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The Causality between Equity Market Development and Economic Growth: An Egg and Chicken Problem?

Athar Iqbal[*], Muhammad Irfan Khan[†] and Samina Riaz[‡]

Abstract

The motivation behind this study is to empirically examine the casual relationship between the equity market development and GDP growth in twenty six emerging market economies over the period of 1995 to 2012.To obtain the reliable results, different econometrical techniques were used; Correlation analysis to know the causality among the equity market development (Independent variables) and real GDP growth rate (dependent variable) and to solve the multicollinearity problem. To check the stationary properties and solve the endogeneity problem, unit root ADF - fisher chi-square test and panel Generalized Method of Moments (GMM) approach were employed. It was found that significant and positive supply leading hypothesis, uni-directional relationship between equity market development and real GDP growth. Beside the macro-economic variables FDI- foreign direct investment (inflows) and trade openness have significant positive while investment ratio, exchange rate and inflation showed negative and insignificant impact on economic growth.

Keywords: Economic Stability, Direction of Economic Growth, Stock Market Performance, Supply-Leading Hypothesis, Demand-Leading Hypothesis

Introduction

Extensive disparity in the development of financial institution and economic growth in many economies have generated great attention, interest and quantity of debate among many economists. In recent years; Rachdi (2011), Johannes, Njong and Cletus (2011), Cavenaile, Christain and Franz (2014), Chakraborty and Ghosh (2011), Odhiambo, (2008), Osuala, Okereke and Nwansi (2013), Lawrence (2014) and Sehrawat and Giri (2015) investigated on the association and flow between the development of equity market and real GDP expansion in the context of

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different countries. The extensively hypothetical and experimental researches have been employed in order to recognize the causality of link between enlargement of financial institution and GDP growth because financial market accelerates growth performance in a country. Equity market and financial sectors support to accomplish the non-comprehensive goals like National growth, Entrepreneurship, saving mobilization and Investment. Financial system includes two main sectors that consist of the market based financial-sector (equity based and bond market) and the banking based financial sector that is recognized as the main determinants or proxies of developments and economic stability. Equity market development is considered as an essential part of the economy's growth in financial system. Well-organized financial structure contributes to the deployment of enhancing the monetary intermediation and initiating long run investment. Equity market and banking system development are interrelated through various channels with economic condition of countries.

This paper empirically focuses on the development of equity market-based financial enhancement and economic growth by constructing three alternative conglomerate indexes as a proxy of overall equity market development based on previous researchers such as Levine & Sarah (1998). They argue that individual equity market indicators may be market capitalization, trade value and turnover ratio which can hardly justify the proxy of financial development. Garcia and Liu (1999) scrutinized linkage between market capitalization ratio and economic growth. The data of fifteen Latin American and developing Asian countries from 1980-1995 were collected. It was found that domestic investment, GDP growth, saving frequency, income level, and monetary market intermediary development are all significant important factors to predict the development of stock market.

There is no particular universal indicator to measure the equity market development. Earlier studies have debated that economies are different in their institutional, political and legal framework and hence the single indicator is unable to identify as a proxy of overall financial development (Demirguc Kunt & Levine, 1996; Pramod & Puja, 2015). Keeping in mind the fact, we constructed three alternative conglomerate indexes by combining market capitalization (measure size), trade value and turnover ratio (measure liquidity) as indicators of overall equity market development of 26 emerging market economies over the sample period. Table 1 describes the list of these emerging countries. The segregation of countries was made based on the classification of International Monetary Fund (IMF) as of 2007-08.

Table 1 List of Emerging Countries

Large Emerging Countries	Other Emerging Countries
Argentina	Bulgaria
Brazil	Chile
China	Czech Republic
Colombia	Morocco
Egypt, Arab Rep.	Oman
India	Peru
Indonesia	
Iran, Islamic Rep.	
Malaysia	
Mexico	
Philippines	
Poland	
Romania	
Russian Federation	
Saudi Arabia	
South Africa	
Thailand	
Turkey	
Ukraine	
Venezuela, RB	

The size of the market was measured with market capitalization ratio, calculated with the total value of all shares divided by the GDP. Volume of aggregated shares traded value is a measure of the overall value of shares traded divided by market % of GDP and Turnover ratio is measured by aggregate shares value divided by market capitalization. The debate of experimental and hypothetical studies is revolving around the issue that whether the equity market development essentially influences on gross domestic product growth or vice versa. Theoretical literature contains four dissimilar opinions on the path of linkage between equity market expansion and GDP growth. The first view postulates "supply leading hypothesis" (F.D → E.G) which means that financial development spurs economic growth. A well-functioning stock market promotes growth by increasing aggregate proportion of investment that is allocated to firms by portfolio diversification of risk. Levine and Zervos (1998) observed liquidity of equity market significantly forecasts aggregate GDP growth. Atje and Jovanic (1993) concluded that in the long-run development of equity market has a significant impact on gross domestic product in an economy through mobilization of saving, risk diversification, different channels of liquidity, obtaining the information about the particular firms and corporate authority.

The second view postulates "demand following hypothesis" (E.G → F.D) which means that the economic performance leads toward development of more financial institutions. Akinlo and Egbetunde (2010) have studied and found the validity of demand leading hypothesis. Athanasios and Antonios (2012) also found the same empirical insights. The third postulates that the "bi-directional causality" (F.D ⇔ E.G) between the economic growth and financial development. Odhiambo (2013) has examined the bi-directional causality between these two variables.

Forth view postulates that there is no linear association between financial development and growth. In this view both variables are independent of each other. Singh (1997) constructed that for a great smooth in GDP growth are not compulsory due to equity market in the context of developing countries. Dabos and Gantman (2010) have found no causality between the two stated variables.

Literature Review

The debate on the topic of causality between financial development and GDP expansion are flourishing in experimental as well as theoretical grounds. The importance of this topic has been recognized and is widely discussed in finance and economic literature among researches and policy makers. There has been a controversy opinion on the connection between financial development and GDP growth. Empirical works regarding market based financial sector –GDP growth nexus about the nature, direction and impact between development of the equity market and growth in any country is still ongoing. Some previous studies are discussed below with separate views about the topic.

Supply leading growth hypothesis that flows from Financial Development toward Economic Growth (F.D → E.G):

Akinlo and Egbetunde (2010) explored the co-integration among economic expansion and development of financial institutions in 10 Sub Saharan Africa from 1980 to 2005 by applying vector error co-integration model. The study concluded the direction of causality which flows from finance to growth in, Nigeria, Gabon, Congo Republic, and Central African Republic.

Rachdi (2011) investigated the association and directional linkage between financial development and growth in 10 economies which include four MENA and six OECD economies from 1990 to 2006. The results from GMM estimator found a single-directional association, in another words significant supply leading assumption in MENA economies. Johannes, Njong and Cletus (2011)used Johansen co-

integration test and found a single directional casual association that flows from development of financial to rate of growth in the context of Cameroon over the period of 1970 to 2005. It concluded that financial sector develops the economy incase if the financial sector does not grow.

Chakraborty and Ghosh (2011) applied a time series data of Philippines, Malaysia, Thailand, Indonesia, and Korea economies over the period of 1989 to 2006 in order to examine the causal linkage between finance and growth. Empirical results from Granger causality test indicates a uni directional association that flows from equity and bank based financial development to growth in 5 Asian economies.

In a recent research, Odhiambo (2013) scrutinized the causality between development of equity market based financial sector and GDP progress in the context of Africa. The research used newly developed ARDL-bounds testing technique by implementing 3 proxies i.e. market capitalization, market turnover and traded value against the equity market and GDP per capita growth rate as an alternative against growth in an economy. In the short and long run, the study supports supply leading hypothesis. Osuala, Okereke and Nwansi (2013)also examined the nature of correlation and the direction among the equity marketplace performance and growth expansion in case of Nigeria over the period 1981- 2011. It concluded that mono-directional causality flows and support the significant evidence of supply leading growth hypothesis.

Lawrence (2014) analyzed the causality between development of stock market based financial system and economic development in the short and the long run. It concluded that there exists a significant uni-directional association between financial development and GDP growth in the context of Nigeria. Bayar, Kaya and Yildirim (2014) also made an effort to observe the role of equity market capitalization and GDP productivity of Turkey by applying Granger causality test and Johansen-Juselius cointegration approach over the period of 1999 to 2013. The result revealed uni-directional and significant causality that flows from development of financial markets to real economic development.

Sehrawat and Giri (2015) studied the nature and path between development of financial based markets and output in term of growth in the context of India, using Auto regressive distributed lag (ARDL) test over the period of 1982 to 2012. It concluded that there exists a uni-directional significant and positive supply leading hypothesis in the context of Indian economy. At the same time, Pramod and Puja (2015) empirically investigated the association among development of equity market and GDP growth across the panel of twenty seven economies from 1995 to 2012. In this study, he used three different methodologies that are second generation panel unit root test, heterogeneous panel

causality test and dynamic panel GMM estimator. They found finance leading growth hypothesis or single directional causation running from equity market development toward growth.

Demand leading hypothesis that flows from Economic Growth toward Financial Development (E.G → F.D):

Nieuwerburgh, Buelens and Cuyvers (2006) investigated the association between the finance based market expansion and GDP development in the context of Belgium over the period of 1873-1935. The study found a strong, significant demand leading growth hypothesis and uni-directional association. Similarly, Odhiambo (2008) examined the impact and direction of cause and effect among three different proxies of financial development and real GDP per capita as a proxy of GDP growth in Kenya. Using dynamic Granger causality model, the study found a significant demand led growth hypothesis. In the next year, Enisal and Olufisayo (2009) explored the association between development of financial markets and real GDP rate in case of seven countries of sub-Saharan Africa. Researcher found uni-directional linkage exists from GDP growth to financial-based market development in case of Nigeria.

Akinlo and Egbetunde (2010) studied the co-integration between the real GDP growth rate and development of financial markets in 10 Sub Saharan Africa from1980 -2005, using vector error cointegration approach and found a significant long run correlation. The direction of causality flows from economic growth to finance. After a year Athanasios and Antonios (2012) applied the vector correlation model and Granger causality approach procedures for investigating the cause and effect between development of financial based markets and GDP growth in case of Greece, using data from 1978 to 2007.They found mono-directional linkage, running from growth in an economy toward market based financial advancement.

Bi-directional relationship between Financial Development and Economic Growth.(F.D ⇔ E.G):

Akinlo and Egbetunde (2010) examined the association between the real GDP growth rate and development of financial markets in 10 Sub Saharan Africa from1980 -2005, using vector error co-integration model. They found a significant bi-directional causation between finance and growth in Switzerland, South Africa, Chad, Sierra Leone and Kenya. In the same year Bangake and Jude (2011) used a panel VECM and panel co-integration techniques methodology to observe the path and causation between growth and financial development in the context of seventy one Industrial and under-developed countries from 1960 to 2004. Results

indicate that there is a bi directional causal linkage, supporting both supply lead growth and demand lead finance hypothesis. Oskooe(2010) investigated the causality between development of equity market and real GDP expansion rate in the context of Iran. The study found two way causal associations between developments of equity market and growth of Iran. In the same year, Colle (2010) indicated that GDP growth positively affects financial sector development whereas financial development also effects growth.

Chakraborty and Ghosh (2011) used Granger causality test, covering the data of 5 Asian countries of Korea, Philippines, Indonesia and Malaysia over the period of 1989 to 2006. The study found a significant feedback hypothesis or bi-directional causal linkage between development of financial markets and growth. In the same year Odhiambo (2013) used a Tri-variate Granger-causality model procedure to re-examine causality between equity market (stock and bond) and bank based market expansion and GDP growth performance in case of South Africa from 1980 to 2007. He found a bi-directional causality. Rachdi(2011) investigated the association and direction between financial development and economic growth in overall 10 economies which include four from MENA and six OECD economies from 1990 to 2006.The results from GMM estimator concluded a bi-directional association between financial markets development and growth in OECD economies.

One year later, Najeb and Glenn (2012) investigated the influence of equity market and banking system on economic growth for forty two emerging economies. They found a bi-direction association between development of equity market and real GDP growth rate performance.

Marques, Fuinhas and Antonio (2013)analyzed the correlation between development of equity market and growth performance by applying Granger-causality approach in case of Portugal from 1993-2011. The empirical results showed evidence of two way causal linkage between the studied variables.

Adeyeye (2015) used Granger pair wise causality test to investigate the association between development in financial sector and economic evolution in Nigeria from 1981 to 2013. The results found a significant feedback hypothesis; bi-direction casual association exists between them. Christopoulos and Efthymois (2004) also find same results unsing the data of 10 developing countries

No Correlation between Financial Development and Economic Growth (Finance<≠>Growth):

Tsangyao (2002) used Granger causality tests and multivariate error correction model. The study indicated that development of financial markets and economic growth are predictors of each other, meaning thereby, there is insignificant association between these dependent and explanatory variables in the context of Mainland China from 1987 to 1999.

Naceur and Ghazouani (2007) investigated the association between development of equity and bank-based financial markets and GDP growth in eleven middle east North Africa (MENA) economies from 1973 to 2003. The results from GMM estimator failed to respond the causality between them. In the same year Frank (2007) analyzed the causality between developments of financial markets on real GDP growth rate in Africa over the period of 1980 to 2001. The results from Johansen cointegration and Granger causality indicated that there is insignificant and positive relationship between them.

Christophe and Baptiste (2008) examined the causality between economic growth and financial development over the period of 1960 to 2000. Results showed that there is no association between them. Gondo (2009) used differing econometric methods to examine the same variables over the period of 1970 to 1999 in the context of South Africa and found conflicting and mixed results.

Ghimire and Giorgioni (2013) surveyed the connection between development of financial markets and economic growth rate from 1996 to 2005 over the sample of one hundred and twenty one countries, involving 28 LDC's economies. The study found no association between equity market expansion and GDP growth. Vuranok (2009) found no significant long run association between financial development and GDP growth in the context of Turkey from1991 to 2008 with Co-integration approach, in the context of fifty three developing and developed countries. Dabos and Gantman (2010) investigated the association between financial development and growth in ninety eight economies from 1996 to 2005. Result concluded from regression and dynamic panel method found that there is no relationship between these two variables.

Research Methods

Although there are mixed results in previous studies, the recent papers show supply leading hypothesis, suggesting economic growth due to financial market development. Besides, among the research papers included in the current study, none of them contained data upto 2015.

Keeping in mind the facts, the following hypotheses are established for the current study.

Hypothesis:

H1: Development of equity markets has positive correlation with real GDP growth in emerging countries.

H2: Equity market development causes economic growth.

The data of twenty-six countries were collected from the World Bank and index mundi data set over the period of 1995 to 2015.We use factor analysis in order to control multicollinearity and construct factor loading of jth element derivative from factor analysis approach. Factor loadings are the weight of a particular factor with underlying aggregation procedure, obtained for twenty six economies over the sample period. By putting the highest factor loading in place of aj, value of X variable that are market capitalization, trade value and turnover ratio in the country *i* over the time period *t* in the sample of 26 emerging market economies over the sample period were computed. Table 2 lists down the variables of this study along with expected signs.

Calculation of Three Indexes as a Proxy of Financial Development

It is already mentioned above that there is no single standard proxy of financial development. Researchers always make an effort to develop a proxy which can best describe the development of financial market. This paper gives a unique contribution in the literature by developing the following three new proxies of financial development. Equity market development Index 1 is computed in equation 1

$$\text{Index1} = \sum((X_{it} - \bar{X}_i)/\sigma X_i) \quad [1]$$

Where

i = country

t= year

X_{it}= *The value of X variable of country$_i$ in the period t for example market capitalization, trade value and turnover ratio over the sample period.*

$\bar{X}_i$ = *Mean value of X variable over the sample period*

σX_i =*Standard deviation value of X variable over the sample period*

Equity market development Index 2 is computed in equation 2

$$\text{Index 2} = (X_{it} - \bar{X})/|\bar{X}| \quad [2]$$

Where

X_{it}= *Value of X variable of country$_i$ period$_t$ for example market capitalization, trade value and turnover ratio over the sample period*

$\bar{X}_i$ = *Mean value of X variable over the sample period*

$|\bar{X}|$ = *Mean removed value of X variable*

Equity market development Index 3 is computed in equation 3

$$\text{Index3} = \sum_{j=1}^{3} a_j \frac{X_{it}}{\sigma(X_i)} \quad [3]$$

a_j =Highest factor loading value of each variables (for example market capitalization, trade value and turnover ratio)
X_{it}=value of X variable for example market capitalization, trade value and turnover ratio over the sample period
$\sigma(X_i)$= standard deviation of particular variable

Table 2 List of Variables

Dependent Variable	Definition	Expected Sign
GDP Growth	Real GDP	
Independent Variables		
Initial Growth Rate	One year lagged growth rate	+
Proxies of Equity Market Development		
EMD	Composite index constructed by combining market capitalization, trade value and turnover ratio	+
Map	Value of market capitalization of listed shares as a percentage of GDP	+
Trade Value	Total value of shares traded on the stock market as a percentage of GDP	+
Turnover Ratio	The ratio of value of shares traded to market capitalization	+
FDI	Inflow of foreign direct investment as a percentage of GDP	+
Trade Openness	Sum of total export and total imports divided by GDP. (variable converted to first differences to meet the stationary property)	+
Exchange Rate	Local currency versus US dollar (variable converted to first difference to meet the stationary property)	-
Inflation	GDP deflator	-
Investment	Gross Fixed Capital Formation as a percentage of GDP (variable converted to first difference to meet the stationary property)	-

Results

This section covers the empirical findings to investigate the impact of financial development on economic growth of emerging economies. The analysis begins with the descriptive statistics which is presented in table 3. The average mean value of growth is 4.056 approximately 4 percent

that is quite low but it is an effective indicator to find out the development in equity markets in the context of emerging economies. The average values of equity market proxies i.e. market capitalization (Map), trade value and turnover ratios are 45.693, 20.190 and 43.634 respectively, showing better in twenty-six emerging economies.

Table 3 Descriptive Statistics

Variables	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.	Obs
Growth	4.056	4.137	-1.071	5.624	223.750	0.000	468
Map	45.693	48.021	2.277	9.125	1135.947	0.000	468
Trade value	20.190	33.489	5.430	47.664	41198.850	0.000	468
Turnover	43.634	50.221	2.421	9.956	1400.581	0.000	468
EMD_1	0.000	2.285	0.601	3.059	28.279	0.000	468
EMD_2	-0.001	3.059	2.959	18.682	5478.012	0.000	468
EMD_3	53.381	55.905	2.246	8.949	1083.575	0.000	468
Investment	23.002	6.035	1.212	4.876	183.264	0.000	468
ExRate	664.477	2167.667	3.679	15.331	4020.852	0.000	468
FDI	2.983	2.905	3.457	27.141	12296.670	0.000	468
Openness	68.077	36.278	1.664	6.547	461.405	0.000	468
Inflation	15.051	50.884	14.877	262.380	1329183.00	0.000	468

Skewness and Kurtosis:

Skewness and kurtosis are used to check the normality in the data series. We found appropriate values in skewness and kurtosis with the help of equation 4 and 5

=Skewness / Standard deviation [4]

=Kurtosis / Standard deviation [5]

The criteria of rejecting or accepting the skewness and kurtosis hypothesis is if the value is less than 1.96.Weconclude that the data is not normally distributed. Jarque-Bera test is also applied to test normality in data and that confirmed that variables are not normally distributed.

Correlation Matrix:

Correlation matrix in table IV indicates the association between equity market development proxies and economic growth. The correlation matrix indicates that market capitalization, trade value and turnover ratio show weak but positive correlation with economic growth. In case of conglomerate indices that developed with the help of equations (1) to equation (3), correlation with growth is positive but weak.

There are several additional complexities faced by researchers when applying unit root and cointegration hypothesis in panel data. There is unobserved heterogeneity exists in parameters. Table V presents the result of unit root test by fisher chi-square cross sectional augmented dicky-fuller test. All variables are stationary at level except trade openness.

Table 4 Correlation matrix round off values

	GRO	MAP	TRADE	TURN	EMD1	EMD2	EMD3	OPEN	INV	INF	FDI	EX
GRO	1.0	0.2	0.2	0.2	0.2	0.3	0.1	0.0	0.3	-0.2	0.1	0.0
MAP	0.162	1.0	0.5	0.0	0.3	0.6	0.9	0.3	0.1	-0.1	0.1	-0.1
TRADE	0.223	0.499	1.0	0.6	0.4	0.9	0.5	0.1	0.2	-0.1	0.0	-0.1
TURN	0.232	0.029	0.621	1.0	0.3	0.7	0.2	-0.1	0.2	0.0	0.0	-0.1
EMD1	0.173	0.3	0.4	0.3	1.0	0.4	0.3	0.1	0.2	-0.1	0.3	0.0
EMD2	0.265	0.6	0.9	0.7	0.4	1.0	0.7	0.1	0.2	-0.1	0.0	-0.1
EMD3	0.149	0.9	0.5	0.2	0.3	0.7	1.0	0.2	0.0	-0.1	0.0	-0.1
OPEN	0.0	0.3	0.1	-0.1	0.1	0.1	0.2	1.0	0.2	0.0	0.2	-0.1
INV	0.3	0.1	0.2	0.2	0.2	0.2	0.0	0.2	1.0	-0.1	0.2	0.2
INF	-0.2	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	-0.1	1.0	0.0	0.0
FDI	0.1	0.1	0.0	0.0	0.3	0.0	0.0	0.2	0.2	0.0	1.0	-0.2
EX	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.2	0.0	-0.2	1.0

Panel Unit Root Test (ADF Fisher test):

Table 5 ADF fisher chi-square

Variables	ADF - Fisher Chi-square		ADF - Choi Z-stat		level of Integration
Growth	119.592	(0.0000)**	-6.04261	(0.0000)**	I (0)
Map	101.998	(0.0000)**	-2.44724	(0.0072)**	I (0)
Trade value	73.3783	(0.0270)**	-2.88885	(0.0019)**	I (0)
Turn over	112.632	(0.0000)**	-5.1961	(0.0000)**	I (0)
EMD 1	76.7821	(0.0143)**	-3.10551	(0.0009)**	I (0)
EMD 2	88.4927	(0.0012)**	-3.58538	(0.0002)**	I (0)
EMD 3	94.3801	(0.0003)**	-2.15207	(0.0157)**	I (0)
FDI	83.2073	(0.0039)**	-3.61034	(0.0002)**	I (0)
ExRate	76.0454	(0.0102)**	-1.96019	(0.0250)**	I (0)
Openness	45.1417	(0.7384)**	0.52242	-0.6993	I (I)
D.Openness	180.018	(0.0000)**	-8.96189	(0.0000)**	I (0)
Investment	88.4242	(0.0012)**	-2.74258	(0.0030)**	I (0)
Inflation	149.152	(0.0000)**	-6.64353	(0.0000)**	I (0)

Notes: The probability values are in parenthesis; Fisher Chi-square cross-sectional augmented dicky fuller test.

Panel Generalized Method of Moments:

We use panel Generalized method of moment to control the endogeneity problem in panel data. The model investigates the association between the equity market development and growth. This is shown in equation 6 below.

$$Growth_{it} = \propto_i + \beta_1 Growth_{it-1} + \beta_2 MAP_{it} + \beta_3 TRADE\ VALUE_{it} + \beta_4 TURN\ OVER_{it} + \beta_5 EMD1_{it} + \beta_6 EMD2_{it} + \beta_7 EMD3_{it} + \beta_8 FDI_{it} + \beta_9 Openness_{it} + \beta_{10} EXRATE_{it} + \beta_{11} INVESTMENT_{it} + \beta_{12} INFLATION_{it} + \gamma_t + \varepsilon_{it} \quad \text{------[6]}$$

Where

$\propto i$ = Captures any country specific effects.

γt= Captures any common t period specific effects, general technical progress.

εit =independent disturbance and the subscripts i and tcharacterize country and time period.

$\beta$is the slop

GDP growth = Real gross domestic product (GDP) growth rate.

MAP = Market capitalization ratio.

TRADEVALUE = Total value of shares traded ratio.

TURNOVER =Turnover ratio.

EMD1 = Index 1 as a proxy of equity market development.

EMD2 = Index 2 as a proxy of equity market development.
EMD3 = Index 3 as a proxy of equity market development.
FDI= Foreign direct investment (inflows only)
OPENNESS= Trade openness
INVESTMENT= Investment ratio
EXRATE= Exchange rate
INFLATION= Rate of inflation

The empirical relation between stock market development and growth showed positive and significant relationship in emerging economies. No doubt that cross country data face many statistical and conceptual frameworks. Nonetheless, the result of emerging economy suggests strong link between stock market development and growth. Generalized method of moments deals with overlooked interval and country effects through the enclosure of period-specific intercepts. GMM deals with the model that is dynamic and contains endogenous explanatory variables. Hence, overlooked country effects need to be measured for by differencing and instrumentation.

Table 6 Results

Variable	Coefficient	Std.Error	t-Statistics	Prob.
GROWTH(-1)	0.139	0.053	2.616	0.009 **
MAP	0.054	0.010	5.230	0.000 **
TRADEVALUE	0.042	0.020	2.108	0.035**
TURNOVER	0.008	0.014	0.554	0.057**
EMD1	0.460	0.096	4.783	0.000**
EMD2	0.606	0.256	2.363	0.018**
EMD3	0.057	0.010	5.474	0.000**
EXRATE	-0.001	0.001	-1.545	0.123
FDI	0.422	0.210	2.008	0.045**
INFLATION	-0.035	0.045	-0.770	0.442
INVESTMENT	0.183	0.108	1.702	0.090
OPENNESS	0.180	0.055	3.238	0.001**
Effects Specification				
Cross-section fixed (first differences)				
Mean dependent var	-0.077383	S.D. dependent var		4.784137
S.E. of regression	5.500433	Sum squared resid		12374.2
J-statistic	170.5668	Instrument rank		136
Prob(J-statistic)	0.008351			

Dynamic panel regression applied on 26 emerging economies data. Three indices developed to represent stock market development and analyzed one by one. The results in table 6 indicate that overall equity market development proxies are not highly correlated with error term in other words no endogeneity problem exist in this model, while EXRATE (0.123), INFLATION (0.442) and INVESTMENT (0.090) are insignificant, showing that there is endogeneity problem exist among these explanatory variables.

Table 7 Dynamic Panel Regression One Step System GMM

	Specification 1	Specification 2	Specification 3	Specification 4	Specification 5	Specification 6
GROWTH(-1)	(2.616) **	(2.172) **	(3.566) ***	(3.009) ***	(2.120) **	(2.187) **
EMD_1	(4.782) **					
EMD_2		(2.363) **				
EMD_3			(5.473) ***			
MAP				(5.229) ***		
TRADE_VALUE					(2.107) **	
TURN_OVER						(0.554) **
FDI	(1.426)	(1.558)	(1.379)	(1.470)	(1.698) *	(2.00) **
D(OPENNESS)	(3.264) ***	(3.364) ***	(3.307) ***	(3.281) ***	(3.313) ***	(3.23) ***
EXRATE	(-1.617)	(-1.630)	(-1.681)	(-1.695)	(-1.605)	(-1.54)
INVESTMENT	(0.508)	(0.950)	(0.349)	(0.492)	(1.285)	(1.702) *
INFLATION	(-0.610)	(-0.687)	(-0.250)	(-0.281)	(-0.651)	(-0.770)
Mean dependent var	-0.077383	-0.077383	-0.077383	-0.077	-0.077383	-0.077383
S.E. of regression	5.293623	5.364345	5.208729	5.2675	5.324179	5.500433
J-statistic	175.5871	169.2667	171.4684	170.037	173.6678	170.5668
Prob(J-statistic)	0.004017	0.010016	0.007348	0.0089	0.005343	0.008351
S.D. dependent var	4.784137	4.784137	4.784137	4.7841	4.784137	4.784137
Sum squared resid	11461.18	11769.47	11096.52	11348.3	11593.88	12374.2
Instrument rank	136	136	136	136	136	136

Note: *The t-statistics are reported in the brackets. ***, **, * indicate level of significance 1, 5 and 10% respectively.*

Specification 4, 5 and 6 In individual specification models which contains standard GDP growth rate value as dependent variable and other macro-economic variables and equity market indicators as potential determinant of GDP growth rate. Specification 1 to specification 3 consists of three substitutes of equity market development proxies which are generated by merging the market capitalization ratio, trade value and turnover ratio. All three financial development indicators are significantly contributed towards growth over the sample of twenty-six emerging market economies. In all specification models, the GDP growth with one lagged as dependent variable is statistically significant and positive. Based on the result, it can implies that the three indicators of equity market development including market capitalization, trade value and turnover ratio when considered individually are also significantly and positively contributed towards growth, hence showed an effective channel to promote GDP growth. The reason might be lower cost of saving mobilization, easily access by firms to equity capital and investment in most productive sector of economy. In the regression models researcher also considered various control variables that might effect on growth like inflation, investment, exchange rate, trade openness and foreign direct investment.

Foreign direct investment is only significant in specification 5. Trade openness is significant in all specifications, hence reflects the significance of trade openness in growing economy. Exchange rate and inflation is not significant while investment is significant in specification 6.

Pairwise Dumitrescu Hurlin Panel Causality Tests:

The Generalized method of moment does not provide us the direction of causality among equity market development and GDP growth, whether the development of equity markets cause real GDP growth rate or growth cause equity market development. For this purpose, we use Christophe & Elena (2012) pairwise causality approach for economic growth and equity market development. The equation is as follows:

$$\mathrm{Growth}_{it} = \alpha_i + \sum_{p=1}^{P} \gamma_i^{(p)} \mathrm{Growth}_{i,t-p} + \sum_{p=1}^{P} \beta_i^{(p)} \mathrm{EMD}_{i,t-p} + \varepsilon_{it} \qquad i = 1, 2, \ldots, N: t = 1, 2, \ldots T \qquad [7]$$

Growth = Real GDP growth rate
EMD = Equity market development (one stationarity variable)
N = no countries (26 emerging countries)T = time period (1995 to 2012)
P = lag orders in all cross sectional in panel units.
β(p) = represents regression coefficient's parameters.
γ_i= represents autoregressive coefficient's parameters.

The table 8 indicates the results of Dumitrescu and Hurlin (2012) test. It shows that there is one-way causation exists between our dependent variable and explanatory variables, running from the equity market development to GDP growth. The results conclude that no causality is evident while equity market development positively and significantly causes economic growth. According to Rachdi (2011), Sehrawat&Giri (2015), Calderon &Liu (2003), Shahbaz, Ahmed & Ali (2008), Nurudeen (2009), Hongbin (2007), Cavenaile, Gengenbach & Palm (2014), Pramod & Puja, 2015, Odhiambo (2013) and Beck and Levine (2001), significant, positive and uni-direction relationship among them is verified.

Table 8 Pairwise Dumitrescu Hurlin Panel Causality Test

Null Hypothesis:	W-Stat.	Zbar-Stat.	Prob.	Results
EMD_1 does not homogeneously cause GROWTH	3.870	2.37	0.018	Significant
GROWTH does not homogeneously cause EMD_1	2.561	0.193	0.847	Insignificant
EMD_2 does not homogeneously cause GROWTH	5.51370	5.107	0.000	Significant
GROWTH does not homogeneously cause EMD_2	2.344	-0.167	0.867	Insignificant
EMD_3 does not homogeneously cause GROWTH	12.242	16.30	0.000	Significant
GROWTH does not homogeneously cause EMD_3	2.559	0.191	0.848	Insignificant
MAP does not homogeneously cause GROWTH	12.896	17.391	0.000	Significant
GROWTH does not homogeneously cause MAP	2.279	-0.275	0.783	Insignificant
TRADE_VALUE does not homogeneously cause GROWTH	3.884	2.39	0.017	Significant
GROWTH does not homogeneously cause TRADE_VALUE	2.077	-0.612	0.541	Insignificant
TURNOVER does not homogeneously cause GROWTH	6.47702	6.710	0.000	Significant
GROWTH does not homogeneously cause TURNOVER	2.966	0.86	0.386	Insignificant

Conclusion

Economic growth is vital for all economies and researcher extensively tested various models to understand the behavior of economic variables including financial development on growth. This study empirically tested various models and concluded that there is an association between equity market development and economic growth is significant plus positive and the direction of association flows from equity expansion

toward the real GDP growth rate in the sample of 26 emerging economies. Care must be taken when generalizing results that researcher data is based on emerging economy where stock market is small. Results of this study are consistent with pervious empirical studies. Researcher use three indices of stock market development covering turnover ratio, value of shares traded and market capitalization. Other than these proxies of stock market development researcher also considered five variables that effect growth like inflation, foreign direct investment, exchange rate, investment and trade openness. Only trade openness is significant in all specifications of models that shows importance of liberal economic policies. Thus it is concluded that well developed financial institutions or equity markets directly impact on economic productivity, due to lower cost of saving mobilization that ultimately helps investors to invest in most productive technologies that directly impact to enhance the productivity of firms by allowing firms to permanent access of capital over equity concerns. In case of controlling variables except inflation, investment and exchange rate, all other variables have significant impact on level of real GDP growth rate.

In addition to control variables, we selected similar variables as studied by Pramod and Puja (2015) who studied the real GDP growth as a dependent variable. In this study we use potential control variables, such as trade openness, foreign direct investment, inflation rate, exchange rate and aggregate investment in order to control model misspecification. We found significant supply leading growth hypothesis that flows from equity market development towards economic growth in this study. The results conclude that by enhancing physical capital accretion by equity markets help in promoting trade and investment in monetary sector. It also facilitates to raise the capital fund for business development and expansion.

References

Adeyeye Olufemi (2015). Does supply-leading hypothesis hold in a developing economy? A Nigerian focus. Proceedings of Economics and Finance Conference 2204823, International Institute of Social and Economic Sciences.

Enisan, A.A., Akinlo O., and Olufisayo (2009). Stock market development and economic growth: evidence from seven sub-Sahara African countries. Journal of Economics and Business,61(2),162–171.

Akinlo, A. E. and TajudeenE. (2010). Financial development and economic growth: the experience of 10 sub-saharan African countries revisited. The Review of Finance and Banking, 2,(1), 17-28.

Athanasios V and AdamopoulosA. (2012). Stock Market Development and Economic Growth: An Empirical Analysis. American Journal Economics and Business Administration, 4, (2), 135-143.

Atje, R., and BoyanJ. (1993). Stock markets and development. European Economic Review, 372, (3), 632-640.

Bangake, C. and Jude E. (2011). Further evidence on finance-growth causality: A panel data analysis. Economic Systems 35 (2), 176-188.

Beck, Thorsten, and Levine Ross (2001). Stock markets, banks, and growth: Correlation or Causality? Policy Research Working Paper No.2670, World Bank.

Calderon C and Lin Liu (2003).The direction of causality between financial development and economic growth, Journal of Development Economics, 72, 321-334.

Cavenaile, L., Christian G. and Franz P. (2014). Stock markets, banks and long run economic growth: A panel cointegration-based analysis. De Economist, 162(1), 19-40.

Chakraborty, I., and Ghosh, S. (2011). The relationship between Financial Development and Economic growth and the Asian financial crisis: An FMOLS analysis. International Journal of Economic Research, 2(3), 88-101.

Tsangyao Chang (2002). Financial development and economic growth in mainland china: A note on testing demand-following or supply-leading hypothesis. Applied Economics Letter, 9, (13), 869-873.

Christopoulos, D. K., and Efthymios G.T. (2004). Financial development and economic growth: evidence from panel unit root and cointegration tests. Journal of Development Economics, 73(1), 55-74.

Dal Colle, A. (2011). Finance-growth nexus: Does causality withstand financial liberalisation? Evidence from co-integration var. Empirical Economics 41, (1), 127-154.

Dabos M. P. and Ernesto R. G. (2010). The fading link? A new empirical analysis of the relationship between financial development and economic growth. MFI working paper series, no. 2010-013, 1-20.

DemirgucKuntA. and Ross Levine (1996). Stock Market, Corporate Finance and Economic Growth: An Overview. The World Bank Economic Review, 10, (2), 223-239

Christophe H. and Elena Dumitrescu (2012). Testing for Granger Non-causality in Heterogeneous Panels. HAL Archive, 1-32

Garcia ValerianoandF. and Lin Liu (1999). Macroeconomic Determinants of Stock Market Development. Journal of Applied Economics 2, (1), 29-59

Ghimire, B., and Giorgioni, G. (2013). Puzzles in the Relationship between Financial Development and Economic Growth. Journal of Applied Finance & Banking 3, (5), 1-15

Gondo, J., (2009). Financial development and economic growth: evidence from South Africa, 1970-1999. Proceeding of Annual Western Cape economics postgraduate student conference. Stellenbosch.

Hongbin, D. U. A. N. (2007). Stock market development and economic growth: Evidence of china. The index of science &engineering,(sei) database.

Christophe Hurlin and Baptiste Venet. (2008). Financial development and growth: A re-examination using a panel granger causality test. HAL Id: halshs-0031995.

Johannes, T. A., Njong, A. M., and Cletus, N. (2011). Financial development and economic growth in Cameroon, 1970-2005. Journal of Economics and International Finance, 3(6), 367.

Lawrence I. A. (2014). Development of financial system and economic growth: An empirical evidence from Nigeria. European Journal of Business and Management. 6(30), 137-152

Levine, Ross and Zervos Sarah, (1998). Stock markets, Banks, and Economic Growth, American Economic Review 88(3):537-558

Marques, Fuinhas and Antonio (2013). Does the Stock Market Cause Economic Growth? Portuguese Evidence of Economic Regime Change. Economic Modeling, 32, 316-324

Najeb Masoud and Glenn Hardaker (2012). The Impact of Financial Development on Economic Growth: Empirical Analysis of

Emerging Market Countries. Studies in Economic and Finance, 29, (3), 148-173

Naceur, S.B. and S. Ghazouani (2007). Stock markets, banks and economic growth: empirical evidence from the Mena Region. Res. Int. Bus. Finance, 21(2): 297-315.

Nieuwerburgh, S. V., Buelens, F., and Cuyvers, l. (2006). Stock market development and economic growth in Belgium, explorations in economic history, 43(1), 13-38.

Nurudeen, A. (2009). Does stock market development raise economic growth? Evidence from Nigeria. The review of finance and banking, 1(1), 15-26.

Odhiambo, N. M. (2008). Financial Development in Kenya: a Dynamic Test of the Finance-led Growth Hypothesis. Economic Issues, 13(2), 21-36.

Odhiambo, N.M. (2013). Stock market development and economic growth in Ghana: An ARDL-bounds testing approach. 21(4), 229-334

Oskooe, S. A. (2010). Emerging stock market performance and economic growth. American Journal of Applied Sciences, 7(2), 265-269

Osuala, A. E., Okereke, J. E., and Nwansi, G. U. (2013). Does stock market development promote economic growth in emerging markets? A causality evidence from Nigeria. World Review of Business Research, 3(4), 1-13.

Pramod Kumar Naik and PujaPadhi , (2015) On the linkage between stock market development and economic growth in emerging market economies, Review of Accounting and Finance, 14 (4), 363 – 381

Rachdi Houssem. (2011). The causality between financial development and economic growth: A panel data cointegration. International Journal of Economics and Finance, 3(1), 143-151.

Sehrawat, M., and Giri, A. K. (2015). Financial development and economic growth: empirical evidence from India. Studies in Economics and Finance, 32(3), 340-356.

Shahbaz M., Ahmed, N., and Ali, l. (2008). Stock market development and economic growth: Ardl causality in Pakistan. International Research Journal of Finance and Economics, 14(1), 182-195.

Vuranok, S. (2009). Study on financial development and economic growth: A co-integration approach. Economic Bulletin, 29(3), 1670-1677