

# The crowding effects of foreign direct investment on domestic investment: Evidence from Asia

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## Keywords

Foreign Direct Investment, Domestic Investment, Instrumental Variables, Fixed Effect, Random Effect, Panel Regression.

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## Abstract

*This paper intends to investigate the impacts and consequences of the inflow of Foreign Direct Investment (FDI) on Domestic Investment (DI) by the occurrence of the financial crisis (before, during and after Asia financial crisis) in Asia. The data were collected from 1993 to 2001 and separated into three sub-periods of 1993-1995 (Before Asia Financial Crisis), 1996-1998 (During Asia Financial Crisis) and 1999-2001 (After Asia Financial Crisis), consisting of 38 Asian countries. In this paper, we estimated the data using the balanced panel data of Fixed Effects (FE) and Random Effects (RE) estimators with the existence of Instrumental Variables (IV). The general empirical finding found that FDI has crowded out (negative) effect on DI for all sub-periods where sub-periods during and after the Asia financial crisis showed significant results. Thus, this study concludes that the inflow of FDI is not statistically significant and harmful for DI before the Asia financial crisis. However, the impact of FDI is significant but negatively correlated with DI for the case of during and after the Asia financial crisis. Therefore, this study reveals that different economic conditions influence the inconsistent significance or not significant impact of FDI on DI in Asian countries.*

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## 1. Introduction

While the world acknowledges that financial crisis is a disruption to economic stability, a small number of studies have been executed to consider these effects. Back in 1997, the world has witnessed the worst crisis ever experienced by the Asians. Along with the greatest crisis burst, foreign direct investment (FDI) slowly spread in affected countries to put itself up as a fundamental alternative for economic recovery. Unfortunately, the country's effort to encourage FDI itself did not affirm spillover effect on DI although it was good for economic recovery. In essence, not all countries experience the effect via improvement of domestic investment (DI).

Domestic investment has great attention in the economies of countries, as it is crucial toward economic development. A study done by Firebaugh (1992) mentions that domestic investment has a greater potential to grow the relationship inside domestic industries. Moreover, Kowalski (2000) believes that domestic investment is a symbolic sign of the growth of an economy. There is an irrefutable proof that domestic investment is one of the tools that leads to the economy to be speedier and easier to

maintain via productivity, capital creation, developmental progress and exporting. Therefore, influencing investors to invest in their own country probably gives the best prospect for domestic investment.

However, the surge in economic stability due to the crisis twists the role of DI on economic growth, resulting in DI role to be no longer helpful. At the time of Asia financial crisis in 1997, DI trend dropped simultaneously with a plunge in GDP that added emphasis on economic shock. The local firm could not thrive to escape from the crisis and ended up declared as default. Turning this phenomenon into an advantage, FDI played their role, resulting in the trend facing radical increase, especially in particularly affected countries like Thailand, the Philippines and South Korea. Most of the firms in these countries experienced financial losses during the crisis. With the high cost of production and slow value of the currency, firms might not survive. This was the starting point where the firms were forced to sell overall or part of their assets with lower costs to survive (UNCTAD, 1998). Transnational companies (TNC) abroad looked at this phenomenon as a chance to invest with lower cost, hoping that it would bring higher profit in the future. This can be considered as one of the reasons for relatively increasing FDI inflow in affected countries.

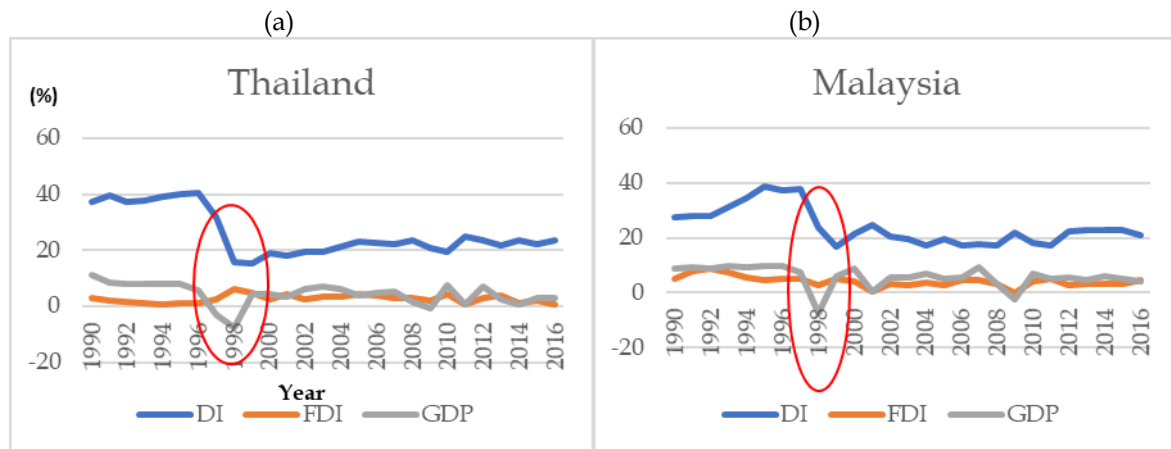


Figure 1: Trends of domestic investment (DI), foreign direct investment (FDI) and gross domestic product (GDP) in affected countries Thailand (a) and Malaysia (b).

Source: World Development Indicators, World Bank (2018)

Figure 1 shows two affected countries where 1(a) displays inconsistent trends for DI, FDI and GDP during the Asia financial crisis with the most affected year of 1998 for Thailand. At the time of crisis, both DI and GDP experienced simultaneous decline in trends. Interestingly, FDI seemed not affected by the surge in Asia financial crisis as the trend flowed in the opposite way. FDI trend kept increasing in time of crisis. As mentioned by Chowdhry and Goyal (2000), Thailand claimed to be the starting point of Asia financial crisis when their currency (bath) lost its value against the dollar. However, Thailand faced the highest rate of FDI among the five most affected countries, which are Thailand, the Philippines, South Korea, Malaysia and Indonesia. The Philippines and South Korea also experienced a similar situation with Thailand where FDI increased while both DI and GDP dropped in time of crisis. This study assumed that the foreign investors were most probably taking high risk by investing in affected countries and expected to gain higher return in the future. This situation aroused an issue and created the lead role in this study.

Meanwhile, Figure 1(b) shows the flow of DI, FDI and GDP in Malaysia. Contrast to the trend shown in Figure 1(a), the trends varied up and down simultaneously for all three variables over 24 years, especially in the year 1998, where Asia financial crisis reached its peak. Thus, this study assumed that, even though Malaysia was listed in the five most affected countries during the Asia financial crisis, its

effect was consistent as it faced dropped rates for all three variables. Another affected country was Indonesia. In essence, this paper comes out with the question of “what is the crowding effect of FDI inflow on DI in the host country?”, and for some reasons, “why FDI and DI trends are inconsistent in different phases of the economic condition?”

Furthermore, this paper detects the argument in Keynesian theory of investment. As explained by Froyen (2013), Keynesian theory believes that people are attracted to invest as interest rate falls. With low interest rate, they may get a low cost of borrowing with hope of achieving higher rate of return in the future. Meanwhile, foreign investors are discouraged from investing when the interest rate in the host country is low.

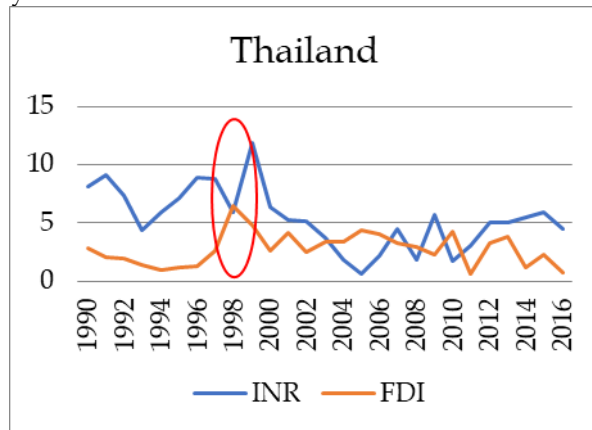


Figure 2: Trends of Interest Rate (INR) and FDI in the affected country, Thailand.

Source: World Development Indicators, World Bank (2018)

FDI and Interest Rate (INR) trends for Thailand are used as an example for argument in theory by Keynes, as shown in Figure 2. The opposite situation occurred during Asia financial crisis where FDI extremely rose with obvious increase in the year 1998 although interest rate trends fell incredibly. It might be due to foreign investors at the time of crisis being not very sensitive with the volatility of interest rate. This situation is against the theory by Keynes, but is supported by the theory of FDI by Hymer (1976) who mentions that higher or lower interest rate could not guarantee FDI to be able to attract foreign investors to invest in a country. Thus, the issue has driven this study to focus on “crowding effects “of FDI on DI in host Asia countries in different economic conditions (before, during and after the Asia financial crisis).

## 2. Literature Review

A study of FDI by Sohn (2014) applied the Knowledge-Capital model (CMM) where they concluded that FDI inflow of China does not pose a threat to neighbouring ASEAN countries unless they are complementary to each other. Another study done by Ang (2009) investigated the long run relationship between private domestic investment, public investment and FDI in Malaysia during the period of 1960-2003. By implementing the multivariate co-integration method, the results reveal that both public investment and FDI are complementary rather than competing with private domestic investment.

Kim and Seo (2003) examined the dynamic relationship between inward FDI, Domestic Investment (DI) and economic growth for Korea from 1985 to 1999 by using the innovation accounting techniques and Vector Autoregression model. They found that there is no evidence that FDI crowds out domestic investment in Korea. Concerned on the impact of FDI on private domestic investment in 91 developing countries for the period of 1970-2000, the GMM estimator employed by Al-Sadig (2013) found

that a one percentage point increase in FDI inflow could increase (crowd in) by nine percent point on domestic private investment.

Contradict finding was reported by Kamaly (2014) which used panel data on 16 emerging countries over 32 years that covered the period of 1978-2010. By using the Two Stage Least Square (2SLS) and Three Stage Least Square (3SLS) estimations, the results suggest that FDI could crowd out DI in some countries (Mexico, Israel and Peru) but have neutral effect in the long term for most of the countries (12 out of 16 countries) as in the sample, where only Morocco is confirmed to have crowd in effect. Gocer, Mercan, and Peker (2014) carried out a study in 30 developing countries involving Asian, African, Latin America and the Caribbean. For this purpose, data were taken from 1992 to 2010, and the GMM estimator for dynamic panel analysis was used. According to empirical results, FDI has a crowd-out effect on DI in Latin America, Asian and Caribbean countries, as well as a crowd-out effect on DI in African countries. As a whole, FDI has a significant impact on the total level of investment in developing countries.

A study by Morrissey and Udomkerdmongkol (2012) intended to investigate the relationship between FDI and DI in developing countries with the existing governance factors. The sample range was in the period of 1996-2009, while two governance factors considered in this study were political stability and corruption. The empirical results prove that there is an existence of crowding out effect of FDI on DI in a host country, as good governance (political stability) increases the total investment for both FDI and domestic private investment. However, a study conducted by Ipek and Kizilgöl (2015) in developing countries found mixed results where FDI has a crowd out effect on DI in Turkey and South Africa, crowd in effect in Russia, while Brazil and Mexico show a statistically insignificant effect on DI.

Another study by Wang (2010) compared the crowding effect of FDI on DI between developed countries and less developed countries. The study claims that FDI has a crowd-out effect on DI in a short-term period, although the effect is neutral during a long-term period. In contrast, less developed countries reported a neutral effect of FDI on DI for a short-term period and crowd-in effect for the case of a long-term period. By concentrating on the scope of developed countries, a study by Lipsey (2000) found that FDI tends to crowd out DI with evidence of negative coefficient of FDI value formed by the empirical result.

Apart from that, Pham (2016) who conducted the study on consequences of FDI on domestically-owned Vietnamese claims that FDI or foreign capital has a tendency to crowd out DI and make them lose the market share as they compete between firms. However, they can gain positive effect when the inflow of foreign capital into their industry is high. For the case of Malaysia, Lean and Tan (2011) applied the VAR system and ECM to reveal the unclear effect of FDI on DI in Malaysia. As a result, they found that FDI is complementary (crowd in) rather than a substitute (crowd out) DI in the host country of Malaysia. This gap and inconsistent trends of investments (FDI and DI) motivate the researcher to investigate further on the "crowding effects" of FDI on DI in the Asian region in different phases (before, during and after Asia financial crisis).

### 3. Research Methodology

Annual panel data were collected for 8 years ranging from 1993 to 2001 for all variables including Domestic Investment (DI), Foreign Direct Investment (FDI), Gross Domestic Product (GDP), Broad Money (M3), Domestic Credit to Private Sector (DCT) and Gross Domestic Saving (GDS). The time framework was separated into three sub-periods due to the Asia financial crisis, which are 1993-1995 (Before Asia financial crisis), 1996-1998 (During Asia financial crisis) and 1999-2001 (After Asia financial crisis). The data for all variables were obtained for only 38 Asian countries. All these data were collected from the World Bank and United Nations Conference on Trade and Development (UNCTAD) database and in annual percentage and percentage of GDP.

The method used in conducting this study was a static panel data approach involving Poolability test such as Breusch Pagan Langarian Multiplier (BPLM) test. Meanwhile, the Hausman test and Sargan-Hansen test in this paper aimed to choose between Fixed Effect (FE) and Random Effect (RE) model. Robust Standard Error was applied with the intention to deal with the existence of econometric problems (autocorrelation and heteroskedasticity) and Variance Inflation Factor (VIF) test applied in detecting multicollinearity problem. As this paper was also concerned on the existing endogeneity problem, Instrumental Variables (IV) estimator has been employed. Here, FDI and DI were assumed to have an endogeneity problem. In this study, the model of investment adopted was based on the model proposed by Agosin and Mayer (2000), which is shown as follows:

$$I_{i,t} = \alpha + \beta_1 F_{i,t} + \beta_2 F_{i,t-1} + \beta_3 F_{i,t-2} + \beta_4 I_{i,t-1} + \beta_5 I_{i,t-2} + \beta_6 G_{i,t-1} + \beta_7 G_{i,t-2} + \eta_t + \varepsilon_{i,t} \quad (1)$$

where  $\alpha$  represents constant, I = investment/GDP ratio, F = FDI/GDP ratio, G = growth rate of GDP,  $\eta$ =time dummies and  $\varepsilon$  = serially uncorrelated random error. However, in this study, we have related the domestic investment and foreign direct investment which included several important economic indicators as control variables as suggested by Chopra and Sachdeva (2014), Obafemi, Oburota, and Amoke (2016) and Olweny and Chiluwe (2012) on model regression (1), an empirical model for this study which is as follows;

$$LDI_{it} = \alpha + \beta_1 LFDI_{it} + \beta_2 LGDP_{it} + \beta_3 LM3_{it} + \beta_4 LDCT_{it} + \beta_5 LGDS_{it} + \varepsilon_{it} \quad (2)$$

where  $\alpha$  is equation constant,  $\beta_1$ - $\beta_5$  is the parameter of explanatory variables to be estimated,  $\varepsilon$  is error term, and subscript  $i$  and  $t$  denote the cross-section and time dimension, respectively. LDI represents domestic investment, LFDI is Foreign Direct Investment, and explanatory variable LGDP (gross domestic product), LM (broad money), LDCT (domestic credit to the private sector) and LDCT (domestic credit to the private sector). All the variables were in the form of percentage.

#### 4. Result & Discussion

The results showed significance for BPLM test in all three sub-periods as p-value was less than 0.05, where it was proven true that the models failed to be pooled by using OLS. Hence, the Hausman test has been employed which revealed that only the period of 1993-1995 was pooled by FE as it was significant, while sub-period of 1999-2001 failed to reject the model as pooled by FE. Meanwhile, sub-period 1996-1998 had a problem of non-positive definite difference covariance matrix in Hausman test which allowed us to perform the Sargan-Hansen test as an alternative to the Hausman test. Sargan-Hansen test revealed that sub-period 1996-1998 was pooled by FE as p-value was less than 0.05. After performing a diagnostic test for the econometric problem by using Modified Wald test, Wooldridge test, VIF test and Pesaran CD test, it was proven true that all sub-periods suffered from heteroscedasticity and autocorrelation. In contrast, none of the models suffered from multicollinearity and cross-section dependence.

Table 1: Regression table for Fixed Effect, Random Effect and IV- Regression in Asia region for period 1993-1995(Before Asia financial crisis), 1996-1998(During Asia financial crisis) and 1999-2001(After Asia financial crisis)

Variables	1993-1995		1996-1998		1999-2001	
	(1)	(2)	(1)	(2)	(3)	(4)
LFDI	-0.0406 (0.0468)	-0.0380 (0.0847)	-0.0886* (0.0509)	-0.1238 (0.0859)	-0.0777*** (0.0207)	-0.0490** (0.0231)
LGDP	-0.1269 (0.0976)	-0.3812** (0.1739)	-0.0018 (0.0235)	-0.0321 (0.0440)	0.0155 (0.0269)	0.0403 (0.0326)
LM3	-0.0426 (0.1642)	0.2132 (0.6778)	-0.4881** (0.2222)	-0.2838 (0.2974)	0.1404 (0.1505)	0.1354 (0.1286)

LDCT	0.0473 (0.1118)	0.0951 (0.5343)	0.2614** (0.1335)	0.2654 (0.1838)	-0.1266 (0.1482)	-0.1261 (0.1271)
LGDS	-0.8016* (0.4143)	-0.2021 (0.3669)	-0.0465 (0.0716)	0.0142 (0.0724)	0.0622 (0.0659)	0.0521 (0.0576)
Constant	5.4643*** (1.4165)	3.0772 (2.0322)	4.0889*** (0.8529)	3.1878*** (1.0015)	2.5796*** (0.2312)	2.5750*** (0.2076)
Rsquared	0.1631	0.1771	0.1871	0.1795	0.1809	0.1546
Prob (F-Statistics)	0.4379	0.0001	0.0865	0.0000	0.0054	0.0848
BPLM	0.0032		0.0001		0.0001	
Hausman	0.0157		-		0.8928	
Sargan-Hansen	-		0.0001		-	
Wooldridge	0.0001		0.0966		0.0644	
Modified Wald	0.0001		0.0001		0.0001	
VIF	1.8800		2.6500		5.4500	
Pesaran CD	0.2217		0.2743		0.4084	

Notes: (1), (2), (3) and (4) represent the Fixed Effects with Robust Standard Error (FE), Fixed Effects Instrumental Variables (FE-IV), Random Effects with Robust Standard Error (RE) and Random Effects Instrumental Variables (RE-IV). Values in the parentheses are standard errors. The critical values are based on percentage levels of 1%, 5% and 10%, which correspond to 99%, 95% and 90% of confidence level. \*\*\*, \*\* and \* indicate significance at levels of 1%, 5% and 10%, respectively.

Based on Table 1, both estimators FE and FE-IV reported a negative relationship between FDI and DI where a 1 percent increase in FDI led to a decline in DI by 0.40 percent for sub-period 1993-1995 although not significant. Thus, crowd out effect occurred as FDI was able to reduce DI. Moreover, the trends of FDI and DI before Asia financial crisis displayed in Figure 1 also represented similar situation for two affected countries, which are the Philippines and South Korea, explaining the opposite effect of FDI on economic growth and DI as compared to the trends during Asia financial crisis. Before the Asia financial crisis, FDI showed constant trends and only started to increase during the Asia financial crisis through both GDP and DI. This study also observed a negative and significant effect of GDP on DI which can be explained as an indirect effect of GDP on DI where, as GDP increased due to the implementation of expansionary fiscal policy which led to a rise in interest rate which ended up being able to discourage people or investors from investing (Froyen, 2013). In spite of that, FE estimator reported that only GDS had a significant result in affecting DI at a 10 percent level. Other explanatory variables showed an insignificant effect on DI.

For sub-period 1996-1998 (during Asia financial crisis), FE estimator showed a negative and significant effect of FDI on DI. This effect induced that an increase in FDI by 1 percent was able to reduce 0.09 percent of DI. By adding some instrumental variables, FE-IV estimators also found a negative relationship between FDI and DI, yet it was not significant. During the Asia financial crisis, FDI played a small significant role in influencing DI which was most probably caused by lack of confidence by foreign investors in doing investment in the severely affected host country. However, the trends of FDI during the crisis for Thailand also represented similar situation with affected countries, the Philippines and South Korea, that showed an increase, which means that the number of FDI inflow into these affected countries was quite high. The increasing trends of FDI were probably driven by low cost of making the investment as interest rate fell and dropped in host countries' currency. It can be considered as one of the attractive factors in attracting foreign investors. DI may find it hard to compete with the high cost of borrowing and small value of the currency that led them out from the business market.

The estimation result and justification on trends of FDI, GDP and DI support a study by Ahmed, Ghani, Mohamad, and Derus (2014) where they state that the effect of FDI on DI in Uganda is influenced by economic sectors. For example, at the sectoral level, FDI has a significant crowd-in effect on manufacturing, mining and wholesale sectors, but does not have a significant effect on community, construction, electricity and finance sectors. During the Asia financial crisis, only two variables, which are M3 and DCT, are significant in influencing DI in Asia host country. FE estimator reported that an increase in M3 by 1 percent reduces DI by 0.49 percent. This empirical results support the study by Anastasia, Omade, and Osemen (2011) which explains that the negative effects are probably caused by poor funding of investment, expensive funds for entrepreneurs, the failure of the sector to efficiently carry out its intermediate functions and lack of confidence in the sector. Meanwhile, Elhiraika (2001) attributes a similar result of positive and significant effect of DCT on DI due to an increase in mobilisation of domestic resources and non-credit which are helpful in stimulating DI.

For sub-period 1999-2001 (after Asia financial crisis), FDI showed crowd-out and negatively significant effect on DI at 1 percent of significant level. For this reason, FDI can be considered as an important variable for economic growth, especially at a time after the Asia financial crisis burst. The performance of both GDP and DI declined during the crisis, this was where FDI played their role in helping countries that were severely hit by crisis throughout investing on default or nearly to default firm (UNCTAD, 1998). At this period, FDI was probably significant on DI through providing advanced technology, funds, and high skilled labour with the aim to recover from the crisis. However, crowd-out effect of FDI on DI once again revealed itself.

## 5. Conclusion & Recommendations

Domestic investment plays an important role in the economic development of a country. Regarding the economic crisis, the role of domestic investment started to decline along with falls in economic growth. FDI has started to play a significant role during the crisis burst. Thus, this study concerns the crowding effects of FDI inflow on DI in Asia for the case of the financial crisis by focusing on the Asia financial crisis. The Four estimation methods have been employed in this paper including FE, FE-IV, RE and RE-IV. Empirical results reveal that all three sub-periods have crowding out effect although only sub-period after the Asia financial crisis (1999-2001) is significant. This finding is similar to the study by McMillan and Harrison (2003) where they mention that the crowding out effect of FDI on DI is due to the increasing number of foreign firms. The higher the number of foreign firms, the more fund or credit should be provided by the domestic bank, which pushes the interest rate to increase and discourage DI. With regards to the Asia financial crisis, this paper concludes that FDI might endanger DI for all three sub-periods (before, during and after) of Asia financial crisis through crowd-out effect. For this reason, it can be assumed that FDI has significant and not significant effects on DI in three different economic conditions in Asian countries. However, the results show that FDI has crowd-out (negative) effect on DI for all phases of economic conditions. As the world is aware of the effect of the crisis on economic growth and development, FDI plays its role as an alternative for country recovery through the improvement of DI especially for the case of Asia in time of crisis. As more FDIs are attracted to invest in affected countries due to the factor of low interest rate leading to the low cost of borrowing, thus DI could crowd out from the market of investment. In spite of that, DI may fail to compete with foreign firms due to a problem like scarce of financial resource and technology as most of Asia consist of developing countries. In turn, FDI may easily crowd out local firms, especially small firms and monopolize the market.

### 5.1 Policy Implication

As not all FDI inflow produces positive spill-over effect in the host country, this paper suggests that the country should implement screening strategy which allows them to screen and choose which type of FDI is more beneficial to the local firm and DI. Specifically, the country should consider the effort of applying vertical FDI, which may help the profitability and success of local firms. Vertical FDIs are directly linked with local firms where foreign-owned companies make local firms their suppliers. Instead of importing part of the production function from another country, they purchase input from local firms that may contribute to the profitability of the local firms. Thus, these types of FDI are able to create positive spill-over effects on the local industry as a whole as well as local firms.

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