.71]***	-0.10 [-1.10]	-0.30 [-2.08]**	-0.42 [-2.56]***	-0.03 [-1.15]	-0.20 [-0.94]	0.01 [0.45]	-0.00 [-0.33]	-0.015 [-0.66]
D (LDCTPS(-1))	-1.20 [-0.94]	-0.08 [-0.45]	0.06 [0.22]	0.02 [0.07]	0.08 [1.50]*	0.22 [-0.54]	0.24 [3.07]***	0.01 [0.26]	0.01 [0.34]
D (LFDI(-1))	-0.18 [-1.15]	0.03 [1.39]*	0.05 [1.66]**	0.086 [2.14]**	0.00 [0.88]	-0.33 [-6.38]***	0.00 [0.35]	0.00 [1.40]*	0.00 [0.50]
D (LGFCF(-1))	0.67 [0.70]	0.14 [1.09]	0.082 [0.38]	0.22 [0.91]	-0.09 [-1.17]	-0.03 [-0.11]	-0.23 [-3.91]***	0.01 [0.40]	0.01 [0.57]
D (LOPNS(-1))	1.20 [0.61]	0.24 [0.89]	0.13 [0.31]	0.05 [0.10]	-0.13941 [-1.56]*	1.28 [2.00]**	-0.05 [-0.42]	-0.02 [-0.45]	-0.00 [-0.10]
D (LSER(-1))	0.33 [0.20]	-0.20 [-0.85]	-0.45 [-1.23]	-0.54 [-1.29]*	0.07 [1.03]	-0.02 [-0.04]	0.03 [0.36]	0.11 [2.16]**	-0.00 [-0.05]
Error correction	-0.75 [-8.66]***	-0.00 [-0.04]	0.030 [1.58]*	0.04 [1.89]**	0.01 [4.07]***	0.08 [2.90]***	0.01 [3.42]***	-0.00 [-0.60]	0.00 [1.00]

\*Indicates significance at 1% level, \*\*At 5% and \*\*\*At 10% respectively. The Capital letters denotes variables in natural logarithmic and t values are in brackets



and negative association between bank development and growth may be directly linked to the overwhelming public sector in the credit allocation, and as such suggest that these countries must improve the credit allocation process by privatizing national banks, strengthening credit regulation and reinforcing competition in the banking sector.

Moving on to the investment proxies, we find evidence that both the gross fixed capital formation proxy as well as the FDI proxy have a highly significant and positive role to play in generating gains in terms of economic growth. This can be clearly seen from the highly significant and positive coefficients of both variables in the long run equation. Indeed, while FDI has a positive and significant coefficient of 0.89328, gross fixed capital formation has a much higher positive and significant coefficient of 5.17799. In other words, investment accounts for a total of  $([0.01 \times 0.89328] + [0.01 \times 5.17799])$  unit increase in economic development. More specifically, a 1% increase in FDI causes a  $(0.01 \times 0.89328)$  unit increase in growth and a 1% increase in gross fixed capital formation causes  $(0.01 \times 5.17799)$  unit increase in economic growth. This suggests that gross fixed capital formation has a much bigger impact on long run economic growth within this particular set of African countries than FDI.

Zooming in on the trade OPNS proxy, rather disappointing results are obtained. Indeed, trade OPNS is seen to have a significant but negative influence on long run economic growth, as indicated by the significant coefficient  $-1.166081$ . Rather similar results are also detected by Naceur and Ghazouani (2007), who find that trade OPNS in the MENA region hampers growth. Although this might seem counter-intuitive, it is possible to unearth some of its causes. Interestingly, the impact of trade OPNS on economic growth might depend on the countries and regions under consideration. Indeed, Kim et al. (2009) show that the effect of trade OPNS on long run growth is dependent on the level of economic growth. On the other hand, North (1990), and Dollar and Aart (2002) argue that institutional arrangements (quality of governance, rent seeking, corruption and policies), market institutions (bureaucracy and competition) and social norms also dictate the degree to which trade OPNS influences growth. Even more recently, studies by Henry (2004), Foster (2008) and Dufrenot et al. (2009) blamed structural characteristics (geography, demographic issues, ecology diseases and cultural factors) as the causes. Additionally, it is also possible that political factors (ethnic fractionalization, lack of democracy, quality of governance and high incidences of conflict) are reflected in this negative link. Indeed, such factors are a crucial influence on the impact of trade, especially in the African region. Moreover, the finger of blame can also be pointed to the high dependence on primary commodities, poor infrastructure, unskilled labor, and dire transport facilities. These cause a substantial rise in the trade costs, especially in African countries who rely heavily on the export of their natural resources (mostly unprocessed), thus limiting the impact of trade. Indeed, since the volatile world prices and declining terms of trade of raw or semi-processed goods prove to be detrimental to growth in the region.

### 5.3. The Short Run Equation

Since the variables are co-integrated, in the short run, deviations from the long run equilibrium will feed back on the changes in

the dependent variables so as to force their movements towards the long run equilibrium state. The deviation from the long-run equilibrium is corrected gradually through a series of partial short term adjustments, the co-integration term or the error correction term. It indicates the speed of adjustment of any disequilibrium towards the long-run equilibrium.

### 5.4. Impact of Stock Market Development and Other Control Variables on Growth

Examining the short run estimates of the equation having GDPG as the dependent variable (the first column), only stock market development proxies, and not any of the control variable is seen to influence growth in the short term. We discern that on the whole, stock market development has a significant and positive impact on economic growth. In fact both mcr and tr induce economic growth in the short run, as indicated by their statistically significant coefficients of 2.326104 and 2.131844 respectively. This implies that a 1% increase in mcr generates a  $(0.01 - 2.326104)$  unit increase in economic development, while a 1% rise in tr causes a  $(0.01 - 2.131844)$  unit increase long run growth. This is in line with several studies including that of Levine and Zervos (1998), Rousseau and Wachtel (2000), Beck and Levine (2004), Tang (2006), Seetanah (2010), and Wong and Zhou (2011). On the other hand, the other stock market development proxy, tvtsr appears to significantly, but negatively influence long run economic growth. Indeed, it has a significant coefficient of  $-2.42778$ . A likely explanation for the negative impact of tvtsr on GDPG is that the series tvtsr and GDPG are diverging- this implies that while GDPG is an increasing function, tvtsr fluctuates a lot periodically, thus possibly causing the negative link of tvtsr on GDPG. Thus, tvtsr may not be an effective measure of stock market liquidity as pointed out by Levine and Zervos (1998) and Rousseau and Wachtel (2000). A probable cause lies in the fact that countries in the African region, being developing countries, have a highly volatile stock market which makes tvtsr a misleading indicator of liquidity (this is in line with Mohtadi and Agarwal, 2004).

### 5.5. Possible Determinants of Stock Market Development

Interestingly, results indicate that investment fosters stock market development in the short run. Indeed, its fdi proxy generates highly significant and positive impacts on each of the three stock market development proxies, namely mcr, tr, and tvtsr. This evident from the positive and significant coefficients of fdi in the 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> column of the Table 3. In fact, a 1% increase in fdi generates a  $(0.01 - 0.031604)$  unit increase in mcr, a 1% increase in fdi generates a  $(0.01 - 0.05928)$  unit increase in tr, and a 1% increase in fdi generates a  $(0.01 - 0.086155)$  unit increase in tvtsr.

### 5.6. Impact of Stock Market Development on Other Control Variables

mcr, a proxy of stock market development, appears to enhance banking development (dctps) and investment in the short run. Indeed, mcr has a positive and significant coefficient of 0.06783 in the 5<sup>th</sup> column, which has banking development as the independent variable. This implies that a 1% increase in mcr generates a  $(0.01 \times 0.06783)$  unit increase in dctps. This suggests

that initially, stock market development does not substitute banking development within the set of countries under consideration, but quite on the contrary, the former tends to complement the latter. Similarly, mcr seems to foster investment through its gfcf proxy in the short run as indicated by its positive and significant coefficient of 0.064121 in the 7<sup>th</sup> column. As such a 1% increase in mcr can be translated into a  $(0.01 \times 0.06783)$  unit increase in gfcf.

On the other hand, tr, another proxy of stock market development, helps in promoting investment as well, but unlike mcr, this occurs through the fdi indicator of investment. As a matter of fact, tr has a significantly positive coefficient of 0.327292 in the 6<sup>th</sup> column, which has fdi as the dependent variable. Again, this can be interpreted as a  $(0.01 \times 0.327292)$  unit increase in fdi if tr increased by 1%.

Note that the stock market development proxy, TVTSR, has no impact on any of the control variables. A few other interesting results that can also be extracted from the VECM (Table 3). For instance, banking development is also seen to bring a boost in investment through gross fixed capital formation, as indicated by the positive and significant coefficient of 0.248908 in the 7<sup>th</sup> column. Moreover, a bi-directional effect is detected between fdi and trade opns. Indeed, a 1% increase in fdi causes a  $(0.01 \times 0.006918)$  unit increase in opns, while a 1% increase in opns generates a  $(0.01 \times 0.280632)$  unit rise in fdi. On the other hand, opns also witnesses a positive enhancement in the short run owing to an increase in the level of human capital. This is unmistakably deduced from the positive and significant coefficient of human capital (ser), 0.11076 in the 8<sup>th</sup> column.

Hence, the regression results confirm the existence of a positive and significant relationship between stock market development and economic growth, both in the short run and in the long run.

## 6. CONCLUSION

Based on the PVECM method, this empirical study investigates whether any links exist between stock market development and economic growth in a selected group of African countries during the years 1989-2011. The study simultaneously takes into account banking development along with stock market development in a unified framework. The equity market is found to be a major contributor of economic growth, as depicted by the presence of significant positive links between the two both in the long-run and the short-run. Interestingly, banking development has no impact on economic growth in the long run. This can be explained by the high degree of corruption or banking crises in the region.

## REFERENCES

- Acemoglu, D., Zilibotti, F. (1997), Was Prometheus unbound by chance? Risk, diversification, and growth. *Journal of Political Economy*, 105(4), 709-751.
- Adjasi, C.K.D. (2007), Links between Stock Market Development and Key Economic Variables: The Case of Selected Countries. Unpublished D.D.P. Dissertation. Bellville: University of Stellenbosch.
- Adjasi, C.K.D., Biekpe, N.B. (2006), Stock Market Development and Economic Growth: The Case of Selected African Countries. Working Paper, ADB.
- Andrianaivo, M., Yartey, C.A. (2009), Understanding the Growth of African Financial Markets. International Monetary Fund, Working Paper 09-182.
- Arellano, M., Bond, S. (1991), Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58, 277-297.
- Arestis, P., Demetriades, P. (1993), Financial liberalization and economic development: A critical exposition. In: Arestis, P., editor. *Money and Banking: Issue for the 21st Century*. London: Macmillan.
- Arestis, P., Demetriades, O.P., Luintel, K.B. (2001), Financial development and economic growth: The role of stock markets. *Journal of Money, Credit and Banking*, 33(1), 16-41.
- Argrawall, R., Tuteja, S.K. (2007), Causality between stock market development and economic growth: A case for India. *Journal of Management Research*, 3(7), 158-168.
- Atje, R., Jovanovic, B. (1993), Stock markets and development. *European Economic Review*, 3, 632-640.
- Bagehot, W. (1873), *Lombard Street: A Description of the Money Market*. Homewood, IL: Richard Irwin, Inc.
- Barro, R.J., Mankiw, G.N., Sala-i-Martin, X. (1995), Capital mobility in neoclassical models of economic growth. *American Economic Review*, 85(1), 103-115.
- Beck, T., Levine, T. (2004), Stock markets, banks, and growth: Panel evidence. *Journal of Banking and Finance*, 28(3), 423-442.
- Beck, T., Levine, R. (2002), *Stock Markets, Banks and Growth: Panel Evidence*, NBER Working Paper Series No. 9082. Cambridge, Mass: National Bureau of Economic Research.
- Beck, T., Levine, R. (2003), Stock markets, banks, and growth: Panel evidence. *Journal of Banking and Finance*, 28(3), 423-442.
- Bekaert, G., Harvey, C.R., Lundblad, C. (2001), Does Financial Liberalization Spur Growth? Unpublished Working Paper.
- Bencivenga, V.R., Smith, B.D. (1991), Financial intermediation and endogenous growth. *Review of Economic Studies*, 58, 195-209.
- Boyd, J.H., Prescott, E.C. (1986), Financial intermediary-coalitions. *Journal of Economic Theory*, 38, 211-232.
- Chakraborty, I. (2010), Financial development and economic growth in India: An analysis of the post - Reform period. *South Asia Economic Journal*, 11(2), 287-308.
- Deb, S.G., Mukherjee, J. (2008), Does stock market development cause economic growth? A time series analysis of the Indian economy. *International Research Journal of Finance and Economics*, 21, 142-149.
- Demetriades, P., Hussein, K. (1996), Does financial development cause economic growth? Time series evidence from 16 countries. *Journal of Development Economics*, 51, 387-411.
- Demirgüç-Kunt, A., Maksimovic, V. (1996), Stock market development and financing choices of firms. *World Bank Economic Review*, 10, 341-369.
- Demirgüç-Kunt, A., Levine, R. (1996), Stock market development and financial intermediaries: Stylized facts. *World Bank Economic Review*, 10, 291-322.
- Devereux, M.B., Smith, G.W. (1994), International risk sharing and economic growth. *International Economic Review*, 35, 535-550.
- Diamond, D. (1984), Financial intermediation and delegated monitoring. *Review of Economic Studies*, 51, 393-414.
- Dollar, D. (1992), Outward-oriented developing economies really do grow more rapidly: Evidence from 95 LDCs, 1976-85. *Economic Development and Cultural Change*, 40(3), 523-544.
- Dollar, D., Kraay, A. (2002), Growth is good for the poor. *Journal of Economic Growth*, 7, 195-225.
- Dow, J., Gorton, G. (1997), Stock market efficiency and economic

- efficiency: Is there a connection? *Journal of Finance*, 52(3), 1087-1129.
- Dritsaki, C., Dritsaki-Bargiota, M. (2006), The causal relationship between stock, credit market and economic development: An empirical evidence for Greece. *Economic Change and Restructuring*, 38, 113-127.
- Dufrénot, G., Mignon, V., Tsangarides, C. (2009), The Trade-growth Nexus in the Developing Countries: A Quantile Regression Approach, Working Papers 2009-04. CEPII Research Center.
- Edwards, S. (1993), Openness, trade liberalization, and growth in developing countries. *Journal of Economic Literature*, 31, 1358-1393.
- Foster, N. (2008), The Impact of trade liberalization on economic growth. *Kyklos*, 61(4), 543-567.
- Frankel, J., Romer, D. (1999), Does trade cause growth? *American Economic Review*, 89, 379-399.
- Fry, M.J. (1997), In favour of financial liberalization. *The Economic Journal*, 107, 754-770.
- Goldsmith, R.W. (1969), *Financial Structure and Development*. New Haven, CT: Yale University Press.
- Greenwood, J., Jovanovic, B. (1990), Financial development, growth, and the distribution of income. *Journal of Political Economy*, 98, 1076-107.
- Greenwood, J., Smith, B. (1999), Financial markets in development and the development of financial market. *Journal of Economic Dynamic and Control*, 21, 181-1456.
- Gurley, J.G., Shaw, E.S. (1955), Financial aspects of economic development. *American Economic Review*, 45, 515-538.
- Henry, P. (2004), Capital account liberalization, the cost of capital, and economic growth. *American Economic Review*, 93, 91-96.
- Holmstrom, B., Tirole, J. (1993), Market liquidity and performance monitoring. *Journal of Political Economy*, 101, 678-709.
- Jappelli, T., Pagano, M. (1989), Aggregate consumption and capital market imperfections: An international comparison. *American Economic Review*, 79, 1088-1105.
- Kassimatis, K., Spyrou, S. (2001), Stock and credit market expansion and economic development in emerging markets: Further evidence utilizing cointegration analysis. *Applied Economics*, 33, 1057-1064.
- Kim, S., Hyunjoon, L., Donghyun, P. (2009), Imports, exports and total factor productivity in Korea. *Applied Economics*, 41(14), 1819-1834.
- King, R., Levine, R. (1993), Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics*, 108(3), 717-737.
- Knight, M. (1998), Developing countries and the globalization of financial markets. *World Development*, 26(7), 1185-1200.
- Levine, R. (2002), Bank-based or market-based financial systems: Which is better? *Journal of Financial Intermediation*, 11, 398-428.
- Levine, R. (2004), Denying foreign bank entry: Implications for bank interest margins. In: Ahumada, L.A., Fuentes, J.R. editors. *Bank Market Structure and Monetary Policy*. Santiago, Chile: Banco Central de Chile. p271-292.
- Levine, R., Zervos, A. (1998), Stock markets, banks and economic growth. *American Economic Review*, 88(3), 537-558.
- Levine, R., Zervos, S. (1996), Stock market development and long-run growth. *World Bank Economic Review*, 10, 323-339.
- Levine, R., Zervos, S. (2008), Stock markets, Banks, and Economic Growth. *The American Economic Review*, ???, ???.
- Levine, R. (1991), Stock markets, growth and tax policy. *Journal of Finance*, 46, 1445-1465.
- Liang, H.Y., Reichert, A. (2007), The relationship between economic growth and banking sector development. *Banks and Bank Systems*, 2(1), 19-35.
- Lucas, R.E. (1988), On the mechanics of economic development. *Journal of Monetary Economics*, 22, 3-42.
- Luintel, K., Khan, M. (1999), A quantitative reassessment of finance-growth nexus: Evidence from a multivariate VAR. *Journal of Development Economics*, 60, 381-405.
- Mazur, E.A., Alexander, W. (2001), Financial sector development and economic growth in New Zealand. *Applied Economics Letters*, 8, 545-549.
- McKinnon, P. (1973), *Money and Capital in Economic Development*. Washington, DC: Brookings Institution.
- Mohtadi, H., Agarwal, S. (2004), *Stock Market Development and Economic Growth: Evidence from Developing Countries*. Milwaukee, WI: Department of Economics, University of Wisconsin-Milwaukee.
- Naceur, S.B., Ghazouani, S. (2007), Stock markets, banks, and economic growth: Empirical evidence from the MENA region. *Research in International Business and Finance*, 21, 297-315.
- Nkontchou, C. (2010), *Private Sector Development: Recent Evolution of the African Financial Markets*. Enko Capital. p3.
- North, D.C. (1990), *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.
- Obstfeld, M. (1994), Risk - Taking, global diversification, and growth. *American Economic Review*, 84, 1310-132.
- Pagano, M. (1993), Financial markets and growth: An overview. *European Economic Review*, 37, 613-622.
- Rajan, R.G., Zingales, L. (1998), Financial dependence and growth. *American Economic Review*, 88, 559-586.
- Robinson, J. (1952), Chapter the generalization of the general theory. *The Rate of Interest and Other Essays*. London: MacMillan.
- Rousseau, P.L., Wachtel, P. (1998), Financial intermediation and economic performance: Historical evidence from five industrial countries. *Journal of Money, Credit and Banking*, 30, 657-678.
- Rousseau, P., Wachtel, P. (2000), Financial intermediation and economic performance: Historical evidence from five industrialised countries. *Journal of Banking and Finance*, 2000, 1933-1957.
- Sachs, J.D., Warner, A.M. (1995), Economic reform and the process of global integration. *Brookings Papers on Economic Activity*, 1, 1-118.
- Saint-Paul, G. (1992), Technological choice, financial markets and economic development. *European Economic Review*, 36, 763-781.
- Schumpeter, J.A. (1911), *Theorie der Wirtschaftlichen Entwicklung*. Dunker & Humblot, Leipzig. *The Theory of Economic Development*. Translated by Opie, R. Cambridge, MA: Harvard University Press.
- Schumpeter, R. (1912), *Theorie der Wirtschaftlichen Entwicklung*, Leipzig, Dunker and Humblot. (*The Theory of Economic Development*). Cambridge, MA: Harvard University Press. p1934.
- Seetanah, B. (2008), Financial development and economic growth in an ARDL approach. *Applied Economics Letter*, 4, 43-50.
- Seetanah, B. (2010), *Stock Market Development and Economic Growth in Developing Countries: Evidence from Panel VAR Framework*. CSAE Working Paper 041. UK: University of Oxford.
- Shahbaz, M., Ahmad, K., Chaudhary, A.R. (2008), Economic growth and its determinants in Pakistan. *The Pakistan Development Review*, 47, 471-486.
- Shaw, E.S. (1973), *Financial Deepening in Economic Development*. New York: Oxford University Press.
- Shen, C., Lee, C. (2006), Same financial development yet different economic growth—why? *Journal of Money, Credit and Banking*, 38(7), 1907-1944.
- Singh, A., Weiss, B. (1998), Emerging stock markets, portfolio capital flows and long-term economic growth: Micro and macroeconomic perspectives. *World Development*, 26, 607-622.
- Sirri, E.R., Tufano, P. (1995), The economics of pooling. In: Crane, D.B., Froot, K.A., Mason, S.P., Perold, A., Merton, R.C., Bodie, Z., et al., editors. *The Global Financial System: A Functional Approach*.



Boston, MA: Harvard Business School Press. p81-128.

- Stiglitz, J.E. (1994), The role of the state in financial markets. In: Bruno, M., Pleskovich, B., editors. Proceedings of the World Bank Annual Bank Conference on Developing Economies. Washington, DC: World Bank. p19-52.
- Tachiwou, A.M. (2010), Day-of-the-week-effects in West African regional stock market. *International Journal of Economics and Finance*, 2(4), 167-173.
- Tang, G.Y. (1996), Day-of-the-week effect on skewness and kurtosis: A direct test and portfolio effect. *The European Journal of Finance*, 2(4), 333-351.
- Wachtel, P. (2001), Growth and finance: What do we know and how do we know it? *International Finance*, 4(3), 353-362.
- Wong, A., Zhou, X. (2011), Development of financial market and economic growth: Review of Hong Kong, China, Japan, the United States and the United Kingdom. *International Journal of Economics and Finance*, 3(2), 111-115.
- Yartey, C.A., Adjasi, C.K. (2007), Stock Market Development in Sub-Saharan Africa: Critical Issues and Challenges. IMF Working Paper 07/209. Washington: International Monetary Fund.