Linkages Between Market Capitalization and Economic Growth: The Case of Emerging Markets

Doç. Dr. Gökhan DÖKMEN
Bülent Ecevit Üniversitesi
İktisadi ve İdari Bilimler Fakültesi
Maliye Bölümü
gokhan.dokmen@karaelmas.edu.tr

Yrd. Doç. Dr. Ahmet AYSU
Erciyes Üniversitesi
İktisadi ve İdari Bilimler Fakültesi
Maliye Bölümü
ahmetaysu@erciyes.edu.tr

Yrd. Doç. Dr. Mehmet Fatih BAYRAMOĞLU
Bülent Ecevit Üniversitesi
İktisadi ve İdari Bilimler Fakültesi
İşletme Bölümü
mfbayram@gmail.com

Abstract
Recent years has seen a market rise in the debate among academic and policy circles regarding the relationship stock markets and economic growth. In this study, the linkages between market capitalization and economic growth is analyzed using annual data of 8 emerging countries for the period 1991 to 2012. The main objectives of this study are to determine the reaction of economic growth in the face of a shock in market capitalization rate and to examine whether stock market development has a positive or negative effect on national economies. Using Panel Vector Autoregressive models, we find positive and statistically significant responses to a market capitalization rate shock.

Keywords*:* Market Capitalization Rate, Gross Domestic Product, Panel Vector Autoregressive Models.

INTRODUCTION

Ensuring economic growth and development is a primary objective of all countries, particularly since Smith (1776) published his famous book 'Wealth of Nations'. There have been many studies on factors affecting economic growth. Economists traditionally have looked to factors such as capital, labour and technology as the only factors which matter to economic growth. However in recent studies on economic growth, there has emerged several new determinants of economic growth such as social capital, innovation activities, macroeconomic environment, political stability, financial development instead of traditional factors (capital, labour and technology) (Chizea, 2012).

The recent financial crisis has shown that there are substantial economic effects of the financial system. Thefore the functioning of financial systems has received special attention in academic literature in recent years. A well-functioning financial system permits an economy to fully exploit its growth potential, as it ensures that the best real investment opportunities receive the necessary funding (Hartmann, at all., 2006).

This paper investigates the long-run impact of stock market performance on economic growth and examines whether such stock market development can influence economic growth negatively or positively. The empirical literature on this subject has mainly focused on the causality relationship between stock market and economic growth based on the time series data models. However in this study, we estimate a panel vector autoregressive model to analyze the highly disputed relationship between stock market development and growth.

The paper is organized as follows. Section 2 provides a summary of theoretical and empirical issues on relationships between stock markets and real economy. Section 3 summarizes the data and presents the empirical findings. The last section contains the concluding remarks.

1. Theoretical Background

Economic development is commonly discussed in terms of wealth, the labor force, output, and income. These real aspects of development have been the center of attention in economic literature to the relative neglect of financial aspects (Gurley and Shaw, 1955:515). However with the financial developments in particularly 20th century, the focus also shifted to the impact of financial development, specifically stock market development, on economic growth (Alghamedi, 2012:9).

The growing importance of stock markets around the world has recently opened a new avenue of research into the relationship between financial improvement and economic growth, which focuses on the effects of stock market performance (Arestis, Demetriades and Luintel, 2001:16). The relationship between financial improvement and economic growth and has been debated quite extensively in the literature. Some argue that a well-functioning stock market can have a positive effect on economic growth by assisting in the mobilization of limited resources from the surplus units to the deficit units, thereby promoting efficient allocation of resources and thus lead other economic sectors in their growth process (Enisan and Olufisayo, 2009:16; Caporale and Spagnolo, 2011:870; Levine, 1991; Diamond, 1996; Greenwood and Smith, 1997). In contrast, others maintain that development of stock market is unimportant for econoimlic growth (Alghamedi, 2012; Levine and Zervos, 1996:6; Devereux and Smith, 1994; Wang, 2010).

Growing interest among academicians over the past decade in the role of the stock market in promoting economic activity has produced alternative explanations. There are four alternative views on the relationship between stock market performance and economic growth. The supply-leading view supports that the causal direction goes from stock market development to economic growth. The demand following view supports that stock market development follows economic growth and demands of the real sector. Another view is that stock market development and economic growth have a mutual impact on each other. Finally the last view argues that there is no relationship at all between stock market development and economic growth (Zegada, 2011).

Most of the theoretical studies attempt to explain the relationship between stock market performance and economic growth through which financial systems influence the development of the real sector from first view (Zegada, 2011). According to Levine (2005), stock market development is seen as contributing to economic growth through various channels: (i) produce information about possible investments and allocate capital, (ii) monitor investments and exert corporate control, (iii) facilitate diversification and management of risk, (iv) mobilize and pool savings and (v) facilitate the exchange of goods and services. Through changing the quality of these functions, a correctly functioning stock market can influence a steady state of growth by changing the rate of savings, technological progress, and economic efficiency (Alghamedi, 2012).

Stock market contributes to the capital allocation process by enhancing the set of financial instruments available to investors to diversify their portfolios providing an important source of investment capital at relatively low cost. A well functioning stock market, that allows investors to diversify away unsystematic risk, will increase the marginal productivity of capital. Stock markets can also exert control over managers through the voting mechanism and the takeover mechanism. Another important aspect through which stock market performance may influence economic growth is risk diversification. It's suggested that international risk sharing through internationally integrated stock markets improves the allocation of resources and accelerates the economic growth rate. In addition, stock markets that are more effective at pooling the savings of individuals can profoundly affect the real economy by increasing savings, exploiting economies of scale, and overcoming investment indivisibilities (Antonios, 2010; Alghamedi, 2012; Levine, 2005).

However, theoretical disagreement exists among economists about the importance of stock markets for economic growth (Devereux and Smith, 1994). Demirguc-Kunt and Levine (1996) point out that greater

risk diversification and liquidity have theoretically ambiguous effects on saving rates. According to Demirguc-Kunt and Levine (1996), saving rates could fall sufficiently for enhanced liguidity and risk diversification to lead to slower economic growth. Moreover, it's argued that stock markets do more harm than good, and that certain features of mature stock markets, such as volatility, deterrence of risk-averse savers and the demands of speculative investors for short-term profits at the expense of long-term growth, would pose far greater problems in developing countries and have an adverse effect on their economies (Alghamedi, 2012:9). Kassimatis (2000:56) argued that the development of the stock market may also have an negative effect on economic growth through increased volatility. According to Kassimatis (2000), if the stock market becomes more volatile as it develops, it could undermine the whole economic system performance. Unstable prices can deter investment and give rise to speculation opportunities. Speculators will divert money from the production process and make the stock market even more volatile.

Several empirical studies have been conducted on the impact of financial development on economic growth. However, only few of these have focused specifically on the impact of stock market performance on real economy (Enisan and Olufisayo, 2009). These include Atje and Jovanovic (1993), Levine and Zervos (1996), Harris (1997), Cheung and Ng (1998), Levine and Zervos (1998), Beck and Levine (2004), Rousseau and Wachtel (2000), Boubakari and Jin (2010) and Bernard (2011). Atje and Jovanovic (1993) tested the hypothesis that the stock markets have a positive impact on economic growth on a sample of 94 countries for the period between 1970 and 1988. They find a positive relationship between stock market development and economic growth. Similarly, studies by Levine and Zervos (1996) using time series regression on 41 countries over the period 1976-1993 indicate that stock market development is positively associated with economic growth. Using the Johansen cointegration technique, Cheung and Ng (1998) found empirical evidence of long run comovements between five national stock market indexes and measures of aggregate real activity including the real oil price, real consumption, real money, and real output. In another study, Levine and Zervos (1998) found that countries with higher stock market capitalization were associated with faster growth of capital and output. Beck and Levine (2004) using GMM methodology in 40 countries between 1976-1998 indicate that stock markets and banks positively influence economic growth. Using a panel VARs for 47 countries over the period 1980-95, Rousseau and Wachtel (2000) showed that stock market liquidity and the intensity of activity in traditional financial intermediaries have a positive impact on per capita output. Boubakari and Jin (2010) explored causality relationship between stock market and economic growth based on time series data compiled from 5 Euronext countries (Belgium, France, Portugal, Netherlands and United Kingdom) for the period 1995:Q1 to 2008:Q4. The results of the study suggest a positive link between the stock market and economic growth for some countries for which the stock market is liquid and highly active. Bernard (2011) examined the role of stock market development on economic growth using time series data from 1994 to 2009. The results show that stock market turnover ratio has a very strong relationship with economic growth while stock market capitalization ratio gives very weak negative correlation which is not statistically significant. On the other hand Harris (1997) showed that the relationship between stock market performance and economic growth is very weak. Using a sample of 49 countries from 1980 to 1991, Harris (1997) founded no hard evidence that the level of stock market activity helps to explain growth in per capita output.

2. Empirical Analysis

2.1. Empirical Methodology

This paper investigates the relationship between stock market and economic development in emerging countries controlling endogeneity problems with the use of panel vector autoregressive model (PVAR). There has been a growing interest in the use of PVAR models for applied economic analysis. VAR models are useful for investigate the dynamic effects between variables. For instance, the model captures the long-term changes of economic growth over time as influenced by stock market performance, especially market capitalization of listed companies.

PVAR methodology fits well with the purpose of this paper, as there is no *a priori* theory regarding the relationship between the stock market development and economic growth. This approach combines the VAR approach, which treats all variables in the system as endogenous, with the panel data approach,

which allows for unobserved heterogeneity. Also, the PVAR methodology allows the estimation of orthogonalised impulse response functions and variance decomposition (Love and Zicchino, 2006:193). As in Boubtane, Coulibaly and Rault (2011), the econometric model takes the following reduced form:

$$Z_{it} = \Gamma(L)Z_{it} + \mu_i + \varepsilon_{it}$$

Where i denotes the country, $t = 1,.....T$, Z_{it} is a vector of stationary variables, $\Gamma(L)$ is a matrix polynomial in the lag operator with $\Gamma(L) = \Gamma_1 L^1 + \Gamma_2 L^2 + ...\Gamma_p L^p$, μ_i is the vector of country specific effects and ε_{it} is the vector of idiosyncratic errors.

The PVAR approach works by integrating the traditional VAR framework with the panel data where unobserved individual heterogeneity is permitted. But allowing for individual fixed effects in case of dependent lags in the PVAR causes the biased estimator problem. Because fixed effects and regressors are correlated. As fixed effects are correlated with the regressors, due to lags of the dependent variable, we use forward mean differencing is also known as "Helmert procedure". The Helmert procedure allows for the use of lagged regressors as instruments to control for potential unobserved heterogeneity with state fixed effects, and the model is estimated using General Methods of Moments (GMM) (Mora and Logan, 2010: 15; Bouvatier et al., 2012:1040).

All variables in the model are transformed via Helmert procedure. This transformation is an orthogonal deviation, where each observation is expressed as a deviation from average future observations.If the original errors are not autocorrelated and have a constant variance; the transformed errors should have common charesteristics. So, this transformation eliminates the homoscedasticity and serial correlation problems (Boubtane, Coulibaly, 2011:8).

2.2. Data and Variables

We use annual data over the period of 1991-2012 for 8 emerging countries (Brazil, Russia, India, China, Mexico, Indonesia, South Korea and Turkey) which are chosen according to their size. All variables are taken from WDI Databases. The data analyzed in this paper consists of economic and financial time series of selected emerging countries. These include Gross Domestic Product (GDP), household consumption expenditure (CONS), gross capital formation (INV), government final consumption expenditure (GOV), trade (OPEN) and stock market development (STOCK). To characterize stock market development, we use annual growth of market capitalization of listed companies. All data are expressed in annual % growth.

2.3. Empirical Results

In this study, panel VAR techniques are used to estimate impulse response functions. Before employing panel VAR analysis, it is essential to verify that all variables are integrated of order one in levels. Therefore, we test our series for the existence of unit roots. In recent years some tests for unit root within panels are developed in the literature. Levin, Lin and Chu (2002), Im, Pesaran and Shin (2003), Maddala and Wu (1999) and Choi (2001) have developed panel unit root tests. Levin, Lin and Chu (2002) suppose a common unit root under the null hypothesis against the alternative of stationarity of all individuals, whereas the other tests allow for individual unit roots under the alternative hypothesis. The results of panel unit root test are reported in Table 1.

Table 1: Results of Panel Unit Root Tests

Variables	Levin, Lin & Chu		Im, Pesaran and Shin		ADF-Fisher		PP-Fisher	
	Individual Intercept	Individual Intercept and trend	Individual Intercept	Individual Intercept and trend	Individual Intercept	Individual Intercept and trend	Individual Intercept	Individual Intercept and trend
GDP	-4.534*	-3.538*	-4.934*	-3.204*	53.886*	37.465*	96.137*	102.043*
CONS	-3.917*	-2.511*	-4.410*	-2.909*	49.489*	35.191*	74.613*	68.354*
INV	-5.180*	-3.428*	-5.911*	-4.155*	64.500*	45.107*	122.596*	100.123*
GOV	-3.573*	-2.591*	-4.186*	-2.905*	46.385*	34.825*	78.505*	55.547*
OPEN	-0.774	-2.147**	-0.327	-1.132	27.941**	25.584***	27.728**	29.173**
STOCK	-9.635*	-7.965*	-9.001*	-7.347*	100.047*	76.136*	193.949*	540.553*

Note: Automatic lag length selection (Schwarz Information Criteria) is used. P values shown below test statistics. The null hypothesis for the first test is a unit root (assumes common unit root process). For the other three tests, the null hypothesis is a unit root (assumes individual unit root process). * indicate significance at the 1%.

The test results show that all the variables are stationary in levels for all countries. When the variables are stationary in levels, a VAR model is employed. As is common in VAR analysis, the discussion of the results focuses on impulse response functions that are derived from the coefficients which are reported in Table 2.

Table 2: Results of the Estimation by System GMM for PVAR

Dependent Variable						
	GDP	**CONS**	**INV**	**GOV**	**OPEN**	**STOCK**
GDP $_{it-1}$	0.702	0.073	2.199	0.019	0.666	1.413
[t-stat]	[4039]*	[0.362]	[2.660] *	[0.091]	[1.189]	[1.133]
CONS $_{it-1}$	-0.244	0.011	-0.935	0.020	-0.211	-0.759
[t-stat]	[1.872]***	[0.071]	[1.453]	[0.188]	[0.761]	[1.088]
INV $_{it-1}$	-0.072	0.038	-0.290	-0.014	-0.018	-0.077
[t-stat]	[2.183]**	[0.967]	[1.913]**	[0.386]	[0.174]	[0.953]
GOV $_{it-1}$	0.162	0.027	0.557	0.425	-0.091	-0.050
[t-stat]	[1.238]	[0.225]	[1.131]	[3.910]*	[0.179]	[0.298]
OPEN $_{it-1}$	-0.004	-0.022	0.006	0.042	0.969	0.072
[t-stat]	[0.086] *	[0.363]	[0.028]	[0.754]	[7.891]*	[1.21]
STOCK $_{it-1}$	0.0039	0.091	0.091	-0.026	0.027	0.028
[t-stat]	[2.096]**	[6.448]*	[1.127]	[2.463]*	[0.591]	[0.491]

Note: t-ratios in the square parenthesis. *,**, and *** indicate significance at the 1%,5% and 10% level respectively.

Before estimating the PVAR** based impulse response functions, coefficients in the model will be interpreted. According to empirical results, stock market development has positive impact on gross domestic product. This result that is statistically significant at the 5 percent level introduces the relationship between economic growth and stock market performance. Our results indicate that stock market performance have been key institutions in promoting economic activity in emerging countries. Depending on these results, it's expected that firms' providing fund from stock market investment decisions are sensitive to stock market performance. In this case the movement of the stock market can be used as a leading indicator for industrial production.

Our point of view is that the results in Table 2, being estimates from a reduced form model do not convey much information. Instead, one should pay attention to the underlying moving average representation of the VAR model, namely the impulse response functions and the associated variance decompositions. Impulse response functions describe the response of an endogenous variable over time to a shock in

** Prior to the estimation of the panel VAR we have to decide the optimal lag order j of the right-hand variables in the system of equations (Lütkepohl, 2005). Optimum lag order is determined by Schwartz Criterion (SC) in our model. The SC suggests that the optimum lag order is one.

another variable in the system. Variance decompositions measure the contributions of each source of shock to the (forecast error) variance of each endogenous variable, at a given forecast horizon. These two combined, convey information on how each variable responds to a surprise change (a shock) to another variable in the system.

To analyze the impulse response functions we need an estimate of their confidence intervals. We calculate standard errors of the impulse response functions with Monte Carlo simulations and generate confidence intervals*. Monte Carlo simulations method essentially randomly generates a draw of coefficients of the VAR using the estimated coefficients and their variance covariance matrix to re-calculate the impulse responses (Love, Zicchino, 2006:195).

In the impulse response function graphs obtained; the direction and the percentile magnitude of other variables' reaction in response to one standard deviated impulse increase given to a related variable are shown on the vertical axis while time elapsed in annual basis after the impulse is given are indicated on the horizontal axis. Dashed lines represent a *±2* standard error confidence bound for reactions of variables and this confidence interval plays a significant part in determining the statistical significance of the results. The dynamic effects of the various shocks are illustrated by the impulse responses presented together with their % 5 error bands in Figure 1.

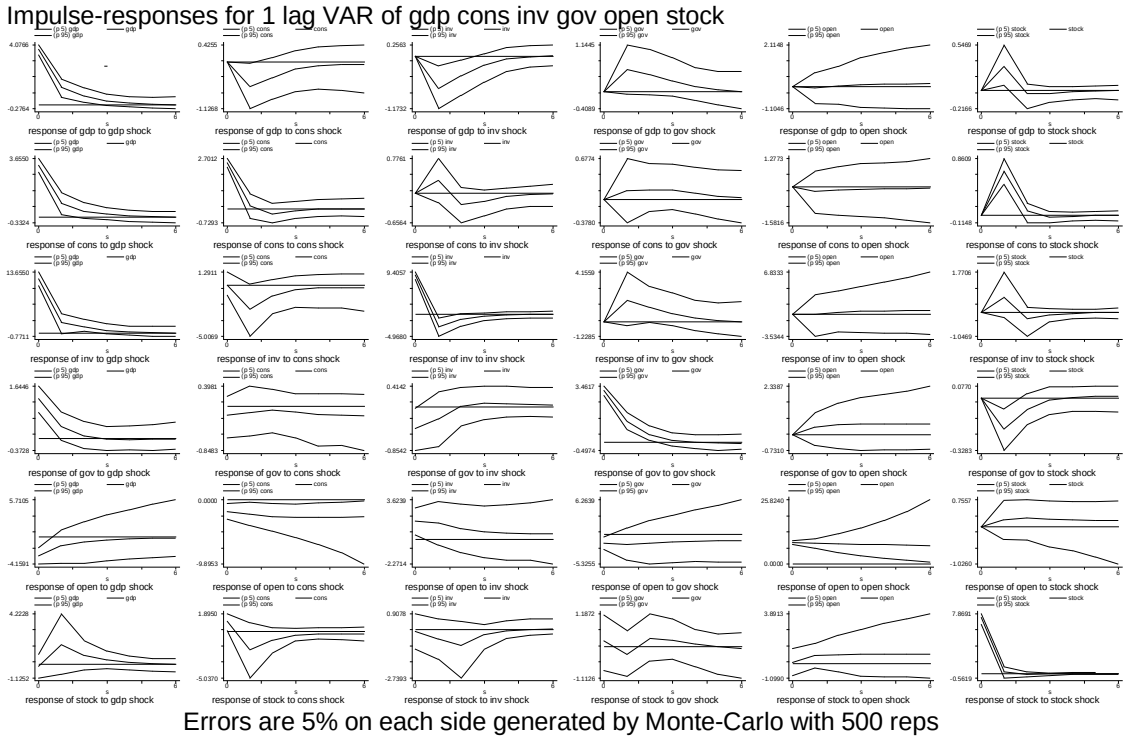

Figure 1: Impulse Response Functions for Stock Market Development

According to impulse-response function, the reaction of gross domestic product in response to one standard deviated impulse given to stock market development is as increasing with statistically meaningful standards. Reaching its maximum level in the first period, the increase in income level appears approximately 0.25 %. However the response of this variable shows a gradually decreasing tendency. These results indicates that an increase in stock market development in emerging countries do not affect real economic growth and real variables negatively; on the contrary, it has an incentive

* This procedure is repeated 500 times to generate 5th and 95th percentiles of this distribution, which are then used as a confidence interval for the impulse-response.

role. In other words, the study, from the impulse-response function results, confirms that there are positive relationship between stock market performance and real economy.
Even though impulse responses give information about the stock market development pass-through to gross domestic product, they do not show how important stock market development is in explaining income fluctuations. To assess the importance of stock market development for income fluctuations, we perform a variance decomposition of gross domestic product. The variance decompositions display the proportion of movements in the dependent variables that are due to their own shocks versus shocks to the other variables. Table 3 (see Appendix) reports variance decompositions derived from the orthogonalized impulse–response coefficient matrices.

Table 3: Variance Decomposition Analysis

	s	GDP	CONS	INV	GOV	OPEN	STOCK
GDP	10	.88516321	.02922496	.0415536	.03056818	.00860438	.00488567
CONS	10	.61640593	.34021199	.00971175	.00475843	.00440399	.02450792
INV	10	.60675248	.02714914	.33311812	.02047725	.01043697	.00206605
GOV	10	.10234506	.0138858	.01501078	.73229134	.13384934	.00261768
OPEN	10	.01578427	.0888185	.01109949	.02440064	.85938103	.00051607
STOCK	10	.04854163	.09373276	.01733212	.00431553	.06795737	.76812059
GDP	20	.87480546	.03013043	.04111203	.03040307	.01871461	.0048344
CONS	20	.61566588	.3399323	.00970448	.004773	.00544524	.02447909
INV	20	.59895435	.02817198	.32888197	.02042633	.02151935	.00204601
GOV	20	.09041607	.02477661	.01369556	.64841946	.22032165	.00237065
OPEN	20	.00977846	.09592292	.00821341	.02129993	.86427218	.0005131
STOCK	20	.04545311	.09457088	.01646091	.00509946	.11969764	.718718

The variance decomposition for the coming period which takes place in Table 3, clarifies the relation among gross domestic product, household consumption expenditure, gross capital formation, government final consumption expenditure, trade and stock market development. According to variance decomposition analysis results, the variance of shocks to economic growth is explained pre-dominantly by its own respective innovations, for example, 20 period after occurrence of shock, 87 percent of the shock is self explained. Explanatory variables account for 13 per cent of the error variance. Household consumption expenditure explains 3 percent, gross capital formation 4 per cent, government final consumption expenditure about 3 per cent, trade 1 per cent. The variance decomposition analysis do not confirm the results of impulse responses functions; it shows that stock market development shocks aren't important in explaining economic growth fluctuations in emerging countries. This result indicates that relationship between stock market development and economic growth has been deemed acceptable in the short period; but in the long period, there is no connection between the two variables.

CONCLUSION

The impact of the stock market performance on economic growth has long been a controversial issue. Theoretical literature offers conflicting predictions about the role of stock markets in promoting economic growth. Some studies concluding that stock market development bosts economic growth. Main advocates of this argument explain differences between stock market development and economic growth by producing information about possible investments, increasing liquidity, reducing intertemporal risk, mobilising and pooling savings and easing the exchange of goods and services. On the orther hand, a few studies have revealed that development of the stock market may have a negative effect on economic growth through increased volatility.

The question guiding this study is concerned with whether the stock market performance has had an impact on economic growth in the context of emerging countries. Using panel vector autoregressive models on 8 emerging countries over the period 1991-2012, we tested relationship between the level of stock market activity and real economy. The main conclusion of the study is that the performance of emerging markets' stock markets has significantly contributed to the growth of the economy. According to impulse response function, a shock in the market capitalization has positive effects on economic growth in the first period. This conclusion suggests that the stock markets are crucial for economic growth by providing services to the non-financial economy. In addition, it may be assumed that investing

in the emerging countries stock market promotes the possibility for this mechanism to increase economic growth. Given this finding, the policy implications for government are numerous. Policymakers should consider reducing barriers to liquidity in the stock market, enhancing awareness to potential investors and stimulating their confidence in the market, encouraging saving among low-income households and stimulating small and medium companies to participate in the stock market.

These result shows that it is theoretically as well as empirically possible that stock market development increases economic growth. In addition to this, financial policy is seen as an important tool not only for the more efficient transfer of funds but also for growing economies, so stock market performance on economy have become a central instrument of financial policies in emerging countries.

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