



DEVELOPMENT OF INWARD FOREIGN DIRECT INVESTMENTS IN THAILAND: DETERMINANTS, EFFECTS AND IMPLICATIONS



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ABSTRACT

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Foreign direct investment (FDI) has played an important role in Thailand's economic growth and development. Since 1988-1990, Thailand has been a major destination for FDI. The aim of this study is to investigate the main determinants of Thailand's inward foreign direct investment (IFDI) and apply a panel data model to identify which determinants have significantly affected Thailand's inward FDI. We consider FDI inflows into Thailand in relation to its five most impacting partner countries throughout the periods 1997-2014. Our empirical results have shown that market size, Thailand's openness, geographical distance, bilateral trade agreements and R&D intensity have positive and statistically significant effects on Thailand's inward FDI. On the other hand, exchange rate, global financial crisis and relative wages have a negative effect, while Asian financial crisis and Thailand's political risk are insignificant effect on Thailand's IFDI. We hope that our empirical results may provide investors and policymakers with guidance for making appropriate investment decisions.

Contribution/ Originality: This study contributes in the existing literature about investigating the main determinants of Thailand's inward foreign direct investment (IFDI) and apply a panel data model to identify which determinants have significantly affected Thailand's inward FDI. We consider FDI inflows into Thailand in relation to its five most impacting partner countries throughout the periods 1997-2014. Our empirical results have shown that market size, Thailand's openness, geographical distance, bilateral trade agreements and R&D intensity have positive and statistically significant effects on Thailand's inward FDI.

1. INTRODUCTION

Foreign direct investment has played an important role in the evolution of globalization and has been a keystone of both industrial expansion and economic development. Thailand has been one of the major destinations for FDI from the 1988-1990 periods until now. In general, there are two ways that organizations launch strategies to manage trades and investments in host country: one is foreign trade and the other is foreign direct investment. Direct investment means investing, producing, marketing products and operating a business abroad. When a firm or an industry chooses to directly invest in a host country, it can not only make full use of the host country's resources for producing and marketing but also reduce the distance between them and their end consumers and

avoid trade barriers, delivery costs and transaction costs. Thailand has also followed this process to implement inward FDI to expand industrial growth and strengthen economic development. IFDI not only provides capital for investment but also technological, knowledge, management and intellectual capital. This will increase the competitiveness of a nation and stimulate the growth of its economy. Especially within developing countries, governments often try to develop an investment friendly environment to attract IFDI. With these inflows, the host country expects to receive not only capital but also technology and management expertise to finally attain higher levels of development (Borensztein *et al.*, 1998; Kohpaiboon, 2003; Wu and Hsu, 2008; Pradhan and Singh, 2009). Beneficiaries of FDI frequently obtain employee training during the course of operating the new business, which contributes to human capital development in the host country. Profits that are induced by FDI lead to corporate tax revenues in the host country (Loungani and Razin, 2001). According to the UNCTAD World Investment Report 2013, Thailand was among the 8 priority destinations for foreign investment during the 2013-2015 periods, the 7th largest FDI recipient in East and Southeast Asia. The largest inward FDI flows in 2013 were from Japan, Hong Kong, the Netherlands, Malaysia, Singapore and the United States. Despite severe flooding in 2011, internal political tensions and global financial crisis, Thailand continues to maintain an open, market-oriented economy and encourages foreign direct investment as a means of promoting economic development, employment, and technology transfer. After many ups and downs, Thailand is still a major destination for foreign direct investment, and investment into Thailand still shows an increasing trend. As of which the main determinants and implications of this increasing trend are important issues for this study.

Thailand has been one of the significant recipients of FDI among developing countries and had the fastest growing level of exports in manufactured goods among Asian economies. Inward FDI has increased rapidly since Plaza Accord Agreement in 1985. However, there was evidence of a sharp drop in IFDI during 2002 because of a decrease in M&As and the decline to compensate for the excess capacity. Though in 2010, Thailand did better than the global trend and the developed economies by maintaining a ratio of inward FDI to GDP above 2%. As a member of ASEAN Economic Community (AEC), Thailand will require greater IFDI to enhance economic, social and political relationships among the countries of AEC and around the world. Thailand has faced substantial growth in FDI globally; this type of increased growth has drawn scholars and researchers to put more effort into understanding the empirical determinants and the relationships between a country's growth and FDI inflows. However, they mostly only considered time series analysis as combined IFDI amount from all sources (aggregate FDI data) and single partner issues (Thanyakhan, 2008; Boonlua, 2011; Sussangkarn and Nikomborirak, 2011; Sermcheep, 2013; Anuchitworawong and Thampanishvong, 2014). This paper considers the use of panel data from Thailand FDI inflows by source country, allowing us to determine the temporal evolution of groups of countries rather than analyzing the temporal behavior of each of them. These issues again suggest that it would be important to identify the main determinants of Thailand's IFDI. In order to produce a more complete examination of the determinants of Thailand's inward investment, this study will specify an empirical model that allows detection of the factors affecting inward investment in Thailand using panel data for different countries to specify a more appropriate model and secure more realistic information for FDI decision making.

The reminders of this study are organized as follows. Section 2 discusses a review of the relevant literature. Section 3 presents model specification and hypothesis development. Section 4 describes the empirical results. This study provides the concluding remarks in Section 5.

2. LITERATURE REVIEW

Before embarking on a detailed analysis for the determinants of IFDI in Thailand, the related literatures are reviewed in order to obtain the more realistic revelations for model specifications in this study. In this section, we will depict the literature review on Thailand's inward FDI.

The main recent studies of Thailand's inward FDI are reviewed. [Thanyakhan \(2008\)](#) evaluated the determinants of FDI in Thailand by applying an extended gravity model to obtain empirical results from 1980 to 2004. His aim was to investigate the determinants and effects of the Asian Financial Crisis on FDI into Thailand. His results showed that Thailand's inward FDI is supply-driven and is significantly influenced by its investment partners and found that Asian Financial Crisis had no impact on the determinants of FDI inflows into Thailand. [Daly and Tosompark \(2011\)](#) also sought to identify the determinants of FDI inflows and considered the effects after the 1997 Asian Financial Crisis. Their empirical investigation considered the periods 1998–2008, which included the Global Financial Crisis of 2007–2008. They found that during the Global Financial Crisis, Thailand was the least affected Asian country with respect to declines in the level of inward FDI.

To assess the factors determining foreign firms' decisions to engage in FDI in Thailand, in an effort to create an appropriate investment climate to attract and promote more FDI, [Boonlua \(2011\)](#) noted that FDI plays an increasingly important role in Thailand's economy, which is highly dependent on FDI inflows from the United States and Japan. He employed the eclectic paradigm to compare the determinants of US and Japanese FDI in Thailand. His research revealed that the most frequently considered factors in deciding whether to engage in FDI are: infrastructure and political stability of the host country, market growth potential and cultural environments (social and cultural factors). In a different vein, to narrow the current savings–investment gap between Thailand and the United States by managing international trade and FDI, [Sussangkarn and Nikomborirak \(2011\)](#) examined potential external and internal economic rebalancing strategies for Thailand. Their results showed that broader rebalancing strategies would help Thailand to become relatively less dependent on exports. These strategies include: the need to improve technological innovation and talents, to increase economic efficiency by exposing non-traded sectors (particularly the service sector) and to create new dynamic industries (such as electronic commerce).

[Sermcheep \(2013\)](#) examined the pattern and the implications of FDI for Thai economy during 1978–2011 by using time series regression model. Regarding the effects on the Thai economy, inward FDI has constantly contributed to Thailand's economic growth and industrial development; despite that over the past few decades, the number of natural disasters has increased and affected Thailand's inward FDI. He pointed out that IFDI also causes industrial structure change in Thailand. [Anuchitworawong and Thampanishvong \(2014\)](#) attempted to detect the economic factors, especially concerning the determination of the effect of natural disaster on FDI by applying the simultaneous equations approach to account for between related variables. Their results revealed that per capita GDP, exchange rates, trade openness, consumer price index (CPI) have positive effects on Thailand IFDI but more severe natural disasters tend to reduce FDI flows into Thailand. In another detailed study, [Wattanadumrong et al. \(2014\)](#) considered the establishment of an extensive and detailed composite dataset to support country-level analysis over the period 1970–2004. They found that not all of the determinants of FDI inflows are under the direct control of the host country and that it may be difficult for the host country to change these variables. Push factors such as changes in the investing country's GDP and relative market sizes are important determinants of inward FDI. When considering IFDI to Thailand, macroeconomic policy via any manipulation of real exchange rates or efforts to increase GDP is likely to be less effective than expected. As such, country-level policies are not major factors for attracting FDI inflows, but concentration on direct policies such as tax incentives represents a more effective way to increase inward FDI.

It needs to be noted that the above literatures each used different main determinants for Thailand's inward FDI: including: market size, openness, wage rate, exchange rate, country distance, R&D intensity, trade agreement, political and financial crisis. However different literatures showed different effects (signs and magnitudes). Clearly there is no consensus among these studies on the factors affecting IFDI in Thailand, as different studies show different determinants influencing inward FDI flows. Likewise, they mostly consider time series analysis as combined IFDI amount from all sources (aggregate FDI data) and neglect to consider country specific aspects (cross sectional heterogeneity). Our approach involves the use of panel data of Thailand FDI inflows by source

country, in order to allow us to determine the temporal evolution of groups of countries rather than analyzing the temporal behavior of each of them. And thus reduce the likelihood of obtaining biased regression estimates through variable misspecification or omissions, taking into account the individual heterogeneity, permitting a larger number of data points and improving the efficiency of estimates.

3. MODEL SPECIFICATIONS AND HYPOTHESES DEVELOPMENT

Based on the related literatures reviewed in this study, when choosing the variables, we focus on determinants (variables) that are realistically related to the main source countries of inward FDI. The model specification and hypotheses development are discussed as follows.

3.1. Model Specification

In this section, the econometric model is outlined followed by a discussion of the variables, their measurements and expected effects.

$$LIFDI = f(LRGDP, LTOPEN, LRWage, LREX, LDIST, LRD, TBA, PR, D_{97}, D_{0814}, D, T)$$

The dynamic panel data model is utilized to incorporate the time-series and the cross-sectional aspects of the five countries under studies.

$$\begin{aligned} LIFDI_{jt} = & \beta_0 + \beta_1 LRGDP_{jt} + \beta_2 LTOPEN_{jt} + \beta_3 LRWage_{jt} + \beta_4 LREX_{jt} \\ & + \beta_5 LDIST_{jt} + \beta_6 LRD_{jt} + \beta_7 TBA_{jt} + \beta_8 PR_{jt} + \beta_9 D97 \\ & + \beta_{10} D8014 + \sum_{j=11}^{14} \beta_j D_{jt} + \beta_{15} T_{jt} + \varepsilon_{jt} \end{aligned} \quad (1)$$

The expected signs of the coefficients are

$$\beta_1 > 0, \beta_2 > 0, \beta_3 < 0, \beta_4 < 0, \beta_5 < 0, \beta_6 > 0, \beta_7 > 0, \beta_8 < 0, \beta_9 < 0, \beta_{10} < 0$$

where

LIFDI_{jt}: Inward FDI, annual inflows of real FDI into Thailand from country j

j: Country (Japan, Hong Kong, the Netherlands, Singapore, the United States)

t: Time (1997-2014)

LRGDP_{jt}: Market size, relative of per capita GDP between Thailand and home countries

LTOPEN_{jt}: Openness, ratio of Thailand's exports plus imports to GDP products

LRWage_{jt}: Relative wage rate, relative real wages between Thailand and home countries

LREX_{jt}: Relative exchange rate, relative exchange rates between Thailand and home countries

LDIST_{jt}: Geographical distance, distances between Thailand and home countries

LRD_{jt}: Relative R&D intensity, relative R&D expenditures of Thailand and home countries

TBA_{jt}: Bilateral trade agreement, the number of bilateral agreements signed by Thailand

PR_{jt}: Political risks in Thailand, where 1=periods of severe risk (2004, 2009, 2013-2014), 0 = Otherwise

D₉₇: Asia Financial Crisis 1996-1998, where 1=Asian Financial Crisis (1996-1998),

0 = Otherwise

D₀₈₁₄: Global Financial Crisis, Subprime Mortgage and Financial Tsunami 2008-2014, where 1 =Subprime

Mortgage and Financial Tsunami (2008-2014),

0 = Otherwise

D_{jt}: Country factors, where 1= Japan, 0= Otherwise; 1=Netherlands,

0= Otherwise; 1= Singapore, 0= Otherwise; 1= US, 0= Otherwise

T_{jt}: Time trend

ε_{jt} : Error term

The discussions above suggest the log-linear model; therefore, the data for the variables are transformed into natural logarithms, as we expect nonlinearities in the relationships based on both theory and previous empirical work.

3.2. Hypotheses Development

This study focuses on the countries that have the more realistically impact through the outstanding inward investment countries (Japan, Hong Kong, the Netherlands, Singapore and the United States) in Thailand during the 1997-2014 periods. Here, we will discuss the theoretical effects of independent variables on dependent variable and also leads hypotheses development.

Dependent Variable

Defining and Measures of IFDI (LIFDI_{jt})

In this study, we use panel data model to conduct an empirical study. Here, LIFDI_{jt} indicates the amount of inward FDI during the 1997-2014 periods from each country, including Japan, Hong Kong, the Netherlands, Singapore and the United States, into Thailand. We use the statistical size of inflow FDI into Thailand from the BOT website and then compute the logarithm for a variance stabilizing transformation.

Independent Variables

The Expected Effects of Independent Variables on Dependent Variable

Market Size (LRGDP_{jt})

Market size is the main attraction for investors entering a new market. According to the relevant literatures, market size is an influential factor in the FDI decision.-Thailand has a location advantage in market size and high technology needed in production. Market size has widely been cited as one of the main determinants of horizontal FDI, and according to [Jordaan \(2004\)](#) FDI is assumed to be attracted to Thailand, which is a country with an expanding market, potential purchasing power and higher profits. This market size hypothesis, says [Chakrabarti \(2001\)](#) supports an idea that a large market is required for efficient utilization of resources and exploitation of economies of scale; moreover, it is identified as an explanatory variable in most empirical studies of the determinants of FDI. Market size is generally measured by the relative per capita GDP between Thailand and the FDI home countries. Given above descriptions, hypothesis *H₁* can be developed.

H₁: The relative per capita GDP between home countries and Thailand would have positive effects on Thailand's inward FDI.

Thailand's Openness (LTOPEN_{jt})

The openness of a country can be determined by the volume of its imports and exports. Openness is one of the location advantages for investors entering a new economy to find new opportunities in production and distribution. Openness indicates how one country decreases barriers to entry for foreigners; therefore, this study will consider the openness of Thailand. [Chakrabarti \(2001\)](#) find mixed evidence regarding the significance of openness, which is measured mostly by the ratio of exports plus imports to GDP, in determining FDI. It is likely that economic conditions for a better investment environment overlap with conditions for a better international trade environment, or trade flows simply correlate with investment flows ([Ng, 2010](#)). The widely held hypothesis is as follows: given that most investment projects are directed towards the tradable sector, a country's degree of openness to international trade should be a relevant factor in these decisions. The impact of openness on FDI, says [Jordaan \(2004\)](#) depends on the type of investment. For market-seeking investments, trade liberalization (and therefore more openness) can have a positive impact on FDI. In contrast, multinational firms engaged in export-oriented investments often prefer to invest in a more open economy because increased imperfections that

accompany trade protection generally imply higher transaction costs associated with exporting. Here, openness is measured as the sum of exports and imports divided by gross domestic production. Based on above discussion, it is therefore hypothesized that

H₃: The openness of Thailand's economy would have positive effects on Thailand's inward FDI.

Wage Rate (LRWAGE_{jt})

A cheaper real wage for the host country relative to the home country means lower costs in production therefore attracting FDI. Thailand has relatively low labor costs compared to most other key emerging countries. Relative real wage between Thailand and FDI home countries is taken into consideration because wages are an indicator of labor and have been the most contentious of the determinants of FDI according to Chakrabarti (2001). Tsai (1994) also obtained strong support for the cheap labor hypothesis over the period from 1983 to 1986 but weak support from 1975 to 1978. Where labor cost is relatively insignificant with little variance in wage rates of Thailand relative to home countries, the skills of the labor force are expected to influence decisions about FDI location. Actually, it is still thought that the relative real wage rate has negative effect on Thailand's inward FDI. It is therefore hypothesized that

H₄: A real wage for the host country relative to the home country would have negative effects on Thailand's inward FDI.

Exchange Rate (LREX_{jt})

Theoretically, there is a negative correlation between host countries' exchange rates and FDI inflows because depreciation of the host country's currency allows foreign firms to purchase cheaper assets and technology a lower relative costs of capital, which then increase the relative wealth position of foreign firms and hence increase inward FDI. An appreciation of the local currency should reduce FDI inflows because local costs of production and wage rates increase and hence decrease FDI inflows (Chakrabarti, 2001). Substantially, as Thailand is well known for its instability, this would be an interesting variable in this study, that is, the relative exchange rate between Thailand and FDI home countries. The strength of a currency (exchange rate) is used as a proxy for the level of inflation and the purchasing power of the investing firm. Devaluation of a currency would result in reduced exchange rate risk. As a currency depreciates, the purchasing power of investors in foreign currency terms is enhanced. This reasoning leads to *H₅*.

H₅: The exchange rates are expected to have negative effects on Thailand's inward FDI.

Geographical Distance (DIST_{jt})

In this study, the distance between Thailand and the FDI home countries' exporting ports will be used to determine the geographical distance. The geographical distance between two countries is usually measured by the spatial distance between the capitals of these countries (Bergstrand, 1985). If the distance between them increases, the transportation of goods and services becomes more costly, and at the same time, history, culture and institutional backgrounds, and communication and management styles because of geographical distance may affect the determination of FDI. The volume of Thailand's inward FDI decreases with distance increase. Here, the geographical distance is measured in kilometers using the natural logarithm for variance stabilizing transformations. Therefore, we expect a negative relationship between the geographical distance and Thailand FDI inflows. It is hypothesized that

H₆: The geographical distance between home countries and Thailand is expected to have negative effects on Thailand's inward FDI.

Relative R&D Intensity (LRD_{jt})

Higher technological capability from investing in R&D is positively related with more extensive FDI, especially FDI in industrial countries by firms or countries. Firms that are rich in human skills tend to prefer majority ownership in FDI in a host country such as Thailand, as predicted by the internalization FDI theory (Tomiura, 2003). Developing countries, such as Thailand, need to stimulate R&D to attract inward FDI, and higher technology and creativity of production can improve manufacturing ability of the country and lead more FDI from other countries. The R&D investment of Thailand in Internet and communication technologies can also lead to the globalization of business operating in Thailand and reduce barriers to communication between two countries, hence increasing inward FDI. Here, relative R&D Intensity is measured as relative R&D expenditures between Thailand and the home countries. Thus, we expect a positive relationship between R&D intensity and Thailand's FDI inflows. It is therefore hypothesized that

H₆: The relative R&D intensity between Thailand and the home countries is expected to have positive effects on Thailand's inward FDI.

Bilateral Trade Agreements Signed by Thailand (TBA_{jt})

This study looks at the number of bilateral agreements signed by Thailand because of trade agreement between countries could attract FDI. Importing and exporting between countries with trade agreements between home and host countries may be more attractive. This is because tariffs may be avoided or reduced and larger profits can be gained. Thailand if became an exporter of certain goods and services and an importer of other products, it would have more opportunities to sign trade agreements with other countries to encourage its exports and imports because their increase will also provide more channels and opportunities for foreign investors engaged in FDI in Thailand. Bilateral trade agreements are signed between two nations made it fairly easy to negotiate and give those two nations a shared favored trading status. This type of trade agreement can reduce the costs of exporting products and services or importing products and services (Binh and Haughton, 2002; Banga, 2004). Therefore, investors are more willing seeks opportunities where a large number of bilateral trade agreements have been signed by a host country, further increasing inward FDI. Therefore, we expected that bilateral trade agreements will have a positive effect on Thailand's inward FDI and hypothesized that

H₇: The bilateral trade agreement signed by Thailand is expected to have positive effects on Thailand's inward FDI.

Political Risks in Thailand (PR_{jt})

Political risk is a type of risk faced by investors, corporations, and governments. It is a risk that can be understood and managed with reasoned foresight and investment. In the past decade, Thailand faced many political debates, causing the economic and financial situations to become unstable. Political risks include internal and external conflicts, corruption, ethnic tensions, degree of law and order, democratic accountability of government, and quality of bureaucracy. This may hamper investment from foreign countries. The studies of Reis (2001) and Kim (2010) found that countries with high level of political risk have lower FDI inflows. Therefore, political risk is expected to have a negative effect on FDI inflows. Here, we use a dummy variable as a proxy for political risk in Thailand, where Crisis=1 for the years 2004, 2009, and 2013-2014; Crisis =0 otherwise. It is hypothesized that

H₈: The political risk is expected to have a negative effect on Thailand's inward FDI.

Asia Financial Crisis 1996-1998 (D_{97})

The Asian financial crisis period gripped much of East Asia beginning in July 1997 and raised fears of a worldwide economic meltdown due to financial contagion. The crisis started in Thailand (known as the Tom Yum Goong crisis) with the financial collapse of the Thai baht after the government was forced to float the currency due to lack of foreign exchange to support its fixed rate, cutting its peg to the US dollar after exhaustive efforts to

support it in the face of a severe financial overextension that was, in part, real estate driven (Thanyakhan, 2008; Daly and Tosompark, 2011). At the time, Thailand had acquired a burden of foreign debt that made the country effectively bankrupt even before the collapse of its currency. This also caused Thailand's inward FDI to decrease. Therefore, we expect a negative relationship between the Asian financial crisis and Thailand's FDI inflows. To capture the effect of the Asian financial crisis on Thailand's inward FDI, we use a dummy variable as a proxy for the Asian Financial Crisis, where Crisis=1 for the 1996-1998 period and 0 otherwise. It is hypothesized that

H₅: The Asian financial crisis is expected to have a negative effect on Thailand's inward FDI.

Global Financial Crisis (D_{0814})

The financial tsunami of 2007–2008, also known as the global financial crisis and the 2008 financial crisis, is considered by many economists to have been the worst financial conditions since the Great Depression of the 1930s. It threatened the total collapse of large financial institutions, which was prevented by bailouts from national governments, but financial markets and economic situations still deteriorated worldwide. The crisis may also worsen Thailand's financial and economic environment and hence reduce inward FDI (Pananond, 2004; Pananond, 2007). Therefore, we expect a negative and significant relationship between FDI inflows and the subprime mortgage crisis and financial tsunami years from 2008 to 2014. To consider the effect of the subprime mortgage crisis and financial tsunami on Thailand's inward FDI, we use dummy variable, where Crisis=1 for the 2008-2014 period and 0 otherwise. It is hypothesized that

H₆: The global financial crisis is expected to have a negative effect on Thailand's inward FDI.

Country Factor (D_{jt})

To consider the effect of country factors on Thailand's inward FDI, we use dummy variables (D_{jt} , where 1=Japan, 0=Otherwise; 1=Netherlands, 0=Otherwise; 1= Singapore, 0= Otherwise; 1=US, 0= Otherwise) as proxies for country effects to control for country-specific fixed effects, such as investment subsidies, tax systems or culture and language (Dunning, 1993).

Time-Trend (T_{jt})

To consider time trend effect for Thailand's inward FDI from host countries (Japan, Hong Kong, the Netherlands, Singapore, the US), we use dummy variables (T_{jt} for $t = 1997-2014$) as proxies for the time trend effect. The summary of measurement, the predicted effects and data sources for all determinants are given in Appendix Table A1.

4. EMPIRICAL RESULTS AND IMPLICATIONS

In this section, we provide the results of the econometric model and explore which of the aforementioned results were supported by the panel statistical data. Basic statistics are estimated using SAS program. The panel unit root tests employed are LLC (Levin *et al.*, 2002) and IPS (Im *et al.*, 2003) unit root tests; model selection is estimated using F-test, Breusch-Pagan LM test and Hausman test (Hausman, 1978) using R statistical program. Finally, the Generalized Least Squares (GLS) method applied to estimate the coefficients of our specified model with SAS to obtain the empirical results. This study focuses on the countries that have the most realistic impact through the outstanding inward investment countries (Japan, Hong Kong, the Netherlands, Singapore and the United States) in Thailand during the 1997-2014 periods.

4.1. Data Descriptions

Before analyzing relationships between Thailand's inward FDI decision and its influence factors, the statistical test diagnostics are undertaken to check the characteristics of the aforementioned data. The summary of descriptive statistics for the variables which expressed in the IFDI in Thailand transformed into natural logarithms, including means, standard error, skewness and kurtosis are shown in Tables 1. As for the variables explaining Thailand's IFDI, the statistics show that the mean value for each variable is quite different while the standard error of the variables such as LREX, LRGDP and LDIST are higher than others. The sample skewness statistics for most variables LRWage, LDIST, LRD are nonnegative. The sample kurtosis statistics are less than 3. Both the sample skewness and kurtosis statistics indicated the distribution pattern for each variable.

Table-1. Descriptive Statistics of Dependent and Independent Variables, Inward FDI Panel Data Model

	LIFDI	LRGDP	LTOPEN	LRWage	LREX	LDIST	LRD
Mean	2.8193	2.2971	2.1092	1.7093	3.9725	3.6351	-0.9115
Median	2.8193	2.4691	2.1160	1.5913	4.3729	3.6421	-0.9800
Maximum	3.8222	3.1780	2.1770	2.3949	4.9053	4.1433	-0.2478
Minimum	0.8549	1.0365	1.9759	1.3314	2.4141	3.1474	-1.4518
Std. Dev.	0.4794	0.7693	0.0593	0.2878	0.8163	0.4016	0.2609
Skewness	-0.7824	-0.3104	-0.7968	0.9341	-0.8600	0.0090	0.9070
Kurtosis	2.3343	-1.5346	-0.3016	-0.4057	-0.7047	-1.6994	0.2390

4.2. Results of the Panel Unit Root Tests

To avoid considering a spurious relationship that will cause misinterpretation of the empirical results, the time series of variables in this study need to be tested for stationarity by employing LLC and IPS panel unit root tests. The results of the LLC and IPS unit root tests are indicated in Table 2, which shows that all series of variables are stationary and indicate that the results of the empirical model do not appear to be spurious.

4.3. Results of Selection for Panel Data Model

This study uses panel data (time series and cross-sectional data) to estimate how each determinant of inward FDI affects decisions by each country during the study period. To select the suitable estimated model, we will use the F test, LM test and Hausman test to decide whether ordinary least squares (OLS), fixed effects or random effects models are suitable. According to Table 3, the F-test rejects the null hypothesis and implies that the fixed effects model is more appropriate than the Ordinary Least Squares (OLS) model. Based on the results of the Breusch-Pagan LM test, the random effects model is better than the OLS model. Therefore, we use a Hausman test to compare the fixed effects model with the random effects model, and we find that the fixed effects model is superior to the random effects model.

Table-2. Panel Unit Root Test of Inward FDI

	None	With drift	With drift and time trend	Maximum lag Period
LLC unit root test				
LIFDI	-13.5392***	-13.1057***	-13.9541***	[4]
LRGDP	-12.9083***	-12.6394***	-13.4587***	[4]
LTOPEN	-10.6530***	-9.8316***	-10.0029***	[4]
LRWage	-12.6056***	-9.8897***	-10.1826***	[4]
LREX	-11.4968***	-10.9771***	-11.5547***	[4]
LDIST	-12.9083***	-12.6394***	-13.4587***	[4]
LRD	-11.2002***	-10.1079***	-10.5249***	[4]
IPS unit root test				
LIFDI		-14.6530***	-14.8391***	[4]
LRGDP		-14.3191***	-14.7755***	[4]
LTOPEN		-12.6005***	-12.7747***	[4]
LRWage		-12.1578***	-12.3640***	[4]
LREX		-12.6645***	-12.8041***	[4]
LDIST		-14.3191***	-14.7755***	[4]
LRD		-12.5851***	-12.6857***	[4]

Notes: 1. ***p < 0.01; **p < 0.05; *p < 0.1.

2. Brackets [] indicate the variables of AIC maximum lag

Table-3. Selections for OLS, Fixed and Random Effects Model Results of IFDI

	F Test	LM test	Hausman test
Hypothesis			
H ₀ :	<i>OLS</i>	<i>OLS</i>	<i>Random effect</i>
H _A :	<i>Fixed effect</i>	<i>Random effect</i>	<i>Fixed effect</i>
	F = 12.5871** (F _{12,77})	LM = 12.6471*** (χ^2_1)	Hausman = 22.0012*** (χ^2_8)
Result	Fixed model is better	Random model is better	Fixed model is better

Note: ***p < 0.01; **p < 0.05; *p < 0.1.

4.4. Empirical Results for the Determinants of Inward FDI

In this study, we use panel data to estimate regression models to explore the determinants of inward FDI in Thailand. We use cross-sectional data for five countries (Japan, Hong Kong, the Netherlands, Singapore and the United States) over the 1997-2014 periods and employed generalized least squares (GLS) for obtaining the panel fixed effects regression parameters. The estimated results will be shown in Table 4.

Table-4. Fixed Effects Results of Determinants of Inward FDI (IFDI) in Thailand by GLS

Variable	Coefficient	Parameter Estimate	t Value	Pr > t
Intercept	β_0	-27.3924***	-2.68	0.0090
LRGDP	β_1	1.4127***	2.81	0.0063
LTOpen	β_2	1.1615***	2.61	0.0087
LRWage	β_3	-0.9379*	-1.71	0.0909
LREX	β_4	-0.3599***	-4.55	0.0001
LDIST	β_5	1.0536***	3.19	0.0021
LRD	β_6	0.0939*	1.71	0.0918
TBA	β_7	0.1861*	1.85	0.0688
PR	β_8	-0.1990	-1.24	0.2629
D97	β_9	0.3621	1.05	0.2275
D0814	β_{10}	-0.0189**	-2.05	0.0464
Dj	β_{11}	9.0544***	3.25	0.0017
Dn	β_{12}	-5.9915***	-3.13	0.0024
Ds	β_{13}	13.1794***	3.09	0.0028
Du	β_{14}	-4.8755***	-2.85	0.0056
T	β_{15}	0.0210	1.01	0.3179
R ²		0.5293	Adjusted R ²	0.4559
F-stat (15,74)		17.21***	White test	4.8433
Durbin-Watson		2.081	Breusch-Pagan test	4.5515

Notes: 1. ***p < 0.01; **p < 0.05; *p < 0.1.
2. The software used is SAS.

As indicated in Table 4, the effect of relative per capita GDP ($\beta_1 = 1.4127***$) has the largest influence on Thailand's IFDI decision, significant at the 1% level. The hypothesis H₁ is supported. The market size and growing market demand encourages foreign investment in Thailand. This result is consistent with the literatures (Dees, 1988; Garibaldi *et al.*, 2002; Nunes *et al.*, 2006; Sahoo, 2006) where a larger host country economy tends to attract more FDI. This also implies that each selected country (Japan, Hong Kong, the Netherlands, Singapore and the United States) that is engaged in direct investment in Thailand will need to consider the market size of the FDI

destination. The effect of Thailand's openness ($\beta_2 = 1.1615^{***}$) on Thailand's IFDI is significant at the 1% level. This means that hypothesis H_2 is supported. Foreign firms will have more opportunities to expand their businesses in Thailand to not only access the host country's resources and market but also enhance general imports and exports in Thailand. Therefore, openness has a positive effect on Thailand's IFDI supported by less restrictive controls enabling firms to acquire information about local market in Thailand. This also suggests that policymakers in Thailand may liberalize its economy to encourage foreign trade and FDI inflows to achieve sustained, high economic growth. The previous studies by Kravis and Lipsey (1982); Culem (1988); Edwards (1990) and Pärletun and Thede (2008) found a strong positive effect of openness on FDI, which support our results.

Relative wages ($\beta_3 = -0.9379^*$) has a negative effect with 10% level statistically significant to Thailand inward FDI. It is not quite significant, the reason being that the cheap-labor hypothesis was over the period 1983 to 1999 in Thailand, but there has been weak support from 2000 to 2014. Where labor cost is relatively insignificant with little variance in relative wage rates of Thailand to home countries (Japan, Hong Kong, Netherland, Singapore and United States), knowledge capital and skills invested in Thailand's labor force are expected to influence decisions about Thailand's inward FDI, Tsai (1994) and Wattanadumrong *et al.* (2014) support our results. It still can be justified that H_3 is supported. Relative exchange rate ($\beta_4 = -0.3599^{***}$) between Thailand and Investor's home countries also has a significant negative effect to Thailand's inward FDI decision, and H_4 is supported. It shows that depreciation of the Thai's currency allows foreign firms to purchase cheaper assets while technology lowers relative cost of capital, which then increases the relative wealth position of foreign firms, and hence increase Thailand's inward's FDI. This information presents investors that when in a situation where there is full pass through of changes in exchange rates into production costs as depreciation of the local currency would supposedly increase FDI inflows since local costs of production have decreased when they have FDI inflow to Thailand. These results are consistent with the literature and supported by the findings of Froot and Stein (1991) and Chakrabarti (2001).

The effect ($\beta_5 = 1.0536^{***}$) of geographical distance has a significantly positive effect on Thailand's inward FDI at 1% level. The hypothesis H_5 is rejected. The reason can be argued that Thailand is a relatively fast developing country in Southeast Asia, with more government policies on FDI added to less cultural distance for foreign investors. This may be one of the conditions that support this empirical result. Also since the selected partner countries (Japan Hong Kong, Netherland, Singapore and United States) have long time FDI experience/relationship on trade and investment with Thailand; together with the development of internet and logistics they can altogether reduce the geographical distance effect on Thailand's inward FDI. Thus, even though geographical distance between Thailand and the selected home countries are positive, the inward FDI from home country does still not decline. Furthermore, this result is consistent with and supported by the study by Egger (2008) who found that if FDI is market-seeking for distant destinations, the internationalizing firms are expected to prefer direct investment over exporting. Thus, increasing distance between home and host countries may not decrease inward FDI.

The relative R&D intensity ($\beta_6 = 0.0939^*$) and bilateral trade agreements ($\beta_7 = 0.1861^*$) are both positive and significant at the 10% level on Thailand's inward FDI. For the relative R&D intensity, the finding of Haskel *et al.* (2007) supported our results, where the improvements in R&D for manufacturing techniques and management methods in Thailand will influence its inward FDI, although with limited effects because the relative R&D intensity in Thailand is smaller in scale compared with the selected countries in this study (Japan, Hong Kong, the Netherlands, Singapore and the US). For the bilateral trade agreements, the positive effects of the bilateral trade

agreements are important determinants to increase Thailand's inward FDI. Neumayer and Spes (2005) mentioned that bilateral trade agreements also guarantee a standard of treatment that can be enforced via binding investor-to-state dispute settlement mechanisms outside the domestic juridical system by signing such BITs (bilateral investment treaty) with developed countries, particularly those that are major FDI exporters and importers. Based on the above discussions, hypotheses H_6 and H_7 can be supported.

For the concerned political risk situation, the effect ($\beta_8 = -0.199$) of political risk on Thailand's inward FDI is negative with non-statistical significance. H_8 is not supported. Though the estimated coefficient is not statistically significant, the sign is negative as we expected. This negative effect could imply that a higher political risk might result in a less attractive and stable climate for foreign investors. The result is consistent with the studies of Boddewyn (1988) and Daly and Tosompark (2011) who found that political risk occurring over the period did reduce Thailand's inward FDI. For the financial situation factors, the effect ($\beta_9 = 0.3621$) of the 1997 Asia financial crisis on Thailand inward FDI is positive and insignificant. The sign is positive which is the opposite as what we expected. H_9 is not supported. This indicates that the collapse of Thai's currency may increase the purchasing power of foreign investors. After the Thai baht was floated and financial crisis erupted in 1997, the FDI flows into Thailand increased, perhaps due to a rise in company takeover/acquisition cases as well as the increase in purchasing power of foreign investors due to depreciation of Thai currency; these situations are supported by studies of Thanyakhan (2008) and Anuchitworawong and Thampanishvong (2014). The effect ($\beta_{10} = -0.0189^{**}$) of the global financial crisis since 2008 to 2014 on Thailand's inward FDI is shown to be significantly negative, which is consistent with the study of Hill and Jongwanich (2009). Thus, hypothesis H_{10} can be supported, indicating that the global financial crisis might have led the selected home country investors (Japan, Hong Kong, the Netherlands, Singapore and the United States) to have lower confidence for inward FDI in Thailand.

Concerning the country factor, the countries with the highest coefficient estimation to inward FDI are Japan ($\beta_{11} = 9.0544^{***}$) and Singapore ($\beta_{13} = 13.1794^{***}$) with positive statistically significant at 1% level. On the other hand, the Netherlands ($\beta_{12} = -5.9915^{***}$) and the United States ($\beta_{14} = -4.8755^{***}$) have negative statistically significant effects on inward Thailand FDI. The results of country dummies (home countries to Thailand) appear to vary both in size and sign. It seems after all that country effects are attributable to both national culture and public policies. Lastly, the effect of the time trend factor ($\beta_{15} = 0.0210$) on inward FDI is positive but insignificant. This indicates that Thailand's FDI from Japan, Hong Kong, the Netherlands, Singapore and the United States may have increasing trends, but this is not quite clear during our study period of 1997-2014.

Based on the statistical analysis (Table 4), the model has a good fit with R^2 0.5293, adjusted R^2 0.4559 and F-Stat 17.21 (at 15, 74 degree of freedom). The Durbin-Watson statistic equals 2.081, White statistic 4.8433 and Breusch-Pagan test 4.5515. Neither autocorrelation nor heteroscedasticity in the estimated error term is observed. This information also indicates that our discussions above about the determinants of Thailand's inward FDI would be appropriate.

The results of the above empirical analysis for the hypotheses tested are summarized in Table 5.

Table-5. Summary of Findings for Determinants on Thailand's Inward FDI

Hypothesis		Result
H ₁	The relative GDP per capita between home countries and Thailand would have positive effects on Thailand's inward FDI.	Accepted
H ₂	The openness of Thailand's economy would have positive effects on Thailand's inward FDI.	Accepted
H ₃	A real wage for the host country relative to the home country would have negative effects on Thailand's inward FDI.	Accepted
H ₄	The exchange rates are expected to have negative effects on Thailand's inward FDI.	Accepted
H ₅	The geographical distance between home countries and Thailand is expected to have negative effects on Thailand's inward FDI.	Rejected
H ₆	The relative R&D intensity between Thailand and the home countries is expected to have positive effects on Thailand's inward FDI.	Accepted
H ₇	The bilateral trade agreement signed by Thailand is expected to have positive effects on Thailand's inward FDI.	Accepted
H ₈	The political risk is expected to have a negative effect on Thailand's inward FDI.	Rejected
H ₉	The Asian financial crisis is expected to have a negative effect on Thailand's inward FDI.	Rejected
H ₁₀	The global financial crisis is expected to have a negative effect on Thailand's inward FDI.	Accepted

5. CONCLUDING REMARKS

In this study, we investigated the determinants of Thailand's inward FDI by the dynamic panel data model that utilized to incorporate the time-series (1997-2014) and the cross-sectional data (Japan, Hong Kong, the Netherland Singapore and the United States). The empirical results indicate that the market size (relative per capita GDP), Thailand's openness, geographical distance, bilateral trade agreements and R&D intensity have positive and statistically significant effects on Thailand's inward FDI. Exchange rate, global financial crisis and relative wages have negative and statistically significant effects, while Asian financial crisis and Thailand's political risk are insignificant effects on Thailand's inward FDI.

To attract Thailand's inward FDI, its needs to consider enlarging its market sizes though GDP expansion, remaining higher level of openness on international trade and investment, by legislating trading policy or negotiating international (bilateral) trade agreements. The improvement of R&D for manufacturing technique and management method is also important to influence foreign firm's decision to operate FDI in Thailand. Regarding to Relative exchange rates between Thailand and home countries (Japan, Hong Kong, the Netherlands, Singapore and the United States) have significant negative effects on Thailand's inward FDI. This information indicates that in a situation where there is full pass-through of changes in exchange rates into production costs, a depreciation of the local currency should increase FDI inflows because local costs of production have decreased when they have FDI inflows into Thailand. Meanwhile labor cost is relatively insignificant with little variance in relative wage rates of Thailand to home countries, since the knowledge capital and skills in Thailand may be a more important decision variable when considering investment into Thailand.

In our study, the effect of geographical distance is significant and positive on Thailand's inward FDI. As there exists long term trade and investment relationships between Thailand and the home countries. Moreover, the development of the Internet and logistics can also reduce the geographical distance effect on Thailand's inward FDI. Although the effect of geographical distance between Thailand and home countries is positive, Thailand's inward FDI from home country can avoid decline if Thailand can maintain the relationships with its partner countries and continue its technological growth in logistics and internet systems. For concerning negative impact of special events on Thailand's inward FDI such as the global financial crisis and local political risk, this implies that Thailand inward FDI will decrease when facing political and financial risks. Firms or government sectors should concern about financial and political risks. The addition of country dummies variables have shown different

effects on Thailand IFDI, country-specific factors need to be involved in attracting Thailand IFDI from different countries.

In sum, the findings of this study may contribute additional facts to support or enhance the theories of FDI. It also provides policy or managerial strategic implications for the Thailand government and related investors to develop appropriate FDI policies or strategies to attract inward FDI.

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Appendix

Table-A 1. Variable Descriptions of Thailand's Inward FDI

Symbol	Determinants	Measures	Expected Effect	Data Source
LIFDI	Inward FDI	Annual inflows into Thailand from five FDI partner countries		Bank of Thailand (BOT)
LRGDP	Relative GDP	Relative per capita GDP between Thailand and home countries	Positive	Trading Economics (2015)
LTOPEN	Thailand's Openness	Ratio of Thailand's exports plus imports to GDP	Positive	Trading Economics (2015), World Bank
LRWage	Relative wage rate	Relative wages between Thailand and home countries (hourly compensation in US dollars)	Negative	The Conference Board, International Labor Comparisons program (December 2014)
LREX	Relative Exchange rate	Relative exchange rate between Thailand and home countries	Negative	Trading Economics (2015)
LDIST	Geographical Distance	Natural logarithm of spatial distance between the capitals of Thailand and home countries	Negative	CEPTII
LRD	Relative R&D Intensity	Relative R&D expenditure between Thailand and home countries	Positive	World Bank
TBA	Bilateral Trade Agreement	Number of bilateral agreements signed by Thailand	Positive	UNCTAD
PR	Political Risk	Political Risks in Thailand (2004, 2009, 2013-2014)	Negative	
D97	Asian Financial Crisis	Asian Financial Crisis (1996-1998)	Negative	
D0814	World Financial Crisis	Subprime Mortgage and Financial Tsunami 2008-2014,	Negative	

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