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Modeling Macroeconomic Determinants for Foreign Direct Investment Inflows in ASEAN-5 countries

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ABSTRACT

This paper aims to revalidate the significant roles of selected macroeconomic indicators that become important characteristics of ASEAN-5 countries such as domestic investment (DI), trade openness (TO) and financial development (FD) as a source of attraction for higher FDI inflows. The study implements Autoregressive Distributed Lag (ARDL) estimation to investigate the short run and long run elasticities of the proposed model. The findings based on long-run elasticities reveals that economic growth rate is significant and positively influenced FDI inflows for Malaysia, Indonesia, and Thailand. Meanwhile, domestic investment is found to be significant and positively influenced FDI inflows only for Malaysia and Singapore. On the other hand, this variable shows a significant and negative sign in the case of Philippines. The increases of government size in both Thailand and Philippines also lead towards higher FDI inflows into this region. Lastly, financial development is found to have a significant and positive sign in the case of Singapore, but negative sign is detected for the case of Thailand and Philippines. This outcome would help the policymakers for each ASEAN-5 countries to revise its current policies on strengthening their macroeconomic indicators that could lure in higher FDI inflows into the country.

JEL Classification:F43, O53
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INTRODUCTION

The importance of achieving sustainable development (SD) has been addressed substantially by various reports from international organizations such as United Nation (UN), United Nation Conference on Trade and Development (UNCTAD), Organization for Economic Co-operation and Development (OECD), and other agencies to preserve a better living for the future generation. Even within ASEAN (Association of South East Asian Nation), especially ASEAN-5 countries (Malaysia, Indonesia, Thailand, Philippines, and Singapore), many special sessions have ensued between the ASEAN foreign ministers to discuss and develop ways in which ASEAN could contribute to regional and global efforts in promoting SD. Based on a report called "Our Common Future", SD is the development that meets the needs of the present without compromising the ability of the future generations to meets their needs. Meanwhile, based on ASEAN's economic, environment, and social context, SD reflects sustainability and balance between economic, environment, and social progress. At present, the United Nations General Assembly is adopting the 2030 Agenda for Sustainable Development, which is a new agenda based on the achievement of the Millennium Development Goals (MDGs) with wider scope and ambition.

Foreign direct investment (FDI) inflows that significantly foster industrialization has become an increased concern on SD in ASEAN region (Karki et al. 2005). As addressed by the World Bank (1999) report, FDI can be the key for ASEAN countries to achieve SD. Given the evolution of foreign capital flows worldwide, UNCTAD (2014) believed that foreign investment has a major potential driver for achieving SD. To reach SD, FDI is expected to be able to continue not only in economic growth, but also leading to improvement in income distribution as well as environmental quality. To sustain higher FDI inflows, ASEAN leaders must focus on the implementation of long-term strategies planning under their regional economic cooperation. The ASEAN Investment Area (AIA), observed in October 1998, secured higher inflows of FDI by facilitating free flows of direct investment, technology, and skilled labour (ASEAN Secretariat, 1998). This agreement functioned as a significant milestone that stimulated the surge of FDI inflows into ASEAN member countries besides providing plenty of mutual advantages for investors to exploit regional business strategies and attract greater sustainable levels of FDI flows into the region. The AIA deepened through the ASEAN Comprehensive Investment Agreement (ACIA) was implemented in 2007. This agreement includes further steps towards liberalization, facilitation, protection and promotion of investments. This agreement has provided the opportunity for ASEAN to embark on deeper and stronger economic integration. Besides, according to the OECD (2013), each member country of ASEAN appears to specialize in attracting FDI in specific sectors, depending on each country's comparative advantage and natural endowments relative to regional neighbours.

Previous economic downturn such the Asian financial crisis in 1997-1998 and global economic crisis in 2007-2008 have revealed that there is a huge decrease of the total FDI inflow into most of the ASEAN-5 countries as displayed in Figure 1. During the first year of Asian financial crisis in 1997, Malaysia recorded a huge amount of FDI inflows as much as US$ 5136.51 million. Unfortunately, it dropped to US$2163.40 million during the peak of the Asian crisis in 1998. This shows a decreased of 58% from 1997 to 1998. In the case of Thailand and Philippines, both recorded a fall of 46% between 1997 and 1998, respectively. Indonesia recorded more serious downfall for its FDI inflows. In 1996, the amount of FDI inflows was reported to be worth of US$6194 million. However, in 1997, the number of foreign investments dwindled to US$4677 million, which is nearly 24% drop from the amount collected in 1996. In 1998, the amount of FDI inflows was reported to be negative which is -US$240 million. Singapore experienced the worst implication from Asian financial crisis in term of the foreign investment. Total FDI inflows have decreased almost a half from US$13752 million in 1997 to only US$7313.86 million in 1998. Again, during the global recession in 2007-2009, Singapore losses the highest amount of foreign investment from US$47733.20 million in 2007 to US$12200.70 million in 2008. Moderate fall in total FDI inflows is detected for other ASEAN-5 countries except for Indonesia where its total FDI inflows only begin to reduce in 2009.

Total FDI inflows (USD million)

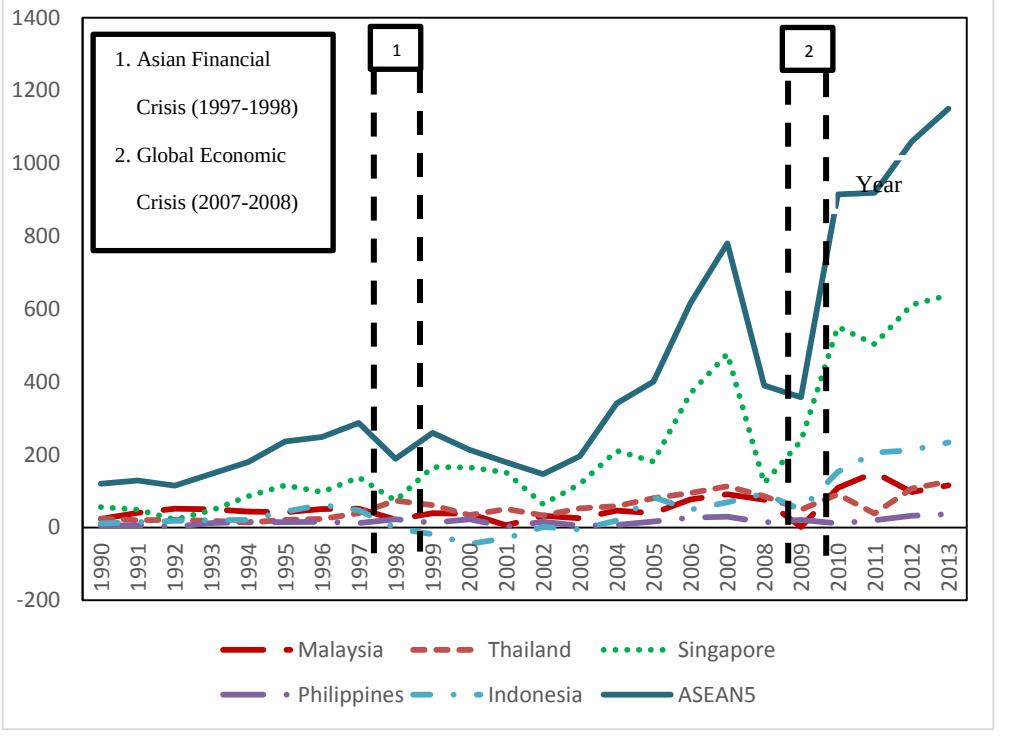


Figure 1 Total Foreign Direct Investment Inflows (US$ million) for ASEAN-5 Countries

Both incidences conclude that most ASEAN-5 countries are vulnerable towards a global economic condition such as financial crisis, and this will be problematic as sustaining FDI inflow is an important criterion for SD goal as stated by UNCTAD (2014). Thus, there is a need to investigate the macroeconomic determinants for FDI inflows in ASEAN-5 countries to ensure the sustainability of FDI inflows into these countries. The determinants are founded based on the selected absorptive capacity of the host countries (ASEAN-5). Absorptive capacity is the measurement that is used to see how well the host country is able to absorb and adopt new incoming technology from foreign country. Achieving sufficient absorptive capacity will result in attracting FDI and in turn FDI will improve the investment climate, thus claiming to the fact of the effectiveness of FDI. In this study, the absorptive capacities are determined as economic growth rate, trade openness, and financial development.

REVIEW OF LITERATURE

In recent years, the empirical analyses of the relationship between FDI and its determinants have received considerable attention in response to the dynamics of the investment environment. Renewed research interest in FDI inflows stems from the change of perspectives among policymakers in host countries to encourage and attract more FDI that would create opportunities and help developing countries to achieve sustainable development (Cassidy and Callaghan, 2006; Erdal and Tatoglu, 2002). There are various determinants of FDI inflow that have been studied comprehensively. In this section, few past studies on macroeconomic determinants for FDI inflows are categorized into two groups which are firstly based on ARDL estimation and the second group is based on any other types of estimation.

Several studies on finding the determinants of FDI using ARDL estimation are listed as follows: Fosu and Magnus (2006), for example, analyzed the long-run relationships among FDI, economic growth rates, trade openness, and domestic investment in Ghana for the period between 1970 until 2002. The results showed that there was a negative impact between FDI and economic growth. Chandran and Krishnan (2008) studied the relationship between FDI inflows and manufacturing growth in Malaysia including labor (LR) and, fixed capital stocks (FCS) for the period between 1970 till 2003. They found short and long run elasticities among FDI, labor and FCS. Faras and Ghali (2009) examined the relationship between FDI inflows and economic growth in Gulf Cooperation Council (GCC) countries including trade openness, domestic investment and market size for the period between 1970 till 2006. They found that there were long-run elasticities among FDI and economic growth. Almsafir et al. (2011) identified the relationship among FDI, market size, export, financial development, company tax and inflation for the 1970 till 2009 period. Based on ARDL estimation, the results revealed that there are co-integration relationships between FDI and its determinants in Malaysia. Similar studies as above were conducted by Bekhet and Al-Smadi (2015) on findings the determinants of FDI inflows for Jordan.

Jordan is classified as one of the top twenty countries in the world in terms of attracting FDI inflows, as a result of various structural reforms and the liberalization of trade and investment. The study on Jordan used annual data covering from 1978 until 2012. The outcome showed that an increase in economic growth, trade openness, financial development and stock market index in Jordan have led towards higher FDI inflows. On the contrary, there is a negative relationship between inflation and FDI inflows. Higher inflation in the economy could show that the country is unable to balanced its budget and thus the monetary policys need to be adjusted.

The second category on this section used other types of estimation such as panel estimation, vector error correction estimation (VECM) and others techniques. Ang (2008) examined the relationship between FDI and its determinants in Malaysia including market size, inflation, financial development and trade openness for the period between 1960 till 2005 by using generalized autoregressive conditional heteroscedasticity (GARCH) volatility time series. The outcomes found that there was a significant relationship between FDI and its determinants. Kok and Ersoy (2009) investigated the relationship between FDI and its determinants in developing countries including market size, inflation, domestic investment and trade openness for 24 countries over the period of 1975 till 2005 using panel data estimation. The results pointed out that there was a strong positive effect between FDI and its determinants. Boateng, Hua, Nisar and Wu (2015), examined the macroeconomic determinants of FDI inflows for Norway based on location-specific advantage. The study in Norway is conducted because of series of changing pattern for FDI inflows into the country over the past three decades. The study on Norway used quarterly data begin from 1986 to 2009 and the technique applied is Full Modified Ordinary Least Square (FMOLS). The outcome of the estimation revealed that real GDP, exchange rate, and trade openness have a positive and significant relationships with FDI inflows. However, money supply, inflation, unemployment and interest rates produce negative and significant results. The findings from Norway is consistent with Dunning (2009) arguments that macroeconomic determinants such as market size, openness to trade, financial development etc. are the key elements of location-specific advantages that exert significant influence on MNC investment decisions in recent years. Catherine and Lena (2017) tested the selected macroeconomic determinants for FDI inflows in Malaysia and US. From the output, it is found that, only domestic interest rates and TO are the significant drivers for attracting FDI into Malaysia. Meanwhile, other determinants such as exchange rates, inflations rate, economic growth, stock market performance, domestic credit, and household consumption failed to positively influence higher FDI inflows. The outcomes for US, on the other hand, showed that only economic growth and domestic credit could positively attract higher FDI inflows into the country. Based on Ordinary Least Square (OLS) estimation, the period of data consists of 33 years of observation from 1981 to 2013. However, the method used by these authors is believed to be suffered from non-stationarity problems which can lead to spurious results.

Most of the studies above show a similar outcome from the tested macroeconomics variables on FDI inflows. The techniques, the choice of variable, and the sample period might influence the results. This research paper used longer sample period and the use of ARDL analysis would be a strength offered by this research paper as it addressed the importance of dynamic studies since the series in concern may influence each other with some lags, thus may provide more reliable results.

RESEARCH METHODOLOGY

The selection of the variables for the model of FDI inflows was specifically based on macroeconomic variables that were believed to play its vital role in ASEAN-5 countries. The regression equation for the FDI inflows model introduced in this study is written as:

$$TFDI_t = f(GDPR, DI, TO, GS, FD) \tag{1.0}$$

where $TFDI$ is net FDI inflows (BoP current US$), $GDPR$ is economic growth rates, DI is domestic investment measured by gross domestic investment as percentage of GDP, TO is trade openness measured by sum of exports and imports over GDP, GS representing government size, proxied by government final consumption on goods and services as percentage of GDP, and lastly FD is financial development also known as financial depth proxied by money supply, M2 over GDP. Despite many previous studies such as Bekhet and Al-Smadi (2015) and Boateng et al (2015) included inflation in the model, we decided not to include this variable in our equation as the ASEAN-5 government managed to maintain low inflation rates. The inclusion of GS in equation (1.0) to replace inflation or other common variable such as exchange rate is to address the commitment of the ASEAN-5 countries to reduce the relative size of the government in order to make it leaner and more efficient that could potentially attract higher FDI inflows into the country.

The log-linear form (LN) of each variable in the above equation is shown as follows:

$$LNTFDI_{it} = \alpha_0 + \beta_1 LNGDPR_{it} + \beta_2 LNDI_{it} + \beta_3 LNTO_{it} + \beta_4 LNGS_{it} + \beta_5 LNFD_{it} + \varepsilon_t \tag{2.0}$$

For consistent and efficient results, all the variables were transformed into natural logarithms (LN) in order to produce elasticities outcomes as well as to reduce heteroscedasticity problem (Bekhet and Matar, 2012). The term ε represents error term and the subscripts i and t denote country and time, respectively.

A stable economic growth rate signifies a good economic performance and therefore is more attractive to foreign investors (Sahoo, 2006). High economic growth rates are likely to lure investors in findings the potential market for higher return values on investments which are confined to a higher level of FDI. A stable economic growth rate signifies a good economic performance and therefore is more attractive to foreign investors. Thus, the expected sign for GDPR (β_1) is positive.

Higher amount of domestic investment (β_2) is recorded for ASEAN-5 countries since its formation. The countries are moving from agriculturally based into manufacturing and services based which are the reasons for higher amount of domestic investment being poured into the economy, thus improving the basic infrastructure development in a country. The improvement in the investment climate could help to attract higher FDI inflows. However, according to Libor and Krkoska (2001), the relationship between DI and FDI is not simple. In the case of certain privatization, it may not lead to increase or even result in reduction. Thus, there is an unclear relationship between DI and FDI especially for transition economies like ASEAN-5 countries. Thus, the relationship between DI and FDI could be positive or negative.

Next, the expected sign for trade openness (β_3) can be varried. According to Dunning (1993), the degree of trade openness could affect FDI inflows, either positively or negatively, depending on the motivation of the FDI activities. A number of researchers argue that liberal of trade regime or trade openness generates positive investments climate (Grossman and Helpman 1991; Liu et al., 2001). Based on FDI theories, this positive relationship is associated with vertical FDI where this type of FDI is largely driven by motives to reduce both trade barriers and transport cost. Fewer trade barriers or more open economy will attract more foreign investors to invest in the country. In contrast, Wheeler and Mody (1992) found that large FDI inflows have been spotted in the countries that practice low levels of TO such as Brazil. This type FDI is called horizontal FDI as it is motivated by market seeking motives where trade barriers impose a considerable cost. In the context of this study, TO in ASEAN-5 countries is expected to improve business friendly economic climate and increase investments, thus leading to further FDI inflows.

The size of the government, on the other hand, indicate the extent of government involvement in the economy. The smaller a government is, the more efficient it is perceived to be, thus creating a conducive environment for robust private investment, domestic and foreign. Reducing the relative size of the government could be done through regular cuts in spending programs, help to increase the efficiency of the government. Thus, a negative relationship is expected between GS (β_4) and FDI inflows. On the other hand, a relatively large government tends to crowd out private investment in an economy as stated by Mkenda and Mkenda (2004). In this sense, one expects a positive relationship between government size (β_4) and FDI inflows.

Financial development (β_5), is expected to have a positive relationship with FDI inflows as stated by Deichmann, Karidis, and Sayek (2003). According to Ang (2009), a more developed financial system allows an economy to exploit the benefits of foreign direct investment more efficiently. The depth in the financial sector can act as a mechanism for facilitating the adoption of new technology in the domestic economy through technology transfer and induce spillover efficiency. The growing financial depth in ASEAN-5 countries could potentially attract higher foreign investment.
The Unrestricted Error Correction Model (UECM) for equation (2.0) as follows:

$$\begin{aligned}\Delta LNTFDI_t = {} & \beta_0 + \theta_0 LNTFDI_{t-1} + \theta_1 LNGDPR_{t-1} + \theta_2 LNDI_{t-1} \\ & + \theta_3 LNGS_{t-1} + \theta_4 LNTO_{t-1} + \theta_5 LNFD_{t-1} \\ & + \sum_{i=1}^{p} \beta_i \Delta LNTFDI_{t-i} + \sum_{i=0}^{q} \gamma_i \Delta LNGDPR_{t-i} \\ & + \sum_{i=0}^{r} \delta_i \Delta LNDI_{t-i} + \sum_{i=0}^{s} \lambda_i \Delta LNGS_{t-i} + \sum_{i=0}^{t} \vartheta_i \Delta LNTO_{t-i} \\ & + \sum_{i=0}^{u} \varsigma_i \Delta LNFD_{t-i} + v_t\end{aligned} \tag{2.0}$$

where Δ is the first difference operator and v_t is a white-noise disturbance term. The final model represented in equation (3.0) above can also can be viewed as an ARDL of order, ($p\ q\ r\ s\ t\ u$). The model indicates that total foreign direct investment inflows (TFDI) to be influenced and explained by its past values, so it involves other disturbance or shocks. From the estimation of UECM, the long run elasticities are the coefficient of the one lagged explanatory variables (multiplied by a negative sign) divided by the coefficient of the one lagged dependent variable. The short-run effects are captured by the coefficient of the first differenced variables. The null of no cointegration in the long run relationship is defined by: H_0: $\theta_0 = \theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = 0$ (there is no long-run relationship), is tested against the alternative of H_1: $\theta_0 \neq \theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq 0$ (there is a long-run relationship exists), by means of familiar F-test. However, the asymptotic distribution of this F-statistics is non-standard irrespective of wheather the variable are *I*(0) or *I*(1). For a small sample size study ranging from 30 to 80 observations, Narayan (2004) has tabulated two set of appropriate critical values. One set assumes all variables are *I*(1), and another assumes that they are all *I*(0). If the F-statistic falls below the bound level, the null hypothesis cannot be rejected. On the other hand, if the F-statistic lies exceed upper bound level, the null hypothesis is rejected, which indicated the existence of cointegration. If, however, it falls within the band, the result is inconclusive.

Sources of Data

Annual data over 44 years starting from 1970 until 2013 are used in the empirical analysis. The list of variables is listed in Table 1 below. The data were collected from World Development Indicator (WDI) published by World Bank in 2016.

Table 1 Sources of data

Model	Description	Sources
$TFDI$	Foreign direct investment, net inflows (current)	WDI
$GDPR$	Real growth rates %	WDI
DI	Gross fixed capital formation as % of GDP	WDI
GS	Government consumption expenditure as % of GDP	WDI
TO	Sum of export and import divided by GDP	WDI
FD	Money supply, M2 as % of GDP	WDI

RESULTS AND DISCUSSION

The presence of unit roots is first checked by unit root test namely Augmented Dickey-Fuller (ADF), followed by Philip-Perron (PP). The purpose of this preliminary analysis is to ensure that the order of integration for each variable are not stationary at $I(2)$ as suggested by Pesaran et al. (2001). The results of this tests can be viewed in Table 2. Based on Malaysia model, the ADF test shows that $LNTFDI$ at level is stationary for both intercept (5% significant level) and trend and intercept (1% significant level). Besides, $LNGDPR$ is also found to be stationary at level (1% significant level) for both intercept and trend and intercept. The rest variables such as $LNDI, LNTO, LNGS$ and $LNFD$ are not significant at level. Next, the ADF unit root test is conducted again but this time at first difference. The results show that there is a mixture of stationarity for the variable both at intercept and trend and intercept. Similar outcomes are seen as a more powerful unit root test, namely, PP is conducted. The rest of ASEAN-5 countries also exhibit a similar outcome just like Malaysia where there is a mix of stationarity of the data both at a level as well as at first difference. In other words, some of the variables in the model are integrated in the order of one, $I(1)$, while some integrated in the order of zero, $I(0)$. Thus, it is confirmed that the ARDL approach to cointegration is the most suitable types of analysis that can be conducted to find the relationship between the variables as proposed in the model.

Table 2 Unit Root Tests

Model		Variable	ADF test		PP test	
			Intercept	Trend and intercept	Intercept	Trend and intercept
Malaysia	Level	$LNTFDI$	-2.97 (0)**	-5.02 (0)***	-2.78 (1)*	-5.02 (0)***
		$LNGDPR$	-6.21 (0)***	-6.33 (0)***	-6.21 (0)***	-6.33 (2)***
		$LNDI$	-2.48 (1)	-2.50 (1)	-2.40 (2)	-2.37 (1)
		$LNGS$	-0.89 (0)	-0.869 (0)	-0.89 (2)	-0.86 (0)
		$LNTO$	-1.98 (0)	-2.72 (0)	-1.81 (2)	-2.71 (1)
		$LNFD$	-2.54 (0)	-2.90 (0)	-2.74 (5)*	-2.81 (3)
	First difference	$LNTFDI$	-3.07 (9)**	-2.70 (9)	-17.03 (13)***	-18.76 (14)***
		$LNGDPR$	-8.25 (1)***	-8.14 (1)***	-24.32 (17)***	-23.90 (17)***
		$LNDI$	-4.71 (0)***	-4.64 (0)***	-4.65 (3)***	-4.58 (3)***
		$LNGS$	-5.70 (0)***	-5.75 (0)***	-5.67 (2)***	-5.72 (3)***
		$LNTO$	-7.82 (0)***	-7.78 (0)***	-8.83 (7)***	-9.36 (9)***
		$LNFD$	-5.92 (1)***	-6.11 (1)***	-6.44 (4)***	-7.00 (6)***
Indonesia	Level	$LNTFDI$	-3.30 (0)**	-3.27 (0)*	-3.39 (3)**	-3.38 (3)*
		$LNGDPR$	-4.75 (0)***	-4.82 (0)***	-4.75 (0)***	-4.84 (1)***
		$LNDI$	-2.28 (1)	-2.52 (1)	-1.78 (1)	-1.96 (1)
		$LNGS$	-2.66 (0)*	-2.65 (0)	-2.84 (4)*	-2.83 (4)
		$LNTO$	-2.10 (0)	-2.29 (0)	-1.97 (2)	-2.17 (2)
		$LNFD$	-1.51 (1)	-0.57 (1)	-2.63 (3)*	-0.90 (2)
	First difference	$LNTFDI$	-10.35 (0)***	-10.25 (0)***	-10.31 (1)***	-10.21 (1)***
		$LNGDPR$	-7.15 (1)***	-7.06 (1)***	-21.46 (27)***	-22.43 (28)***
		$LNDI$	-4.48 (0)***	-4.45 (0)***	-4.42 (5)***	-4.39 (5)***
		$LNGS$	-8.17 (0)***	-8.07 (0)***	-8.29 (2)***	-8.18 (2)***
		$LNTO$	-8.55 (0)***	-8.44 (0)***	-8.56 (1)***	-8.45 (1)***
		$LNFD$	-4.74 (0)***	-4.92 (0)***	-4.73 (2)***	-4.93 (1)***
Thailand	Level	$LNTFDI$	-1.29 (0)	-2.87 (0)	-1.29 (0)	-2.79 (8)
		$LNGDPR$	-4.63 (0)***	-5.02 (0)***	-4.63 (0)***	-5.03 (2)***
		$LNDI$	-1.67 (1)	-2.52 (1)	-1.48 (2)	-1.81 (2)
		$LNGS$	-0.28 (0)	-2.49 (0)	-0.20 (4)	-2.54 (1)
		$LNTO$	-1.90 (1)	-2.17 (1)	-1.41 (2)	-1.65 (2)
		$LNFD$	-1.32 (0)	-1.35 (0)	-1.25 (2)	-1.35 (0)
	First difference	$LNTFDI$	-5.96 (0)***	-4.63 (5)***	-5.95 (3)***	-6.04 (3)***
		$LNGDPR$	-9.41 (0)***	-9.28 (0)***	-24.98 (30)***	-24.59 (30)***
		$LNDI$	-3.78 (0)***	-3.83 (0)**	-3.77 (2)***	-3.82 (2)**
		$LNGS$	-6.70 (0)***	-6.60 (0)***	-6.77 (5)***	-6.66 (5)***
		$LNTO$	-4.27 (0)***	-4.33 (0)***	-4.26 (2)***	-4.39 (1)***
		$LNFD$	-4.94 (0)***	-4.89 (0)***	-4.90 (3)***	-4.81 (4)***

Table 2 (Cont.)

Philippines	Level	*LNTFDI*	-7.35 (0)***	-8.02 (0)***	-7.25 (2)***	-7.96 (2)***
		LNGDPR	-3.78 (0)***	-4.11 (1)**	-3.64 (4)***	-3.60 (4)**
		LNDI	-3.28 (1)**	-3.45 (1)*	-2.56 (1)	-2.67 (2)
		LNGS	-1.12 (0)	-0.89 (0)	-1.12 (2)	-1.04 (2)
		LNTO	-1.95 (1)	-2.05 (1)	-1.87 (3)	-1.96 (3)
		LNFD	-0.27 (0)	-2.47 (0)	-0.22 (3)	-2.47 (0)
	First difference	*LNTFDI*	-3.76 (5)***	-5.01 (8)***	-36.23 (41)***	-42.38 (41)***
		LNGDPR	-6.29 (1)***	-6.23 (1)***	-11.31 (20)***	-13.44 (22)***
		LNDI	-4.79 (0)***	-4.75 (0)***	-4.58 (5)***	-4.53 (5)***
		LNGS	-5.90 (0)***	-5.99 (0)***	-5.90 (1)***	-5.99 (0)***
		LNTO	-4.99 (0)***	-4.94 (0)***	-5.02 (3)***	-4.96 (3)***
		LNFD	-6.43 (0)***	-6.36 (0)***	-6.44 (5)***	-6.36 (4)***
Singapore	Level	*LNTFDI*	-1.67 (5)	-4.32 (0)***	-1.36 (13)	-4.16 (4)**
		LNGDPR	-5.78 (0)***	-6.16 (0)***	-5.75 (2)***	-6.16 (0)***
		LNDI	-1.70 (1)	-2.72 (1)	-1.38 (2)	-2.62 (2)
		LNGS	-3.78 (0)***	-2.55 (0)	-3.52 (3)**	-2.58 (3)
		LNTO	-2.45 (0)	-2.37 (0)	-2.53 (1)	-2.47 (1)
		LNFD	-0.30 (0)	-4.02 (0)**	-0.08 (3)	-3.97 (3)**
	First difference	*LNTFDI*	-6.61 (1)***	-6.68 (4)***	-13.97 (31)***	-19.17 (35)***
		LNGDPR	-9.01 (1)***	-8.90 (1)***	-15.76 (7)***	-15.53 (7)***
		LNDI	-4.56 (0)***	-4.49 (0)***	-4.56 (3)***	-4.50 (3)***
		LNGS	-4.81 (0)***	-5.46 (0)***	-4.78 (3)***	-5.39 (5)***
		LNTO	-6.08 (0)***	-6.06 (0)***	-6.08 (1)***	-6.06 (1)***
		LNFD	-6.97 (0)***	-6.90 (0)***	-8.11 (7)***	-8.08 (7)***

Note: 1. *******, ****** and ***** are 1%, 5% and 10% of significant levels, respectively. 2. The optimal lag length is selected automatically using the Schwarz information criteria for ADF test and the bandwidth has been the selected by using the Newey–West method for the PP test. 3. Number inside the parentheses represent the lag detected for each variable.

Table 3 shows the ARDL approach to cointegration using F-test to confirm the existence of cointegration between variables in the model. The optimum lag was obtained by using Akaike Information Criteria (AIC). AIC in the Table 3 implied that the optimum orders were 1, 0, 1, 0, 0, 0 for Malaysia, 4, 2, 2, 2, 2, 0 for Indonesia, 3, 2, 4, 0, 4, 1 for Thailand, 1, 1, 0, 0, 0, 3 for Philippines and 1, 3, 1, 0, 0, 0 for Singapore. The F-statistics need to be compared with the critical value provided by Narayan (2004). The results of cointegration show that the F- statistics obtained from the optimum lag for each ASEAN-5 countries are greater than its upper bound critical value. For example, the F statistics of Malaysia (5.274), Indonesia (13.747), Thailand (11.502), and Philippines (6.671), are greater than the upper bound value at 1% significant level. On the other hand, the F-statistic for Singapore which is 4.151 is only greater at 5% upper

bound, I(1). Thus, it is confirmed that there is an existence of long run relationship between the variables for each ASEAN-5 countries.

Table 3 ARDL Tests for Co-integration

Model	AIC (Lag order)	F Statistic
Malaysia	(1,0,1,0,0,0)	5.274***
Indonesia	(4,2,2,2,2,0)	13.747***
Thailand	(3,2,4,0,4,1)	11.502***
Philippines	(1,1,0,0,0,3)	6.671***
Singapore	(1,3,1,0,0,0)	4.151**
Critical Values for *F*-statistics[#]	Lower Bound, I (0)	Upper Bound, I (1)
1%	3.41	4.68
5%	2.62	3.79
10%	2.26	3.35

Note: # The critical values are obtained automatically under Eviews 9, k is a number of variables (IV), critical values for the bounds test: case III: unrestricted intercept and no trend. *, **, and *** represent 10%, 5% and 1% level of significance, respectively. k = 5.

The diagnostic statistics as revealed in Table 4 indicates that the equation or the model are well specified. None of the statistics (probability value) shown in the table are significant at 10%, 5% or 1% level. Based on the critical value of for one degree of freedom, the null hypothesis of normality of residuals, null hypothesis of no first-order serial correlation and the null hypothesis of no heteroskedasticity were accepted in all the selected countries. In addition, based on the critical values of for two degrees of freedom, the null hypothesis of no misspecification of the functional form can also be accepted in all the cases.

Table 4 Diagnostic Tests

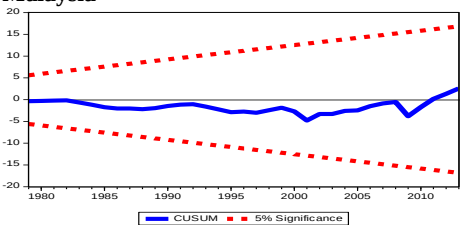
Model	A. Serial correlation $\chi^2(1)$ [p-value]	B. Functional form $\chi^2(1)$ [p-value]	C. Normality $\chi^2(2)$ [p-value]	D. Heteroscedasticity $\chi^2(1)$ [p-value]
Malaysia	0.251	0.030	3.892	1.914
	[0.779]	[0.861]	[0.142]	[0.100]
Indonesia	2.406	0.649	0.730	1.317
	[0.115]	[0.429]	[0.694]	[0.268]
Thailand	0.776	0.056	1.095	0.753
	[0.474]	[0.814]	[0.578]	[0.729]
Philippines	0.119	0.034	2.707	0.627
	[0.887]	[0.854]	[0.258]	[0.778]
Singapore	0.792	0.0006	0.028	1.774
	[0.462]	[0.980]	[0.867]	[0.109]

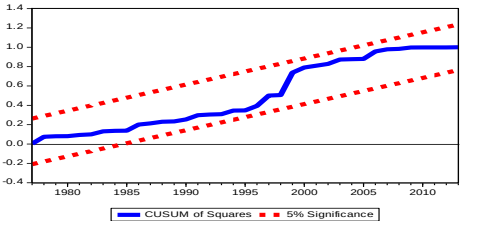
Note. S signifies stable model.*. The probability values of the battery of Diagnostic tests are presented in squared brackets. A. Lagrange multiplier test for residual serial correlation; B. Ramsey's RESET test using the square of the fitted values; C. Based on a test of skewness and kurtosis of residuals; D. Based on the regression of squared fitted values.

To enhance further the reliability of the output, CUSUM and CUSUMSQ are also tested on the model. The stability was supported in all ASEAN-5 countries because the plots of both CUSUM and CUSUMSQ fell inside the critical bounds of five percent significance level. The plots of CUSUM and CUSUMSQ tests are displayed in Figure 2 below.

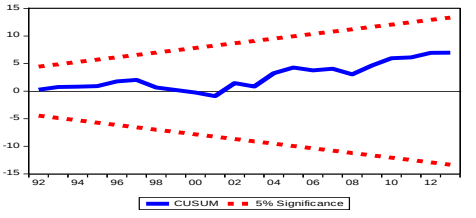
CUSUM **CUSUMSQ**

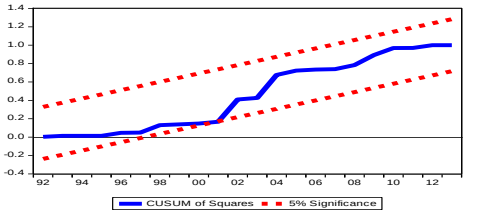
Malaysia



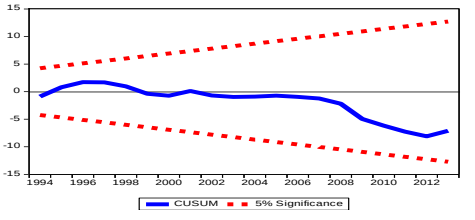


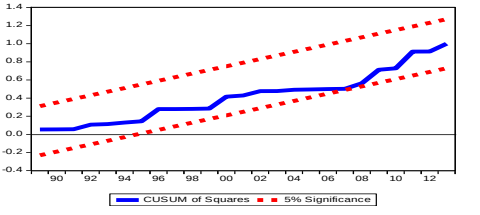
Indonesia



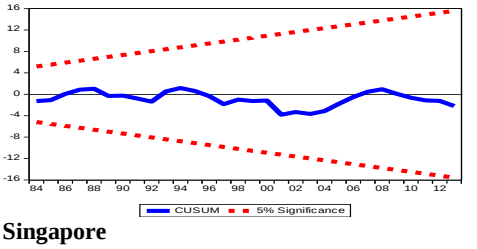


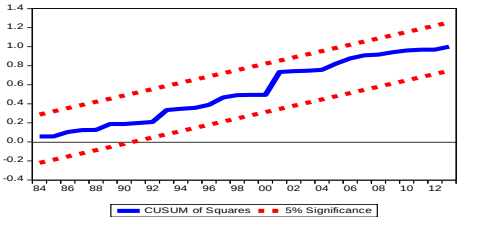
Thailand



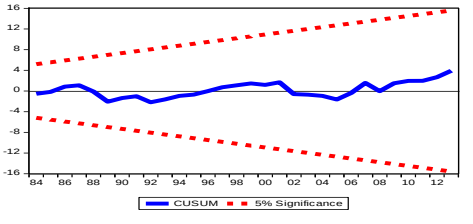


Philippines





Singapore



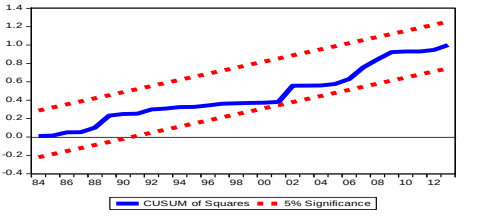


Figure 2: CUSUM and CUSUM SQ Stability Tests

Table 5 shows the long run elasticities of the variables. There was a significant and positive sign detected between economic growth rates ($LNGDPR$) and total foreign direct investment inflows ($LNTFDI$) in Malaysia, Indonesia, and Thailand. 1% increase in GDPR increased the TFDI by 0.65%, 1.12% and 1.07% in these countries, respectively. The positive relationship between these two variables in Malaysia is in line with previous studies of determinants of FDI inflows in Malaysia, conducted by Ang (2008). Authors such as Globerman and Shapiro (2003) concluded that higher economic growth rates show the dynamic of the countries producing higher amount of goods and services which attracts a higher amount of investment from foreign investors. There was a negative relationship between $GDPR$ and $TFDI$ for both Philippines and Singapore. The negative coefficient indicates that faster economic growth may offset cost advantages of the less developed countries (in this case Philippine) for international firms are seeking relatively cheap destinations for their labor-intensive production. Faster economic growth (in this case Singapore) may lead to higher inflation, which can discourage FDI inflows into this country. However, given that it was not significant, thus, it can be concluded that this variable is not able to explain or being one of the potential determinants for $TFDI$ in both Philippines and Singapore.

Next, the domestic investment ($LNDI$) was positive and statistically significant at standard significant in Malaysia (5% significant level) and Singapore (10% significant level), while the significant and negative relationship were detected in the Philippines. A 1% increase in DI will increase $TFDI$ in Malaysia and Singapore by the amount of 1.26% and 1.18%, respectively. In other interpretation, a 100 million US$ increase in domestic investment increased the total FDI inflows by 126 million US$ and 118 million US$ in Malaysia and Singapore. A higher level of domestic investment in the country could mean better infrastructure available in the country. Historically, ASEAN-5 countries have been transforming its economy from agriculturally based during the earlier formation of ASEAN group into industry and services based on the present. Thus, impressive infrastructure (in this case Malaysia and Singapore) such as port, road, electricity, facilities and others could attract more foreign investment into the countries. Meanwhile, due to foreign capital control practice by Philippines's government, the relation seems to suggest that higher DI discourage $TFDI$. This may due to the crowding out effect of domestic investment replacing foreign investment and vice versa during this period of study.

The trade openness ($LNTO$) coefficients for ASEAN-5 countries except for Singapore showed a significant and positive relationship between TO and $TFDI$ in four out of five countries, and thus confirming the theoretical argument. The positive relationship between these two variables indicate that the higher the level of international trade, the more positive is the outlook for foreign investors to build capacity and production in that country. These results highlighted the argument that trade liberalization or openness to trade practice in these countries successfully encouraged FDI inflow into the developing countries of ASEAN-4 which consists of Malaysia, Indonesia, Thailand and Philippines. The significant benefit from developing countries of ASEAN-4 could derive from negotiation in regional trade agreement such

as ASEAN Free Trade Area (AFTA), so these countries will not be side-lined and miss out on investment and trade opportunities. In addition, an openly practiced free market is able to attract potential investors to invests more into the country. For elaboration, a 1% increase in TO increase the $TFDI$ by 8.58% in Thailand, followed by 2.94% in Malaysia, 1.80% in Indonesia and 1.14% in the Philippines. High increase of FDI inflows in Thailand is explained by the effectiveness of Thailand's trade policies over the past few decades which have boosted long term foreign engagements in FDI, equity investments as well as investment loans.

Next, the positive and significant impact of government size ($LNGS$) on $TFDI$ is detected in both Thailand and Philippines. A positive sign was also detected in Malaysia and Singapore; however, the coefficient is not significant at any level. Meanwhile, insignificant and negative sign of GS was detected in Indonesia. As described before, the level of government size can indicate the extent of government involvement in the economy. The lower the government size, the more conducive environment that the government could prepare for foreign investments. However, the outcomes seem to be reversed for the case of Thailand and Philippines. Based on technical interpretation, a 1% increase in GS increased $TFDI$ by 4.98% in Thailand and 1.82% in the Philippines.

The impact of financial development ($LNFD$) was significant and positive to $LNTFDI$ in Singapore while significant and negative in Thailand and Philippines. For instance, in the case of Malaysia and Indonesia, the impact of FD on $TFDI$ was positive but insignificant at the usual significance levels. This indicates that there was no clear impact of financial development on foreign direct investment inflows in these two countries. In the case of Singapore, advancement in financial market instrument ($LNFD$) is a very important channel to attract higher TFDI. An increase in 1% of FD increased $TFDI$ by 2.29%, indicating that financial sector is well developed in this country. This finding is consistent with the view that financial development is a necessary condition for achieving a higher amount of FDI inflows and countries with well-developed financial markets gained significantly from $TFDI$ as stated by Carkovic and Levine, (2002) and Ang (2008). The negative relationship that was found in Thailand and Philippines, on the other hand, reveal that the deepening of financial development in these two countries has reduced the inflows of FDI into the countries. This finding is hardly explained as it exhibits paradox for the usual relationship between FD and FDI inflows.

Table 5 Long-Run Elasticities

Country	Malaysia	Indonesia	Thailand	Philippines	Singapore
DV	LNTFDI	LNTFDI	LNTFDI	LNTFDI	LNTFDI
Lag order	(1,0,1,0,0,0)	(4,2,2,2,2,0)	(1,1,0,3,0,4)	(1,1,0,0,0,3)	(1,3,1,0,0,0)
IV	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
$LNGDPR$	0.646***	1.119***	1.068**	-0.043	-1.077
$LNDI$	1.260**	0.158	0.759	-1.516***	1.177*
$LNTO$	2.935***	1.997***	8.582***	1.144**	1.839
$LNGS$	1.308	-0.069	4.975**	1.823***	0.192
$LNFD$	0.538	0.232	-4.558**	-0.880*	2.287**
C	-4.170	-11.887**	-19.466**	-0.394	-12.996**

Note: (*),(**),(***) indicate significant at 10%,5% and 1% significant level respectively. DV and IV represents dependent and independent variable

Lastly, the results of short-run elasticities and error correction term (ECT) are explained by referring to Table 6. The short run elasticities elaboration is only based on zero lag. In the short run, the $GDPR$ have a significance and positive relationship with $TFDI$ in all ASEAN-5 countries except for the Philippines where the results reveal a negative relationship. Next, it is found that DI has significant and negative relationships in the Philippines. Furthermore, this country also showed a significant and positive relationship between GS and $TFDI$. Based on the last tested variables, FD has a positive relationship with $TFDI$ in both Philippines and Singapore. One practical implication of the existence of cointegration is that any one variable can be targeted as a policy variable to bring about the desired changes in other variables in the system. Empirically, cointegration means that changes in the dependent variables are a function of changes in the other independent variables in the system. This means that the changes in the dependent variable are also a function of the degree of disequilibrium in the cointegrating relationship, which can be captured by the error correction term (ECT).

As shown in Table 6, the estimated lagged error correction term (ECT) in ARDL regression for all ASEAN-5 countries appear to be negative and statistically significant, which are features necessary for model stability. Importantly, the t-statistics on lagged residual of the ECM is statistically significant, again reinforcing the finding that the variables introduced in the model are cointegrated. A higher value of coefficient represents the higher speed of adjustment for the variables to converge in the long run. Based on ECT value as revealed in Table 6, the highest speed of adjustment also known as ECT is obtained by Philippines (-0.97), followed by Singapore (-0.89), Malaysia (-0.85), Indonesia (-0.82) and Thailand (-0.75). For instance, more than 97%, 89%, 85%, 82% and 75% of the adjustment are completed in a year for ASEAN-5 countries due to short-run adjustment, which is considered very rapid. The explanation of Table 6 is ended with the revelation of R-square and adjusted R-square for all ASEAN- countries. The size of the R-square indicated a good fit in all the models with that almost 68 percent and above of the variables in equations are explain the dependent variable ($LNTFDI$).

Table 6 Short Run Elasticities and Error Correction Term

Variables	Malaysia Coefficient	Indonesia Coefficient	Thailand Coefficient	Philippines Coefficient	Singapore Coefficient
$\Delta LNTFDI$	-	-	-	-	-
$\Delta LNTFDI_{-1}$	-	0.059	0.198**	-	-
$\Delta LNTFDI_{-2}$	-	-0.010	0.123	-	-
$\Delta LNTFDI_{-3}$	-	0.190*	-	-	-
$\Delta LNGDPR$	0.547***	0.432***	0.398**	-0.150**	6.794***
$\Delta LNGDPR_{-1}$	-	-0.430***	-0.484***	-	-0.0007
$\Delta LNGDPR_{-2}$	-	-	-	-	4.359**
$\Delta LNGDPR_{-3}$	-	-	-	-	-
$\Delta LNDI$	-0.897	-0.104	-4.146*	-1.477***	-0.808
$\Delta LNDI_{-1}$	-	-0.548	-4.008	-	-
$\Delta LNDI_{-2}$	-	-	2.157	-	-
$\Delta LNDI_{-3}$	-	-	-3.863***	1.115**	-

Table 6 Cont

$\Delta LNTO$	2.489***	3.101***	6.422***	-	1.644
$\Delta LNTO_{-1}$	-	-1.000	-	-	-
$\Delta LNTO_{-2}$	-	-	-	-	-
$\Delta LNTO_{-3}$	-	-	-	-	-
$\Delta LNGS$	1.109	0.443	0.541	1.777***	0.172
$\Delta LNGS_{-1}$	-	2.252***	-6.763**	-	-
$\Delta LNGS_{-2}$	-	-	10.996***	-	-
$\Delta LNGS_{-3}$	-	-	-9.771***	-	-
$\Delta LNFD$	0.457	0.191	2.629	1.135*	2.044**
$\Delta LNFD_{-1}$	-	-	-	2.746***	-
$\Delta LNFD_{-2}$	-	-	-	-1.778***	-
$\Delta LNFD_{-3}$	-	-	-	-	-
ECT_{-1}	-0.848***	-0.821***	-0.748***	-0.974***	-0.893***
R square	0.77	0.85	0.98	0.70	0.68
Adj.Rsquare	0.73	0.78	0.96	0.60	0.58

Note: Dependent variable is D(LNTFDI). (*), (**), (***) indicate significant at 10%,5% and 1% significant level.

CONCLUSION AND POLICY RECOMMENDATION

The current paper investigated selected macroeconomic determinants of FDI inflows in ASEAN-5 countries based on sample period 1970 until 2013. The outcomes of this research paper are varried for each ASEAN-5 countries. The variables that attract the FDI inflows significantly according to highest elasticities for the case of Malaysia are TO, followed by domestic investment, and economic growth rate. For the case of Indonesia, TO and economic growth rates are suitable determinants for FDI inflows. For the case of Thailand, it is found that TO, government size and economic growth rates positively influences the level of FDI inflows. For the case of Philippines, only government size and trade openness are suitable determinants for FDI inflows. Finally, it is found that financial development and domestic investment are the two determinants that positively and significantly influence FDI inflows in the case of Singapore. Among all five tested variables, the deepening of trade openness and higher economic growth rates are seen to be the most important determinants that influenced higher FDI inflows in most of ASEAN-5 countries. Policymakers for ASEAN-5 except Singapore should place greater emphasized on deepening trade liberalization by removing trade and non-trade barriers on its imports and exports to lure more FDI into the country. Besides, it is important for the policymaker of Malaysia, Thailand and Indonesia to implement policies that can sustain their economic growth rates by monitoring the level of unemployment and inflation rates through fiscal and monetary policies.

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