Interaction between Domestic and Foreign Direct Investment in Thailand

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Author’s contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

This paper has investigated interdependency between Foreign Direct Investment (FDI) and Domestic investment in Thailand for period 1975-2013. Following the model which comprises FDI, Investment (INV) and Gross Domestic Product (GDP), and estimated through ADF unit root, Cointegration and Granger Causality. The empirical outcome of this study suggests that FDI, INV and GDP have long run association. The Causality findings also indicate that FDI causes INV, while both FDI and INV are causing GDP, which implies that FDI and Domestic Investment mutually promoting each other and hence reject the crowding out Hypothesis in this case of Thailand. Government should make necessary reforms in order to make sufficient inflow of FDI which will also contribute to economic growth.

Keywords: Domestic investment; Foreign Direct Investment (FDI); cointegration; ECM.

1. INTRODUCTION

Developing countries often gave incentives to enhance capital inflow, especially from last two decades less developing countries have made several fiscal and monetary reforms in order to enhance capital inflow. Capital inflow can be in form of Foreign Direct Investment (FDI), Portfolio

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investment and economic grants and loans. Host countries pay interest and principal upon portfolio and economic grants & loans while FDI does not pay any interests and principal amounts, due to this feature FDI has more attractiveness to host country. The effects of FDI in the host economy are normally believed to be; increase in the employment, augment in the productivity, boost in exports (Falki [1]). Foreign Direct Investment (FDI) can play a significant role in accelerating economic activities in host country growth via simulating domestic investment enhancing human capital formation, generating employment opportunities and diffusion of new technologies to the host country. FDI is the most needed capital fund and provided a supplement to finance current account deficit (Shah and Ahmad [2]).

FDI may affect domestic investment in numbers of ways it can be decomposed theories regarding FDI and investment into two sub categories namely micro (industrial organization) theories and macro finance (cost of capital) theories (Razin [3]). In early literature FDI are mainly discuss in microeconomics framework with imperfect competition in product market which give incentive to foreign investor to expand their market power. Imperfect market situation allows foreign investors to that holds product superiority, and superior marketing strategies, introducing advance technology and gain economies of scale via enlarging production.

FDI is largely discussed in macroeconomic theoretical framework; FDI has positive association with exchange rate depreciation in host country. Deprecation lowers the cost of production and investment in host country and increase the profitability of FDI. Similarly depreciation has also wealth effect and thus rise FDI via raising the relative wealth of foreign firms, this capital is further used to invest abroad (Froot [4]; and Razin et al. [5]). Despite the fact that FDI exert positive impact to speed up economic growth, FDI is found to crowding out domestic investment in some cases. The realistic impact of FDI on domestic investment empirically is still imprecise. In fact, the empirical evidence varies from country to country, region to region (Eregha [6]). The economy of Thailand a newly industrialized and it successfully achieved to export from the primary product to the manufacture products, however in past it basically agriculture export economy. Thailand is an attractive place for foreign investment and its policies mainly focused on free trade. FDI has opened employment opportunities to Thai youth and import numerous technology advances in product sector. Like many other counties Thailand also gave incentives to acquire FDI and the amount of FDI rose from USD 85626229 to 1264974951.77, from 1975 to 2013. The Thailand Board of Investment offers verify of opportunities to foreign investors in order to insure to more capital inflow to the country. The Business Act is mainly defining the ownership of assets in the country. Various tax incentives have been given to foreign investors including the reduction of 50 percent corporate income tax, exemption is applied to the invest in the selected industries. Since it Thailand welcomes investors from all over the world, therefore it is highly desirable to examine the impact of foreign direct investment on local investment. Therefore the present study is trying to analyze the impact of foreign direct investment on local investment, which will provide a valuable policy recommendation to Thai government.

2. LITERATURE REVIEW

Li et al. [7] the China’s FDI flow to Thailand, they used investors’ satisfaction level as dependent variable, while financial resource capabilities, physical capabilities, technical capabilities, organization capabilities, human capabilities and innovation capabilities are used as explanatory variables in their model. Their research outcomes show that Chinese FDI has positive and significant effect on available physical resources which implies that FDI inflow from China has positive implication for local investment in Thailand.

Tanomponkang and Hovey [8] studied the Foreign Direct Investment (FDI) impact on emerging markets with the case of Thailand. The primary objective of their study is to investigate the impact Australian FDI to Thailand. They used different resources and found that FDI has positive implication for the most of the variables, implying to boost up local market.

Desai et al. [9] found that FDI stimulated domestic investment and efficiently contributed to domestic capital stock. There has been two perception for the impact of FDI inflow one is crow in effect, which means that FDI inflow increases local investment, the other perception is the crow out effect, which implies that foreign direct investment, decrease the local investment. To this context in our case the empirical findings leads to rejection of the crowing out effect of foreign direct investment for local investment.
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Girma, et al. [10] investigated the outbound effect of FDI and their result indicated that low level of foreign investment bring more businesses for the firm at home country, which implies that FDI inflow increase local investment. Contrary to this a higher level of FDI inflow doesn’t has significant implication for the local investment and low level of domestic investment is boost against the higher level of foreign investment.

Eregha [6] used panel cointegration analysis for period 1970-2008 for Economic Community of West African States (ECOWAS). It is found that Foreign Direct Investment (FDI) inflow crowding out the domestic investment in ECOWAS region. This happened because foreign direct investment harms local investment due to capturing the local investment market demand etc.

Goedegebuure [11] analyzed the outward impact of FDI on domestic investment for Netherlands for period 1996-2000 and stated that FDI outflow is playing supportive role for the desire period and FDI has positive association with domestic investment. This means that FDI inflow in Netherlands can increase local investment.

Steven and Lipsey [12] studied interaction between domestic and foreign investment using US production and finance sector. They found the little interaction between foreign investment and production sector, while finance sector has strong impact on foreign investment.

Ndikumana and Verick [13] examined the impact of FDI inflow on local investment in Sub-Saharan African countries and examine the hypothesis of crowding out. They found that FDI discourages domestic investment and found the crowding out domestic investment in Sub-Saharan African counties, while it has positive impact on growth.

Agosin and Mayer [14] concluded that FDI has not always pleasant effect on investment for every economy because in some cases domestic investment crowding out domestic investment. Nevertheless, most of studies have found the evidence of positive association between FDI and domestic investment.

3. ECONOMETRIC METHODOLOGY

This study uses time series data, which analyzes through the conventional time series. Following the Irfan-Ullah et al. [15] model for the empirical analysis as follows:

FDI = (GDP, INV)

Where

FDI = Foreign Direct Investment inflow
GDP = Gross Domestic Product
INV = Investment, which is gross capital formation

Theoretically, there should be a positive long run relationship between FDI, Investment, GDP, portfolio investment.

The conventional Ordinary Least Square (OLS) technique has several flaws in estimation while using long period time series data including unidirectional estimation, spurious results, therefore I will use more advance appreciate techniques like unit root analysis, cointegration and causality techniques. Since I are using long period time series data, therefore, it is highly desirable to check stationary properties of the relevant variables, Augmented Duky Fuller (ADF) test has been carried out to determine the order of integration by estimating following regression:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_t - 1 + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-1} + \varepsilon_t$$

Suppose if t-values (t=τ) of δYt-1 exceeds from critical τ values one can accept the hypothesis that δYt-1 is non-stationary. Cointegration analysis will use to find long-run relation between the variables. There are mainly two major approaches used for cointegration analysis namely Engle and Granger [16] approach and Johansen technique. I am using Johansen and Juselius [17] Cointegration which is preferred to Engle and Granger [16] technique for several statistical reasons. Johansen methods is based on the trace and maximum Eigenvalue to test statistics for cointegrating vectors if statistical values exceed than critical values one may reject the hypothesis of no cointegration and vice versa. If series does not cointegrated, Granger Causality test can be used (Angela and Lee [18]; and Afzal [19]) Suppose taking bivariate case as:

$$\Delta Y_t = \alpha_0 + \alpha_2 \Delta Y_{t-1} + \ldots \ldots + \alpha_n \Delta Y_{t-1} + \beta_0 \Delta x_{t-1} + \ldots \ldots + \beta_m \Delta x_{t-1} + \varepsilon_t$$

$$\Delta Y_t = \lambda_0 + \lambda_1 \Delta x_{t} + \ldots \ldots + \ldots + \gamma \Delta Y_{t-1} + \varepsilon_{t-1} + \gamma \Delta Y_{t-1} + \varepsilon_t$$
Causality can be estimated using equations by testing null hypotheses $\beta_i = \gamma = 0$ against the alternative hypotheses $\beta_i \neq 0$, and $\gamma \neq 0$. There may be bidirectional, unidirectional, and no causality if $\beta_i$ and $Y_i$ are statistically significant, $\beta_i$ and $Y_i$ is statistically significant and both are insignificant respectively (Afzal [19]). This study uses time series data from 1975 to 2013 empirical investigation; Data for all variables are collected from World Bank Database.

4. EMPIRICAL FINDINGS

For our convenience I separately estimate equations 1 and 2. Table 1 and Table 2 show OLS results respectively.

All the variable are non-stationary at level and became stationary at first difference, which is desirable to carry out Johansen cointegration test. Engle and Granger [16] suggested that if variables are integrated at order 1, there should be possibility of long run relationship, which is also supported by Johansen and Juselius [17] cointegration in Table 2.

Both Maximal and trace Eigenvalue values reject the null hypothesis of No cointegration. The cointegration findings show that three possible vectors in the system both in maximal Eigen value and trace statistics at 5 percent level of significance. This implies that all variables FDI, INV and GDP have long run relationship between each other. Since cointegration only provide information regarding the long run relationship among the variables, it doesn’t give information about the mutual interaction of between the variables, therefore I am applying the standard Granger causality test in order to know the mutual relationship between the variables.

Table 1. ADF unit root test

<table>
<thead>
<tr>
<th>Variable</th>
<th>At level</th>
<th>At 1st difference</th>
<th>Conclusion</th>
<th>Order of integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDI</td>
<td>0.795971</td>
<td>-8.324516</td>
<td>Non-stationary at level</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.950117)</td>
<td>(-1.950117)</td>
<td>Stationary at level at 1st difference</td>
<td>I(1)</td>
</tr>
<tr>
<td>INV</td>
<td>1.500277</td>
<td>-4.960261</td>
<td>Non-stationary at level</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.949856)</td>
<td>(-1.950117)</td>
<td>Stationary at level at 1st difference</td>
<td>I(1)</td>
</tr>
<tr>
<td>GDP</td>
<td>4.595211</td>
<td>-3.098322</td>
<td>Non-stationary at level</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.949856)</td>
<td>(-1.950117)</td>
<td>Stationary at level at 1st difference</td>
<td>I(1)</td>
</tr>
</tbody>
</table>

*All the values are computed with an Intercept and no trend; ** Parenthesis shows relevant critical values

Table 2. Johansen cointegration

Trend assumption: No deterministic trend
Series: FDI GDP INV
Lags interval (in first differences): 1 to 1

Unrestricted cointegration rank test (Trace)

<table>
<thead>
<tr>
<th>Hypothesized</th>
<th>Trace</th>
<th>0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of CE(s)</td>
<td>Eigenvalue</td>
<td>Statistic</td>
</tr>
<tr>
<td>None *</td>
<td>0.440870</td>
<td>38.25102</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.278933</td>
<td>16.74024</td>
</tr>
<tr>
<td>At most 2 *</td>
<td>0.117869</td>
<td>4.640354</td>
</tr>
</tbody>
</table>

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level; * denotes rejection of the hypothesis at the 0.05 level; **MacKinnon-Haug-Michelis (1999) p-values

Unrestricted cointegration rank test (Maximum eigenvalue)

<table>
<thead>
<tr>
<th>Hypothesized</th>
<th>Max-Eigen</th>
<th>0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of CE(s)</td>
<td>Eigenvalue</td>
<td>Statistic</td>
</tr>
<tr>
<td>None *</td>
<td>0.440870</td>
<td>21.51078</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.278933</td>
<td>12.09988</td>
</tr>
<tr>
<td>At most 2 *</td>
<td>0.117869</td>
<td>4.640354</td>
</tr>
</tbody>
</table>

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level; * denotes rejection of the hypothesis at the 0.05 level; **MacKinnon-Haug-Michelis (1999) p-values
### Table 3. Pairwise granger causality tests

<table>
<thead>
<tr>
<th>Null hypothesis</th>
<th>Obs</th>
<th>F-statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP does not granger cause FDI</td>
<td>37</td>
<td>8.21227</td>
<td>0.0013</td>
</tr>
<tr>
<td>FDI does not granger cause GDP</td>
<td>0.47544</td>
<td>0.6259</td>
<td></td>
</tr>
<tr>
<td>INV does not granger cause FDI</td>
<td>37</td>
<td>7.05599</td>
<td>0.0029</td>
</tr>
<tr>
<td>FDI does not granger cause INV</td>
<td>0.68943</td>
<td>0.5092</td>
<td></td>
</tr>
<tr>
<td>INV does not granger cause GDP</td>
<td>37</td>
<td>3.89223</td>
<td>0.0307</td>
</tr>
<tr>
<td>GDP does not granger cause INV</td>
<td>6.44462</td>
<td>0.0044</td>
<td></td>
</tr>
</tbody>
</table>

The Granger causality result shows that FDI causes INV, which means that FDI is boosting up local investment. Similarly, FDI and INV also cause GDP, which implies that both FDI and local investment generates economic growth (GDP). This analysis rejects the crowd out effect of FDI for the local investment. The data for the all variables are obtained from World Bank database online and all variables are taken on current US dollar.

### 5. CONCLUSION

This study examines interaction between Foreign Direct Investment and Domestic Investment in Thailand for period 1975 to 2013. This study adopts Irfan-Ullah model which has three variables in the system, one is GDP, second is FDI and third is local investment (INV). The empirical findings of this study show that all variables hold a long run relationship between each other. This mean FDI, INV and GDP are affecting each other in long run, however cointegration results only provide information regarding the number of cointegrating vectors, and it does not give efficient information mutual relationship between the variables. Therefore Granger causality test is applied which indicates that FDI causes INV which implies that FDI stimulates local investment in Thailand. Similarly FDI and INV also cause GDP, which shows that both FDI and INV are boosting up economic growth in Thailand. To summarize the results FDI and local investment generates economic growth (GDP) and this analysis rejects the crowd out effect of FDI for the local investment. Which implies that FDI does not crowding out domestic investment and, FDI has positive contribution to domestic investment activities and expand domestic investment via spillover of new technologies and make easier access to international market.

Both FDI and domestic investment can stimulate GDP and other variables like employment and production. To this context Thai government should make both fiscal and Monetary reforms congenial to foreign investors and encourage FDI inflow which in other way will expand domestic investment. Similarly exchange rate uncertainty also discourage FDI, Government should adopt sound exchange rate policies in order to promote FDI inflow.

### COMPETING INTERESTS

Author has declared that no competing interests exist.

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