EFFECT OF CAPITAL MARKET DEVELOPMENT ON ECONOMIC GROWTH IN GHANA

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Abstract

This study contributes to the general body of knowledge and research works in the area of the role of finance in economic growth and development with specific reference to the effect of capital market development on economic growth in Ghana. This study was motivated by the fact that some studies have reported negative effects of capital markets on economic growth in some developing nations, despite its expected positive effect on growth and development. The study is a multiple linear regression based on quarterly time series data spanning from 1991:1 to 2011:4. Exploratory data analysis was used to ensure that the basic assumptions of regression analysis were verified and resolved. Structural Equation Modeling (SEM) through Path Analysis (i.e. Layered Regression Technique) was used to identify the possible causal relationship between GDP growth and capital market development, as well as other causal effects in the model. The study shows that GDP growth is linearly related to by the independent variables in the model. There is also a positive bi-directional relationship between economic growth and capital market development. However, the stronger effect is from capital market development to economic growth. The study recommends that developing countries should place greater emphasis on financial sector development with specific focus on capital markets development to promote economic growth.

Keywords: Ghana, capital market, economic growth, neoclassical growth model, multiple linear regression, structural equation modelling

1.1 Introduction

Financial resources enable nations to harness economic resources for development. The World Bank (1989) writes that the difference between the rich nations and poor nations is attributed to lack of financial resources to

harness the economic resources of poor nations. Financial deepening or the development of the financial system plays an important role in raising the adaptability and pace of development of an economy through its effects on saving and investment (Killick & Martin, 1990). Thus, an efficient financial system that is supported by a good regulatory system promotes a country's economic growth and development.

The financial sector is generally divided into the banking sector, the capital market and the non-bank financial institutions. In recent years due to the collapse of the Soviet Union and the positive effect of the capital market on most developed nations like United States of America (USA), and the United Kingdom (UK), capital market activities have taken a centre stage in financial sector development in many developing or emerging economies (UNITAR/DFM, 2005).

Evidences of positive effect of capital market development on economic growth have been reported by some researchers. For example, Nazir, Nawaz, & Gilani (2010) report that economic growth can be attained by increasing the size of the stock market and market capitalisation in an emerging market. Similarly, Levine & Zervos (1996) show that stock market development is positively and robustly associated with economic growth and development.

Unfortunately, Nuhiu & Hoti (2011) and Osinubi (2001) report that there are evidences that show that the establishment and development of capital markets in developing countries have contributed more negatively to economic growth, because these countries tend to have high rates of volatility in the prices of securities, market illiquidity, less regulated and organized markets, and volatile macroeconomic environments relative to capital markets in most developed countries.

By the end of the 1980s, many low-income countries faced an unsustainable amount of both local and foreign debts causing investment to evaporate, choking off economic growth, dropping social spending and increasing the suffering of the masses (World Bank Institute, 2013). In response to these problems most countries in sub-Saharan Africa liberalised their financial sectors in the early 1990s to include the establishment of capital markets to raise long term capital to finance both governments and business firms' activities to stimulate pro poor economic growth. In July 25, 1989 the Ghana Stock Exchange was formed under the Financial Sector Adjustment Programme (FINSAP) and as part of the overall Economic Recovery Programme (ERP) that took off in 1988. Ghana's capital market was adjudged the world's best performing market at the end of 2004 with a year return of 144% in US dollar terms compared with 30% return by Morgan Stanley Capital International Global Index (Dewotor, 2004). Despite the recent developments in the market, the market in Ghana is relatively

underdeveloped with its attendant negative effects on economic growth (Bawumia, Owusu-Danso, & McIntyre, 2008; Senbet & Otchere, 2008; and Agyeman, 2010).

Given the expected positive role of capital market development in economic growth, and the fact that capital market development have not necessarily impacted positively on economic growth in developing nations, this study sought to empirically investigate the effect of capital market development on economic growth in Ghana and to develop a model that will predict the path of economic growth.

The next section of this article provides a review of the relevant literature on the theoretical and empirical works on the effects of finance and capital market development on economic growth and development.

2.0 Literature Review

The role of finance in economic development and, for that matter, the effect of capital market development on economic growth and development continues to engage the attention of researchers. Generally, a well-functioning financial sector is said to ensure an efficient allocation of an economy's scarce economic resources to profitable investments. The neo-classical economists suggest that economic growth is entirely propelled by the accumulation of capital, labour, and technical progress. The Endogenous growth models, on the other hand, stress the role of entrepreneurship and innovation in economic growth, suggesting that finance provides incentives for research and innovation or rent-seeking (Aghion, Comin, & Howitt, 2006). These two schools of thought admit unequivocally the positive role of finance in economic growth.

Schumpeter (1911) contends that financial intermediation plays a key role in economic growth by improving productivity and technical change. Financial development impacts on economic growth through the raising and pooling of funds (allowing riskier investments to be undertaken); the allocation of resources to their most productive uses; effective monitoring of the use of funds; the provision of instruments for risk mitigation (especially for small and medium enterprises); and reducing inequality. These intermediaries become essential players in fostering technological innovation and economic growth.

The supply-leading hypothesis view of financial development which evolved from the works of Goldsmith (1969), Patrick (1966), and McKinnon (1973) advances that in the early stages of economic development the financial sector grows substantially faster than economic growth. It is, therefore, important to build financial institutions well in advance of demand for their services and intervention policies put in place to enable finance become a conduit for real sector development. A contrary view is expressed

by economists such as Joan Robinson (1952) and Robert Lucas (1988). They argue that financial development springs from the need for financial services by deficit spending units who attempt to take advantage of investment opportunities as the real sector of the economy grows. In this wise, the managers of an economy must ensure that the financial sector is developed in the course of time to meet societies' need for financial resources as an economy grows.

In various jurisdictions the above views have been tested and different results reported. Kargbo & Adamu (2010) examined the relationship between financial development and economic growth in Sierra Leone over the period 1970-2008. They established that in both the short run and long run, financial development index, ratio of investment to GDP and real deposit rate exerted positive effects on economic growth through the channel of increased investment. **Hassan, Kabir, Benito, & Yu (2011) find** a positive relationship between financial development and economic growth in developing countries. Moreover, short-term multivariate analysis provides mixed results: a two-way causality relationship between finance and growth and one-way causality from growth to finance for the two poorest regions.

For the past two decades emerging or developing countries in particular have turned their attention to capital market development because of the collapse of the Soviet Union in the early 1990's, and the positive effect of capital market development on economic growth in most advanced countries such as England and the United States of America. In most sub-Saharan African countries too, the development of capital markets has been a deliberate and national strategy to restructure the financial sector to encourage greater economic growth and creation of wealth, as well as facilitating the privatisation of state-owned enterprises. Capital markets serve as a signal of economic performance and a channel for mass mobilization of capital for development.

Levine (1996) shows that countries that had more liquid stock markets in 1976 enjoyed both faster rates of capital accumulation and greater productivity gains over the next 18 years. Liquid capital markets make investments less risky and more attractive in that they allow savers to acquire assets and be able to sell them quickly and at lower costs if they need access to their savings or want to diversify their portfolios. Nazir, Nawaz, & Gilani (2010) reveal that economic growth can be attained by increasing the size of the stock markets of a country as well as the market capitalisation in an emerging market like Pakistan. Again, Ujunwa, & Salami (2010) report that stock market size and turnover ratios are positive in explaining economic growth. Furthermore, Surya & Suman (2006) find that the stock market plays a significant role in determining economic growth and vice versa. Surprisingly, there are reports that the establishment and development of

capital markets in developing countries have contributed more negatively to economic growth (Nuhiu & Hoti, 2011; Osinubi, 2001).

The differences in the reports on the effect capital market development on economic growth among researchers call for further investigations into the issues at stake so as to contribute to the general body of knowledge in the role of finance in economic growth. The next section explains the method used for the study.

3.0 METHODOLOGY

3.1 Research Design

The study is quantitative and explanatory in nature. Quantitative research involves gathering numerical data, so that it can be examined in an unbiased manner as possible. Explanatory research establishes causal relationships between variables. The emphasis is on studying a situation or a problem in order to explain the relationship between the variables involved in the study (Cooper & Schindler, 2001).

3.2 Data Type and Source

The study uses secondary data. The data is a quarterly time series data spanning from 1991:1 to 2011:4. The annual data was extrapolated into quarterly series to increase the data points for analysis. Data for study was obtained from the World Bank group data base.

3.3 Model Specification

This study is a multiple linear regression. This study is based on the Neoclassical Growth Model (otherwise known as the Growth Accounting Framework) which explains the sources of growth in an economy. This is stated as g = f (L, K, T). This means economic growth is a function of labour, capital, and technical progress. This model has been enhanced to incorporate other economic and financial variables such as financial sector development (proxy by stock market development index); trade (openness or liberalization); debt overhang; state of political instability; public policy (proxy by public investment); and country/policy dummies (for example by Collier & Gunning, 1998; Demirguc-Kunt & Levine, 1996; Emenuga, 1998; and Filler et al. 1996), Osinubi (2001).

The multiple linear regression model for the study is stated as:

$$GDP\ growth_t = a_0 + a_1MKT_t + a_2FDI_t + a_3GFI_t + a_4DFI_t + a_5CML_t + a_6INF_t - a_7T\text{-}BILLS_t + e_t$$

Where,

a_0 is a constant. $a_1, a_2, a_3, a_4, a_5, a_6,$ and a_7 are the parameters or the coefficients of the variables under consideration. t denotes time. The apriori expectations

of the coefficients of the independent variables in the model are a_0, a_1, a_2, a_3, a_4, a_5 $a_6 > 0$, and $a_7 < 0$.

GDP growth is the dependent variable. The independent variables in the model are MKT (defined as market capitalization ratio); GFI (defined as gross capital formation); DFI (defined as development of financial intermediaries - measured as the ratio of total credit to private sector to GDP); CML (defined as capital market liquidity - proxy by stock turnover ratio, and value traded ratio); FDI (defined as foreign direct investment); INF (defined as macroeconomic stability - proxy by the rate of inflation); T-BILLs (defined as the 91-day government treasury bill rate), e_t is the error term.

Market capitalisation (MKT) is used as a proxy for capital market development. Market capitalisation as a proxy for capital market development is found to be less arbitrary than any other index (Garcia & Liu, 1999). Market size and the ability to mobilize capital and diversify risk are positively correlated with economic growth. This is measured as total market value of all listed securities divided by GDP.

Gross capital formation (GFI) is calculated as the ratio of gross fixed capital to gross disposable income. As investment rate depends on saving rate, we expect investment to be important determinants of capital market development and economic growth (Plossner, 1992; Levine & Renelt, 1992).

Macroeconomic stability (MS): The higher the macroeconomic stability the more incentives for firms and investors to participate in the stock market and a possible positive effect on growth. Proxies for macroeconomic volatility are inflation rate, inflation change, and the standard deviation of inflation rate, and exchange rate (Garcia & Liu, 1999). High rates of inflation slow down economic growth by discouraging savings and investment among other things.

Foreign investors have emerged as major participants in emerging stock markets. Otchere,, Yourougou, & Soumaré. (2011) say that economic growth, FDI and financial market development are interconnected. FDI is measured as foreign direct investment as a percentage of GDP.

Schumpeter asserts that the level of financial intermediaries' development crucially determines the rate of economic growth by affecting the pace of productivity growth and technological change. It is, therefore, concluded that financial intermediaries influence economic development (Azege, 2004).

Capital market liquidity is measured by two indicators. The first measure is the ratio of total value of traded securities to GDP multiplied by hundred. This measures the value of stocks and bonds transactions relative to the size of the economy. The second measure is the turnover ratio calculated as the value of securities traded divided by market capitalization. High

turnover often is used as an indicator of low transaction costs. It often measures the value of equity and bonds transactions relative to the size of the capital market (Garcia & Liu, 1999).

Interest rate affects economic growth and capital market development negatively. This is proxy by Treasury bill rate. Government Treasury bills and other government debts securities compete in the financial market for investors and as a result directly influence the workings of the capital market and economic growth negatively. The study will use 91-day Treasury bill rates for the period of study because that is common in Ghana (Hoyt, 2012).

3.4 Model Estimation Techniques

The Shapiro-Wilk test was first used to test for the normality of all data. The Box-Cox mechanism was used to normalize the non-normal data (Li, 2005; Osborne, 2010). The data was also made stationary as suggested by Tsay (1984); and Wooldrige (2006). The plot of Studentized Residuals and Unstandardized Predicted values of regression of GDP growth and all valid predictors were used to verify stationarity of the variables. Meanwhile, the influences of some of the eight independent variables on the dependent variable were weak so Principal Component Analysis was used to reduce variables from eight (8) to five (5). Structural Equation Modelling (SEM) through Path Analysis, (i.e. Layered Regression technique) is used to identify the possible causal relationship between GDP growth and capital market development, as well as other causal effects in the model. The estimates were done using the SPSS version 20.

4.1 Empirical Results and Discussions

In this section a multiple linear regression of GDP growth using MKT, FDI, GFI, DFI, TVST, STTO, T-BILLS, and INFLATION as predictors (independent variables) .is evaluated. Meanwhile, due to the fact that the predictors are quite many and some had weak influences on the dependent variable, rincipal Components Analysis (PCA) is used to eliminate potentially weak predictors from the expected model.

In the first place, the Shapiro-Wilk Test of normality is used to verify the normality of the data (Osborne & Waters, 2002). The test indicated that data of all the variables were not normally distributed, except INFLATION. As a result, the Box-Cox process was used to normalise the data (Li, 2005; Osborne, 2010). The normalised data are shown in Table 4.1.

Table 4.1 Tests of Normality (Standardized Variables)

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
DFI	.189	84	.212	.567	84	.087
TVST	.787	84	.543	.145	84	.432
STTO	.345	84	.213	.593	84	.222
T-BILLS	.321	84	.565	.860	84	.231
GDP growth	.549	84	.234	.605	84	.465
MKT	.555	84	.216`	.630	84	.144
FDI	.655	84	.444	.868	84	.564
GFI	.366	84	.409	.544	84	.099

a. Lilliefors Significance Correction

Source: Computed Results, 2013, Using SPSS Version 20

Also, the variables associated with this study were trending with time; hence there was the likelihood of encountering spurious regression. This gave rise to the conversion of data to make them stationary for analysis. In table 4.2, Durbin-Watson statistics now reveal the presence of stationarity in data.

Table 4.2 Durbin-Watson Statistics after Eliminating Non-stationarity

Regression layer	Outcome Variable	Predictors	Durbin-Watson
1	GDP growth	MKT, FDI, GFI, T-BILLS, INF	1.98
2	MKT CAP	GDP growth, FDI, GFI, T-BILLS, INF	2.01
3	T-BILLS	MKT, FDI, GFI, GDP growth, INF	2.02
4	INF	MKT, FDI, GFI, T-BILLS, GDP growth	1.99

Source: Computed Results, 2013, Using SPSS Version 20

Another way to identify stationarity is by using a plot of Studentized Residuals and unstandardized predicted values of regression of GDP growth and all valid predictors. Figure 4.1 shows this graph.

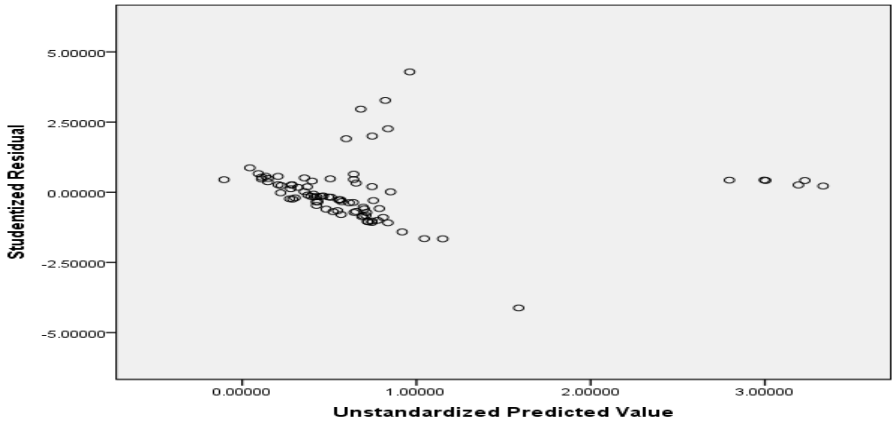

Figure 4.1: Stationary Plot for Natural Log Data
Source: Computed Results, 2013, Using SPSS Version 20

The pictorial evidence of stationarity and normality of data, as well as Homoscedasticity is the Normal P-P plot of the regression of GDP growth and all the significant predictors, shown in Figure 4.2. With Figure 4.1 coupled with Figure 4.2, it can also be said that homoscedasticity assumption is met. This is because in Figure 4.2, all points in the graph are very close to the fit line. Correlation between dependent and criterion variable(s) is a precursor of regression.

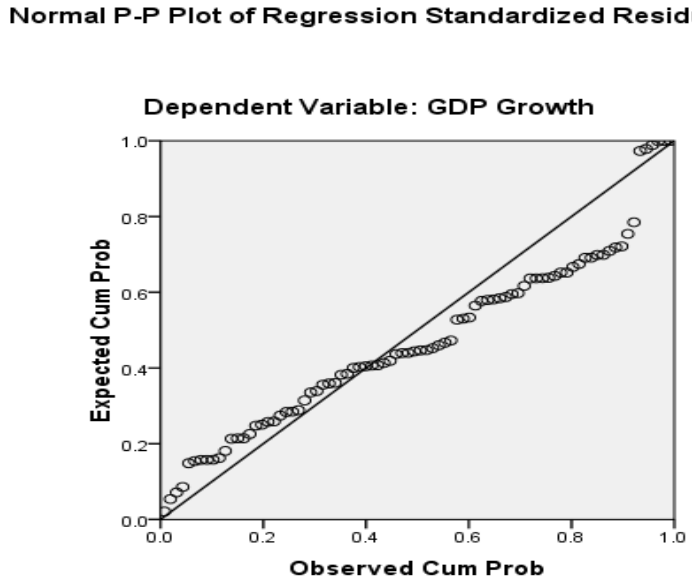

Figure 4.2: Regression Line of Best Fit
Source: Computed Result, 2013, Using SPSS Version 20

4.2 Correlation Matrix

Table 4.3 shows the Pearson's correlation matrix among the variables under consideration.

Table 4.3 Pearson's Correlations

		GDP growth	MKT	INF	T-BILLS	FDI	GFI
GDP growth	Pearson Correlation	1.000	.745**	0.188	-0.128	.557**	.632**
	Sig. (2-tailed)		0.000	0.087	0.247	0.000	0.000
	N	84.000	84.000	84.000	84.000	84.000	84.000
MKT	Pearson Correlation	.745**	1.000	0.071	-.281**	.511**	.707**
	Sig. (2-tailed)	0.000		0.524	0.010	0.000	0.000
	N	84.000	84.000	84.000	84.000	84.000	84.000
INF	Pearson Correlation	0.188	0.071	1.000	.647**	.231*	0.206
	Sig. (2-tailed)	0.087	0.524		0.000	0.034	0.060
	N	84.000	84.000	84.000	84.000	84.000	84.000
T-BILLS	Pearson Correlation	-0.128	-.281**	.647**	1.000	0.055	-0.148
	Sig. (2-tailed)	0.247	0.010	0.000		0.617	0.180
	N	84.000	84.000	84.000	84.000	84.000	84.000
FDI	Pearson Correlation	0.557	.511**	.231*	0.055	1.000	.422**
	Sig. (2-tailed)	0.000	0.000	0.034	0.617		0.000
	N	84.000	84.000	84.000	84.000	84.000	84.000
GFI	Pearson Correlation	.632**	.707**	0.206	-0.148	.422**	1.000
	Sig. (2-tailed)	0.000	0.000	0.060	0.180	0.000	
	N	84.000	84.000	84.000	84.000	84.000	84.000

Source: Computed Results, 2013, Using SPSS Version 20

4.3 Variable Reduction Procedure

Having tested for and met most of the assumptions of regression, Table 4.4 comes with the correlation matrix for all variables using Principal Component Analysis (PCA) to eliminate predictors coming with weak influence.

Table 4.4 Correlation Matrix (1st Iteration of PCA)

		DFI	TVST	STTO	INF	T-BILLS	MKT	FDI	GFI
Correlation	**DFI**	1.000	-.217	.072	.054	-.082	.444	.362	.370
	TVST	-.217	1.000	.026	-.148	.009	-.430	-.281	-.328
	STTO	.072	.026	1.000	-.328	-.287	.010	-.130	-.092
	INF	.054	-.148	-.328	1.000	.647	.071	.231	.206
	T-BILLS	-.082	.009	-.287	.647	1.000	-.281	.055	-.148
	MKT	.444	-.430	.010	.071	-.281	1.000	.511	.707
	FDI	.362	-.281	-.130	.231	.055	.511	1.000	.422
	GFI	.370	-.328	-.092	.206	-.148	.707	.422	1.000

Source: Computed Result, 2013, Using SPSS Version 20

For a valid Principal Component Analysis, a good number of factor (variable) pairs must be related. Table 4.4 indicates correlation matrix that displays correlation coefficients of all pairs of factors. It can be seen that pairs such as DFI*MKT (r = .444), DFI*FDI (r = .362), DFI*GFI (r = .370), T-BILLS*INFLATION (r = .647), FDI*MKT (r = .511) and others are much correlated. The substantial number of significant correlations indicates that Principal Component Analysis is possible for the participating variables (factors).

Table 4.5 KMO and Bartlett's Test (1st Iteration)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.696
Bartlett's Test of Sphericity	Approx. Chi-Square	200.025
	Df	28
	Sig.	.000

Source: Computed Results, 2013, Using SPSS Version 20

A stronger indicator of the applicability of PCA is the Keiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Spericity. From Table 4.5, it can be agreed with that PCA can be carried out since both conditions are met.

Table 4.8a in Appendix A demonstrates the anti-image correlations of factors associated with Table 4.4. These correlations are also evidences to the applicability of the PCA. Anti-image correlations are the correlation coefficients of the same variable pair (i.e. DFI*DFI (r = 0.762), TVST*TVST (r = 0.796), etc.).

Table 4.6 Communalities (1st Iteration of PCA)

	Initial	Extraction
Dfi	1.000	.408
Tvst	1.000	.342
Stto	1.000	.373
Inf	1.000	.772
T-Bills	1.000	.774
Mkt	1.000	.802
Fdi	1.000	.532
Gfi	1.000	.662

Extraction Method: Principal Component Analysis

Source: Computed Result, 2013, Using SPSS Version 20

Table 4.6 displays communalities for the first iteration of the Principal Component Analysis. It can be seen that Extraction values for DFI, TVST and STTO are less than 0.50; hence they need to be eliminated out of

the PCA. The communality of a variable represents the degree of its generality across n-1 behaviour (Tryon, 1957).

Table 4.7 KMO and Bartlett's Test (2nd Iteration of PCA)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.583
Bartlett's Test of Sphericity	Approx. Chi-Square	151.239
	Df	10
	Sig.	.000

Source: Computed Result, 2013, Using SPSS Version 20

Table 4.7 shows Keiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Spericity for the second iteration of the PCA. At this level also, the PCA can be carried out since both statistics associated with Keiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Spericity are satisfactory.

Tables 4.8b and 4.8c in Appendix A provide the Anti-image correlations for the second iteration of the PCA. Though, the Anti-image correlation coefficients of T-BIILS and INFLATION are slightly less than 0.50, those of the remaining three variables are satisfactory (i.e. have Anti-image correlation coefficients more than 0.50). Relative to findings in Table 10, this further buttresses the validity of the PCA.

Table 4.8 Communalities (2nd Iteration of PCA)

	Initial	Extraction
INFLATION	1.000	.840
T-BILLS	1.000	.872
MKT CAP	1.000	.836
FDI	1.000	.579
GFI	1.000	.748

Extraction Method: Principal Component Analysis

Source: Computer Print, 2013, Using SPSS Version 20

Table 4.8 shows communalities for the second iteration of PCA. At this level, there is no factor that has an Extraction value below 0.50. This indicates that the remaining variables, INFLATION, T-BILLS, MKT, FDI and GFI are significant (relevant) predictors or independent variables. Therefore, they are the only criterion variables to be considered in the prediction of GDP growth.

4.4 Prediction of GDP Growth

Table 4.8 Model Summary[b] (GDP growth as Outcome Variable)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.787[a]	.619	.594	.58209

a. Predictors: (Constant), INFLATION, MKT, FDI, GFI, T BILLS
b. Dependent Variable: GDP growth

Source: Computed result, 2013, Using SPSS

Version 20

Table 4.8 is a model summary of the prediction of GDP growth, where INF, T-BILLS, MKT, FDI and GFI serve as criterion variables or predictors. The table comes with the coefficient of determination (R Square) of the relationship between GDP growth and the criterion variables. The R Square value from the table is 0.619, which indicates that INF, T-BILLS, MKT, FDI and GFI account for about 61.9% of variability (influence) in GDP growth. Since R Square is close to 1.00, it can be said that the relationship between GDP growth and the criterion variables is strong. Even so, Adjusted R Square, which has a value of 0.594, gives a more reliable indication of this relationship. This is because it gives a better scrutiny to the relationship between GDP growth and the criterion variables using some characteristics (such as sample size) associated with data.

Table 4.9 ANOVA[b] (GDP Growth as Outcome Variable)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	42.910	5	8.582	25.328	.000[a]
	Residual	26.429	78	.339		
	Total	69.338	83			

a. Predictors: (Constant), INFLATION, MKT, FDI, GFI, T-BILLS
b. Dependent Variable: GDP Growth

Source: Computed Result, 2013, Using SPSS

Version 20

Table 4.9 is the ANOVA test associated with the prediction of GDP growth from INF, MKT, FDI, GFI, T-BILLS. Fortunately, the F statistic of the ANOVA test is significant at 0.05 level of significance, $F(5, 78) = 25.328$, $p = .000$. This means that GDP growth is linearly related to by INFLATION, MKT, FDI, GFI, T-BILLS.

Our regression coefficients are presented in the model below. The collinearity statistics also indicate that there are no multicollinearity problems in the model. This is the case because none of the criterion variables have their Variance Inflation Factors (VIF) to be more than 10.

GDP growth = – 0.38 + 0.18FDI + 0.67MKT + 0.14GFI – 0.25T-BILLS + 0.69INF

(0.19)	(0.07)	(0.15)	(0.09)	(0.85)	(0.77)
[- 1.97]	[2.48]	[4.62]	[1.56]	[-0.29]	[0.89]

Note that the figures in the brackets are standard errors (SE) and the figures in the prentices are t-statistics for individual parameters.

To interpret the model above, a unit rise in FDI increases the conditional mean of GDP growth by 0.18 at the rate of between 0.04 and 0.33 (using 95% confidence interval) when MKT, GFI, T-BILLS, and INF are held constant. The t-statistic of 2.48 explains that the parameter is significant at 5% level of significance. Therefore, a unit change in FDI will have a significant effect on economic growth when other variables are held constant. The results support both economic theory and some empirical works. Countries with more developed capital markets benefit more from foreign direct investments and as a result develop faster when such resources are channelled into productive sectors of such economies(Adam & Tweneboah, 2009; Tachiwou, 2010)..

Again, a unit rise in MKT, increases the conditional mean of GDP growth by 0.67 at the rate of between 0.38 and 0.96 (using 95% confidence interval), when FDI, GFI, T-BILLS, and INF are held constant. The t-statistic of 4.62 implies that the parameter is significant at 5% level of significance and that a unit change in MKT will have a significant effect on GDP growth. As a result, the flow of funds to business firms through the capital market has the potential of increasing economic growth. The results support the supply-leading hypothesis view of financial development which postulates that financial development (Goldsmith, 1969; Patrick, 1966; Shaw, 1973; McKinnon, 1973; and Kolapo & Adaramola, 2012).

Also, the results reveal that a unit rise in GFI increases the conditional mean of GDP growth by 0.14 at the rate of between -0.04 and 0.32 (using 95% confidence interval), when FDI, MKT, T-BILLS, and INFLATION are held constant. The t-statistic of 1.56 shows that the parameter is insignificant at 5% level of significance. As a result a unit change in GFI though will have a positive insignificant effect on GDP growth. This result may be supported by the huge infrastructural gap that exists in the country. The significant differences in the level of economic development and rates of economic growth among countries or in the same countries over time are, to a great extent, interrelated with the differences that exist in the level and composition of the capital stock (Plossner, 1992; Levine & Renelt, 1992). Developing nations need to engage in massive infrastructural development to ensure that GFI impacts significantly on economic growth.

Furthermore, a unit rise in T-BILL rate decreases the conditional mean of GDP growth by -0.25 at the rate of between -1.94 and 1.43 (using 95% confidence interval), when FDI, MKT, GFI, and INFLATION are held

constant. Here too, the t-statistic of -0.297 shows that the parameter is insignificant at 5% level of significance and that a unit change in the 91-day Treasury bill rate will have an insignificant effect on the conditional mean of GDP growth when other variables are held constant. This shows that either an increase or decrease in T-Bill rate has an insignificant effect on economic growth. Many traditional economists believe that there is a negative relationship between capital accumulation and capital cost (interest rate). This result lends support to the fact that treasury bill rates have a and weak predictive power on economic growth (Anaripour, 2011).

Lastly, the result shows that a unit fall in inflation increases the conditional mean of GDP growth by 0.69 at the rate of between -0.84 and 2.21 (using 95% confidence interval), when FDI, MKT, GFI, and T-BILLS are held constant. The t-statistic of 0.89 tells us that the parameter is insignificant at 5% level of significance. The results support Gokal & Hanif (2004) who looked at Fiji's economic growth and inflation performance, report a weak negative link between economic growth and inflation.

4.4 Causality Tests

In this section, Structural Equation Modelling (SEM) through Path Analysis is used to test the causality between GDP growth and capital market development. Path Analysis is done through layered regression. This involves four layers of regression.

Table 4.10 is a summary of the four layered regression process. For the first layer, GDP growth is the outcome variable for MKT, FDI, GFI, T-BILLS, INF. But the t-statics and their significances show that only FDI and MKT are worth considering in this model. This means that MKT and FDI are relevant predictors of GDP growth. In the second layer, GFI, T-BILLS and GDP growth are found to be relevant in predicting MKT. This indicates that MKT and GDP growth express causality.

For the third layer, only T-BILL is worth considering in predicting INFLATION. Finally, the fourth layer indicates that MKT and INF are worth considering in the prediction of T-BILLS. The inclusion of the other predictors (i.e. predictors whose t-statistic are not significant) could be based on once judgement of industry situations. All the four models are quite strong, except the third one, which has an Adjusted R Square value of 0.492. Impressively, all the models are linearly driven.

The layered regression analysis or Path Analysis indicates that there is adequate causality between GDP growth and MKT, but stronger from MKT to GDP growth.

Table 4.10 Summary of Layered Regression

Layer	Predictors	Outcome	R Square	Adjusted R Square	Linearity (Sig.)	Valid Predictors
1	MKT, FDI, GFI, T-BILLS, INF	GDP growth	0.619	0.594	.000	FDI, MKT
2	GDP growth, FDI, GFI, T-BILLS, INF	MKT	0.686	0.666	.000	GFI, T-BILLS, GDP Growth
3	MKT, FDI, GFI, GDP growth, IT-BILLS	INFLATION	0.523	0.492	.000	T-BILLS
4	MKT, FDI, GFI, T-BILLS, GDP growth	T-BILLS	0.539	0.509	.000	MKT, INFLATION

Source: Computed Results, 2013, Using SPSS

Version 20

Table 4.11 shows an ANOVA test for the regression of MKT from GDP growth, FDI, GFI, T-BILLS and INF. The F statistic in the table is significant at 0.05 level of significance, F (5, 78) = 34.14, p = .000. This means that MKT can linearly be predicted by GDP growth, FDI, GFI, T-BILLS and INF Meanwhile, the rate at which MKT causes a change in GDP growth is between 0.38 and 0.96 when all other predictors are held constant. Thus, a unit rise in MKT increases the conditional mean of GDP growth by 0.67 at the rate of between 0.38 and 0.96 when other predictors are held constant.

Table 4.11 ANOVA[b] (MKT as Outcome Variable)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.448	5	5.490	34.136	.000[a]
	Residual	12.544	78	.161		
	Total	39.991	83			

a. Predictors: (Constant), GDP growth, T-BILLS, FDI, GFI, INFLATION

b. Dependent Variable: MKT

Source: Computed Results, 2013, Using SPSS Version 20

Table 4.12 shows an ANOVA test for the regression of INF from MKT, GDP growth, T-BILLS, FDI and GFI. Here too, the F statistic in the table is significant at 0.05 level of significance, F (5, 78) = 17.092, p = .000. This means that INF can linearly be predicted by MKT, GDP growth, T-BILLS, FDI and GFI. As a reminder, there are no multicollinearity problems with this model, neither are they associated with earlier models. This is

because the Variance Inflation Factors (VIF) of predictors in the coefficients table are all less than 10.

Table 4.12 ANOVA[b] (INFLATION as Outcome Variable)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.624	5	.125	17.092	.000[a]
	Residual	.569	78	.007		
	Total	1.193	83			

a. Predictors: (Constant), MKT, T-BILLS, FDI, GFI, GDP growth

b. Dependent Variable: INFLATION

Source: Computed Results, 2013, Using SPSS

Version 20

Table 4.24 shows an ANOVA test for the regression of T-BILLS from INF, MKT, FDI, GFI and GDP Growth. The F statistic in the table is significant at 0.05 level of significance, F (5, 78) = 18.226, p = .000. This means that T-BILLS can linearly be predicted by INF, MKT, FDI, GFI and GDP growth.

Table 4.13 ANOVA[b] (T-BILLS as Outcome Variable)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.553	5	.111	18.226	.000[a]
	Residual	.473	78	.006		
	Total	1.026	83			

a.Predictors: (Constant), INFLATION, MKT CAP, FDI, GFI, GDP Growth

b. Dependent Variable: T-BILLS

Source: Computed Results, 2013, Using SPSS

Version 20

Figure 4.4 shows the path diagram associated with the four layered regression process.

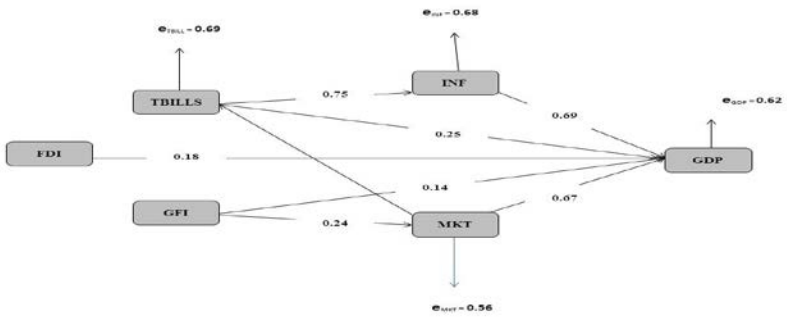

Figure 4.4 Path Diagram of Layered Regression (Showing only Relevant Paths)
Source: Computed Results, 2013, Using SPSS Version 20

Figure 4.4 demonstrates the relevant paths of the four layered regression process. GDP growth serves as the primary outcome variable, but MKT, INF, and T-BIILS also serve as outcome variables. The diagram shows that INF makes the highest impact on GDP growth at 0.69, followed by MKT at 0.67. Meanwhile, INF largely receives its strength from T-BILLS. Thus T-BILLS make relatively high impact on GDP growth directly at -0.25 and indirectly at 0.69. MKT receives its strength from GDP growth at 0.32 and GFI at 0.24. Evidently, MKT and GDP growth have causality between them. It must be remembered that some weak paths have been taken out of this diagram.

5.2 Conclusion

The study established positive significant effects of capital market development (MKT) and FDI on GDP growth. However, GFI, T-Bills, and INF met their expected signs, but they had insignificant effects on GDP growth.

There is also a bi-directional relationship between GDP growth and capital market development. However, the direction of causality is stronger from capital market development to economic growth. This supports the supply-leading hypothesis view of financial development which states that economic growth and development spring from availability of credit facilities from surplus spending units to deficit spending units in an economy.

5.3 Recommendations

It is recommended that developing countries should place greater emphasis on financial sector development with special focus on capital markets development to ensure economic growth.

It is important that a threshold level of inflation for the development of every developing country be determined.

Again, more efforts must be made by developing nations to improve on infrastructural development to promote economic growth.

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APPENDIX A
STATISTICAL RESULTS

Table 4.4a Anti-image Matrices (1st Iteration of PCA)

		DFI	TVST	STTO	INFLATION	T-BILLS	MKT	FDI	GFI
Anti-image Covariance	DFI	0.762	0.013	-0.094	0.017	-0.027	-0.098	-0.123	-0.054
	TVST	0.013	0.796	0.015	0.031	0.031	0.142	0.03	0.007
	STTO	-0.094	0.015	0.859	0.094	0.065	-0.022	0.07	0.057
	INFLATION	0.017	0.031	0.094	0.469	-0.302	-0.025	-0.033	-0.101
	T-BILLS	-0.027	0.031	0.065	-0.302	0.455	0.109	-0.057	0.06
	MKT	-0.098	0.142	-0.022	-0.025	0.109	0.354	-0.148	-0.213
	FDI	-0.123	0.03	0.07	-0.033	-0.057	-0.148	0.662	-0.023
	GFI	-0.054	0.007	0.057	-0.101	0.06	-0.213	-0.023	0.461
Anti-image Correlation	DFI	.853[a]	0.017	-0.116	0.029	-0.045	-0.189	-0.173	-0.091
	TVST	0.017	.847[a]	0.018	0.051	0.051	0.268	0.042	0.012
	STTO	-0.116	0.018	.774[a]	0.148	0.103	-0.04	0.093	0.09
	INFLATION	0.029	0.051	0.148	.563[a]	-0.653	-0.062	-0.058	-0.216
	T-BILLS	-0.045	0.051	0.103	-0.653	.529[a]	0.272	-0.104	0.131
	MKT	-0.189	0.268	-0.04	-0.062	0.272	.687[a]	-0.306	-0.527
	FDI	-0.173	0.042	0.093	-0.058	-0.104	-0.306	.828[a]	-0.042
	GFI	-0.091	0.012	0.09	-0.216	0.131	-0.527	-0.042	.734[a]

a. Measures of Sampling Adequacy (MSA)

Table 4.8b Anti-image Matrices (2nd Iteration of PCA)

		INFLATION	T-BILLS	MKT CAP	FDI	GFI
Anti-image Covariance	INFLATION	.482	-.322	-.028	-.040	-.110
	T-BILLS	-.322	.462	.118	-.070	.056
	MKT	-.028	.118	.399	-.196	-.251
	FDI	-.040	-.070	-.196	.688	-.038
	GFI	-.110	.056	-.251	-.038	.468
Anti-image Correlation	INFLATION	.495[a]	-.683	-.065	-.069	-.231
	T-BILLS	-.683	.477[a]	.274	-.124	.121
	MKT	-.065	.274	.603[a]	-.374	-.581
	FDI	-.069	-.124	-.374	.751[a]	-.066
	GFI	-.231	.121	-.581	-.066	.644[a]

a. Measures of Sampling Adequacy(MSA)

Table 4.8c Total Variance Explained (2nd Iteration of PCA)

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.178	43.566	43.566	2.178	43.566	43.566	2.177	43.531	43.531
2	1.697	33.940	77.506	1.697	33.940	77.506	1.699	33.975	77.506
3	.599	11.983	89.489						
4	.271	5.425	94.914						
5	.254	5.086	100.000						

Extraction Method: Principal Component Analysis.