Relationship Between Foreign Direct Investment And Stock Market Development In Developing Countries.

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Abstract: This study explores the relationship between two elementary sources of capital that is foreign direct investment and stock market development. Using data from five developing economies, the study uses panel data approach to explore bidirectional interrelationship of the two capital sources. Results confirm the importance and feedback of two variables for each other. The results have policy implications for economies.

Keywords: FDI, SMD, Developing economies, economic growth.

I. Introduction

Foreign direct investment and stock market development are two elementary sources of capital for a country. FDI and stock market are considered to contribute to economic growth of a country (Oseni and Enilolobo; 2011). Stock market of a country performs fundamental function in the industry and commerce being crucial for investors and industry. FDI plays an important role in the development of stock market. For example, liquidity of stock markets can increase if the foreign investors are investing by purchasing the equity (Claessens; 2001). Moreover, for a country to benefit from FDI inflows into the country, development of financial markets is a prerequisite. It is because if the financial system of the country is developed, it is better able to absorb the benefits from FDI inflows due to its strong financial markets (Lee and Chang; 2009). If stock markets are developed, they might attract more capital inflows into the country (Chang and Lee; 2009). Foreign direct investment refers to investment in physical assets in another country. FDI is a kind of active investment in another country to acquire management control (Garaham and Spaulding; 2005), opposite to portfolio investment which is usually short term investment. Threshold level for FDI is usually 10% in many countries. That is, an investor doing direct investment must hold at least 10% of the ownership of the company. Broadly categorizing, it can be in form of Greenfield investment or privatization proceeds. Investment in new facilities or enhancing the existing facilities refers to the Greenfield investment. Privatization proceeds mean purchase of a unit or part in another country. Foreign direct investment is considered as relatively a permanent source of capital inflows into a country. Therefore, it is considered to bring multiple benefits with it. The core motive behind FDI is to globalize competition and production. Other reasons might include moving production to more profitable locations (Oseni and Enilolobo; 2011). Many theories try to explain these motivations such as product life cycle theory (Raymond Vernon;1999), portfolio theory and internationalisation theory (Buckly and Casson;1976) etc.

Foreign direct investment is beneficial to both the investor and the host country. Investors benefit from the FDI by having access to the larger markets, having the opportunity of cheap labor, using resources in the host country and opportunity for diversification.1 For host country, it is considered even more beneficial. It usually brings with it advanced technology, raises the standard of operations by introducing efficient management, research and development and trainings to the human resource. FDI inflows provide access of host country to the global
markets bringing many opportunities. Competition is increased and new opportunities for jobs are formed in the host country (S.khan; 2008). Production facilities are improved which give rise to healthy competition. Foreign direct investment also plays role in promoting the financial markets of the host country by providing relatively permanent capital. Due to the benefits it brings, foreign direct investment has become an essential part of strategies of economic development for many countries. There could be certain threats of foreign direct investment inflows as well. These threats might be in form of loss of control and management by the host country (Garaham and Spaulding; 2005). However, it is generally considered as a benefit for the host country. Foreign direct investment is considered as a source of economic growth for the host country (Boersnzstein, Gregorio and Lee; 1998). Due to all the benefits of FDI mentioned above, FDI promotes economic growth in the host country.

There are two school of thoughts in the literature regarding the relationship of FDI and SMD. According to first view, FDI is larger in countries which are underdeveloped with weak institutions and are riskier. According to this point of view, FDI is substitute for SMD. Therefore, negative relationship is expected between FDI and SMD. The reason for negative relationship could be that MNC’s reduce the productivity of local firms through competition (Aitken and Harrison, 1999). According to the second point of view, FDI is attracted towards countries where financial markets are developed with strong fundamentals. According to this point of view, FDI and SMD are complementary and therefore, positive relationship is expected between them (Hausman and Arias, 2000; Saibu et al: 2011; Claessens, et al: 2001).

Positive relationship between SMD and FDI is also supported by the absorptive capacity theory according to which the positive effects of FDI depend upon the conditions in the host country. Among these conditions an important one is the development of financial markets. Financial markets play their positive role by facilitating if they are developed. According to this theory, positive relationship is expected between SMD and FDI (Nguyen et al, 2009; Krogstrup, S., & Matar, L., 2005, Farkas, B., 2012).

The literature and empirical evidence on the direct relationship of these two variables is insufficient. There are very few studies on this issue. This research would provide evidence on the bidirectional and causal relationship of FDI and stock markets in these rising economies of Pakistan, India, Korea, Sri Lanka and Indonesia, investigating the direct, causal and dynamic relationship of foreign direct investment and stock markets in the emerging economies. As these economies are emerging, foreign direct investment inflows and stock market developments are necessary for their growth and identification of their link would be valuable for policy purposes.

II. Theoretical Framework

Foreign direct investment means investing equity in another country to impact management of operations (Bitzenis, 2001). Among determinants of FDI, market size has been found an important variable (Chakrabarti, A; 2001, Grubel; 1968, List; 2001, Alfaro et al; 2006). This is because it is generally believed that FDI increases the productivity in host country and promotes economic growth through various spillover effects (Alfaro et al.2010, Boersnzstein, Gregorio and Lee; 1998, Choong et al; 2009, Hossain and Hossain; 2012, Vo et al.; 2006, Akinlo; 2004, Olofsdotter, Bengoa and Robles; 2002). However, some contrary views and evidences also exist (Loungani and Razin; Herzer etal.2007). Relationship of FDI and economic growth is found significant in developed countries but not in developing countries (Beugelsdijk, Smeets and Zwinkels; 2008). Absorptive capacity of the economy plays role to benefit from FDI (Bengoa and Robles; 2002, Omran and Bolbol). Developed financial markets play their role in the economic growth (Agarwal, Petros).

Relationship of financial markets development and growth has been tested empirically in many countries (Enisan and Olufisayo; 2008, Nieuwerburgh, Buelens and Cuyvers; 2005, Nazir, Nawaz and Gillani; 2010, Boubakari and Jin; 2010, Naceur, Ghanoouani, and Omran; 2007, Mohtadi and Agarwal). However, evidence of no relationship was found by Naceur and Ghanzuanni (2006) MENA region countries.

Therefore, it is evident that stock market development and FDI are two important sources of promoting economic growth in an economy. Literature on the interactive relations of these two important sources is somewhat mixed. FDI promotes economic growth when financial markets are developed to a certain level (Saini, Law and Ahmed; 2010, Nasser and Gomes; 2009, Lee and chang; 2009). Developed economic systems attract more capital and absorb its positive impacts. Oseni and Enilolobo (2011) investigated the joint effect of stock market development and FDI on economic growth. Moreover, complementary role of stock market and FDI in promoting economic growth was also confirmed (Cheer and Nair; 2010, Alfaro et al.; 2003) Results show that foreign direct investment inflows lead to higher growth in developed financial markets as compared to under developed markets. Developed financial markets can reap more advantages from FDI due to their absorbing capacity (Alfaro et al.; 2009).
As development of stock market is an important factor for a country to benefit from FDI inflows, in the same way FDI can also play its role in the development of stock markets. But this relationship has been investigated in very few studies. Moreover, the empirical evidence on the relationship is mixed. FDI along with other variables plays an important role in the development of stock market (Raza et al; 2012, Kalim and Shahbaz; 2009, Duarte and canal; 2007, Adam et al; 2008). Rahman and Salahuddin (2010) found positive relationship of FDI and efficient stock markets in Pakistan while studying the determinants of growth. However, Claessens, Klingebiel, Schmukler (2001) argued that FDI is a complement to stock market development. Increase in FDI is related positively to market capitalization. However, there are certain empirical evidences in which no relationship has been found (Yartey 2008).

Thus, the relationship of FDI and SMD is ambiguous in the literature as mixed results are found on the issue. Therefore, this study aims at filling this gap by providing empirical evidence from emerging markets of Asia.

III. Data and Methodology

The variables being explored include SMD and FDI. Development of stock market can be measured through its size or liquidity. Size shows the number and prices of shares listed on the exchange and liquidity refers to the volume of trade. If the size and liquidity of a stock market is high, it shows the market is developed and economy is growing.

There are three main measures of SMD in the literature. These include market capitalization, value of shares traded and turnover ratio. Among these three measures, the market capitalization is considered the most appropriate measure (Sumit and Agarwal; Claessens, 2001). Market capitalization is calculated as market value of all the listed shares. In this study market capitalization has been used as measurement for stock market development. For scaling purpose, natural log of the variable has been used.

Foreign direct investment is taken as the net inflows of foreign direct investment into the country divided by GDP. The reason being that in this study FDI is being studied as a source of capital. Therefore, only inflow of FDI into the country is being taken.

Data for foreign direct investment for all sample economies of Pakistan, India, Sri Lanka, Indonesia and Korea has been taken from International Financial Statistics, International Monetary Fund. Measurement of second variable of stock market development needs data for stock market capitalization. Data for market capitalization of sample economies has been taken from financial indicators on World Bank website. To divide variable of FDI by GDP, data for GDP for sample economies has been taken from World Bank data. Analysis period consist annually from 1988 to 2012.

3.1 Methodology

To estimate the relationship, panel data analysis has been used. Unit root test is applied to test whether the data is stationary or non-stationary. Working of simple unit root is as under:

$$\Delta Y_t = \beta_1 Y_{t-1} + \beta_2 \Delta Y_{t-1} + \epsilon_t (1)$$

In the above equation, if $\beta_1$ is equal to zero, it would mean that the data is stationary.

Cointegration is used to test whether long term relationship exists between the variables in the long run. Johansen cointegration test is built upon trace and Eigen value. The equation is given as follows:

$$X_t = \alpha + \sum_{j=1}^k \beta_j X_{t-j} + \epsilon_t (2)$$

Where

- $\alpha$ is a constant of n×1 vectors,
- $x_t$ is variable of nx1 vectors which are I(1) stationary,
- $k$ denotes the no. of lags ,
- $B_j$ is vector's coefficient and $\epsilon_t$ is the error term.

Granger causality test given by Clive Granger is used to test whether one-time series can be helpful in forecasting the other. The equation for lag of x causing y would be:

$$Y_t = \alpha + \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \ldots + \alpha_k Y_{t-k} + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \ldots + \beta_k X_{t-k} + \epsilon_t (3)$$

The equation for lag of y causing x would be:

$$X_t = \alpha + \alpha_1 X_{t-1} + \alpha_2 X_{t-2} + \ldots + \alpha_k X_{t-k} + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \ldots + \beta_k Y_{t-k} + \epsilon_t (4)$$

The decision regarding the rejection or no rejection is made on the basis of P-value. If P-value is less than level of significance, null hypothesis of no Granger causality is rejected.
3.2.1 Panel Regression Models

In this study, panel data analysis has been used. It is because panel data in this study would give more meaningful results than would alone cross-sectional or time series. In panel data regression models, all the data is across time and space is combined together. In this study, balanced panel is being used as time series observations are same across all countries. In equation form, it might be expressed as follows:

\[ Y_{it} = \beta_1 + \beta_2 X_{2it} + \ldots + \beta_n X_{nit} + \mu_i + \nu_{it} \]  

(5)

Where, \( Y \) is the dependent variable and \( X \) is the independent variable. \( \beta \) represents the coefficients. Cross-sectional units are represented by \( i \) and \( t \) denotes the time period. This is also called pooling of data. There are different models to analyze this type of data and its different dimensions. These include fixed effects model and random effects model.

In fixed effects model, fixed effect of each unit is estimated on the dependent variable. Dummy variables approach is used to capture the effects. The purpose is to check the individual specific effects but keep the time invariant. For this purpose, this model decomposes the \( \mu_i \) used in equation (5) into \( \mu_i \) and \( \nu_{it} \). \( \mu_i \) captures the individual specific effects and \( V_{it} \) varies over entities and time. Thus, the equation becomes,

\[ Y_{it} = \alpha + \beta X_{it} + \mu_i + \nu_{it} \]  

(6)

This model could be estimated using dummy variables which is called Least squares dummy variables approach (LSDV).

\[ Y_{it} = \beta X_{it} + \mu_i D_1 + \mu_i D_2 + \mu_i D_3 + \ldots + \mu_i D_{10} + \nu_{it} \]  

(7)

In this equation, \( D_1 \) is the dummy variable which takes the value of 1 for all observations of first entity and 0 otherwise. In the same way, \( D_2 \) takes the value of 2 for all observations of second entity and otherwise zero. This model takes the assumption that slopes coefficients are constant but intercept varies across individuals. If these variables are significant, it means there are significant factors which affect individuals differently.

To capture the time effects, again dummy variables are used. Dummies are incorporated for each year to capture time variation.

\[ Y_{it} = \beta X_{it} + \lambda_1 D_{1it} + \lambda_2 D_{2it} + \lambda_3 D_{3it} + \ldots + \lambda_n D_{nit} + \nu_{it} \]  

(8)

In this equation, \( D_1 \) takes the value of 1 for first time period and 0 for other time periods. If these variables are found significant, it would mean that there are time effects. This means that slope coefficients are constant but intercept varies across time. These two effects could be analyzed together in a model as given below:

\[ Y_{it} = \beta X_{it} + \mu_i D_1 + \mu_i D_2 + \mu_i D_3 + \ldots + \mu_i D_{10} + \lambda_1 D_{1it} + \lambda_2 D_{2it} + \lambda_3 D_{3it} + \ldots + \lambda_n D_{nit} + \nu_{it} \]  

(9)

Through this model, individual or time effects could be captured if they are significant. The random effects model is also called error components model. In this model there are different intercept terms for each entity which are constant across time. Slope coefficients are constant both across cross section and time. But in this model, instead of dummy variables, varying intercept for each entity is assumed to arise from a common intercept and a random variable which varies cross-sectionally but is constant over time. The model may be expressed as:

\[ Y_{it} = \alpha + \beta X_{it} + w_{it} \]  

(10)

Where, \( w_{it} = \epsilon_i + v_{it} \)

\( \epsilon_i \) is the term which varies across cross section but is constant over time. For time effects, a time specific error term might be included which remains constant across cross-sectional but is variant across time. It might be expressed as below:

\[ Y_{it} = \alpha + \beta X_{it} + w_{it} \]  

(11)

Where, \( w_{it} = \epsilon_i + v_{it} \)

It means that now error term captures the time effects. These both effects could also be incorporated into one model.

IV. Empirical Results and Discussion:

4.1 Panel Unit Root Test

Panel unit root has been applied to test the stationarity of the data. Results reveal that foreign direct investment series has become stationary at first difference. The probability is 0.0490 at level which is less than 0.05, the significance level. It rejects the null hypothesis of stationarity. Therefore, series is stationary at first difference as probability is 0.8567 greater than level of significance. Thus null hypothesis of stationarity is being accepted at 1st difference.
Results of investigation of unit root test for stock market development are given in table 4. Results show that stock market development series also becomes stationary at first difference because the probability at level is 0.0000 which is less than 0.05. Thus, null hypothesis of stationarity is being rejected. It is being accepted at first difference. Thus, series of stock market development is also being stationary at first difference.

### Table 3: FDI Panel unit root test

<table>
<thead>
<tr>
<th>Method</th>
<th>Level Statistic</th>
<th>Prob.**</th>
<th>1st Difference Statistic</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hadri Z-stat</td>
<td>1.65480</td>
<td>0.0490</td>
<td>-1.06565</td>
<td>0.8567</td>
</tr>
<tr>
<td>Heteroscedastic Consistent Z-stat</td>
<td>1.82479</td>
<td>0.0340</td>
<td>-0.26223</td>
<td>0.6034</td>
</tr>
</tbody>
</table>

### Table 4: SMD Panel unit root test

<table>
<thead>
<tr>
<th>Method</th>
<th>Level Statistic</th>
<th>Prob.**</th>
<th>1st Difference Statistic</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hadri Z-stat</td>
<td>6.41980</td>
<td>0.0000</td>
<td>1.18899</td>
<td>0.1172</td>
</tr>
<tr>
<td>Heteroscedastic Consistent Z-stat</td>
<td>6.34520</td>
<td>0.0000</td>
<td>1.21538</td>
<td>0.1121</td>
</tr>
</tbody>
</table>

### Panel Cointegration (Fisher Combined Johansen Test):

To test the relationship between SMD and FDI, cointegration test has been applied. As both variables are stationary at first difference I(1), it is appropriate to test the relationship using cointegration. For the purpose, panel combined Johansen cointegration has been used. The results are given in table. They indicate that FDI and SMD are cointegrated, as t-static from trace test and Max-eigen value is greater and probability is less than 0.05, the level of significance and thus reject the null hypothesis of no cointegration. Therefore, it is concluded from the test that SMD and FDI are cointegrated.

### Table 5: Cointegration Results

<table>
<thead>
<tr>
<th>Hypothesized No. of Cointegration Equation(s)</th>
<th>Fisher Stat.* (from trace test)</th>
<th>Probability</th>
<th>Fisher Stat.* (from Max-Eigen)</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>89.32</td>
<td>0.0000</td>
<td>88.36</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 1</td>
<td>22.89</td>
<td>0.0111</td>
<td>22.89</td>
<td>0.0111</td>
</tr>
</tbody>
</table>

### Pair wise Granger Causality Test

Granger causality test has been applied to test the bidirectional causality between stock market development and foreign direct investment. Although correlation analysis has revealed that there is a relationship between stock market developments but granger causality test is applied to know the direction of the causality. In granger causality, at first lag is to be selected. For this purpose, a VAR lag order selection method has been used. This method gives the appropriate value of lag under different criterion such as Akaike information criterion, Schwarz information criterion and Hannan-Quinn information criterion. As the data being used in this study is annual, lag has been taken 1 to select the appropriate lag for granger causality. Applying the method, all the three criteria mentioned above tell that appropriate value of lag is 5 for applying granger causality. Therefore, this lag is being used in the granger causality test.

Results for Granger test are given in the table 4. Null hypothesis of FDI causing Stock market development is not being rejected as F-statistic is less than 2 and probability is greater than significance level of 0.05. It means that FDI does not Granger cause Stock market development.

The second null hypothesis of Stock market development causing FDI is being rejected as the F-statistic is higher than 2 and probability is less than level of significance. It means that SMD does granger cause FDI. Thus, granger causality shows that there is unidirectional relationship between the stock market development and foreign direct investment. Development of stock markets influences the inflows of foreign direct investment.

### Table 6: Pairwise Granger Causality Tests

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>F-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDI does not Granger Cause SMD</td>
<td>0.52637</td>
<td>0.7556</td>
</tr>
<tr>
<td>SMD does not Granger Cause FDI</td>
<td>3.31737</td>
<td>0.0090</td>
</tr>
</tbody>
</table>

Lags: 5
Panel Regression Models

SMD has been taken as independent variable and FDI as dependent variable because the results of Granger Causality show that stock market development effects foreign direct investment. At first, the model is regressed using pooled regression that is neither fixed effects nor random effects. The results are insignificant. Then, fixed effects model is applied. It has been tested in all three situations that is cross-section or entity fixed effects, time fixed effects and combining both. Only the results of cross-section fixed effects are being significant. Cross section fixed effects means that error term captures all variables which affect dependent variable cross sectionally but they are constant over time. The results are shown in table.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>T-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-0.072917</td>
<td>-4.254030</td>
<td>0.0000</td>
</tr>
<tr>
<td>SMD</td>
<td>0.003404</td>
<td>4.817469</td>
<td>0.0000</td>
</tr>
<tr>
<td>Random fixed (dummy variables)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.227668</td>
<td>F-statistic</td>
<td>6.426192</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.192240</td>
<td>Prob(F-statistic)</td>
<td>0.000029</td>
</tr>
</tbody>
</table>

The results show that both the intercept and SMD are significant as the probability is less than level of significance of 5% and null of no impact is being rejected. Moreover, t-statics also indicates that stock market development is impacting significantly foreign direct investment in fixed cross section effects model. Applying redundant fixed effects model also confirms the use of fixed effects model. This test is used to select between the pooled regression model and fixed effects model. The null for the test is that there is no individual effect. The results are shown in table. They show that null hypothesis is being rejected as the P-value is less than level of significance. It means that fixed effects model is appropriate to use.

<table>
<thead>
<tr>
<th>Effects Test</th>
<th>Statistic</th>
<th>d.f.</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section F</td>
<td>7.94858</td>
<td>(4,109)</td>
<td>0.0000</td>
</tr>
<tr>
<td>Cross-section Chi-square</td>
<td>29.435413</td>
<td>4</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Random effects model is insignificant in all three cases that is entity random effects, time period random effects and both random effects. Moreover, applying Hausman test also indicates that fixed effects model is being more appropriate. Hausman test is used to select between fixed effects model and random effects model. P-value for the test is 0.0000 which is less than level of significance. Therefore, fixed effects model is more appropriate.

These results are consistent with results of Omran and Bolbol (2003) and Hermes and Lensink (2001) and Saini (2010). This implies that FDI is being impacted by the SMD of the local country. If it is a developed market, it might attract more foreign investors to invest in the country and thus benefit the economy.

The results reveal that stock market development is being an important variable for the attraction of foreign direct investment into these countries. The findings are consistent with those of Lee and Chang (2009). Development of stock market denotes the capacity and financial development of an economy. Most often, foreign direct investment brings technology, competition and opportunities which need developed financial institutions to provide for funds. If this facility is provided, foreign firms are more willing to invest in the country and expand their innovative activities (Rajan and Zingales, 1998; Hermes an d Lensink, 2003). This might be one reason for the relationship.

V. Conclusion

Economic growth models consider capital an important source of growth. Therefore, these two sources of capital are important for an economy. Their relationship confirms their importance and their role in the economy as explained by economic growth models. Therefore, their relationship is point of interest to make policies for the country. Exploring the relationship of FDI and SMD in five Asian emerging economies, it is found that SMD plays an important role in attracting FDI into the country. Foreign direct investment plays very positive role for the development of economy. Therefore, it might be recommended that development of stock markets should also be promoted through policies. As other policies are made to attract FDI, development of stock market should be an important objective of these policies. Because developing stock markets of the economy would bring many other benefits as well along with attracting FDI. However, no evidence for impact of FDI on SMD was found. This finding is consistent with findings of Herzer et al.(2008) and inconsistent with those of Raza et al.(2010).
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