

HOW DOES STOCK MARKET DEVELOPMENT INFLUENCE THE ECONOMIC GROWTH? AN EVIDENCE FROM PAKISTAN

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Abstract

The stock market performance is an emerging issue in global world. The theories and empirical studies strongly refer that stock market performance is a tool to mobilize the savings and investment to promote the industrialization and economic growth. The present study is an effort to establish the empirical relationship between stock market development and economic growth in Pakistan. Three proxies namely stock market capitalization (SMC), stock traded value (STV) and stock turnover ratio (STOR) are used for stock market development, financial depth (FD) is used as the proxy of financial intermediary and the economic growth measured with GDP growth over the time period 1988-2012. The OLS and Granger Causality test are applied to assess the investigation. The results interpret that the 99% change in economic growth is explained with the above said explanatory variables. The STV, STOR and FD are significant while SMC appears insignificant. The causality test reported that there is bidirectional causality between FD and GDP and a unidirectional causality present between GDP to STV, SMC to GDP, FD to STOR and FD to STV. The findings suggest to policy makers that there is a strong relationship between stock market development, financial intermediary and economic growth in Pakistan.

Keywords: Stock market development, market capitalization, traded value, turnover ratio, financial intermediary, economic growth

INTRODUCTION

The capital market is one of the major indicators of financial system which indicates the size, depth and health of the economy. The capital markets pooled the saving and mobilize the resources from the unproductive means to productive means of the economy. The productive means requires the long term capital to invest which promise to economic growth. The financial system of a country advocate the financial situation running in the equity market, better performance of the financial market attract the better capital flow by announcing its various strategic behavior. These behaviors of the market provide the equal and fair opportunities to capture the confidence of the domestic but also the foreigner investor.

The stock and debt markets are collectively called the capital market. The capital market enables the people to divert their saving from little to greater reliable projects. These sort of diversion creates the demand of capital goods, increase in the demand activate the long run projects that shifts the country towards industrialization that took forward the output and development. The freedom and right to invest according to personal interest prolong the socio economic phenomena that develop the public as well as private sector in the economy. The contribution from private sector pushes the paddle of efficiency with market expansion.

The capital market of Pakistan consists of two elements one is stock market and the second one is non- banking financial institution. The trend and scenario of stock market is witnessed that whenever the policies and environment are friendly it showed the prominent economic growth.

Pakistan has three stocks exchange namely Karachi stock exchange, Lahore stock exchange and Islamabad stock exchange which are working under the security and exchange commission of Pakistan. The Karachi stock exchange is the oldest, most liquidate and benchmark stock exchange of Pakistan. It was established in 1947 after two month of independence. KSE announced the best performing stock exchange in the world in 2002. Currently KSE-100 index is increased by 155% points from 11348 to 28913 points within two years (jan-2012 to april-2014). Its Market capitalization increased from 32.9 billion US dollar to 72.2 billion US dollar during the same time period. The total listed capital is rose from 1048.44 billion PK. rupees to 1153.18 billion rupee during the above said period.

The second largest stock market of Pakistan is Lahore stock exchange that came into being in 1970. The LSE-25 index also recorded the positive growth; the index point was 4370.7 in june-2013 and 5131.1 points at end of March 2014. The total listed capital in LSE-25 index increased from 1042.2 billion rupees to 1092.1 billion rupee. The market capitalization during 2013-2014 is rupee 6258.2 billion.

The third stock exchange of Pakistan is Islamabad stock exchange that also contributing its share in the stock market of Pakistan. ISE-10 index was increased from 3,904.6 to 4440 points on jan-2013 to march-2014 which is almost increased by 14%. Total listed capital of ISE-10 index increased from 871.1 billion rupee to 890.9 billion during the same period. The addition of 994.5 billion rupee is made in the market capitalization in the same period.

The brief profiles of the stock market explains the growth of capital market of Pakistan helps to understand that how the stock market play its role in the economic growth of the country. The extensive literature shows the importance of stock market performance on economic growth. Osamwanyi (2005) stated that stock market is a place where people arrange financial trading. The allocation of available capital is used in different sectors by ensuring the competitiveness and efficient allocation of resources (financial). Kenny and Moss (1998) investigated that the stock market enhancing the performance of financial system. The establishment of stock market is raise the level of saving which cause the capital formation and technological change increase the level of investment which enhance the economic growth (Singh, 1997). Yartery & Adjsai (2007) found that stock market provides financing to the companies for their investment that boost the economic growth.

The global stock markets also grow in last year but the stock market of Pakistan has outstanding performance during the last year among the world's largest and most liquid stock markets including china, India, Hong Kong, Singapore, UK, Japan and USA. The KSE-100 index shown a more than 37% growth during the' first ten months in 2013-14 and ranked at top as compared to the leading regional and global stock markets. The US' S&P increased 17.3 %, Bombay Sensex grew by 15.6 %, UK FTSC-100 increased by 9.1 % Hang Seng of Hong Kong grew by 6.4 % and Chinese Shanghai Composite increased by 2.4%.

Stock market is the key instrument of capital market, its benefit to the economy is a critical issue in the modern economics. The stock market arguably support the phenomena that the financial markets contribute to reduce the frictions and costs of the society by delivering it best operation and control over the market instability alternatively it is the argument that those countries who wants to excel their growth they give importance to develop their stock market. The present study has been focused on the relationship between stock market development and economic growth in Pakistan. This research is helpful for policy making for the prosperity and progress of the economy. In The first part of the paper, research question, objectives, theoretical and conceptual framework have been explained while data and methodology, results and conclusion have been discussed in the later part of paper. Moreover in the last section some policies and general guidelines have been recommended.

Research Question

The research question is to study how does stock market development affect the Economic growth with special reference to the growth of Pakistan's Stock Market? Another question is that to investigate the dynamics of Pakistan's stock market since 2000.

Objective of the Study

The study attempts to investigate the following objectives:

1. To identify the impact of stock market development on economic growth in Pakistan.
2. To investigate that is there a relationship exists between stock market development and economic growth.
3. To identify the direction and nature of the causality between stock market development and economic growth.
4. To investigate the role of financial intermediaries on economic growth.

LITERATURE REVIEW

The extensive work has been done to magnify the relationship between financial and capital market and economic growth. Since the 1900's economists like Schumpeter (1912), Goldsmith (1969), Mckinnon (1973), Shaw (1973), Levine (1996), Iuinted and Khan (1999) found and stressed that a stable and developed financial system runs the economy fast. But there was a little focus on the stock market performance and economic growth in the literature. The present study focuses to estimate the relationship empirically.

The performance of stock market is determined through market capitalization; Stock traded value, turnover ratio, listed securities and the economic growth with gross domestic product or gross domestic per capita. The relationship generally examined through ordinary least square method, johansen juselius cointegration and various causality test. The summary of current studies between stock market development and economic growth are chronologically presented in the table 1 (in the Appendix).

The studies found the mixed outcomes due to country or country groups. Some studies like Bayer et al. (2014), Ikiiki and Nzomoi (2013), Zafar (2013), Ho and Odhiambo (2012), Sallahuddin Mohammad (2010), Ensian and Ollufisayo (2009), Deb and Mukherjee (2008), Adjsai and Biekpe (2006), Arestis et al. (2001) and Levine and Zevorse (1996) have found that stock market development had a positive significant effect on economic growth while the Haque Enamul (2013) and Ake and Ognaligui (2010) found a negative or insignificant effect of stock market on economic growth.

Theoretical and Conceptual Model

The classical and Neo classical revolution to economic growth sorts the idea of capital market performance. Theories such as new growth theory some time called Endogenous growth theory, Market friendly approach, efficient market hypothesis and Modern portfolio theory explains the idea of capital market and economic performance.

The capital market especially the stock market contributes in economic growth through various channels. It provides the base to allocate and utilized the factor resources efficiently which mobilized saving to capital accumulation and raises the income level of the country.

The financial intermediaries play an important role to enhance the liquidity. These intermediaries provides the capital to small as well as large scale productive units and increasing the incentives like asymmetric information and low cost production which yield efficiency with technological change (King & Levine, 1993b). Along with the financial intermediaries build the confidence to investment. The optimal use of financial intermediaries leads growth and raises the demand for new deposits and financial services (Greenwood & Javanovic, 1990).

The bank based capital markets had better opportunities to long term and more profitable projects than non-bank based capital markets. The banks can offer a low risky investment, increase liquidity by introducing liquid deposits, project insurance and high return by both acquisitions in liquid and illiquid investment (Bencivenga & B.smith, 1991).

The market liquidity enhances the confidence of investor because of stock price adjustments. The ease of buying and selling the assets without changing the assets prices in the stock market. Levine (1991), Bencivenga et al. (1995) and Smith (1996) found that stock markets with more liquidity like equities reduce the risk and cost of investment. Investors have complete control over savings and firm also have their control by selling equities and use it in favorable long term projects. The stock market liquidity positively contributes in future economic growth (Rousseau & Wachtel, 2000).

The opportunities in different portfolio attracts the investor towards capital market, people having more than one portfolio investment in a sector release the uncertainty and permits confidence at market. The risk diversification and pooling the investment increased the reliability of the rivals who can easily trust and handle the shocks in market. Saint Paul (1992) and Obstfeld (1994) stated that risk diversification in stock market increase specialization and efficiency of the economy that leads economic growth. They stated that risk diversification changes the investment plan from high to low risk projects.

Stock Market Capitalization stands for the overall listed securities in the domestic stock markets. It refers the size and strength of stock market as long as the listed securities increase the strength of the financial market increases and raise the economic activities in the country.

The investor are invested their saving in the more liquid assets which positively contribute in the growth of economy. Nurudeen (2009), Hondroyiannis et al (2005) found that endogenous factors affects the stock market capitalization that caused to increase country's real output.

It is proved that if someone has better and reliable information about the acquisition in the market then definitely they get more reward as compared to others. To collect the information is very difficult and costly for an entrepreneur or organization by survey, consumer clinic or any other sort. Individuals have not sufficient time as well as capital to collect information that's why the investor is utmost ready to invest in those projects where they had little information. People having more information about the acquisition of the firms not only increase their wealth but also increases the performance of capital market. Information about the stock prices and market situation provides the stand for investor as well as for the firm to allocate and utilized their resources in the meaningful place i.e. investors can buy and sell the stocks rapidly to generate their profits as respond to the changing market situation. The reliable information therefore support the entrepreneur to select the best resources , identifying the better technology , financial intermediaries which raise the innovation for those who launched successfully the new products can account a great deal of portfolio investment which significantly associated with capital market performance and economic growth.(king and Levine, 1993).

METHODOLOGY

The annual time series data from 1988 to 2012 is used to empirically investigate the relationship between stock market development and economic growth in Pakistan. Data was taken from world development indicators and various economic survey of Pakistan. To avoid the ambiguous and arbitrariness of model, we used the following selected variables in our study.

Stock Market Capitalization (SMC)

It measures the domestic listed shares of all companies as the percentage growth of GDP. SMC determines the size of the stock market. This ratio explains how much the stock market is strengthen with hypothesis that stock market capitalization is positively associated with economic growth which depicts greater the SMC will cause the higher economic growth.

Stock Traded Value (STV)

STV presents the size and liquidity of the stock market which measures the value of trade divided by GDP. It showed the value of equity transaction relative to size of economy. It is assumed that STV has positive influence on economic growth.

Turnover ratio (TOR)

It is computed as the ratio of total traded value in domestic stock exchanges to stock market capitalization which measures the market liquidity, the value of domestic equities traded relative to the size of stock market. The hypothesis for TOR is also positively significant on economic growth. This postulates that more the turnover ratio higher the market liquidity.

Financial Depth (FD)

The financial intermediary is measured by financial depth that is the available stock of broad money (M2) over gross domestic product (GDP) with a negative impact on economic growth. The financial depth measures the volume of financial intermediary in a country, M2 is considered the proxy for financial sector. Increase in financial depth means that financial assets are growing faster than non-financial assets which indicate that as the money supply increases will cause to reduce the economic activity, so it is hypothesized that the expected relationship between financial depth and economic growth is inverse.

Gross Domestic Product (GDP)

The final goods and services produced within a country after utilizing its resources within a specified time period. GDP presents the volume of growth in the country.

To estimate the empirical relationship between stock market development and economic growth, we used ordinary least square (OLS) method and causality by granger causality test as used earlier by Ikkii & Nzomoi (2013) and Brasoveanu et al. (2008).

Brasoveanu et al. (2008) examined the relationship between capital market and economic growth in Romania on 8 years quarterly time series data using OLS and VAR, same as Ikkii & Nzomoi (2013). We used the same techniques to estimate the desired relationship with some necessary modifications.

Econometric Model

The mathematical and econometric form of model is as follow:

$$GDP = f(SMC, STV, TOR, FD)$$

$$\ln GDP = \alpha_0 + \beta_1 \ln SMC + \beta_2 \ln STV + \beta_3 \ln STOR + \beta_4 \ln FD + \epsilon_t$$

Where

α_0 = Intercept

$\beta_1, \beta_2, \beta_3, \beta_4$ = the slope coefficient of independent variables

ϵ_t = the stochastic error term.

GDP = Gross Domestic Product proxy of Economic Growth

SMC = Stock Market Capitalization proxy of Market Development

STV = Stock Traded Value proxy of Market Development

STOR = Stock Turnover Ratio proxy of Market Development

FD = Financial Depth proxy of Financial Intermediaries

First of all we conduct the unit root by Augmented Dicker-Fuller Statistic (ADF) to check the stationarity of the variables. After stationarity test we applied the ordinary least square method to identify that either there is any relationship exists among the variables or not and finally we used the Granger Causality test to check the direction of the causal relationship

ANALYSIS AND RESULTS

The secondary time series analysis always acquire the stationarity of variables which is conducted through ADF test before unit root we check the trend of all the selected variables, there is no unique trend found in the data. The result of unit root test verified that all the variables are stationary at level and at a difference with constant variance and zero mean. The statistical analysis includes descriptive statistics and Correlation Matrix. The Jarque Bera test identified that the p value is closer to zero confirms the normal distribution of data. The correlation matrix shows the degree of association among the variables and it is confirmed that the entire variables have strong correlation. The regression results are presented in the table below:

Table 1 Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LSTOR	-0.096462	0.060309	-1.599472	0.1271
LSTV	0.113082	0.056780	1.991570	0.0618
LFD	-0.978204	0.018291	-53.47977	0.0000
LSMC	0.035672	0.036954	0.965313	0.3472
C	3.713802	0.214916	17.28026	0.0000
AR(1)	0.789751	0.161670	4.884950	0.0001
R2 = 0.99	Adj.R ² =	F-stat =	DW = 2.01	

Note: All related tables and graphs are given in the appendices)

The estimated value of the probability and t statistics showed that the FD, STV, STOR are statistically significant which indicates that there is a relationship between the dependent and independent variable according to the hypothesis. The goodness of model is verified with coefficient of determination and adjusted coefficient of determination, the value of adjusted R2

showed that 99 percent variation has been explained because of the SMC, STOR, STV and FD. The overall goodness of fit of the model or explanatory power of the regression is tested with F statistics, the F estimated is 533.99 is greater than the tabular value at 1% level of significance proved the relationship between dependent and independent variable. The Durban Watson Test confirmed that there is no autocorrelation with value of 2.01.

The coefficient of stock market turnover is -0.096 which indicates that a 1% increase in STOR would decrease GDP by .096% while theoretically it is admitted that the relationship between STOR and GDP is positive but the expected sign is inverse according to our prior expectation. It is because of the lack of efficiency of market.

A 1% increase in STV increase GDP by 0.11% given by the coefficient of stock traded value. The expected sign has been proved true.

The coefficient of Financial Depth reported that if the FD increased by 1% it will reduce GDP by 0.97% as per expectation and highly influenced on the economic growth.

The stock market capitalization in our analysis is insignificant and negative which may be of the lack of confidence of investors on the stock market. The efficient market hypothesis stated that the investors always prefer those portfolio where there return is high and low risk, as the risk and uncertainty are high the investor lose their confidence and the stock market capitalization falls and goes insignificant.

The time series analysis has the serious problems in estimation, in the presence of these problems the results are biased and inconsistent, for the reliability of the estimation such diagnostic approaches being used. The *Glejser test* shows that there is no *hetroskedasticity* in the residuals that is the variance of residuals are constant. The *Breusch-Godfrey test*, results suggested that there is no serial autocorrelation in the model. *Ramsey's RESET* test results explained that the estimated value of F-statistic is smaller than the F-tabular with 17 degree of freedom recommended to accept the hypothesis that the model is correctly specified. *The normal distribution* of the residuals is verified by the histogram that described the probability density of variable, The graph diagnose on the estimated value of Kurtosis and Skewness that the variables are normally distributed in such a manner that there values are closer to 3 and 0 respectively. *Stability Test* is performed by CUSUM and CUCUM square that present the average sequence of the data, cumulative sum control graph showed the mean deviation of data trend at 5% level of significant.(The results are given in the appendices)

To identify the causation and direction of causality whether the relationship is unidirectional or bidirectional among GDP, SMC, STV, STOR and FD Granger test has been conducted, the pair wise causality results are presented in the table 2.

Table 2 Pairwise Granger Causality Tests

Date: 03/12/14 Time: 04:59			
Sample: 1988 2012			
Lags: 6			
Null Hypothesis:	Obs	F-Statistic	Prob.
LSTV does not Granger Cause LGDP	19	0.94457	0.5267
LGDP does not Granger Cause LSTV		3.02209	0.1021
LFD does not Granger Cause LGDP	19	14.5922	0.0024
LGDP does not Granger Cause LFD		12.8072	0.0034
LSMC does not Granger Cause LGDP	19	3.49033	0.0768
LGDP does not Granger Cause LSMC		0.11275	0.9911
LFD does not Granger Cause LSTOR	19	2.80344	0.1176
LSTOR does not Granger Cause LFD		0.38773	0.8631

The results found a unidirectional causation from GDP to STV, SMC to GDP, FD to STOR and FD to STV at 10% level of significant, while bidirectional causality presents between FD and GDP at 1% level of significance.

CONCLUSIONS

Study attempts to discuss the relationship between stock market development and economic growth in Pakistan. The stock market is the major component of capital market; there are several issues with capital market along with the performance of stock market contributed in economic growth.

The results have been derived by applying OLS and Granger causality over the time period of 1988 to 2012, there are four explanatory variables regressed against the dependent variable. We have used various tests to make our results reliable, consistent and BLUE. The regression results interpret that stock traded value contributed positively in GDP by 0.11 percent as a 1 percent change take place. Financial depth has statistically significant influence on GDP; it suggested that a 1 percent decrease in FD will contribute 0.98 percent in GDP and highly significant. Our results established the relationship between stock turnover ratio and GDP. The parameter is probably significant but due to a logical reason it becomes with negative sign. The final variable left behind that is Stock market capitalization which appears insignificant this may be because of the lack of Diversification and lack of efficiency of the market.

The overall fitness of the model and the explanatory power of the model is much better, our results suggested that 99 percent variation has been explained by the independent variables, even too much value of R^2 defines the problem of multi-co linearity, in this model the problem of multi-co linearity was not found.

The causality test resulted that the GDP cause to stock traded value; it means as the GDP increases the stock traded value increases and the size of the stock market improves.

Stock market capitalization is cause to change the GDP, as well our hypothesis about the positive contribution make true. The causality indicates the unidirectional relationship from SMC to GDP.

The Financial depth cause to change the STOR, it means that if the FD strengthen the market liquidity (STOR) that if they had little money in hand the traded value grow faster than market capitalization and the turnover ratio improves. The same result was found for STV that FD causes a change to STV.

Finally we found a bi directional causality between FD and GDP. It indicates that the FD cause GDP, and GDP cause FD, in both cases if the financial depth falls it will cause GDP to rise and in the second case as the GDP improves the FD will reduced because as soon as the money supply grow faster than GDP the financial depth increase and vice versa i.e. there is an inverse relationship between FD and GDP.

The importance of capital market forced the researchers to investigate the effects and relationship of stock market and economic growth. The current study attempts to empirically build a relationship by taking market size, market liquidity and financial intermediaries as independent variables. The financial depth and market capitalization along with stock traded value are the important variables of stock market development that are strongly influenced the economic growth in Pakistan.

The empirical results confirmed that development of stock market is positively associated with economic growth in Pakistan. Furthermore the findings are consistent with the studies of Atje and Jovenovic (1993), Levine (1997), Caporal et al (2004), Shahbaz et al (2008), Sallahuddin (2010) and Raza et al (2012) who's concluded that stock market development has positive impact on economic growth.

POLICY RECOMMENDATIONS

Pakistan is a developing country there is more space for growth, stock market performance can spur the economic growth of the country if the commercial, fiscal and monetary policies are announced fairly with the objective of development. There is no doubt that the stock market can play a crucial role in the development process of Pakistan, Pakistan is naturally a rich country

around the world but a little bit efforts are required. For utilization of resources in sense of saving or capital we recommend some policies to the government as under:

- Financial system should be regulated properly by the government.
- Efficiency of the capital market can be improved by financial innovation.
- Allocation and mobilization of resources should take place from in active part to active part of the economy.
- The corporate control should be made better, the professional institution established for the education of corporate control.
- Government should reduce the trade restriction in order to promote stock market.
- Investment can rise through public private partnership which would help to enhance capital mobility.
- For better investment opportunities government must control and stabilize the political, social and economic environment.

All of the above suggestions basically revolve around the market stability; it is necessary for the improvement of economic growth that the traders are satisfied and show their confidence to investment. If the investment process continuous it will boost the economy in such a manner that the process of industrialization starts, market capitalization improves , traded volume increases, market is more liquidate and these indicators develop the stock market not only the stock market while the level of capital formation enhances the level of innovation which leads to the technological change , the cost of production and the cost of acquisition of firm reduces , the employment level improves so on the output increase the growth and economy will move towards development.

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APPENDICES

APPENDIX 0: Literature Summary

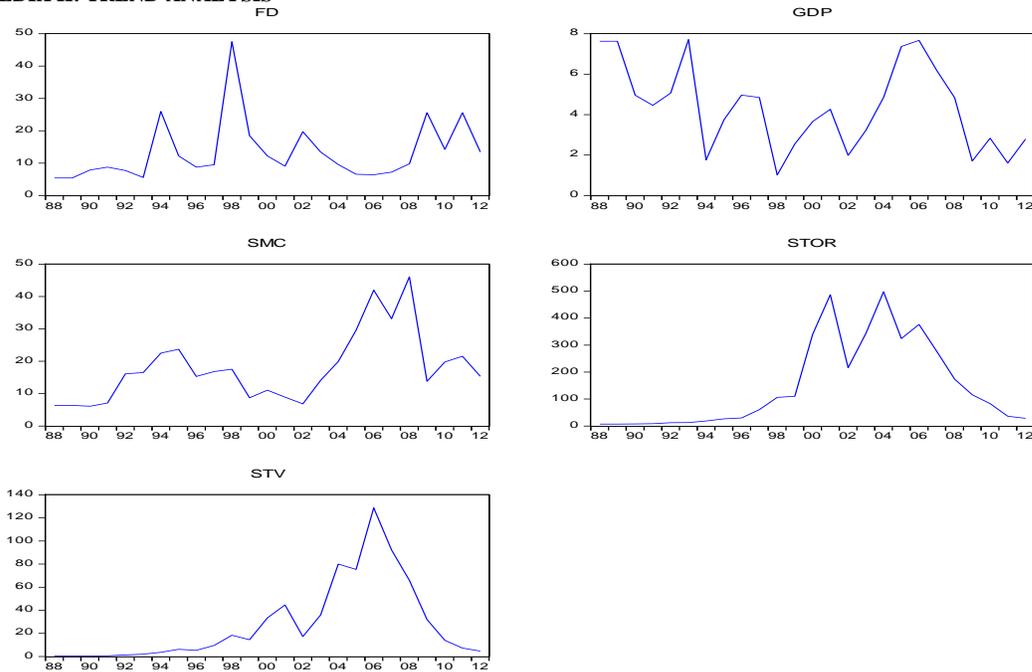
Author	Country/country group (time period)	Methodology	Main Findings
Bayar et al. (2014)	Turkey (1999-2013)	Cointegration and Granger causality tests	A unidirectional causality found from market capitalization, stock traded value and turnover ratio to economic growth.
Tang (2013)	Australia (1960 -2008)	Cointegration and Granger causality tests	a unidirectional causality exists from stock prices to economic growth.
Haque Enamul (2013)	Bangladesh, India, Pakistan, and Sri Lanka (1980 -2005)	Dynamic panel	There was no effect of stock market on GDP per capita
Ikikii and Nzomoi (2013)	Kenya (2000 -2011)	Linear Regression Model Granger Causality	There was bi directional causality between stock market development and economic growth.
Ho and Odhiambo (2012)	Hong Kong (1980-2010)	Autoregressive Distributed Lag (ARDL) bounds test	A unidirectional causality from stock market capitalization to economic growth, and a unidirectional from economic growth to stock market turnover in the short and long run and a casual from stock market turnover to economic growth in the short term, and a causality flow from economic growth to traded value.
Iskenderoglu et al. (2011)	Turkey (January 1991- December 2011)	Johansen cointegration test and error correction model	BIST Index influenced industria index unidirectional.
Rahman and Salahuddin (2010)	Pakistan (1971 -2006)	Fully Modified Ordinary Least Squares (FMLS) and ARDL model bounds-testing and Error Correction Model	The stock market liquidity shown positive effects on economic growth. Stock market development causes economic growth in Egypt and South Africa while there is a bidirectional relationship between stock market development and economic growth for Cote D'Ivoire, Kenya, Morocco and Zimbabwe.
Ake and Ognaligui (2010)	Cameroon (2006-2010)	Granger causality	Stock market did not affect economic growth.
Enisan and Olufisayo (2009)	Cote D'Ivoire, Egypt, Kenya, Morocco, Nigeria, South Africa, and Zimbabwe (1980 - 2004)	ARDL bounds test	There was a positive significant effect of stock market on economic growth.

Author	Country/country group (time period)	Methodology	Main Findings
Deb and Mukherjee (2008)	India (1996: Q4 -2007: Q1)	Granger causality	There was a strong causal flow from stock market to economic growth.
Liu and Sinclair (2008)	China (February 1992 - February 2003), Hong Kong (January 1973 - February 2003) and Taiwan (January 1967 - February 2003)	Co-integration and causality tests	A unidirectional causality between stock prices and economic growth in short run.
Agrawalla and Tuteja (2007)	India (1990-2007)	Multivariate Granger causality	Stock market development effects economic growth in the long run.
Buelens et al. (2006)	Belgium (1830–2000)	Cointegration analysis	Stock market development influenced economic growth in Belgium. Stock market performance is a better indicator of economic growth than bank-based development.
Adjasi and Biekpe (2006)	14 African countries	Dynamic panel data analysis	There was a positive relationship between stock market development and economic growth.
Hondroyannis et al. (2005)	Greece (1986–1999)	Vector Auto Regression (VAR)	There was a bidirectional causality between real economic activity and stock market capitalization
Caporale et al. (2004)	Argentina, Chile , Greece, Korea, Malaysia, Philippines and Portugal (January 1977 -April 1998)	Causality test and VAR	There was causality between stock market development and economic growth.
Arestis et al. (2001)	Germany (January 1973 - April 1997), US (February 1972 - January 1998), Japan (February 1974 -January 1998), United Kingdom (February 1968 -April 1997) and France (January 1974 -January 1998)	VAR	Stock markets and banks both play key role in GDP Germany, France and Japan, but the effects of the banks were more dominant.
Levine and Zervos (1998)	47 countries (1976–1993)	Least-square regression	Stock market was not a rapid indicator of economic growth, stock growth and productivity growth. Stock market liquidity had significant relationship with output, capital stock growth and productivity growth.

APPENDIX I: AUGMENTED DICKER FULLER TEST

Variables	Coefficient value at Level		At First Difference level	
	Intercept	Intercept and Trend	intercept	Intercept and Trend
GDP	-3.49**	-3.56	-6.57*	-4.83*
SMC	-2.24	-4.84**	-5.44*	-5.45*
STOR	-2.63	-0.69	-0.172	-1.87
STV	-2.54***	0.69	-0.48	-4.57*
FD	-3.58*	-3.66**	-5.32*	-5.15*

Author's Estimation

APPEDIX II: TREND ANALYSIS**APPENDIX III: DESCRIPTIVE STATISTICS**

	SMC	STV	STOR	FD
Mean	17.82	27.78	148.29	13.45
Median	16.13	14.015	82.94	9.58
Maximum	46.11	128.76	497.40	47.52
Minimum	6.12	0.46	7.20	5.43
Std. Dev.	10.66	34.73	160.82	9.53
Skewness	1.17	1.45	0.92	2.075
Kurtosis	3.88	4.20	2.48	7.58
Jarque-Bera	6.51	10.19	3.79	39.84
Probability	0.038	0.0061	0.15	0
Sum	445.43	694.41	3707.15	336.21
Sum Sq. Dev.	2724.81	28941.12	620747.7	2178.99
Observations	25	25	25	25

APPENDIX IV: CORRELATION MATRIX RESULTS

	FD	GDP	SMC	STOR	STV
FD	1				
GDP	-0.8	1			
SMC	-0.06	0.2	1		
STOR	-0.13	0.09	0.27	1	
STV	-0.2	0.32	0.71	0.79	1

APPENDIX V: OLS GROWTH ESTIMATION

Dependent Variable: LGDP

Method: Least Squares

Date: 03/09/14 Time: 04:37

Sample (adjusted): 1989 2012

Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LSTOR	-0.096462	0.060309	-1.599472	0.1271
LSTV	0.113082	0.056780	1.991570	0.0618
LFD	-0.978204	0.018291	-53.47977	0.0000
LSMC	0.035672	0.036954	0.965313	0.3472
C	3.713802	0.214916	17.28026	0.0000
AR(1)	0.789751	0.161670	4.884950	0.0001

R-squared	0.993303	Mean dependent var	1.311923
Adjusted R-squared	0.991443	S.D. dependent var	0.555524
S.E. of regression	0.051387	Akaike info criterion	-2.886537
Sum squared resid	0.047532	Schwarz criterion	-2.592023
Log likelihood	40.63844	Hannan-Quinn criter.	-2.808402
F-statistic	533.9931	Durbin-Watson stat	2.019394
Prob(F-statistic)	0.000000		

Inverted AR Roots .79

APPENDIX VI: Heteroskedasticity Test: Glejser

F-statistic	1.342030	Prob. F(4,19)	0.2909
Obs*R-squared	5.287024	Prob. Chi-Square(4)	0.2591
Scaled explained SS	4.045326	Prob. Chi-Square(4)	0.3999

APPENDIX VII: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.238268	Prob. F(2,16)	0.7907
Obs*R-squared	0.694130	Prob. Chi-Square(2)	0.7068

APPENDIX VIII: Model Specification Test

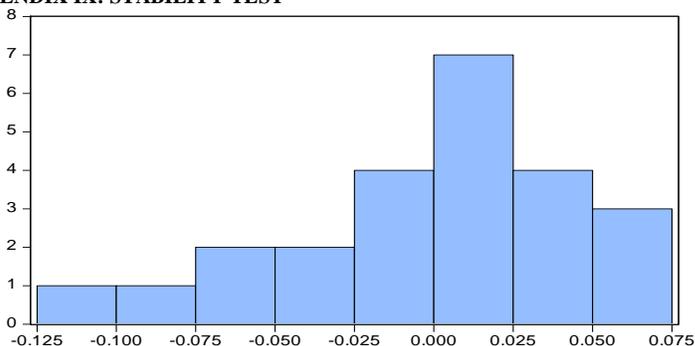
Ramsey RESET Test

Specification: LGDP LSTOR LSTV LFD LSMC C AR(1)

Omitted Variables: Squares of fitted values

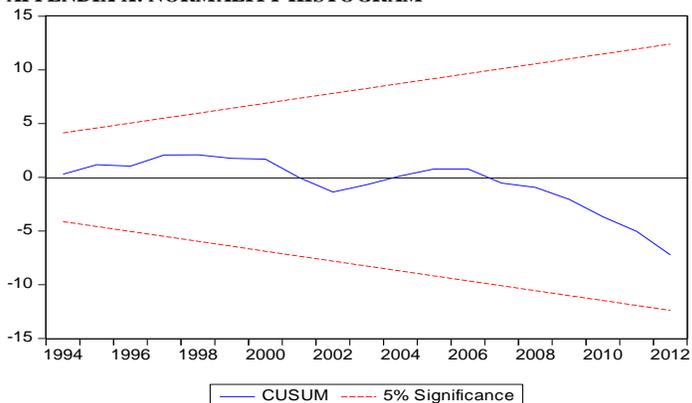
	Value	df	Probability
t-statistic	0.511028	17	0.6159
F-statistic	0.261150	(1, 17)	0.6159
Likelihood ratio	0.365879	1	0.5453

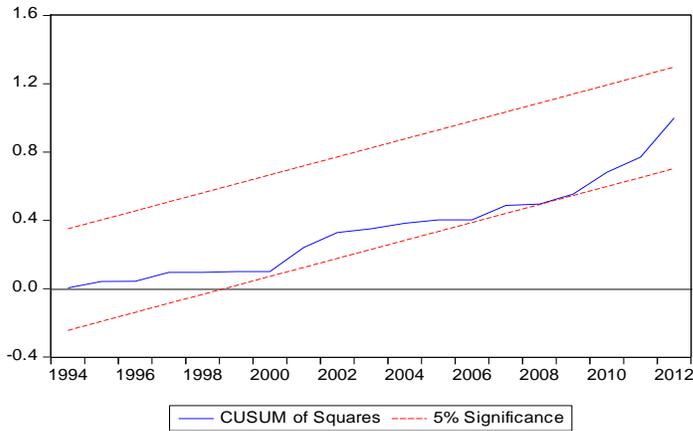
APPENDIX IX: STABILITY TEST



Series: Residuals	
Sample 1989 2012	
Observations 24	
Mean	-1.19e-10
Median	0.009538
Maximum	0.073915
Minimum	-0.109212
Std. Dev.	0.045460
Skewness	-0.576194
Kurtosis	2.935246
Jarque-Bera	1.332190
Probability	0.513711

APPENDIX X: NORMALITY HISTOGRAM





APPENDIX XI: PAIRWISE GRANGER CAUSALITY TESTS

Date: 03/09/14 Time: 04:59

Sample: 1988 2012

Lags: 6

Null Hypothesis:	Obs	F-Statistic	Prob.
LSTOR does not Granger Cause LGDP	19	0.51195	0.7823
LGDP does not Granger Cause LSTOR		2.54211	0.1405
LSTV does not Granger Cause LGDP	19	0.94457	0.5267
LGDP does not Granger Cause LSTV		3.02209	0.1021
LFD does not Granger Cause LGDP	19	14.5922	0.0024
LGDP does not Granger Cause LFD		12.8072	0.0034
LSMC does not Granger Cause LGDP	19	3.49033	0.0768
LGDP does not Granger Cause LSMC		0.11275	0.9911
LSTV does not Granger Cause LSTOR	19	1.18165	0.4223
LSTOR does not Granger Cause LSTV		1.73803	0.2593
LFD does not Granger Cause LSTOR	19	2.80344	0.1176
LSTOR does not Granger Cause LFD		0.38773	0.8631
LSMC does not Granger Cause LSTOR	19	1.81164	0.2440
LSTOR does not Granger Cause LSMC		1.62249	0.2857
LFD does not Granger Cause LSTV	19	2.68184	0.1276
LSTV does not Granger Cause LFD		1.19446	0.4174
LSMC does not Granger Cause LSTV	19	1.96015	0.2166
LSTV does not Granger Cause LSMC		1.57141	0.2984
LSMC does not Granger Cause LFD	19	2.62370	0.1328
LFD does not Granger Cause LSMC		0.15985	0.9789