



## THE EFFECT OF MACROECONOMIC & MARKET SPECIFIC DYNAMICS ON STOCK MARKET DEVELOPMENT IN GLOBAL GROWTH GENERATOR COUNTRIES

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### ABSTRACT

*As the global financial crisis dethrones the developed world from its economic supremacy, by leading the global economic recovery and growth, the global growth generator (3G) countries are expected to fill the vacuum. Capital market i.e. stock market development can play a crucial role in augmenting such growth in these 3G countries. This study aims at augmenting the determinants of stock market development in the 3G countries so that policy makers can be aided for developing a functioning and stable stock market. Using panel ARDL model for 8 (eight) out of 11 (eleven) 3G countries over a period of 1980-2011, the study confirms that several macroeconomics i.e. foreign direct investment, real interest rate and stock market operating characteristics have a significant long run contribution to the development of stock market and thereupon a sustained economic growth.*

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**Keywords:** Macroeconomic variables, Panel ARDL, Stock market development, 3G countries.

**JEL Classification:** E44, F3, F36, G15.

### INTRODUCTION

On 21 February 2011, in the backdrop of severe economic and financial crisis in Europe and USA, Citi Investment Research & Analysis, a division of Citigroup Global Markets Inc published a report titled —Global Growth Generators: Moving beyond ‘Emerging Markets’ and ‘BRIC’|. Coauthored by Willem Buiter and Ebrahim Rahbari the report suggests that while the so-called "BRIC" countries are a key part of the world growth story through 2050, but there is a need to examine the potential in a much wider range of markets. [Buiter and Ebrahim \(2011\)](#) identified developing Asia and Africa as the fastest growing regions, driven by population and income per capita growth, followed by the Middle East, Latin America, Central and Eastern Europe, the CIS, and finally the advanced nations of today. The research observes that many countries with

emerging markets have reached a threshold level of institutional quality and political stability, and are already positioned well for growth. For poor countries with large young populations and at an earlier stage of development, [Buiter and Rahbari \(2011\)](#) pointed to a clear path for growth i.e. —start poor, start young, open up, don't be unlucky and don't burst. Thus they suggested that once a country starts with poor country status and with almost unlimited young labor forces, they must create some form of reform by opening up their markets and invest in human and physical capital. At that stage, many countries are poised for more growth from a period of "catch-up" and "convergence" with the developed world. But there are chances that those countries may become unlucky i.e. Bangladesh facing the danger of raising sea level and thus requiring a substantial shift of investment from growth sector and finally don't burst i.e. like what happened to Greece or Ireland.

The study argued that the expression like “emerging markets” is clearly past its sell-by date. Moreover, it emerged as a politically correct alternative to the no longer acceptable designation (successful) developing countries. The use of the term “emerging markets” is very common – so common indeed that it has become hard to get around it – but clear definitions are few and far between and useful definitions are virtually nonexistent. Moreover, some agencies like IMF developed their “inductive classifications”, simply providing lists of countries with a label attached to them “advanced economies”, consisting of 33 countries, and “emerging and developing economies”, with 150 countries, without explaining the meaning of the label or the reason for attaching a specific country to a specific label. Moreover according to [Buiter and Ebrahim \(2011\)](#) the categories “emerging markets (EMs)”, “advanced economies (AEs)”, “developing countries”, “BRICs (Brazil, Russia, India and China)”, “Next Eleven (emerging economies—Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, South Korea, Turkey and Vietnam)” or the Growth Markets (BRICs plus Mexico, South Korea, Turkey and Indonesia) are all labels belonging to classification schemes that either have outlived their usefulness or are unlikely to ever have any. The study argued that the term growth has been used in the sense of —sustained and sustainable growth||, excluding both cyclical recoveries and production that represents capital depreciation, broadly defined, including the depletion of non-renewable or exhaustible natural resources. Thus there can be legitimate and profitable investment opportunities associated with resource-depleting activities, but they should not be mislabeled as growth. Therefore on the basis of fundamental analysis of economic, political and social determinants of growth, the study intend to establish verifiable, observable criteria that will enable us to select the future generic global growth generators and the future generators of outstanding returns to private investment. Thus the study has selected six criteria like domestic saving/investment, demographic prospects, health, education, quality of institutions and policies and trade openness to developed index for identifying global growth generator countries (3G). According to these criteria, the study identified 11 countries

which have the most promising growth prospects – Bangladesh, China, Egypt, India, Indonesia, Iraq, Mongolia, Nigeria, Philippines, Sri Lanka and Vietnam and designated them as 3G countries.

**Table-1.** The state of global growth generator (3G) countries

Country	2010 GDP/Capital	% of US GDP/Capita	% Av. Growth <sup>2</sup>	3G Index
Bangladesh	\$1,735	4.00	6.30	0.39
China	\$7,430	16.00	5.00	0.81
Egypt	\$5,878	13.00	5.00	0.37
India	\$3,298	7.00	6.40	0.71
Indonesia	\$4,363	10.00	5.60	0.70
Iraq	\$3,538	8.00	6.10	0.58
Mongolia	\$3,764	8.00	6.30	0.63
Nigeria	\$2,335	5.00	6.90	0.25
Philippines	\$3,684	8.00	5.50	0.60
Sri Lanka	\$4,988	11.00	5.50	0.33
Vietnam	\$3,108	7.00	6.40	0.86

While explaining the role of institutions and policies, the report argued that quality of financial sector regulation and supervision has potentially important impacts on growth and economic stability both through the prevention and mitigation of financial crises and through its impact on the efficiency of the intermediation process. Even though [Buiter and Ebrahim \(2011\)](#) mostly focused on the role of banking industry but they nonetheless have not disregarded the role of capital market i.e. stock or bond markets in channeling fund to achieve allocative, informational and operational efficiency in augmenting their role in economic development. Therefore the current study has been undertaken to understand the factors that can affect the growth and development of a stable mature and functioning capital market to unleash the growth potential of these countries in the years to come.

### Stock Market and Economic Growth

The role of stock market in the modern economy has been a very controversial one due to its inconclusive effect on economic growth. Academic literature including [Akinlo and Olufisayo \(2009\)](#), [Caporale \*et al.\* \(2004\)](#), [Henry \(2003\)](#), [Arestis and Luintel \(2001\)](#), [Rousseau and Wachtel \(2000\)](#), [Levine and Zervos \(1998\)](#), [Bencivenga and Smith \(1996\)](#), [Levine and Zervos \(1996\)](#), [Obstfeld \(1994\)](#), and [Atje and Javanovic \(1993\)](#) among others are divided in their opinion about the true effect of stock market on economic growth. While some of these literatures support that stock market growth does not lead to economic growth, but most of the others have found a positive relationship between stock market developments and economic growth both in short term as well as in long term. From the point of positive contribution, there are number of ways financial market especially capital market can help in improving the economic outcome. For example, financial intermediaries and security markets provide opportunities for trading, pooling and diversifying risk. According to [Gurley and Shaw \(1955\)](#) and [Greenwood and Jovanovic \(1990\)](#) financial

intermediaries like capital market or bank can become an avenue for higher economic growth by diversifying the risk and inducing the investors to hold and invest in more risky investment projects. Furthermore stock market generally trend to promote liquidity and thus creates an environment where raising capital become easy for the companies, this in turn increases economic growth (Bencivenga and Smith, 1996; Levine and Zervos, 1996; Levine and Zervos, 1998; Rousseau and Wachtel, 2000). Hondroyiannis *et al.* (2005) using Greece data concluded that both banks and stock markets financing can promote economic growth in the long-run although their effect is small and more importantly the effect of stock market is relatively low. Van Nieuwerburgh *et al.* (2006) using Belgium data found strong evidence that stock markets development causes economic growth. Moreover Rousseau and Wachtel (2000) and Beck and Levine (2004) studies have found that there is a significant contribution of stock market growth in the subsequent economic development. Caporale *et al.* (2004) using the methodology developed by Toda and Yamamoto (1995) showed that a well developed stock market can have significant impact on the long term economic growth of a country by fueling the engine of growth through improving the rate of capital accumulation and improving the allocative efficiency of the economic resources. Furthermore Arusha Cooray (2010) working with 35 countries data noted that policy measures taken to increase the size, liquidity and activity of the stock market will further enhance growth. Expanding the Mankiw *et al.* (1992) model by adding a stock market variable to examine the influence of the stock market on the level and growth rate of economy, Atje and Javanovic (1993) concluded that there is a significant positive effect of the stock market on economic growth. However, the recent global financial crisis leading to global economic meltdown has added new fuel to question the validity of any literature that concludes that stock market development can fuel economic growth. For example Samy and Samir (2007) using estimation of a dynamic panel model with GMM estimators for 11 MENA countries argued that there is no significant relationship between banking and stock market development, and growth. Thus even though there are literatures supporting both camps, but the weigh is more tilted towards those who argue that stock market development has significant positive contribution in economic growth. However, the instability of stock market put serious question about the perceived benefit of such economic growth. As mentioned earlier the development of an optimum capital market compatible with the size of the economy and its future need is more important than an unruly growth of the capital market. Considering the economic potential of the 3G countries, countries those can offer a recipe for global progress and improvement in living standard especially during the period dip down global economic recessions, the empirical investigation of the determinants of stock market growth and development which in turn can contribute to the economic growth for these 3G countries is quite time befitting.

## Determinants of Stock Market Development

Over the last twenty years much focus has been on the impact of financial development i.e. capital market, banking industry growth on economic development. The literature review in the previous section and the voluminous number of empirical investigation suggests that such a focus has been intense amongst the academicians throughout the world. However empirical question addressing the issue of the determinants of stock market development has been considerably low. In understanding the conceptual foundation of financial theory for stock market growth (Calderon-Rossell, 1990; Calderon-Rossell, 1991) developed a comprehensive partial equilibrium model using 42 countries dataset form 1980 to 1987. The study identified stock market liquidity and domestic economic growth as the determinants of stock market growth. Moreover developments of institutional and regulatory forces like guidelines for disclosure of reliable information, investor's confidence driven regulatory reforms increases the market participation and thus enhances the growth of stock market, (Pagano, 1993). Additionally La Porta *et al.* (1997) argued that legal origin i.e. common law country or civil law countries have significant difference impact on the development of stock market. Garcia and Lin (1999) examining the Latin American and Asian data have identified that macroeconomic factors such as growth rate in Gross Domestic Product (GDP), domestic investment and financial intermediary sector development are important drivers for the growth of stock market. Levin *et al.* (2002) examined the impact of privatization on stock market development by controlling for financial liberalization for 22 emerging economies undergoing privatization programs for a period of 1988-1995. The study suggests that progress in privatization gradually leads to more confidence which acts as a resolution of policy risk resulting from successful privatization and financial liberalization and thus leads to stock market growth in emerging economies.

El-Wassal (2005) investigating data set from 40 emerging markets between 1980 and 2000 has identified that economic growth, financial liberalization policies and foreign portfolio investments were the leading factors for the growth of stock markets in these emerging economies. Narjess and Olfa (2007) studied a panel of 61 countries by addressing the endogeneity between privatization and stock market development. Their findings suggest that initial legal environment is a significant contemporary determinant of stock market development while privatization is not. By examining the dynamics of privatization in interaction with the legal environment, the study concluded that privatization has a two-year-lagged effect on stock market development in emerging markets, and a one year-lagged effect in developed countries. Bortolotti *et al.* (2002) using a sample of 19 OECD countries for 1985-2000 period found that privatization has had a significant impact on stock market liquidity, a measure for stock market development. Finally, Yartey (2008) using a panel data of 42 emerging economies for the period 1990 to 2004 has argued that income level, gross domestic investment, banking sector development, private capital flows and stock market liquidity are important determinants of stock market development in emerging market.

## Data & Methodology

Based on the above reviews of the empirical studies regarding the determinants of the stock market development, the present study employed a host of macroeconomic and market specific variables for assessing the empirical determinants stock market growth in the 3G countries.

To measure stock market development, growth in market capitalization (gmcl) of listed companies in respective countries has been used as a proxy variable. Moreover, amongst the dependent variables the present study includes domestic credit provided by the banking sector (lngcbg), gross domestic savings (lngds), gross domestic product (lngdp), total value of stock market trading (lnsttv), stock market turnover ratio (sttr), real interest rate (rir), foreign direct investment (lnfdi) as suggested by Orphanides (1992), Krueger (1996) and Tursoy et al. (2008), and finally foreign direct investment (lnfdi) as suggested by Yartey (2008). The independent variables considered for the study includes two distinct categories of variables i.e. stock market related variables representing the size of operation and its liquidity performance measured by lnsttv and sttr while macroeconomic related variables are represented by lngcbg, lngds, lngdp, rir, and lnfdi etc. The data set has been retrieved from World Bank sources and out of 11 3G countries; the study has excluded 3 countries i.e. Vietnam, Nigeria, and Iraq for lack of observations of both dependent and a number of important independent variables. The window of study is from 1980-2011 constituting a perfect setting for panel analysis.

## Panel Unit Root Test

Before moving forward for the estimation process it is necessary to determine the existence of unit roots in the data series. This is because the existence or non-existence of unit root in the data is critical to the validity of any conclusion made in the paper. This study has used popular Im et al. (2003) methodology which is based on well-known ADF procedure of Dickey and Fuller (1979) for testing unit root in the panel data series.

Im et al. (2003) proposed a test to investigate the presence of unit roots in panels in such a way that even with fewer time observations the test displays significant power i.e. has superior test power for analyzing long-run relationships in panel data. Im et al. (2003) begin by specifying a separate ADF regression for each cross-section with individual effects and no time trend:

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t-1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{i,t-j} + \varepsilon_{it} \dots\dots\dots(01)$$

Where,  $i = 1, \dots, N$  and  $t = 1, \dots, T$

Im et al. (2003) used separate unit root tests for each of N cross-section units. Since this test is based on the Augmented Dickey-fuller (ADF) statistics averaged across groups, the average of the

t-statistics for  $\pi_i$  is calculated from the individual ADF regressions,  $t_i(\pi_i)$  as given below, once estimation of the separate ADF regressions for the cross sectional unit is completed.

$$\bar{t}_{NT} = \frac{1}{N} \sum_{i=1}^N t_i(\pi_i) \dots\dots\dots(02)$$

The t-bar is then standardized and it is found that the standardized t-bar statistic converges to the standard normal distribution as  $N$  and  $T \rightarrow \infty$ . *Im et al. (2003)* showed that t-bar test has better performance when  $N$  and  $T$  are small. They proposed a cross-sectionally demeaned version of both test to be used in the case where the errors in different regressions contain a common time-specific component. Finally this study has employed other panel unit root tests as have been suggested by *Levin et al. (2002)*, *Breitung (2000)* etc.

**The MG, PMG and DFE approach**

In a panel set up equation (03) is nested in an ARDL (autoregressive distributed lag) specification to allow for rich dynamics in a way that stock market growth adjusts to the change in macroeconomic and stock market related operating variables those enters into the equation. The ARDL (p, d... q) model where the dependent and independent variables enter the right-hand side with lags of order p and q, respectively, can be written as:

$$y_{it} = \mu_i + \sum_{j=1}^p \lambda_{ij} y_{it-j} + \sum_{j=0}^q \delta_{ij}' x_{it-j} + \varepsilon_{it} \dots\dots\dots(03)$$

Where,  $i = 1, 2, \dots, N$  represents country,  $t = 1, 2, 3, \dots, T$  represent time (annual),  $j$  is the number of time lag,  $y_{it}$  = stock market growth,  $x_{it}$  = independent variables like  $\ln sttv_{it}$ ,  $sttr_{it}$ ,  $\ln gdp_{it}$  etc and finally  $\mu_i$  is the fixed effect. By re-parameterization, the above equation can be written as:

$$\Delta y_{it} = \mu_i + \phi_i y_{it-1} + \beta_i' x_{it} + \sum_{j=1}^{p-1} \lambda_{ij}^* \Delta y_{it-j} + \sum_{j=0}^{q-1} \delta_{ij}^{*'} \Delta x_{it-j} + \varepsilon_{it} \dots\dots\dots(04)$$

where,

$$\begin{aligned} \phi_i &= -1(1 - \sum_{j=1}^p \lambda_{ij}), \beta_i = \sum_{j=0}^p \delta_{ij}, \\ \lambda_{ij}^* &= - \sum_{m=j+1}^p \lambda_{im}, j=1,2,\dots,p-1, \text{ and} \\ \delta_{ij}^{*'} &= - \sum_{m=j+1}^p \delta_{im}, j=1,2,\dots,q-1. \end{aligned}$$

Now by grouping the variables in levels further, equation (04) can be rewritten as an error correction equation shown below:

$$\Delta y_{it} = \mu_i + \phi_i(y_{it-1} - \theta_i'x_{it}) + \sum_{j=1}^{p-1} \lambda_{ij}^* \Delta y_{it-j} + \sum_{j=0}^{q-1} \delta_{ij}^* \Delta x_{it-j} + \varepsilon_{it} \dots\dots\dots(05)$$

Where  $\theta_i = -(\beta_i/\phi_i)$  defines the long-run or equilibrium relationship among  $y_{it}$  and  $x_{it}$ . In contrast  $\lambda_{ij}^*$  and  $\delta_{ij}^*$  are short run coefficients relating stock market development to its past values and other determinants like  $x_{it}$ . Finally, the error-correction coefficient  $\phi_i$  measures the speed of adjustment of  $y_{it}$  toward its long-run equilibrium following a change in  $x_{it}$ . The condition  $\phi_i < 0$  ensures that a long-run relationship exists. Therefore, a negative and statistically significant value of  $\phi_i$  is treated as an evidence of cointegration between  $y_{it}$  and  $x_{it}$ . [Kim D. H. et al. \(2010\)](#) suggested that there are a few existing procedures for estimating the above model and at one extreme, the simple pooled estimator assumes the fully homogeneous-coefficient model in which all slope and intercept parameters are restricted to be identical across countries. While on the other extreme, the fully heterogeneous-coefficient model imposes no cross country coefficients constraints and can be estimated on a country-by- country basis. This is the mean group (MG) estimator introduced by [Pesaran and Smith \(1995\)](#). The approach estimates separate ARDL regressions for each group and obtains  $\theta$  and  $\phi$  as simple averages of individual group coefficients  $\theta_i$  and  $\phi_i$ . In particular, [Pesaran and Smith \(1995\)](#) showed that the MG estimator will provide consistent estimates of the average of parameters interested.

Where  $\theta_i = -(\beta_i/\phi_i)$  defines the long-run or equilibrium relationship among  $y_{it}$  and  $x_{it}$ . In contrast  $\lambda_{ij}^*$  and  $\delta_{ij}^*$  are short run coefficients relating stock market development to its past values and other determinants like  $x_{it}$ . Finally, the error-correction coefficient  $\phi_i$  measures the speed of adjustment of  $y_{it}$  toward its long-run equilibrium following a change in  $x_{it}$ . The condition  $\phi_i < 0$  ensures that a long-run relationship exists. Therefore, a negative and statistically significant value of  $\phi_i$  is treated as an evidence of cointegration between  $y_{it}$  and  $x_{it}$ . [Kim D. H. et al. \(2010\)](#) suggested that there are a few existing procedures for estimating the above model and at one extreme, the simple pooled estimator assumes the fully homogeneous-coefficient model in which all slope and intercept parameters are restricted to be identical across countries. While on the other extreme, the fully heterogeneous-coefficient model imposes no cross country coefficients constraints and can be estimated on a country by- country basis. This is the mean group (MG) estimator introduced by [Pesaran and Smith \(1995\)](#). The approach estimates separate ARDL regressions for each group and obtains  $\theta$  and  $\phi$  as simple averages of individual group coefficients  $\theta_i$  and  $\phi_i$ . In particular, [Pesaran and Smith \(1995\)](#) showed that the MG estimator will provide consistent estimates of the average of parameters interested. However, there is another methodology i.e. the dynamic fixed-effect (DFE) method that allows the intercepts to differ across groups, but imposes homogeneity of all slope



coefficients and error variances. Under slope heterogeneity, Pesaran and Smith (1995) point out that the DFE estimates are affected by a potentially serious heterogeneity bias, especially in small country samples. As an alternative, Pesaran *et al.* (1999) propose the Pooled Mean Group (PMG) estimator which restricts the long-run parameters to be identical over the cross section, but allows the intercepts, short-run coefficients (including the speed of adjustment), and error variances to differ across groups on the cross section. If the long-run homogeneity restrictions are valid, it is known that MG estimates will be inefficient. Thus Pesaran *et al.* (1999) developed the maximum likelihood-based PMG approach which yields a more efficient estimator. As shown in Pesaran *et al.* (1999), the validity of a cross-sectional, long-run homogeneity restriction of the form  $\theta_i = \theta$ ,  $i=1, 2, \dots, N$  and hence the suitability of the PMG estimator can be tested by a standard Hausman-type statistic. Thus Hausman (1978) has been used to identify the relative choice among the MG, PMG and DFE methods.

## ANALYSIS AND FINDINGS

As mentioned earlier the test of stationarity is very important since macroeconomic time series data are considered non-stationary i.e. they follow unit root. Thus to understand the long run impact of macroeconomic and stock market related operating variables impact on the stock market development, the test of stationarity is a necessary condition. In fact Nelson and Plosser (1982) led a large volume of literature investigating possible non-stationarity of macroeconomic time series data. Thus before proceeding with autoregressive distributed lag based MG, PMG or DFE model, the test for the stationarity status of the variables have been performed in order to determine the respective order of integration of the variables under consideration. It is also important because according to Pesaran and Pesaran (1997) if the variables are I(2) stationary then it will generate spurious result. Thus a host of test has been performed to check for the I (\*) so that the methodology can be applied. The result has been produced in table 02.

**Table-2.** Result from panel unit root test (with trend and intercept under first difference.)

Variables	Assumes common unit root process		Assumes individual unit root process		
	Levin, Lin & Chu t*	Breitung t-stat	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square
<i>gmcl</i>	-6.01***	-2.19***	-6.68***	70.61***	156.52***
<i>lnsttv</i>	-3.46***	-2.57***	-4.79***	52.10***	209.03**
<i>sttr</i>	-2.21**	-2.19**	-7.03***	74.53***	213.89***
<i>lngdcb</i>	-5.42***	-3.78***	-8.45***	91.67***	525.84***
<i>lngds</i>	-4.11***	-3.63***	-4.01***	46.25***	339.80***
<i>lngdp</i>	-4.05***	-2.52***	-3.84***	42.40***	118.57***
<i>rir</i>	-4.22***	-2.86***	-3.38***	37.72***	87.58***
<i>lnfdi</i>	-3.84***	-3.13***	-4.32***	48.76***	130.21***

\*\*\* and \*\* Indicates that variables are stationary at 1% & 5% significance level respectively.

Moreover, to examine the long-run effect of macroeconomic and stock market related operating variables on the stock market development, following panel regression has been estimated:

$$gmcl_{it} = \alpha + \beta' macrovar_{it} + \gamma' market_{it} + \varepsilon_{it} \dots\dots\dots(06)$$

Where macrovar<sub>it</sub> and market<sub>it</sub> represent a wide variety of variables listed in the data and methodology section. In fact the study has identified following functional form for macrovar<sub>it</sub> and market<sub>it</sub> respectively:

$$macrovar_{it} = f(\ln gdc\hat{h}_{it}, \ln gds\hat{g}_{it}, \ln gd\hat{\eta}_{it}, rir_{it}, \ln fd\hat{i}_{it}) \dots\dots\dots(07)$$

$$\text{and, } market_{it} = f(\ln sttv_{it}, sttr_{it}) \dots\dots\dots(08)$$

Moreover, following the (Pesaran and Smith, 1995; Pesaran *et al.*, 1999) methodology the following error-correction model has been estimated to uncover the long- and short-run consequences of macroeconomic and market related variables on the growth and development of stock markets in 3G countries.

$$gmcl_{it} = \alpha_i + \zeta_1 \ln sttv_{it} + \zeta_2 sttr_{it} + \zeta_3 \ln gdc\hat{h}_{it} + \zeta_4 \ln gd\hat{s}_{it} + \zeta_5 \ln gd\hat{\eta}_{it} + \zeta_6 rir_{it} + \zeta_7 \ln fd\hat{i}_{it} + \delta_{it} \dots(09)$$

$$gmcl_{it} = \alpha_i + \zeta_1 \ln sttv_{it} + \zeta_2 sttr_{it} + \zeta_3 \ln gdc\hat{h}_{it} + \zeta_4 \ln gd\hat{s}_{it} + \zeta_5 \ln gd\hat{\eta}_{it} + \zeta_6 rir_{it} + \zeta_7 \ln fd\hat{i}_{it} + v_{it} + \delta_{it} \dots(10)$$

Moreover, following the (Pesaran and Smith, 1995; Pesaran *et al.*, 1999) methodology the following error-correction model has been estimated to uncover the long and short-run impact of macroeconomic and market specific characteristics on stock market development in 3G countries.

$$\begin{aligned} \Delta gmcl_{it} = & -\mu_i + \phi_i (\ln mcl_{i,t-1} - \lambda_1 \ln sttv_{i,t-1} - \lambda_2 sttr_{i,t-1} - \lambda_3 \ln gdc\hat{h}_{i,t-1} - \lambda_4 \ln gd\hat{s}_{i,t-1} - \lambda_5 \ln gd\hat{\eta}_{i,t-1} - \lambda_6 rir_{i,t-1} - \lambda_7 fd\hat{i}_{i,t-1}) \\ & + \sum_{j=1}^{p-1} \gamma_j \Delta (\ln mcl)_{i,t-j} + \sum_{j=0}^{q-1} \delta_{1j}^i \Delta \ln sttv_{i,t-j} + \sum_{j=0}^{q-1} \delta_{2j}^i \Delta sttr_{i,t-j} + \sum_{j=0}^{q-1} \delta_{3j}^i \Delta \ln gdc\hat{h}_{i,t-j} + \sum_{j=0}^{q-1} \delta_{4j}^i \Delta \ln gd\hat{s}_{i,t-j} \\ & + \sum_{j=0}^{q-1} \delta_{5j}^i \Delta \ln gd\hat{\eta}_{i,t-j} + \sum_{j=0}^{q-1} \delta_{6j}^i \Delta rir_{i,t-j} + \sum_{j=0}^{q-1} \delta_{7j}^i \Delta \ln fd\hat{i}_{i,t-j} + \delta_{i,t} \dots\dots\dots(11) \end{aligned}$$

Where gmcl<sub>it</sub> is the dependent variable and the remaining variables are macroeconomic and stock market related regressand. Following Loayza and Ranciere (2006), the current study imposes a common lag structure across countries rather than using some consistent information criteria (e.g., Schwartz Bayesian criterion) due to some missing data. The existence of a long-run relationship between stock market development and macroeconomic and market related variables requires that the error-correction coefficient i.e.  $\phi_i$  is negative and significant. In addition, the coefficients of  $\beta_i$ s denote corresponding long-run elasticity and are constrained to be the same across countries. The long-run impacts of macroeconomic and market operating variables on stock market development can be examined based on the significance of  $\beta_i$ s while short-run impacts of the dependent variables are observed if the first-differenced variables are significant. As mentioned earlier the study has employed 8 different types of variables under two broad categories i.e. macroeconomic variables and market related variables. It may be mentioned that the second category variables i.e. stock market trading volume and stock traded turnover ratio highlights the operating characteristics of the stock market which itself can induce investors to invest and thus aids the market to grow.

There may be argument that such variables are not truly exogenous rather endogenous. However, one must know that a company's liquidity or promotional expenditure which is endogenous has significant effect on the growth of the company. Similarly market operating characteristics of can play significant role in the growth of a market. Upon clarifying any doubt about misapplication of the model, the following table 03 reports MG, PMG and DFE estimates and specification tests of equation (11). The rest reports suggest that the error-correction coefficient  $\phi_1$  is negative and significant and falls within the dynamically stable range for MG, PMG and DFE estimators. This indicates that there exists a long-run relationship between stock market development and macroeconomic and market related variables. Moreover, this also gives evidences of mean reversion to a non-spurious long-run relationship and therefore stationary residuals, meaning that stock market development and macroeconomic and market operating variables are cointegrated. Moreover, a higher average  $\phi$ 's imply greater adjustment process towards the long run equilibrium. Regarding the long-run coefficient, there is quite a drastic difference in the reported result under MG, PMG and DFE models. Apart from the theoretically and statistically more desirable properties of PMG model over MG and DFE models, the reported result suggests also suggests that there are more number of statistically significant variables in PMG than in other two models. The Hausman test statistics confirms that PMG is superior compared to MG and DFE.

As reported in the table 03, market specific variables like *Insttv* has positive and significant long term relationship while *sttr* has statistically significant negative long run relationship with the growth in stock market capitalization under all the alternative models. This finding is theoretically acceptable as a higher trading volume represents higher public confidence in the stock market and as well as it indicates an increasing capacity of the market in dealing with larger trading volume i.e. higher market breadth. In either way this contributes to stock market growth. Furthermore, stock market turnover ratio (*sttr*) has been found to have long run negative relationship under all the models. This is also theoretically acceptable in some cases as higher turnover ratio means more liquidity or sometimes an indication of more volatility which can contribute negative in the development of a stable and mature market as supported by [Shleifer and Vishny \(1986\)](#) and [Garcia and Lin \(1999\)](#). This is because a higher turnover ratio may hurt growth since a very liquid stock market encourage investor myopia because they can sell their shares easily which weakens their commitment and incentive to monitor managerial actions ([Shleifer and Vishny, 1986](#)). Moreover this raises important question for the theoretical finance i.e. whether higher liquidity is really good for the market development. In fact this study suggests that higher liquidity is counterproductive to stable growth and development of the stock market and this is equivocally supported by the recent phenomenon in the global financial crisis. However, others may counter such view since more liquidity refers to more opportunity to cash the investment or less transaction cost as suggested by [Bencivenga and Smith \(1996\)](#). Both have the potential to improve the efficiency of the market. However, employment of much superior methodology in this study reveals that a 1% change

increase in stock market turnover ratio has a 0.38% statistically significant negative impact on the stock market growth in the long run.

**Table-3.** The effect of macroeconomic and market related variables on the growth of stock market capitalization in 3G countries.

Variables (gmcl)	Model (mean group)	Model (pooled mean group)	Model (dynamic fixed effect)
<i>Long run coefficient</i>			
<i>lnsttv</i>	10.001**	4.247**	4.247*
<i>str</i>	-0.356*	-0.388***	-0.106*
<i>lngdcb</i>	-3.449	-0.667	2.779
<i>lngds</i>	46.103**	-9.471	-20.375**
<i>lngdp</i>	-42.059	28.530*	52.065***
<i>rir</i>	-0.708*	-4.411**	0.245
<i>lnfdi</i>	-3.289	1.935***	1.170
<i>error correction coefficient</i>			
<i>Ec</i>	-1.009***	-0.365**	-0.494***
$\Delta$ <i>lnsttv</i>	8.341***	10.515***	7.113***
$\Delta$ <i>str</i>	-.134	-0.125	0.049*
$\Delta$ <i>lngdcb</i>	-16.335	-3.060	1.681
$\Delta$ <i>lngds</i>	-13.385	7.740	5.914
$\Delta$ <i>lngdp</i>	-65.578*	54.570	19.341
$\Delta$ <i>rir</i>	-0.126	0.224	-0.047
$\Delta$ <i>lnfdi</i>	-2.040	-2.579	0.067
$\alpha$	-248.429	-199.507**	-408.835***
Hausman Test	0.00 ***		

*Note:* The dependent variable is financial development. The values in the parentheses (brackets) are the standard errors (p-value) of corresponding coefficient estimates. \*\*\*, \*\*, and \* indicate significant at 1%, 5% and 10% levels, respectively.

With regard to macroeconomic determinants of stock market growth, domestic credit provided by banking sector has been found to have statistically insignificant long run negative elasticity contradicting the claim of [Levine and Zervos \(1998\)](#). Moreover, [Garcia and Lin \(1999\)](#), [Nacuer et al. \(2007\)](#) and [Yartey \(2008\)](#) have urged for a positive relationship between banking sector development and stock market development. Though the findings of the current study cannot be seriously considered acceptable due to the absence of statistical significance, yet banking sector and stock market are the two most important sectors that compete for fund in the economy. Moreover, a very high level of banking sector development may have negative effects because stock markets and banks tend to substitute one another as financing sources. Again gross domestic savings has statistically positive long run relationship with stock market growth under MG model, though under DFE such findings no longer holds true. The contrary result is due to the inner methodological differences. Generally increase in domestic savings should have improved the potential for growth of stock market. Moreover GDP has been found to have statistically significant positive while real interest rate has statistically significant negative and finally FDI has statistically

significant long term impact on stock market. This result is consistent with Claessens *et al.* (2001), who find that foreign direct investment is positively correlated with stock market capitalization. In fact the long run coefficient of *lnfdi* is 1.935. This also confirms the earlier findings of Errunza (1983), Yartey (2008) and others. Yartey (2008) argued that foreign investment is associated with institutional and regulatory reform, adequate disclosure and listing requirements and fair trading practices which inspire increase inspire greater confidence in domestic markets. This increases the investor's base and participation and leads to market development. As for the short term relationship the error correction coefficient is negative and statistically significant under all the three models meaning that there is a fixed effect of these variables on the growth of stock market under all the models. Since we are concerned with the PMG, the error correction coefficient of -0.365 indicates that it takes around three years before any short-run shock either in the form of stock market operating characteristics or macroeconomic variables is adjusted to the long run relationship in 3G countries. The short-run coefficients give a different impression. Since under PMG methodology, short-run coefficients are not restricted to be the same across countries, so there is no single pooled estimate for each coefficient. However, by considering the mean of the corresponding countries coefficient the average short-run effect can still be analyzed. Among the short run coefficient *lnsttv* has been found to have significant positive impact on the development of stock market. Moreover the coefficient is almost double in short run than in long run. Thus, comparing the long- and short-run estimates, a first broad conclusion is that the sign of the relationship between stock market development and market operating characteristics depends on whether change in trading volume is temporary or permanent. Though none other short run coefficients are not statistically significant, but in most cases the signs are desirable.

**Table-4.** The effect of macroeconomic and market related variables on the growth of stock market capitalization in 3G countries.

Variables (gmcl)	Model (mean group)	Model (pooled mean group)	Model (dynamic fixed effect)
<i>Long run coefficient</i>			
<i>Lnsttv</i>	11.786**	3.150*	0.974
<i>Sstr</i>	-0.580**	-0.374***	-0.103*
<i>Lngds</i>	62.566**	-2.007	-18.966**
<i>Lngdp</i>	-84.441**	21.243 *	53.980 ***
<i>Rir</i>	0.282	-0.405**	0.250
<i>lnfdi</i>	0.199	2.309***	0.776
<i>Error correction coefficient</i>			
<i>Ec</i>	-0.820 ***	-.350***	-.491***
$\Delta lnsttv$	7.199 ***	11.498***	6.985***
$\Delta sstr$	-0.066	-0.168*	.048*
$\Delta lngds$	-20.192*	5.541437	4.372
$\Delta lngdp$	84.107 *	58.83664	26.056
$\Delta rir$	0.138	.2518982	-.043
$\Delta lnfdi$	-2.239	-2.89628	.115

$\alpha$	-69.880	-203.5462 **	-407.872***
Hausman Test (DFE and PMG)		-27.96 **	

*Note: The dependent variable is financial development. The values in the parentheses (brackets) are the standard errors (p-value) of corresponding coefficient estimates. \*\*\*, \*\*, and \* indicate significant at 1%, 5% and 10% levels, respectively.*

Since most lngdcb i.e. gross domestic credit by banking sector has been found to be insignificant, this study has eliminated lngdcb and re-estimated the result under all three options. The result has been presented in table 04. Again the Hausman test now confirms that PMG is a better estimation than the other two. Moreover, the long run association is also confirmed by the statistically significant negative error correction parameter all three models. Interestingly the result suggest that without the presence of lngdcb the performance of foreign direct investment in augmenting the potential for capital market development has also been confirmed with much improved parameters for Infdi. Thus the result confirms earlier result of [Adam and Tweneboah \(2009\)](#), [Gilani et al. \(2010\)](#), [Kalim and Shahbaz \(2009\)](#), [Baker et al. \(2004\)](#), [Halalmeh and Sayah \(2010\)](#) etc. Moreover in case of short-run both the stock market trading volume and stock market turnover ratio has provided consistent result compared to that of long run. Thus the stability and growth of capital market in the short run in 3G countries depends more on market related operating characteristics than the overall macro economic variables.

## CONCLUSION

Given the global economic condition today, with Europe and USA sinking in debt, unemployment and long term painful economic recessions, the global growth generation (3G) countries accounting almost 65% of the global population can provide much needed stability and growth to global economy. This is important for the entire global community as we move forward for achieving our long term commitment of sustainable & continued economic development. Today blocks like ASEAN, G20, Next 11, BRICS etc provide a viable alternative to EU, NAFTA and G8. However, as suggested by [Buiter and Ebrahim \(2011\)](#), if the global growth generators i.e. 3G countries have to deliver a sustainable growth via a well developed financial sector, a strong domestic demand led real economic sector needs to flourish. The study supports the hypothesis that a stock market liquidity measured by higher level of turnover is in fact destabilizing and counterproductive to stock market development. Moreover foreign direct investment, a strong economic performance can play a significant contribution for the long term sustainable growth of the stock market. As 3G country aims to take the leap to generate global growth, policy makers must work on for growth enhancing and stable banking sector reform as well as increasing the efficiency of capital market internal operating mechanism to help developing the stable stock market and thus helping the economic growth itself.

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