Country Specific Determinants of Foreign Direct Investment in Major ASEAN Countries

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บทคัดย่อ

งานวิจัยฉบับนี้ ศึกษาปัจจัยกำหนดการลงทุนโดยตรงไหลเข้าในกลุ่มประเทศอาเซียนชั้นนำหกประเทศ ได้แก่ อินโดนีเซีย มาเลเซีย ฟิลิปปินส์ สิงคโปร์ ไทย และเวียดนาม ในช่วงปี ค.ศ. 1980 ถึง 2013 ผลการวิจัยสรุปว่า ปัจจัยที่กำหนดการลงทุนโดยตรงไหลเข้าในกลุ่มประเทศอาเซียนชั้นนำทั้งหกประเทศ ประกอบด้วย ขนาดของตลาด ที่ใหญ่ บรรยากาศการลงทุนภายในประเทศที่ดี (ยกเว้นสิงคโปร์) อัตราการว่างงานที่ต่ำ โครงสร้างพื้นฐานที่ดี และการ แข็งค่าของเงินตราสกุลท้องถิ่น นอกจากนี้ยังพบว่า วิกฤติเศรษฐกิจและการเงินไม่มีผลต่อเงินลงทุนโดยตรงไหลเข้า ทั้งหกประเทศอาเซียน

Abstract

This paper investigates the country specific determinants of foreign direct investment net inflows from multinational enterprises to six Southeast Asian countries, namely; Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam, over the period of 1980-2013. The results suggest that foreign direct investment net inflows to these six countries are attracted by bigger market size, better domestic investment climate (excluding Singapore), lower unemployment rate, better infrastructure, and the appreciation of the local currency. Further, crisis is found to have no effect on the 6 countries' foreign direct investment inflows.

Keywords: FDI inflows, ASEAN, gross domestic product growth, market size, infrastructure
JEL classification: *F21, F30, F41*

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1. Introduction

Since the Association of Southeast Asian Nations (ASEAN) was born on August 8, 1967, it has been developing and growing. Starting with 5 nations, ASEAN is now consisting of 10 members: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. In 1992, The ASEAN Free Trade Area (AFTA) was signed to increase ASEAN's competitive edge by eliminating tariffs and non-tariff barriers within ASEAN members. The full regional economic integration was set on December 31, 2015, to establish the ASEAN Economic Community (AEC).

One of the primary goals of AFTA is to attract more multinational enterprises (MNEs) to have foreign direct investment (FDI) in the ASEAN area. Table 1 shows the cumulative FDI net inflows to ASEAN from 2003 to 2014. It can be seen that Singapore has received $468,594 million, which dominated the FDI inflows with a 50.48 percent share of total net inflows to ASEAN during the period. Indonesia, Malaysia, the Philippines, Thailand, and Vietnam (ASEAN 5 countries) received $419,700 million, which is 45.21 percent of the total, whereas the other four countries, Brunei, Cambodia, Laos, and Myanmar, received only 4.31 percent in total.

ASEAN continued to attract MNEs' foreign investments with an increasing trend. Song (2013) reported that the ASEAN countries, including Indonesia, Malaysia, the Philippines, Singapore, and Thailand, received even more FDI than China by $10.8 billion in 2013. Table 2 lists the total FDI net inflows to ASEAN countries for 2010 to 2014. The total FDI net inflows into the region increased from $98,872.8 million in 2010 to $136,181.4 million in 2014. Moreover, the FDI net inflows into ASEAN 5 countries increased from $41,336.3 million, 41.8 percent of the total in 2010, to $59,928.9 million, which was 44.0 percent of the total in 2014.

Table 1: Cumulative FDI net inflows to ASEAN from 2003 to 2014[1]

Host country	(million USD)	(% to total)
Brunei Darussalam	9,182	0.99%
Cambodia	9,535	1.03%
Indonesia	128,542	13.85%
Lao PDR	3,555	0.38%
Malaysia	87,993	9.48%
Myanmar	13,088	1.41%
Philippines	28,348	3.05%
Singapore	468,594	50.48%
Thailand	101,537	10.94%
Vietnam	73,280	7.89%
ASEAN Total	928,342	100.00%
ASEAN 5[2]	419,700	45.21%

[1] Source: The ASEAN Secretariat, 2015, and ASEAN Foreign Direct Investment Statistics Database as of May 26, 2015.

[2] ASEAN 5 consists of Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

Among ASEAN countries, Singapore always received the highest amount of FDI net inflows, with more than 50 percent of the total. The FDI net inflows into Singapore increased from $53,547.0 million to $72,098.3 million in 2014. The main destination of those FDI net inflows is the financial sector, which is quite different from other countries, such as ASEAN 5 countries, where the main use of FDI inflows is manufacturing. Further, Brunei, Cambodia, Laos, and Myanmar attracted only a small percentage of total FDI net inflows. Therefore, this paper will focus on the country specific determinants of FDI inflows for Singapore and the ASEAN 5 countries, namely Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam, and it excludes Brunei, Cambodia, Laos, and Myanmar because of their small percentage of FDI attracted, as mentioned before.

Even though all of the six countries are in the same ASEAN region, they share some similarities such as social structure, and differences such as economic and political structures. They are also competitors in attracting foreign direct investment inflows during the past four decades. Therefore, it is of great interest to ask: what exact country specific advantages do these countries have to attract FDI from the multinational corporations? Thus, the contribution of this paper is to explore the possible country specific determinants of foreign direct investments to these six countries, which can provide some information to each country's government for future policy making or reforming to better attract foreign direct investment inflows from MNEs.

This paper studies the foreign direct investment net inflows to Singapore and each of the ASEAN 5 countries as a dependent variable; it is measured as the percentage of gross domestic product (GDP). The possible country specific determinants are chosen from five different aspects as found in previous studies: market size (proxied by annual gross domestic production growth rate), cost (proxied by unemployment), infrastructure (proxied by fixed telephone subscriptions), FDI substitutes (proxied by gross capital formation), and risk (proxied by the exchange rate risk and crisis dummy).

Table 2: Total FDI net inflows to ASEAN countries from 2010 to 2014[1]

(Value in million USD)

Country	2010	2011	2012	2013	2014
Brunei Darussalam	625.4	1,208.3	864.8	725.5	568.2
Cambodia	782.6	891.7	1,557.1	1,274.9	1,726.5
Indonesia	13,770.9	19,241.6	19,137.9	18,443.8	22,276.3
Lao PDR	332.6	300.7	294.4	426.7	913.2
Malaysia	9,155.9	12,000.9	9,400.0	12,297.4	10,714.0
Myanmar	2,249.0	2,057.0	1,354.2	2,620.9	946.2
Philippines	1,298.0	1,815.9	2,797.0	3,859.8	6,200.5
Singapore	53,547.0	55,285.2	60,980.3	56,138.3	72,098.3
Thailand	9,111.6	8,999.4	10,699.2	12,999.8	11,537.9
Vietnam	8,000.0	7,519.0	8,368.0	8,900.0	9,200.1
ASEAN Total	**98,872.8**	**109,319.9**	**115,452.8**	**117,687.0**	**136,181.4**
ASEAN 5[2]	**41,336.3**	**49,576.9**	**50,402.0**	**56,500.8**	**59,928.9**
ASEAN 5's share to total	41.8%	45.4%	43.7%	48.0%	44.0%

[1] Source: ASEAN Foreign Direct Investment Statistics Database as of 26 May 2015.

[2] ASEAN 5 consists of Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

The rest of the paper is organized as follows: Section 2 reviews the literature, methodology and data are explained in Section 3, empirical results are detailed in Section 4, and Section 5 concludes the paper.

2. Literature Review

In the field of international business, there have been shifts in the core unit of analysis. First, there was analysis at country level, using national statistics on trade and foreign direct investment (FDI). Next, the focus shifted to the multinational enterprise (MNE) and the parent's firm specific advantages (FSAs) and then the foreign subsidiary. This is outlined in the theoretical integrative framework of country-specific advantages (CSA) and firm-specific advantage (FSA) developed by Rugman (Rugman, Verbeke and Nguyen, 2011). This study will employ the aggregate FDI data into the ASEAN major countries, therefore, the focus is on the CSA only to study the country specific advantages of ASEAN major countries to attract FDI from MNEs.

CSA is also defined as location-based advantage in the Dunning's OLI framework (Dunning and Lundan, 2008), where OLI stands for ownership, location, and internalization. Location advantages or variables are FDI host country factors such as labor force, natural resources, market size, country wage level, trade cost, additional fixed cost of FDI, cultural, legal, religion, political and broad institutional factors, etc. (Dunning and Lundan, 2008; Rugman, 2010; Rugman et al., 2011). Examples are given such as western manufacturing firms have FDI in China due to China's CSA in cheap labor whereas IT firms have FDI in India due to India's relatively cheap, skilled and educated labor (Rugman et al., 2011).

Dunning further identified four motives for FDI as natural resource-seeking, market-seeking, efficiency-seeking, and strategic asset-seeking (Rugman, 2010). The motivations for specific subsidiaries are shifting from the resource-seeking or market-seeking in the early period to efficiency-seeking or asset-seeking in the later period. Furthermore, a single country might have multiple location-based advantages that attract MNEs' FDI simultaneously motivated by different intentions (Narula and Dunning, 2010).

In the case of ASEAN regional trade agreement (RTA), Oh and Selmier II (2008) concluded that it increased both regional economic interdependency through institutional agreement, and trade with non-member countries through a process of economic diplomacy. Hence, regionalization is considered as a complement rather than a substitute to globalization. It is further found that RTA membership could empower ASEAN member nations to engage in more value-claiming with more powerful trading partners than might be expected through trade diplomats' efforts (Selmier II and Oh, 2013). In addition, Seno-Alday (2015) showed that the Southeast region network was at its least

vulnerable during the global financial crisis when countries in the region were much more connected to each other, therefore, deeper and broader regionalization could effectively lower risk for itself and other firms in the region.

Many research papers focus on the foreign direct investment to developing countries such as Brazil (Angelo, Eunni, and Fouto, 2010), China (Fan et al., 2007; Sun, Tong, and Yu, 2002), India (Singhania and Gupta, 2011), Mexico (Thomas and Grosse, 2001), South Africa (Fedderke and Romm, 2006), and Vietnam (Chien and Zhang, 2012). Some papers explore the CSA determinants of Japan's foreign direct investments in other countries (Farrell, Gaston, and Sturm, 2004; Takagi and Shi, 2011). Yet other papers studied different CSA determinants of foreign direct investments based on multiple countries (Alemu, 2013; Alsan, Bloom, and Canning, 2006; Lim, 2008; Mathur and Singh, 2013; Plummer and Cheong, 2008; Williams, 2015).

2.1 Studies on single developing countries

China's economic transition from a planned economy to a market economy has attracted worldwide attention, especially in terms of foreign direct investment. Hence, several papers studied the determinants of foreign direct investment inflows to China. For instance, Sun, Tong, and Yu (2002) studied the spatial and temporal variation in foreign direct investment among 30 provinces of China from 1986 to 1998 using the ordinary least square (OLS), generalized least square (GLS), and fixed effect regression. The study showed that labor quality, infrastructure, political stability, and openness to the foreign world are important determinants of foreign direct investment. In another paper, Fan et al. (2007) concluded that foreign direct investment might be increased since the Chinese government protected foreign firms better than domestic ones. Further, Giner and Giner (2004) found political risk, operational risk, and total exports in relation to GDP to be statistically positively correlated to FDI inflows to China.

The internal market growth represented by aggregate consumer sales is found to be a significant determinant of FDI into Brazil (Angelo, Eunni, and Fouto, 2010). For India, GDP, inflation rate, and scientific research are suggested to have a significant impact on FDI inflows during 1991-2008 (Singhania and Gupta, 2011). For Vietnam, the results of Chien and Zhang (2012) showed that there was a strong bidirectional relationship between FDI and GDP in the North Central Area and South Coast of Vietnam during 2000-2010. Further, the ability to access information and infrastructure quality significantly and positively affect the attraction of FDI in this region.

Fedderke and Romm (2006) employed the annual time series data of South Africa for the period of 1962-1996 to study the determinants of foreign direct investment. The results reveal that the foreign direct investment in South Africa is dominated by horizontal investment. The market sizes, exports, property rights index, and political stability have a positive effect on the foreign direct investment, whereas tax, average wage, and imports have negative effects on foreign direct investment.

Raluca and Alecsandru (2012) conducted a survey on a sample of foreign investment companies in the manufacturing industry in Romania. The cluster analysis of responses from middle and top managers of 235 firms shows that foreign direct investment is related to regional factors, i.e., that foreign direct investments in the first cluster – Center, South, South East, and West regions – are driven by new markets, qualified labor force, and infrastructure facilities, whereas foreign direct investments in the second cluster – North East, North West, and South West regions – are more cost-oriented.

Thomas and Grosse (2001) examined the country-of-origin determinants of foreign direct investment inflows to Mexico during the period of 1980-1995. The results indicate that the level of bilateral trade, political risk, geographic distance, cultural distance, and exchange rates are significantly positively related to FDI into Mexico, whereas wage, market size (GDP), and cost of borrowing have a negative effect on FDI inflows to Mexico.

2.2 Studies on Japan's outward and inward foreign direct investments

Japan is famous for its foreign direct investment into other countries; as a result, academic researchers have been interested in the topic for a long time. Farrell, Gaston, and Sturm (2004) studied the determinants of Japan's outward foreign direct investment over the period of 1984-1998 using panel data covering eight manufacturing industries and 15 countries. It is found that the market size of the host economy is only important for some industries. Labor cost difference is not significant if country dummies are added in the model. The trade barrier has a significant positive effect on foreign direct investment, which suggests that Japanese foreign direct investment has been a response to rising protectionism in host countries. The imports are positively correlated to Japanese foreign direct investment, whereas exports and Japanese foreign direct investment are significantly positively correlated for the Japanese electrical and electronics industry. The Japanese real interest rate and real bilateral exchange rate have no significant effect on foreign direct investment.

Takagi and Shi (2011) studied the impact of exchange rate movements on foreign direct investment using the panel data of Japanese FDI flows to nine Asian countries over the period of 1987-2008. The empirical results show that FDI decreases with an appreciation of the host country currency against yen. On the other hand, FDI increases with exchange rate volatility. It is also found that the Asian financial crisis had little effect on the FDI.

Abugri and Soydemir (2002) studied Japan's inward FDI from the U.S. over 1963-1998 and found that the appreciation in the U.S. dollar or the depreciation of the Japanese yen would increase the U.S. FDI into Japan.

2.3 Studies of different CSA determinants of foreign direct investments based on multiple countries

Hsiao and Gastanaga (2001) studied 23 developing countries over 1970-1995 and found that the average growth rate, absence of bureaucratic delay index, contract enforcement index, and index of absence of corruption positively and significantly affected the FDI as a percentage of GDP.

Alsan, Bloom, and Canning (2006) investigated the effect of population health on gross foreign direct investment inflow to 74 industrialized and developing countries over the period of 1980-2000 with emphasis on low- and middle-income countries. The evidence shows that life expectancy has a significant positive effect on foreign direct investment inflows in both industrialized and developing countries. The regression result reveals that better bureaucratic quality is strongly positively correlated to foreign direct investment inflows. However, the index of corruption only significantly affects foreign direct investment in low- and middle-level countries in a wrong way: higher levels of corruption are correlated with higher levels of foreign direct investment inflows. The paper argues that some types of corruption may allow more efficient service provisions to foreign firms, hence increasing foreign direct investment inflows.

Lim (2008) used data from 68 countries in 1999 to study the effect of investment promotion agency (IPA) on attracting foreign direct investment. The effectiveness of IPA is found to positively affect foreign direct investment through a mediation effect that coordinates other determinants of foreign direct investment such as market size, low labor cost, and market growth.

Plummer and Cheong (2008) investigated 34 home countries and 74 host countries, including ASEAN countries, over the period of 1982-2004. The empirical results demonstrate that the home country's GDP, rather than the host's, is a statistically significant determinant of FDI; FDI moves from skilled-rich to skilled-poor countries; vertical FDI decreases as the home country's pool of unskilled labor increases relative to the host country; and higher trade costs tend to discourage vertical FDI but have the opposite effect on horizontal FDI. Williams (2015) studied 68 developing countries and found that the infrastructure attracted FDI to Latin American and Caribbean (LAC) countries whereas constraints on the executive and high debt discouraged FDI to non-LAC countries over the period of 1975-2005.

Alemu (2013) investigated the effects of corruption on FDI inflow for a panel of 16 Asian countries from 1995 to 2009. The result indicates that a one-unit increase in the level of corruption would decrease the FDI inflow by approximately 9.1 percentage points. Further, the author claimed that some of the countries with a high level of corruption and a concurrent high level of FDI inflow could even double their FDI inflow if they could manage to reduce their corruption. A similar result is found in Mathur and Singh (2013), where the study of 29 countries over 1980-2000 concluded that poor corruption perception index ranking leads to lower FDI inflows.

3. Data and Methodology

3.1 Data

Since only the aggregated FDI net inflows to each country will be analyzed, this paper intends to study the country specific determinants of FDI inflows to Singapore and ASEAN 5 countries, including Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam, over the period of 1980-2013. The starting point of 1980 is chosen because the take-off of FDI inflows to ASEAN occurred in the 1980s, according to Organization for Economic Co-operation and Development (OECD) (2014). Annual data for FDI net inflows, GDPG (GDP growth rate), CAP (gross capital formation), UNEMP (unemployment rate), TELE (telephone lines per 100 people), and official exchange rate are obtained from World Bank's World Development Indicators database. Among the variables, FDI, GDP, and CAP are measured by constant 2005 USD to avoid the inflation effect as reported by World Bank databases. There are a few data missing for the variable UNEMP, so the simple regression value is substituted for missing data if there is a clear trend pattern in the closest five observations, and the mean value is substituted for the missing data if there is no trend pattern.

For Indonesia, the data for 1980 is not available, and for Vietnam, the data for years 1980-1985 are not available; hence, there are 33 and 28 years data for Indonesia and Vietnam, respectively, and 34 years data for the other 4 countries. Therefore, there are total 163 country-year observations for the ASEAN 5 countries pooled sample and 197 country-year observations for the 6 countries pooled sample.

3.2 Methodology

To investigate the country specific determinants of foreign direct investment inflows to Singapore and ASEAN 5 countries, the following CSA variables (also summarized in Table 3) are chosen based on findings of previous studies and characteristics of the ASEAN countries:

Dependent variable:

• Foreign direct investment: FDI, following Hsiao and Gastanaga (2001), Williams (2015), and Alemu (2013), is measured by the ratio of net foreign investment inflows to the GDP, i.e., FDI as a percentage of GDP.

Independent variables are CSA factors or location-based advantages defined by the OLI framework classified from the following five different aspects:

1) Market size, following Giner and Giner (2004), Lim (2008), and Williams (2015), is proxied by annual GDP growth rate. Higher GDP growth indicates bigger market size, which may attract more FDI inflows, hence, a positive effect of market size on FDI is expected.

2) FDI substitute, which is proxied by CAP: gross capital formation, or gross domestic investment, consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories; all data are measured by constant 2005 USD to avoid the inflation effect. Higher CAP shows more gross domestic investment. Since it is the FDI substitute, higher CAP may hinder FDI inflows. Hence, a negative effect of CAP on FDI is expected.

3) Cost, which is proxied by unemployment rate: UNEMP is the percentage of unemployment to total labor force; higher UNEMP implies lower cost since there is a large supply of labor, which may attract more FDI inflows; i.e., a positive effect of Cost on FDI is expected.

4) Infrastructure, which is proxied by TELE: it is the number of fixed telephone subscriptions per 100 people. Higher TELE indicates a better infrastructure, which may attract more FDI inflows. Thus, a positive effect of TELE on FDI is expected.

5) Risk, which is proxied by two variables:

• Exchange rate movement: EXMOVE, which is measured by the annual percentage movement of the official exchange rate; a positive EXMOVE means the local currency is appreciated and a negative EXMOVE means the local currency is depreciated. The depreciation of the host country currency might increase the FDI inflows (Abugri and Soydemir, 2002; Takagi and Shi, 2011). Thus, a negative effect of EXMOVE on FDI is expected.

• Crisis dummy: this dummy is added to take into account the effect of the 1997 Asian financial crisis and the 2008 world financial crisis, which may hinder the FDI inflows into ASEAN countries, i.e., a negative effect of Crisis on FDI is expected. The Crisis dummy is equal to 1 for the years 1997-2000 and 2008-2009, and equals 0 for other years.

Table 3: Descriptions of variables

Variable	Measurement	Expected effect on FDI
Dependent variable: Foreign direct investment	FDI: the ratio of net foreign investment inflows to the GDP	
Independent variables: 1. Market size	GDPG: annual GDP growth rate	+
2. FDI substitute	CAP: gross capital formation, or gross domestic investment	−
3. Cost	UNEMP: the percentage of unemployment to total labor force	+
4. Infrastructure	TELE: the number of fixed telephone subscriptions per 100 people	+
5. Exchange risk	EXMOVE: the annual percentage movement of the official exchange rate	−
6. Crisis	CRISIS: equal to 1 for years 1997-2000 and 2008-2009, and 0 for other years	−

Since the country specific determinants affecting FDI inflows to each country might be different, the OLS regression model is first run for each country as follows:

$$FDI_t = a + b_1 GDPG_{t-1} + b_2 CAP_{t-1} + b_3 UNEMP_{t-1} + b_4 TELE_{t-1} + b_5 EXMOVE_{t-1} + b_6 CRISIS + e_t \quad (1)$$

Where t represents years 1980, 1981, …. , 2013.

Then, the OLS regression model is run on the pooled data as follows:

$$FDI_{it} = a_i + b_1 GDPG_{it-1} + b_2 CAP_{it-1} + b_3 UNEMP_{it-1} + b_4 TELE_{it-1} + b_5 EXMOVE_{it-1} + b_6 CRISIS + b_{7-11} CountryDummies + e_{it} \quad (2)$$

Where i represents countries Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam, and t represents years 1980, 1981, …. , 2013.

Since Singapore is quite different from the other ASEAN 5 countries in terms of FDI inflows' magnitude and characteristics, the model (2) will be run two times with and without Singapore.

Following Sun, Tong, and Yu (2002) and William (2015), five variables – GDPG, CAP, UNEMP, TELE, and EXMOVE – in the two models are in one-year lag to avoid the potential endogeneity problem.

The multicollinearity problem will be detected by studying the correlation matrix of the independent variables; the highly correlated pair will be considered in the regression by deleting one variable. Since there are 5 or 6 countries in the pooled data set, there might be a heteroscedasticity problem. This will be solved by running regression with White heteroscedasticity-consistent standard error and covariance. Further, there might be a serial correlation problem in this time series data set, which will be found by detecting Durbin-Watson statistic of the regression results. If the serial correlation is detected, then the GLS is run by adding the AR(1) term in the regression model.

4. Empirical Results

4.1 Descriptive results

The trend lines of FDI net inflows, as a percentage to GDP of ASEAN 6 countries over the period of 1980-2013, are shown in Fig. 1. It can be seen from Fig. 1 that the 1997 Asian financial crisis and the 2008 global financial crisis do not have much effect on the ASEAN countries' FDI net inflow. In addition, it seems that there is no negative effect to FDI inflows in the long run.
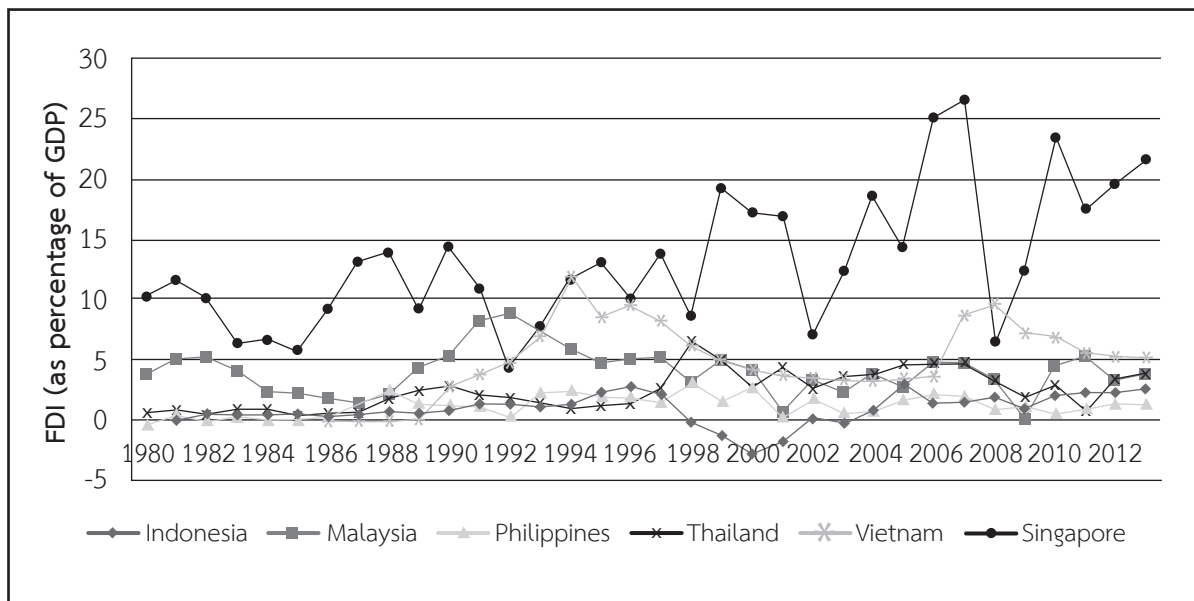
Figure 1: FDI as a percentage of GDP for ASEAN 6 countries over the period of 1980-2013

Table 4 shows the preliminary statistics of studied variables for six countries over the period of 1980-2013. Singapore has the highest average annual FDI as a percentage of GDP with 13.144 percent, whereas Indonesia has the lowest average annual FDI as percentage of GDP with 0.864 percent. Singapore also has the highest average annual GDP growth rate with 6.853 percent, while the Philippines has the lowest average annual growth rate with 3.455 percent. For gross domestic capital formation as a percentage of GDP, Singapore has the highest annual average with 33.11 percent, while the Philippines again has the lowest annual average with 21.476 percent. The Philippines has the highest unemployment rate, 8.074 percent, while Thailand has the lowest level with 1.997 percent. Singapore has the best infrastructure with 37.609 fixed telephone subscriptions per 100 people, while the Philippines has the lowest with 2.526 fixed telephone subscriptions per 100 people. The local currency in Vietnam depreciated the most, by 17.041 percent annually, while the local currency in Singapore appreciated by 1.725 percent annually during 1980–2013.

Panel B of Table 4 also displays the descriptive statistics of the variables of the 2 pooled samples: one with 5 countries excluding Singapore, and the other with 6 countries. The average annual FDI is 2.635 percent of GDP for 5 countries and 4.448 percent for 6 countries. The average annual GDP growth rate is 5.303 percent for 5 countries and 5.571 percent for 6 countries. The average gross domestic capital formation is 26.984 percent of GDP for 5 countries and 28.042 percent of GDP for 6 countries. On average, 5 countries have 4.387 percent unemployment, whereas 6 countries have 4.203 percent. 6.395 per 100 people have fixed telephone lines in 5 countries and 11.782 per 100 people have fixed telephone lines in 6 countries. The currencies in 5 countries depreciated by 5.503 percent annually whereas only 4.256

Table 4: Descriptive statistics of variables over the period of 1980-2013

	FDI(%)	GDPG(%)	CAP(%)	UNEMP(%)	TELE	EXMOVE(%)
Panel A: Single country						
Indonesia (33 years)						
Mean	0.864	5.408	27.954	5.482	4.475	-6.288
Standard Deviation	1.280	3.877	5.051	2.762	5.322	15.532
Minimum	-2.757	-13.127	11.367	2.200	0.287	-70.946
Maximum	2.916	9.085	35.072	11.200	17.007	27.478
Malaysia (34 years)						
Mean	3.996	5.944	28.496	3.827	13.020	-0.846
Standard Deviation	1.930	3.790	7.151	1.392	5.641	6.324
Minimum	0.057	-7.359	17.836	1.120	2.860	-28.315
Maximum	8.763	10.003	43.640	7.400	19.760	9.420
Philippines (34 years)						
Mean	1.218	3.455	21.476	8.074	2.526	-4.477
Standard Deviation	0.877	3.435	3.738	1.822	1.445	9.827
Minimum	-0.327	-7.324	14.347	4.800	0.886	-33.452
Maximum	3.167	7.632	29.595	11.900	4.510	11.194
Singapore (34 years)						
Mean	13.144	6.853	33.110	3.319	37.609	1.725
Standard Deviation	5.720	4.127	7.552	1.085	7.320	4.202
Minimum	4.226	-2.225	17.641	2.000	22.224	-11.281
Maximum	26.521	15.240	46.954	6.800	49.666	8.406
Thailand (34 years)						
Mean	2.415	5.400	30.234	1.997	6.165	-0.924
Standard Deviation	1.580	4.398	6.586	1.210	4.014	7.136
Minimum	0.420	-10.510	20.447	0.700	0.773	-24.166
Maximum	6.539	13.288	42.841	5.800	11.172	9.745
Vietnam (28 years)						
Mean	5.055	6.530	26.750	2.203	5.590	-17.041
Standard Deviation	3.120	1.623	7.815	0.226	6.067	29.736
Minimum	0.000	2.789	12.566	1.800	0.118	-95.596
Maximum	11.939	9.540	39.566	2.900	19.759	5.274

Table 4: Descriptive statistics of variables over the period of 1980-2013 (continued)

	FDI(%)	GDPG(%)	CAP(%)	UNEMP(%)	TELE	EXMOVE(%)
Panel B: Multiple countries						
5 countries (163 country-year observations)						
Mean	2.635	5.303	26.984	4.387	6.395	-5.503
Standard Deviation	2.417	3.707	6.825	2.841	5.928	16.295
Minimum	-2.757	-13.127	11.367	0.700	0.118	-95.596
Maximum	11.939	13.288	43.640	11.900	19.760	27.478
6 countries (197 country-year observations)						
Mean	4.448	5.571	28.042	4.203	11.782	-4.256
Standard Deviation	5.117	3.817	7.314	2.652	13.338	15.164
Minimum	-2.757	-13.127	11.367	0.700	0.118	-95.596
Maximum	26.521	15.240	46.954	11.900	49.666	27.478

Note: FDI: foreign direct investment as a percentage of GDP, GDPG: annual GDP growth rate, CAP: gross capital formation as a percentage of GDP, UNEMP: unemployment, TELE: telephone lines per 100 people, EXMOVE: exchange rate movement.

percent depreciated in 6 countries. It can be seen that all variables improve when Singapore is included.

The correlations among variables for all regressions are shown in Table 5. It can be seen that the correlations among variables are lower than 0.8; thus, there should not be a serious multicollinearity problem in the regression.

Table 5: Correlation coefficients of variables

Panel A: Single country

	GDPG	CAP	UNEMP	TELE
Indonesia				
CAP	0.619			
UNEMP	-0.183	-0.370		
TELE	-0.020	0.236	0.571	
EXMOVE	0.552	0.016	0.231	0.212
Malaysia				
CAP	0.504			
UNEMP	-0.075	-0.248		
TELE	-0.173	-0.129	-0.391	
EXMOVE	0.584	-0.081	-0.042	-0.016
Philippines				
CAP	0.131			
UNEMP	0.133	-0.181		
TELE	0.352	-0.284	0.455	
EXMOVE	0.623	-0.229	0.028	0.315
Singapore				
CAP	0.178			
UNEMP	-0.394	-0.307		
TELE	-0.257	-0.669	0.067	
EXMOVE	0.537	-0.203	-0.199	-0.210
Thailand				
CAP	0.551			
UNEMP	0.046	-0.214		
TELE	-0.441	-0.399	-0.490	
EXMOVE	0.559	0.061	-0.187	0.166
Vietnam				
CAP	0.277			
UNEMP	0.181	0.057		
TELE	-0.083	0.788	-0.236	
EXMOVE	0.520	0.735	0.123	0.433

Table 5: Correlation coefficients of variables (continued)

Panel B: Multiple countries

	GDPG	CAP	UNEMP	TELE
5 countries				
CAP	0.464			
UNEMP	-0.212	-0.406		
TELE	-0.001	0.248	-0.181	
EXMOVE	0.320	0.275	0.085	0.265
6 countries				
CAP	0.430			
UNEMP	-0.235	-0.406		
TELE	0.110	0.302	-0.204	
EXMOVE	0.331	0.275	0.049	0.259

Note: FDI: foreign direct investment as a percentage of GDP, GDPG: annual GDP growth rate, CAP: gross capital formation as a percentage of GDP, UNEMP: unemployment, TELE: telephone lines per 100 people, EXMOVE: exchange rate movement.

4.2 Regression results

Table 6 shows the regression results for each of the ASEAN 6 countries, whereas Table 7 details the regression results for the pooled 5 countries (excluding Singapore) and 6 countries samples. For each pooled sample, 2 regressions are run with and without the country dummies, which are included to take into account the country-specific characteristics. GDPG does not significantly affect the FDI for each single country in Table 6, but it is found to be significantly positively related to FDI as a percentage of GDP in Table 7 at a 5-percent significance level for the pooled sample. This is consistent with the literature stating that higher GDP growth or bigger market size has a positive effect on FDI inflows, such as Hsiao and Gastanaga (2001), Fedderke and Romm (2006), and Malhotra, Russow, and Singh (2014).

It can be seen from Table 6 that CAP, the gross domestic formation as a percentage of GDP, is positively related to FDI in Indonesia at the 1-percent significance level, but it is negatively related to Singapore at the 5-percent level. Furthermore, it can be seen from Table 7 that CAP is significantly positively related to FDI as a percentage of GDP at the 5-percent significance level for the 5 countries as a whole. This result suggests that foreign direct investment and domestic investment are complementary rather than substitutes in ASEAN 5 countries, but they are substitutes in Singapore. This can be explained by the fact that ASEAN 5 countries are still less developed than Singapore; therefore, both FDI and domestic investment are required to boost the economy at the same pace.

UNEMP, the unemployment rate, is found to be significantly positively related to FDI in Indonesia and the Philippines at the 1- and 5-percent significance levels in Table 6, but it is shown in Table 7 that it is significantly negatively correlated to FDI at the 1- and 5-percent significance levels. This result suggests that higher unemployment would encourage FDI inflows to Indonesia and the Philippines, suggesting that FDI inflows to these 2 countries are attracted by the lower cost of largely supplied labor. However, higher unemployment would discourage FDI inflows in an overall picture of 6 countries. Higher unemployment may indicate a country's poor current economic situation and future prospects, which would hinder foreign direct investment inflows.

TELE, the fixed telephone subscriptions per 100 people, is shown to have a significant positive effect on FDI as a percentage of GDP for Thailand in Table 6 and for 5 countries and 6 countries in Table 7 at the 1-percent significance level. This result is consistent with the literature stating that better infrastructure would attract more foreign direct investment inflows (Chien and Zhang, 2012).

The coefficients of variable EXMOVE are not consistent in all regressions; it is negatively related to FDI for Thailand at the 1-percent significance level, but positively correlated to FDI for the Philippines and Vietnam at the 10-percent significance level in Table 6, and 5 countries and 6 countries at the 5-percent significance level in Table 7. This result implies that exchange rate movement does affect the FDI in ASEAN countries, but in a different way: the depreciation of Thai Baht would lead to more FDI inflows to Thailand – this result is consistent with Abugri and Soydemir (2002) and Takagi and Shi (2011), but the appreciation of the Philippines and Vietnam local currencies would lead to more FDI inflows to them. Overall, the appreciation of the ASEAN local currency would attract more FDI inflows.

Variable CRISIS is found to be significant at the 5-percent level only for the Philippines in Table 6. Further, none of the regression results show a significant relationship in Table 7. This is consistent with Takagi and Shi (2011). Thus, it can be concluded that the 1997 financial crisis and the 2008 global financial crisis do not affect FDI inflows to ASEAN 6 countries.

In Table 7, all of the coefficients for the country dummies are found to be negatively significant at the 1-percent level. This result is consistent with the fact that all of the 5 countries' FDI inflows are significantly less than the base country Singapore.

Surprisingly, it is noted that in Table 6 there is no variable found to be significant for Malaysia. This suggests that there are no special characteristics of Malaysia that could attract more FDI inflows. This can be explained by that FDI is hampered by an at times burdensome regulatory regime and restrictions in some sectors during the study period (U.S. Department of State, 2014). Further mentioned in the statement is that Malaysia's performance in attracting FDI relative to the rest of ASEAN countries has slowed after the 2008-2009 crisis.

Table 6: Regression results for single country

Dependent variable FDI: FDI net inflows as a percentage of GDP

	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
C	-7.240***	12.492	0.069	35.710**	-0.048	-0.819
	(0.000)	(0.136)	(0.951)	(0.037)	(0.977)	(0.881)
GDPG(-1)	-0.035	-0.102	0.010	0.192	0.114	0.334
	(0.663)	(0.416)	(0.860)	(0.486)	(0.203)	(0.343)
CAP(-1)	0.257***	-0.028	-0.003	-0.586**	-0.012	0.250
	(0.001)	(0.799)	(0.935)	(0.012)	(0.779)	(0.112)
UNEMP(-1)	0.254***	-0.765	0.210**	0.284	0.025	-0.513
	(0.007)	(0.316)	(0.019)	(0.782)	(0.908)	(0.682)
TELE(-1)	-0.031	-0.281	-0.186	-0.111	0.331***	-0.189
	(0.543)	(0.355)	(0.138)	(0.603)	(0.000)	(0.282)
EXMOVE(-1)	0.009	0.017	0.034*	-0.458	-0.118***	0.059*
	(0.534)	(0.792)	(0.086)	(0.150)	(0.007)	(0.077)
CRISIS	-0.079	-0.510	0.858**	-1.437	0.489	-0.198
	(0.849)	(0.610)	(0.027)	(0.588)	(0.414)	(0.850)
R-squared	0.695	0.424	0.378	0.421	0.623	0.733
Observations	33	34	34	34	34	28

Note: GDPG stands for annual growth rate of gross domestic production, CAP stands for gross capital formation as a percentage of GDP, UNEMP stands for unemployment rate, TELE stands for fixed telephone subscriptions per 100 people, EXMOVE stands for exchange rate movement, CRISIS stands for 1997 and 2008 financial crises dummy. (-1) stands for one-year lag.

Numbers in parentheses are p-values; ***, **, and * indicate significance at the level of 1%, 5%, and 10%, respectively.

Table 7: Regression results for pooled sample

Dependent variable FDI: FDI net inflows as a percentage of GDP

	5 countries		6 countries	
C	1.995	3.760***	2.573*	10.003***
	(0.102)	(0.002)	(0.057)	(0.000)
GDPG(-1)	0.134**	0.007	0.155**	0.048
	(0.016)	(0.901)	(0.045)	(0.524)
CAP(-1)	0.004	0.057**	-0.060	-0.057
	(0.901)	(0.049)	(0.180)	(0.211)
UNEMP(-1)	-0.215***	0.036	-0.179**	0.054
	(0.001)	(0.530)	(0.013)	(0.452)
TELE(-1)	0.110***	0.023	0.302***	0.121***
	(0.001)	(0.487)	(0.000)	(0.001)
EXMOVE(-1)	0.006	0.034**	-0.003	0.034**
	(0.600)	(0.015)	(0.832)	(0.034)
CRISIS	0.550	0.440	-0.392	0.021
	(0.250)	(0.234)	(0.550)	(0.970)
INDONESIA		-4.653***		-8.400***
		(0.000)		(0.000)
MALAYSIA		-1.910***		-6.403***
		(0.004)		(0.000)
PHILIPPINES		-4.072***		-8.347***
		(0.000)		(0.000)
THAILAND		-3.343***		-6.963***
		(0.000)		(0.000)
VIETNAM				-3.964***
				(0.001)
R-squared	0.253	0.522	0.634	0.718
Observations	163	163	197	197

Note: GDPG stands for annual growth rate of gross domestic production, CAP stands for gross capital formation as a percentage of GDP, UNEMP stands for unemployment rate, TELE stands for fixed telephone subscriptions per 100 people, EXMOVE stands for exchange rate movement, CRISIS stands for 1997 and 2008 financial crises dummy. (-1) stands for one-year lag. 5 countries include Indonesia, Malaysia, the Philippines, Thailand and Vietnam; 6 countries include 5 above countries and Singapore.

Numbers in parentheses are p-values; ***, **, and * indicate significance at the level of 1%, 5%, and 10%, respectively.

5. Conclusion

This paper investigates the country specific determinants of FDI net inflows as a percentage of GDP to ASEAN 6 countries, namely Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam, over the period of 1980-2013. The possible location-based advantage determinants are chosen from five different aspects based on previous studies: market size (proxied by annual gross domestic production growth rate), FDI substitutes (proxied by gross capital formation), cost (proxied by unemployment), infrastructure (proxied by fixed telephone subscriptions), and risk (proxied by exchange rate risk and crisis risk).

Since Singapore is very different from the other 5 countries, the regression is run with and without it. The empirical results show that GDP growth, fixed telephone subscription, and exchange rate movement are significantly positively related to FDI as a percentage of GDP for both 5 countries and 6 countries samples, whereas unemployment rate is significantly negatively related to FDI as a percentage of GDP in 5 and 6 countries samples. However, domestic capital formation is only positively significantly related to the FDI inflows of the 5 countries sample, but not the 6 countries sample. The results suggest that the FDI net inflows to ASEAN 6 countries are attracted by bigger market size, better domestic investment climate (excluding Singapore), lower unemployment rate, better infrastructure, and the appreciation of the local currency. FDI and domestic investment are found to be complementary for 5 countries but substitutes for Singapore. A higher unemployment rate would discourage FDI inflows; however, opposite results were found for Indonesia and the Philippines. Further, crisis is found to have no effect on 6 countries' FDI inflows.

Hence, the implication of the study is that the public policy makers in Singapore and ASEAN 5 countries should focus more on improving the GDP, infrastructure, and domestic investment climate, and reducing the unemployment rate in order to attract more foreign direct investment inflows from the multinational enterprises.

This paper has several limitations. One is that only 5 aspects of CSA are studied due to the data unavailability, future research can explore other aspects such as institutional factors of the ASEAN major countries. Another limitation is that the structural break of 1992 caused by ASEAN's conversion to a regional trade agreement (Selmier and Oh, 2013) is not considered in the current study, which could be taken into account in the future research. In addition, this paper studies only the aggregate FDI data and CSA factors, in the future researches, data from different industries such as electronics and automobiles can be analyzed to study the FSA factors.

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