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The Role of the Calderon-Rossell Model on Determining the Developments of Equity Capital Markets: A Study of Fragile Five Countries

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ABSTRACT

Equity capital markets are important indicators in sharing information among investors, and in predicting firm value and fundamental economic parameters. Equity markets conducting these functions form a link between economic activities and financing. Therefore, development of equity markets plays an important role on the improvement of the global economy and finance. Especially, well functioning of capital markets possesses a separate importance for savings to be utilized effectively in the financial system and for the flow of funds in the system in emerging economies. The countries named as fragile five countries which are Brazil, India, Indonesia, South Africa and Turkey, with resemblance to each other due to their current account deficits, deterioration of government budget balance and loans granted at high levels, are studied with The Calderon-Rossell Model for the period of 2003-2013 in this article. For the development of equity markets, the analysis proves that real economic growth, turnover ratio, gross domestic savings and foreign direct investment variables have been statistically significant and have positive influence on the development of equity capital markets. On the other side, bank loans granted to private sector and inflation rate parameters have been statistically insignificant which proves that they have no effect on the development of equity capital markets.

1. Introduction

No one disputes the role of an effective and well-functioning financial system in a growing economy. Therefore, it becomes essential to investigate the equity markets as part of the financial system and the specific factors, which cause the development of these markets. Financial sector acts as a "catalyst" for the economic growth. Economies with well-developed financial systems and dynamics grow faster. Thus, countries with well-functioning banking sector and financial markets grow faster and develop more than other countries (Levine, 1997).

Especially in developing countries, stock markets, becoming more well-functioning by utilizing and channeling savings to investments for growth and meanwhile providing funds flow in the financial system, are vitally important and they aim two fundamental points: First, stock markets provide various investment alternatives to investors with different risk and return considerations and they direct investors towards investing in these alternatives which will result in an increase in the amount of savings. Second, stock markets

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provide the transfer of savings to the most correct and most efficient investments by the market mechanism, thus they cause utilization of economic sources more rationally and more correct. The Exchanges do not only provide liquidity to financial securities. Besides, they make it possible that securities are traded at one price at one point of time, the companies of public ownership plays an important role on redistribution of wealth, sources are channeled to the industry sector and as a result structural changes are observed in the industry, and confidence is established. Thus, the Exchanges function as a barometer in the financial system.

Furthermore, the Exchanges, thus the development of equity markets, posses functions such as increasing savings of individuals by means of Exchanges, pooling of small investments into large amounts and channeling them directly to investments, and thus, utilizing of capital (available funds, sources) more efficiently in the system.

The aim of this article is to investigate the developments in equity markets and to determine the factors that have an effect on the development of equity markets, which form the most fundamental environment for financial and economic development. The study uses The Calderon-Rossell Model and investigates the fragile five countries as being Brazil, India, Indonesia, South Africa and Turkey. The analysis spans the period of 2003-2013; and investigates to determine the factors, which have an effect on the stock market development by conducting panel regression with yearly data. Although "fragile eight countries" are discussed and studied similarly to "fragile five" countries very recently in the literature, this article follows and spans the bulk of the studies conducted for "fragile five countries" and it investigates the economic factors for the equity market development for those five countries.

2. The Importance of Stock Market Development and the Fragile Five Countries

The financial system has two main markets as the money markets and the capital markets. Demand and supply of short-term funds (with maturities up to one year) match with each other in money markets; and demand and supply of long-term funds (with maturities greater than one year) match in capital markets. The liquidity of financial securities, which are traded in capital markets, may be problematic since they have long-term maturities. The difficulty may be resolved by trading of these securities easily in active secondary markets to increase their liquidity. This necessitates the presence of well organized, well functioning and active Exchanges as secondary markets. (No investor prefers to purchase long term securities that have no liquidity in the secondary markets.) Therefore, the long-term fund suppliers (investors) will behave unwillingly in transferring their sources or savings to the long-term fund demanders (mainly corporations). This causes the situation in which corporations cannot increase their fixed asset investments or capital investments, they avoid long-term real investments and thus, they prefer and incline towards short-term commercial activities. Besides, fund suppliers (investors) prefer to invest in short term money markets. The above-described financial environment impedes both investors and corporations to earn more in the long run investments and activities and negatively effects the country's development (Madura, 2011).

The channeling of savings into productive and profitable investments has vital importance especially for the economic development of developing countries. During improvement and development process, the main problem arises in increasing savings and transferring them into effective investments in these countries. The presence of well-functioning financial system has great importance due to its role in helping to transfer savings into real investments and in accelerating the rapid capital accumulation in the economy (Shahbaz, 2008). Both theoretical discussions and empirical evidence put forward that a strong and well-functioning financial system would accelerate the economic growth. A strong and well-established financial system conducts various functions and effects the capital accumulation, individuals' savings ratio, and technological renovations, and thus, it accelerates the economic growth (Enisan, 2008).

The basic output is common stock returns as the result of stock markets development. The indirect relation of stock returns with real economic activities has been related to the contribution of stock investments to personal wealth. That means, stock price increases result in the increase in personal wealth of individuals. Increased level of prosperity means much more consumption and much more investments (Baro, 1991). In this way, stock returns become directly related to the investment level in future periods. On the other side, because investment levels affect the coming future periods' profits and cash flows, the stock returns in current period are indirectly related with the future period's cash flows (Fama, 1990). Accordingly, long term relation between stock returns and real economic activities, shows that production will increase permanently and increased production will mean much higher cash flows. The expectations for high levels of cash flow in the future will be reflected as an increase to the stock prices (Nasseh, 2000). In this way, the current level of stock prices will become a leading indicator, which provides information about the future levels of industrial production (Choi et. Al, 1999). For savings to be gathered and pooled in the economy and to distribute financial sources effectively in Turkey, Law of Capital Markets was enacted in 1981, the Istanbul Stock Exchange started functioning in 1985, and the first trading started in 1986.

Thus, private sector companies have been able to obtain required funds from the capital markets by issuing financial securities such as commercial paper, corporate bonds, and common stocks in capital markets, besides internal financing, bank loans, and trade credits. Especially in countries where long-term funds supply is inadequate, it becomes highly necessary for corporations to have a stock market to obtain long-term fund requirements. Companies grow with new, real capital investments made by the sources obtained from capital markets; they accelerate the economic growth and create new areas for increasing employment.

After the announcement of USA on May 22, 2013 for the intention of slowing down the monetary increase, it had been observed that some countries were more severely affected from the fluctuations in global markets. During the progression, USA investment banking corporation, Morgan Stanley published its report and started to mention a group of five countries India, Brazil, Turkey, Indonesia, and South Africa as the "fragile five countries" in the report. The justification of this definition is the high percentages of devaluation of local currencies in these five countries after the FED's Announcement on May 22. Besides, high levels of current account deficits, relatively high levels of inflation rates, the severe drops in their economic growth rates, and the dependence to foreign country sources are among the factors to be named and defined as "fragile five". When compared to developed countries, it is observed that financial system to GNP ratio in these five countries is not at adequate levels. Financial institutions and financial instruments do not show any diversity. All these negatively affect the growth volume of financial sources (funds) and impede the spreading out of these funds into many and various areas. Only some of the financial instruments traded in the markets of developed economies are utilized in these five countries. Furthermore, limited financial securities are issued by a few numbers of financial institutions, which are mostly banks, and this situation seems to create problems.

Financial systems of these five economies had shown a serious improvement trend since 1980, but could not reach to the desired levels. It may be stated that those financial systems are currently in the stage of progress. When compared to developed countries, the five financial systems do not posses adequate depths and their markets are small and shallow. The enlargement in the variety of financial institutions and financial instruments will create a financial structure at which all economic units, and especially the real private sector, will be able to provide their different financial requirements.

The development of equity capital markets provide funds and financial resources to private sector companies with a cost which is much lower than the cost of funds that can be obtained from the banking sector. On the other side, while investors' portfolios become enriched with globalization, the level of foreign capital flowing into domestic financial markets increase. This situation increases the trading volume of Exchanges in developing countries and puts forward positive contribution to the development of developing markets. These contributions are;

- Development of stock markets increases the demand for Exchanges and thus, results in the increase in the depth of the Exchanges. The developments also make positive contributions to the private sector companies and thus, to the economic growth by the availability and easiness of obtaining financial resources for the necessary requirements.

- The flow of foreign capital into the country causes a decrease in the foreign exchange rates (revaluation of the domestic currency) due to increased supply of foreign currency. The foreign flow also results in an increase in funds, which are used for the financing of government deficits and causes a decrease in real interest rates. In this way, as a result of relaxing in the returns of both alternative investment choices, it becomes possible that the demand for transfers into the Exchanges and the earnings in Exchanges increase (Tachiwou, 2010).

In fragile five countries, the main reason for the insufficiency of scale is the lower number of investors that makes transactions in stock markets. One of the reasons of inadequate investors trading in the Exchanges is that the markets possess high volatility. Volatility is the variability of the returns in Exchanges from their mean values. Basically, high volatility may provide high chances for higher earnings and cause investors to trade more in the Exchanges, which increases the liquidity. On the other hand, high volatility does not fit into the desires of investors who especially do not prefer high risk, and thus high volatility. The sharp increases or decreases that are not based to a basic and fundamental reason create the main point in the reluctance of those investors to trade in Exchanges. This situation diminishes especially the small-scale investors trading in Exchanges, lowers the trading volume and causes the Exchanges to become shallow. One other reason for Exchanges to be shallow is that Governments heavily use internal and domestic borrowing for financing the government deficits. In periods when portion of borrowing highly increases in national income, the real interest rates highly increase as well.

Table 1: Economic Indicators for the "Fragile Five Countries" for 2003-2013 (% change)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Growth												
Brazil	1.1	5.7	3.2	4	6.1	5.2	-0.3	7.5	2.7	0.9	2.5	3.4
Indonesia	4.8	5	5.7	5.5	6.3	6	4.6	6.2	6.5	6.2	5.3	5.6
India	6.9	7.6	9	9.5	10	6.9	5.9	10.1	6.8	3.2	3.8	7
South Africa	3	4.6	5.3	5.6	5.5	3.6	-1.5	3.1	3.5	2.5	2	3.4
Turkey	5.3	9.4	8.4	6.9	4.7	0.7	-4.7	9.2	8.5	2.2	3.8	5.1
Inflation Rate												
Brazil	9.3	7.6	5.7	3.1	4.5	5.9	4.3	5.9	6.5	5.8	5.9	6.4
Indonesia	5.2	6.4	17.1	6.6	6	11.1	2.8	7	3.8	4.3	9.5	7.5
India	2.9	4.6	5.3	6.7	5.5	9.7	15	9.5	6.5	11.4	9	7.5
South Africa	0.3	3.5	3.6	5.8	9	10.1	6.3	3.5	6.1	5.6	5.7	6
Turkey	18.4	9.3	7.7	9.6	8.4	10.1	6.5	6.4	10.5	6.2	8	10.9
Unemployment Rate												
Brazil	12.3	11.5	9.8	10	9.3	7.9	8.1	6.7	6	5.5	5.8	8.7
Indonesia	9.5	9.9	11.2	10.3	9.1	8.4	7.9	7.1	6.6	6.1	5.9	8.4
India	9.5	9.2	8.9	7.8	7.2	6.8	10.7	10.8	9.8	9.9	9.8	9.1
South Africa	28	25.5	25	23.9	23.3	23	24	24.9	24.9	25.1	26	25.2
Turkey	11	10.8	10.6	10.2	10.3	11	14	11.9	9.8	9.2	9.4	10.8
Budget Balance												
Brazil	-3.3	-3.9	-3.9	-3.3	-3.5	-4.1	-2.2	-2.5	-3.2	-2.7	-1.9	-3.1
Indonesia	-1.4	-0.6	0.6	0.2	-1	0	-1.8	-1.2	-0.6	-1.7	-2.2	-0.9
India	-10.3	-8.3	-7.2	-6.2	-4.4	-10	-9.8	-8.4	-8.5	-8	-8.5	-8.3
South Africa	-1.9	-1.2	0	1.2	1.4	-0.4	-5.5	-5.1	-4	-4.8	-4.9	-2.2
Turkey	-10.5	-4.4	-0.8	-0.7	-2	-2.7	-6	-3	-0.7	-1.6	-2.3	-4.1
Current Account Balance												
Brazil	-5.2	-2.7	-3.5	-3.5	-2.7	-1.4	-3.1	-2.7	-2.5	-2.7	-3	-3.1
Indonesia	3.5	2	0.6	2.6	1.6	0	2	0.7	0.2	-2.7	-3.4	0.9
India	1.5	0.1	-1.3	-1	-0.7	-2.5	-2	-3.2	-3.4	-4.7	-4.4	-1.7
South Africa	-1	-3	-3.5	-5.3	-7	-7	-4	-2.8	-3.4	-6.3	-6.1	-4.1
Turkey	-2.5	-3.7	-4.6	-6.1	-5.9	-5.7	-2.2	-6.3	-10	-6.1	-7.4	-5.1

Source: IMF, Global Financial Stability Report, http://www.imf.org/external/pubs (12.09.2014) (IMF, 2014).

On the other side, as maturities of financial securities become shorter as a result of uncertainties in inflation rates, the Risk Premium increases and this increase totally reflects to the real interest rates. In Turkey, high returns of Government securities have prevented the realization of the depth of the Exchange, (Borsa Istanbul-BIST). The domestic borrowing (debt) policies carried out by the Government with high interest rates, have been a severe obstacle in the development of the BIST. Both the low number of companies going public, and the low publicly traded ratio of companies in the BIST result in inadequate and lower levels of trading in the BIST and have formed obstacles for the market to deepen and have higher levels of depth.

Table 1 gives some basic parameters for those five countries. When observed thoroughly, for country growth rates as of 2013, Turkey takes place in the middle; Brazil and South Africa take place at the bottom. The worst countries as per the current account deficit have been Turkey and South Africa. As per the year of 2013, the ratio of current account deficit to national income has been 7.5% for Turkey and 6.5% for South Africa. Other countries in the "fragile five" possess almost half ratios for those parameters, as compared to Turkey and South Africa. As per the ratio of budget deficit to national income, Turkey has the best situation, while the figures of India and South Africa have the worst outcomes. As per the unemployment rates, South Africa is at the top; while India and Turkey follow this country. In inflation rates, India is at the top; and other four countries are in the 6%-7% interval and they have close figures to each other.

When overall and general observations have been made for the period of 2003-2013 in Table 1, it can be stated that the situation for Turkey does not put forward a good state as per the five parameters representing the risk perception. Therefore, Turkey has entered into a period in which she has to work out in her all plans and projects more carefully both in economic and political context.

3. Literature Review

The economic role of stock markets witnessed rapid increases around the world and has lately opened a new path of research into the association between stock market development and economic expansion, through enhancing mobilization of domestic and foreign resources and facilitating investments. The initial verification of the relation between stock market development and economic expansion was reported by Gurley and Shaw (1960, 1967, 1955), Goldsmith (1969), McKinnon (1973), and Shaw (1973). The debates continued on whether stock market development causes economic expansion, or is a consequence of economic expansion.

Calderon-Rossell (1991) investigated 42 countries and put forward that the liquidity of stock markets and the economic growth are important indicators and determinants of the stock market development.

An advanced study about the association among stock markets development and financial intermediaries in developing countries were examined by Demirguc-Kunt and Levine (1996). The findings indicated that most stock market signs are highly associated with banking sector developments. The findings also indicated that countries in the company of advanced stock markets are likely to have a highly developed banking sector, since banks are considered one of the main determinants of financing projects in developing and developed countries.

Likewise, Levine and Zervos (1996, 1998) and Singh (1997) found a direct association between stock market growth and future economic expansion. They also argued that there is a powerful positive relationship between stock market liquidity and long-run economic expansion.

Garcia and Lin (1999) investigated the macroeconomic determinants of stock market development, using pooled data from 15 countries in both industrial and developing countries for the period between 1980 and 1995. Their results confirmed that income level, saving rate, and financial market liquidity are all significant forecasters of stock market capitalization development. On the other hand, economic stability was found to have no effect. Also, intermediary financial institution and stock markets were found to go together hand in hand, rather than replacing one another in the growth course.

Likewise El-Wassal (2005) studied 40 developing economies and found out that economic growth, financial liberalization policies and foreign portfolio investments positively and highly effect the development of stock markets in those developing countries. Similarly, Osei (2005) investigated the causal relationship between stock market development and economic growth in Ghana between 1991 and 2003, using quarterly time series data on market capitalization and real GDP. The main weakness associated with Osei's study is that since stock markets are "forward looking", market capitalization is effected by the price effect of stock markets. Therefore, the use of stock market capitalization and market capitalization ratio may not be the appropriate indicators for the study because it may lead to spurious relationship or effects. Moreover, he did not examine the long run and short-run relationships between stock market development and economic growth.

Naceur, Ghazouani and Omran (2007) investigated the impact of stock market development in the MENA economies expansion, using fixed and random specification models. They found out that stock market liquidity, financial intermediary, saving rate, and economic stability are all vital causes of financial market development.

Likewise Yartey (2008) examined the institutional and macroeconomic variables that contribute to stock market development. Employing panel data for 42 emerging economies covering the period between 1990 and 2004, he found out that income level, gross domestic investment, banking sector development, private capital flows, and the liquidity of stock markets are fundamental determinants of stock market development. He also confirms that political risk and bureaucratic quality are important causes of stock market development, as they enhance the viability of external finance.

A more recent study carried out by Cherif and Gazdar (2010) examined the influence of macroeconomic

environment and institutional quality on stock market development. They used both panel data and instrumental variable techniques from 14 MENA countries over the period of 1990-2007. They found that stock market development are influenced by income level, saving rate, stock market liquidity, and interest rates. They also showed that the banking and the stock market sectors are complementary instead of being substitutes. In addition, they found that the institutional environment did not appear to be a driving force for the stock market capitalization in the region.

A cointegration and vector autoregression (VAR) models were employed by Mansor (2011) in order to examine the long-term connection between stock market development and real economic variables for Thailand. Results indicated dual -directional causality between the stock market capitalization increase and real GDP. Both variables exhibit positive and significant responses to innovations in the other variables. In addition to that, a causal connection was confirmed between stock market development and investment ratios, which runs from the former to the latter. Finally, dual-directional causality was found between real GDP and investment ratio, and substantial contributions of both real GDP and stock market development to variations in the aggregate price level.

Employing a multivariate vector error correction model (VECM) examined by Mishal (2011), the relationship between the economic development and financial sector developments in Jordan. The findings showed a powerful stable long-term equilibrium link between financial markets' development and economic development. The study also showed dual-directional causality between banking sector increase and economic expansion in long run, and a bi-directional causality among the banking sector progress and stock market development. Moreover, the causality runs from GDP growth to the stock market development, and not vice versa.

Kemboi and Tarus (2012) investigated the macroeconomic factors that cause stock market development in Kenya for the period between 2000 and 2009, using quarterly secondary data. The error correction model was employed to estimate the association between the macroeconomic variables and stock market development. The results confirmed that macroeconomic variables such as income level, banking sector development, and stock market liquidity are significant determinants of the development of the Nairobi Stock market. In addition, the findings showed that macroeconomic stability is not a significant forecast for the development of the securities market.

4. Methodology, Data and Empirical Results

4.1. Methodology (The Calderon-Rossell Model)

The theoretical set up that is used in this article has been built upon a behavioral model of stock market development, which is introduced by Calderon-Rossell (19991) and is later developed by Yartey (2008).

The main hypothesis of the model is that the level of economic development, which is captured by output growth, and market liquidity, determines stock market development. The classical Calderon-Rossell Model states that stock market capitalization is a function of the number of firms listed in the Exchanges and the value of those companies. According to the basic model, the prices of listed companies depend on number of listed companies and yearly output (generally measured by gross domestic product), and the number of listed companies are function of output and liquidity available for the financial transactions.

$$Y = PV \quad (1)$$

$$Y = PV = Y(G, T) \quad (2)$$

$$V = V(G, P) \quad (3)$$

$$P = P(T, V) \quad (4)$$

Where;

Y: Market Capitalization (in Local Currency)
P: Number of companies listed on the stock market
V: Price of listed companies in local currency
T: Turnover ratio, which measures liquidity in the market
G: Measurement of output per year (Gross Domestic Product (GDP), Gross National Product (GNP), or per capita measurements)

As it may be observed, The Calderon-Rossell Model represents an interrelated set of functions. Equation (3) and Equation (4) can be expressed in terms of growth rates as;

$$LogV = \alpha_1 LogG + \alpha_2 LogT \quad (5)$$

$$LogP = \phi_1 LogG + \phi_2 LogT \quad (6)$$

Combining Equations (5) and (6) with Equation (2), gives;

$$LogY = \log(PV) = \alpha_1 LogG + \alpha_2 LogT + \phi_1 LogG + \phi_2 LogT \quad (7)$$

Factoring out similar terms in Equation (7) gives;

$$LogY = (\alpha_1 + \phi_1) LogG + (\alpha_2 + \phi_2) LogT \quad (8)$$

The model specification in Equation (8) can be expressed as the reduced form behavioral model:

$$LogY = \beta_1 LogG + \beta_2 LogT \quad (9)$$

where;

$$\beta_1 = (\alpha_1 + \phi_1) \quad (10)$$

$$\beta_2 = (\alpha_2 + \phi_2) \quad (11)$$

According to the basic Calderon-Rossell Model, the sophistication level of an economy and availability of liquidity sources determine development of stock markets.

4.2. Data

In this study, some other economic control variables are added other than the variables, which are taken into consideration in The Calderon-Rossell Model. It has been observed in the literature that variables to measure the corporate structure and economic control variables other than the parameters proposed by the basic Model have been added in the studies. As the main purpose of the study is to analyze only the economic variables, which may have effects on the stock market development, those corporate structure variables have not been included in the study.

The economic control variables are constructed from the World Development Indicators and World Development Finance datasets. The selection of control variables is influenced both by the existing economic literature as well as by number of empirical tests. The final regressions are based on the following control variables: foreign direct investments, gross domestic savings, bank loans granted to private sector and inflation rates.

Market capitalization in the stock market, defines the total market values of listed and traded companies in the Exchanges. This study uses this variable as the ratio of stock market capitalization to GDP in the Model for determining stock market development.

Table 2: Definitions of Variables in the Model

Notations	Variables
SMC	Stock Market Capitalization relative to GDP
GDP	Real Economic Growth (U.S. dollars (%))
TR	Turnover Ratio (%)
GDS	Gross Domestic Savings (as % of GDP)
PSL	Bank Loans Granted to Private Sector (as % of GDP)
INF	Inflation Rate (%)
FDI	Foreign Direct Investment (as % of GDP)

4.3. Panel Unit Root Test Results

As in all time series analyses, the panel data methodology conducting both time and cross sectional analyses requires that variables should be stationary in order to show the real relationships between the variables. This study investigates common unit root processes with panel unit root tests in accordance with the study of to Levin, Fin and Chu (2002) and the unit root process for each unit (country) individually in parallel with the study of Dickey and Fuller (1979). The stationarity in individual invariant series is analyzed Dickey and Fuller (1979) test. The results of the stationary analyses of the data used in the panel regression are given in Table 3.

Table 3 shows the results of the unit root tests conducted to the variable levels, and it is observed that series at I(0) are not stationary. The results demonstrate that SMC, GDP, TR, GDS, PSL, INF, and FDI variables were I (1).

Table 3: Panel Unit Root Test Results

	Levin, Lin & Chu Test Results		Im, Pesaran & Shin Test Results		ADF-Fisher Chi-square	
	Level	First Difference	Level	First Difference	Level	First Difference
Variables	**Trend and Constant**	**Constant**	**Trend and Constant**	**Constant**	**Trend and Constant**	**Constant**
SMC	0.0722	0.0001*	0.0677	0.0211*	0.0823	0.0064*
GDP	0.0921	0.0000*	0.0934	0.0022*	0.1103	0.0000*
TR	0.2188	0.0000*	0.2341	0.0000*	0.0976	0.0000*
GDS	0.1536	0.0018*	0.1835	0.0030*	0.1289	0.0000*
PSL	0.1273	0.0022*	0.0933	0.0000*	0.1366	0.0221*
INF	0.1760	0.0000*	0.1031	0.0023*	0.1590	0.0000*
FDI	0.1365	0.0011*	0.1073	0.0031*	0.0954	0.0000*

♦Time series were deseasonalized by tramo/seats and periods of crisis and policy changes were considered in regard to their statistical significance and they were included in the model if their trend and constant components were statistically significant.

♦(*) Significant at the 0.05 and 0.01 level, lags for ADF test were selected automatically based on Schwarz information criterion; bandwidths for Phillips-Peron test were selected automatically based on Newey-West bandwidth.

♦Cu sum path lies within the confidence interval bounds at %5, it was not observed structural breakpoint.

4.4. Panel Regression Results

Panel data analysis has been implemented by pooled, fixed and random effects as specified by Baltagi (2004). Some statistical tests have been applied to determine which estimation method has to be used in the analysis. The main issue is whether the data will be pooled among the countries and years because all the variables in the models may be changed among the countries and years. The Chow Test has been used to determine common significance of country specific effects and time specific effects. Here effective estimator under null hypothesis is pooled ordinary least squares, while effective estimator under alternative hypothesis is fixed effect model. The Chow and Breush-Pagan (BP) tests have been conducted to determine which panel regression model would be used; and the results of the tests are presented in Table 4 below. Null and alternative hypotheses for BP tests respectively pooled regression and random effects model, while null and alternative hypotheses for the Chow test respectively are pooled regression and fixed effects model.

Table 4. Test Results of Panel Regression Estimation Method

Test	p value	Decision
Chow (F test)	0.0127	Accept H_1
BP(χ^2 test)	0.0294	Accept H_1

Hausman test has been used to decide whether the random effects model or the fixed effects model are to be used. In The Hausman Test, the null hypothesis shows that there are random effects, while alternative hypothesis shows that there are no random effects. The results of the Hausman Test are presented in Table 5. The Hausman Test results demonstrate that alternative hypothesis is accepted. Therefore, the fixed effects model has been used in the analysis.

Table 5. The Hausman Test Results

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	19.380357	(4,34)	0.0000
Cross-section Chi-square	65.332092	4	0.0000
Period F	8.984772	(10,34)	0.0047
Period Chi-square	13.989917	10	0.0035
Cross-Section/Period F	7.308208	(14,34)	0.0000
Cross-Section/Period Chi-square	76.373396	14	0.0000

Different algorithms have been used for the analysis and the estimation results of the model obtained by Period SUR (PCSE) algorithm, have been used due to the minimum value of total squared error.

Table 6. The Results of Panel Regression Estimation

Cross-section fixed effects test equation
Dependent Variable: DSMC
Method: Panel Least Squares
Sample: 2003 2013
Total panel (balanced) observations: 55
Period SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DGDP	0.269727	0.031215	8.641038	0.0000
DTR	0.155408	0.035243	4.409614	0.0000
DGDS	0.142678	0.021764	6.555607	0.0000
DPSL	0.009578	0.012755	0.750941	0.4542
DINF	-0.011082	0.009738	-1.138102	0.2571
DFDI	0.136285	0.050999	2.672315	0.0085
C	10.56610	4.120481	2.564287	0.0115

Effects Specification

Period fixed (dummy variables)

R-squared	0.774438	Mean dependent var	6.400774
Adjusted R-squared	0.762297	S.D. dependent var	5.183550
S.E. of regression	2.563907	Akaike info criterion	4.892401
Sum squared resid	722.4420	Schwarz criterion	5.459718
Log likelihood	-387.4681	Hannan-Quinn criter.	5.122942
F-statistic	59.49561	Durbin-Watson stat	1.934428
Prob(F-statistic)	0.000000		

Results show that all the variables are positive statistically significant, except that the PSL and the INF variables are not statistically significant on SMC variable. Other variables, which have effects on the dependent variable, are listed in order as GDP, TR, GDS, and FDI as per their greatness in the variables' coefficients. The total explanatory variables in this research explained 77.4% of variation in the dependent variable.

The variables GDP and TR effect the capital market capitalization positive statistically significant. Thus, it is possible to state that an increase in GDP and TR will positively effect the stock market development. The results are in parallel to the findings of Calderon-Rossell (1991), Garcia and Lin (1999), and Baltagi (2004). The GDS has positively increasing effect on the dependent variable.

The private sector loans granted by banks have a positive statistically significant effect on the capital markets capitalization. Thus, increases in bank loans, which have granted to the private sector have positive effect on the stock market development. The results are in parallel with Garcia and Lin (1999), Yartey (2010), Demirguc-Kunt and Levine (1996), and Naceur, Ghazouani and Omran (2007).

The direct foreign capital investments and capital markets capitalization have a positive and statistically significant relation among themselves. This proves that the increase in direct foreign investments positively effects the development of stock markets. Similar results were obtained in the studies of El-Wassal (2005) and Yartey (2010). The variables INF and PS have come out statistically insignificant, which are against the expectations of this study.

The variable for inflation rate has come out statistically ineffective. While this is an unexpected result, it totally matches with the results of Poon and Taylor (1991) and Gultekin (1983).

5. Conclusion

The development of equity capital markets gives an opportunity for small-scale savings, (which can not contribute alone in any way to the economy to be used for economic development), to be invested in various financial securities and thus, to be converted into large-scale and profitable investments. Stock market development helps to meet the inadequacy of domestic savings in less-developed countries. For individuals, it provides possibility for very small amounts of funds to be invested in productive investments and to earn additional earnings. Individuals who have low amounts of capital, while who do not have enough aggregation of knowledge, experience, and time for making individual investments, can find a financial environment to utilize their savings and capital. Developed equity markets have the characteristics of being a leading indicator for the changes that are observed in real markets.

The development of stock markets also acts a role of improvement for the global economy and finance. A well-functioning and active stock market seems to be the basic element or basic component of finance sector. It is declared that well-functioning financial institutions and the development of stock market have a critical role in the realization of a sustainable economic growth.

This study investigates the factors that effect the stock market development within the framework of The Calderon-Rossell Model, for the “five fragile countries”. The study spans the period of 2003-2013 and a panel data analysis method has been conducted by using the yearly data of the above-mentioned period. The study possesses the capital market capitalization as a representative dependent variable of the stock market development. Real economic growth, turnover ratio, gross domestic savings, foreign direct investment, bank loans granted to the private sector and inflation rate are included as the independent variables in the model.

The results of the analysis prove that the real economic growth, turnover ratio, gross domestic savings and foreign direct investment variables have been statistically significant on stock markets development; and these variables are positively effective on the increase of the markets’ development. On the other hand, independent variables, which are bank loans granted to the private sector and inflation rate, have come out statistically insignificant and thus, they have no effect on the stock market development.

When “fragile five” countries are compared to the developed countries, the financial systems are not big enough, the inadequacy of variety of financial instruments and the insufficiency in corporate investors are observed as the issues to be discussed. However, financial systems are in a progression of high growth in these countries. The financial systems in these countries basically bear the characteristic that they heavily depend on banking sectors. The “fragile five” countries do not possess the desired and high level of development in their stock markets due to their high current account deficits, high inflation rates, and decreases in their growth performances.

In the overall perspective, these economies should make long-term plans and new reformations for increasing their low-to-medium levels of per capita income and for solving the problems in their income distribution. They also need to become more integrated with international markets to attract more international capital by means of well-functioning financial intermediation mechanisms and organizations, and a large variety of financial instruments. These countries should produce solutions to the facts that low number of publicly listed companies is traded in the stock markets and savings in the economies are not adequately utilized in the stock markets. It is determined that these countries should prioritize policies and solutions that increase earnings and savings in the economies.

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