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Impact of Financial Risk, Current Accounts, and Financial Crisis on Foreign Direct Investment:
A Study on Developing Countries in the ASEAN Region

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Abstract
This study investigates the impact of financial risk, current accounts, and financial crisis on FDI in the developing countries of ASEAN. More specifically, the study examines the effects of the inflation rate, FOREX, lending interest rate, and foreign debt as financial risk components. The panel data have been used from 1995 to 2019 in the region's eight selected countries, divided into two categories according to their income levels: the low-middle income (viz., Cambodia, Laos, Myanmar, the Philippines, and Vietnam) and upper-middle-income (viz., Indonesia, Malaysia, Thailand). The study showed that foreign debt, exchange rate, interest rate, and current accounts for lower-middle-income ASEAN countries are potential determinants of FDI. In contrast, inflation and the financial crisis are both found to be insignificant in determining FDI. For upper-middle-income ASEAN countries, the panel least square method revealed that current accounts, foreign debt, interest rate, inflation rate, and exchange rate are significant factors of FDI. Hence, like lower-middle-income countries, the financial crisis also has no effect on FDI in this region. However, the random effects method exhibited that all variables affect the FDI for upper-middle-income countries.

INTRODUCTION

Foreign direct investment (FDI) is the investment made in another country and is considered a necessary factor for economic growth (Noor et al., 2016). Sokang (2018) mentioned that FDI influences the host country's

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economic growth through the transfer of new technologies and practical information, human resources and global markets integration, increased competition, and development and reorganisation of firms. According to the Organisation for Economic Co-operation and Development (OECD, 2019), the Southeast Asia (SEA) has been considered one of the most successful emerging regions in export-led development in part through FDI. Additionally, Thomsen et al. (2011) argued that FDI played a leading role in promoting sustainable development, and it has been an essential source of capital and technology in the Association of Southeast Asian Nations (ASEAN).

Susicv (2017) mentioned that FDI primarily improves the key macroeconomic indicators of a country and has a significant contribution in overcoming the trade gap. Moreover, Sissani and Belkacem (2014) stated that widespread globalisation, together with economic and political changes, opened a connectedness of business, production, and technologies across developing countries. Studies have shown that the Asian financial crisis (AFC) and the global financial crisis (GFC) negatively affected FDI inflows. Diaconu (2014) found that the AFC from 1997 to 1998 brought about a slowdown in the FDI inflows into ASEAN countries. The affected countries regained a positive trend in their FDI inflows in 2002. However, the GFC from 2008 to 2009 resulted again in the values for FDI inflows to drop sharply. Thomsen et al. (2011) articulated that the subprime crisis that began in mid-2007 in the United States could be considered the root of the global economic recession.

Historically, SEA has done very well in attracting FDI, which has been strongly felt since the late 1980s, its inflows have developed rapidly (Sjoholm, 2013). However, most economies have also liberalised their international investment restrictions, and in ASEAN, they have started late on adopting this system (OECD, 2019). Given that many of the ASEAN countries began the era with a high degree of restrictiveness, they were still the top reformers since 1997. According to Sjoholm (2013), the AFC and Dotcom bust crisis that struck the ASEAN region in the late 1990s and early 2000s has commenced FDI inflows to drop. Hence, the region was pushed for liberalisation. According to Cooray and Vadlamannati (2014), policy liberalisation is induced through the outward pressure from the increased competition for FDI by peer countries. Ali et al. (2014) found that financial risk has a significant impact on FDI. While Hayakawa et al. (2012) argued that only the political risk is associated with FDI inflows among political risk and financial risk. Furthermore, it remained unexplored for financial sector risks in FDI, including financial crises, which was considered as less critical (Kellard et al., 2018).

This study divided the eight sample countries into two groups according to their income levels: the lower-middle-income (Cambodia, Laos, Myanmar, Philippines, Vietnam) and upper-middle-income (Indonesia, Malaysia, Thailand) with the primary purpose of investigating the impact

of financial risk, current accounts, and financial crisis on FDI in ASEAN. More specifically, the effects of inflation rate, foreign exchange rate (FOREX), lending interest rate, and foreign debt as financial risk components were examined.

LITERATURE REVIEW

The following paragraphs discuss the review of literature concerning the study.

Foreign Direct Investment

Susicv (2018) mentioned that the inflow of foreign capital is a fundamental prerequisite in generating and accelerating the general economic developments, and it increases the business activities in undeveloped and slower economies. Ahmeti and Kukaj (2016) highlighted that FDI contributes to economic development as FDI includes the augmentation of domestic capital and enhances efficiency through the transfer of new technology, marketing, managerial skills, innovation, and best practices. Noor et al. (2016) observed that FDI is an essential factor in the growth of the economies of developing countries. Additionally, Yusuf et al. (2020) explained that FDI is a means to technology and knowledge transfers that results in productive spill-overs such as increasing returns to production, which drives economic growth.

Furthermore, Osano and Koine (2016) established that FDI had created many positive externalities over a long period of time like transfers of general knowledge, specific technologies in production and distribution, industrial upgrading, work experience for the labor force and establishment of finance-related and trading networks and upgrading of telecommunications services. Bodman and Le (2016) and Aurangzeb and Stengos (2014) also elaborated the spillover effects from FDI and economic growth, which are knowledge diffusion and higher productivity in the export sector. However, Mamingi and Martin (2018) found that the effect of FDI on growth in Eastern Caribbean States is significant but indirect.

Foreign Direct Investment in ASEAN

Xaypanya and Paweenawat (2015) examined the different determinants of FDI in ASEAN3 and ASEAN5 and indicated that infrastructure facility and openness level have a significant positive effect, while inflation hurts the FDI inflow in ASEAN3 (Cambodia, Laos, and Vietnam). In addition, some determinants such as FOREX, GDP, and net official development have no impact on FDI. In terms of ASEAN5 (Indonesia, Malaysia, Philippines, Thailand, and Singapore), the only significant factors in this region are the market size and infrastructure facility. Sasana and Fathoni (2019) revealed that the positive determinants of FDI in ASEAN were market size, government integrity, and infrastructure quality and negative determinants were wages and exchange rate.

Hor (2016) showed that the GDP and FOREX reserve have a significant

positive relationship with FDI for both the long- and short-run in Cambodia. Meanwhile, trade openness is the only variable that negatively affects the FDI for the long-and-short run. Moreover, Sokang (2018) revealed the positive impact on economic growth due to sufficient FDI funds invested in Cambodia's economy that enhance its development, resulting in spill-overs on improving human skills and technology. In Indonesia, Darmawan (2016) used the extensive dunning and gravity approach to understand FDI determinants. The study analysed that economic growth, transportation and communication, political stability, and FOREX volatility significantly impact Indonesia's FDI.

Moreover, Mugableh (2015) showed that the aspects that positively impact FDI inflows are FOREX, GDP, broadest money supply, and trade in Malaysia. Shahrudin et al. (2010) stated that financial development and economic growth contribute positively to the inflow of FDI in Malaysia which is similar to Fazidah (2013) and the only difference is that infrastructure and market size significantly influence FDI, and FOREX is not significantly related. For Lao PDR, Khamphengvong et al. (2018) revealed that the primary FDI inflows attractants were the market size, trade openness, inflation rate, labour cost, and FOREX. Additionally, Liu and Dejhanompom (2018) studied the main determinants of inward FDI in Thailand by applying a dynamic panel data model to identify the significant factors. The results showed that the variables with positive and significant FDI effects are bilateral trade agreements, geographical distance, market size, Thailand's openness, and R&D intensity.

Furthermore, Kueh and Soo (2020) used unit root tests, panel cointegration tests, Fully Modified Ordinary Least Square (FMOLS), and panel Granger causality to examine the macroeconomic determinants of FDI inflows in Cambodia, Laos, Myanmar, and Vietnam. The results showed that market size, real effective exchange rate (REER), and total labour force increased the FDI inflows in developing countries. Hence, the panel cointegration tests demonstrated that market size, inflation rate, REER, trade openness, and total labour force are significant and positively correlated with FDI.

Foreign Direct Investment and Financial Risk

Valaskova et al. (2018) referred to financial risks as the probability that shareholders will lose money if a corporation has debt. Financial risks include credit risk, market risk, investment risk, and operational risk, which were all correlated with any form of financing (Kou et al., 2014). Khrawish and Siam (2010) and Balan (2019) have used foreign debt, current accounts, and FOREX stability as financial risk components to measure the relationship between FDI and financial risk while Khrawish (2014) and Sissani and Belkacem (2014) added net international liquidity in their financial risk components. Whereas Bildiosta and Suhadak (2018) used central government debt, total debt service, gross domestic saving, interest rate, and FOREX.

FDI is a highly risky investment because its ex-post illiquidity enables host-state governments to renegotiate investment terms without inducing capital flight (Kerner & Lawrence, 2014). Individual investors' financial decisions are always considered to be affected by risk, and the individuals' ability to agree to make financial decisions in the face of maximum uncertainty is referred to as financial risk tolerance (Prabhakaran & Karthika 2011). Risk is what we associate with losses, and risk assessing is the process in which we identify the potential risk factors of such events (Rodriguez, 2016). According to Bildiosta and Suhadak (2018), economic and financial risks are identified to be premium risks for most countries. As Kellard et al. (2018) stated, financial stability matters for FDI. Favourable investment profile, profits repatriation and payment delays, lower religious tensions, and lower risk points of current account are associated with the FDI (Balan, 2019). Moreover, financial, and economic uncertainties in the host country have a significant effect on FDI levels in countries and market entry decisions and business operations (Ismail, 2017).

Several studies have analysed the causal relationship between FDI, financial risk, and macroeconomic factors in determining to what extent financial risk influences the FDI of host countries. Findings have been mixed, but the standard assumptions of these studies are that financial risk influences the inflow of FDI. Likewise, Ali et al. (2014) concluded that financial risk has a significant impact on FDI. Kariuki (2015) stated that financial risk and FDI have a negative relationship. While Topal (2016) stated the relationship between risk and investment preferences and found that financial risk has no meaningful effect on FDI inflows. Moreover, Hayakawa et al. (2012) claimed that financial risk is not associated with the FDI of 93 countries (including 60 developing countries). Overall, most of these empirical studies indicated that each country's financial risk dimension had different FDI intake flow results due to differences in risk characteristics.

Foreign Direct Investment and Exchange Rate

Mostafa (2020) defined FOREX as the rate where one currency is exchanged for another, wherein frequently identified as a significant factor of FDI. Conversely, Hoang (2012) defined the exchange rate as a representation of price competition, wherein he presumed a positive linkage between FDI inflows and FOREX. Boateng et al. (2015) found that FOREX has a positive and significant impact on FDI inflows through using cointegrating regressions with Fully Modified OLS (FMOLS) and vector autoregressive and error correction model (VAR/VECM) on their quarterly data. Bano et al. (2019) and Muhammad et al. (2014) stated a significant positive relationship of FOREX on FDI. Huong et al. (2020) exhibited a positive causal correlation between FDI and its REER in Vietnam. In Bangladesh, FOREX has a significant positive association with FDI both in the long and short run (Mostafa, 2020). Vidhya and Ahamed (2019) indicated that the Chinese FOREX and FDI have

a strong positive connection. Alba et al. (2010) stated that the FOREX has a significant positive impact on the average rate of FDI inflows under a favourable FDI environment. Musyoka (2018) emphasised that FOREX and FDI inflows have a significant negative relationship. Lee and Brahmasrene (2020) stated that in the long run, the changes in FOREX hurt the FDI, while in the short run, there is no evidence that it affects the FDI inflows.

Foreign Direct Investment and Inflation Rate

According to Mostafa (2020), inflation rate and FDI inflows have an inverse relationship. Agudze and Ibhagui (2021) found that developing economies have a five times higher inflation threshold than the industrialised economies. They showed that inflation decreases the FDI inflows in developing and industrialised economies in certain conditions. Boateng et al. (2015) examined indicated that inflation rate significantly hurts FDI inflows. Asiamah et al. (2019) revealed that the inflation rate has a statistically significant negative effect on FDI in the long-run and short-run as confirmed by Sujit et al. (2020).

Meanwhile, Bano et al. (2018) and Al-Eitan (2012) indicated that the inflation rate positively correlates with FDI. While Alshamsi et al. (2015) found that inflation had no significant effect on FDI in the emerging markets. Tsaurai (2018) used both fixed effects and pooled OLS to determine the impact of the inflation rate on FDI. The result implied that there is an insignificant negative relationship between the two variables. Moreover, inflation is insignificant with FDI because it does not exceed a certain threshold (Alshamsi et al., 2015).

Foreign Direct Investment and Interest Rate

Hoang (2012) stated that countries with low-interest rates may encourage investors to finance their investment activities. Musyoka and Ocharo (2018) and Boateng et al. (2015) stated that interest rates produced significantly negative results with FDI inflows. Mukhopadhyay and Das (2019) examined the impact of major political risk factors on FDI inflows of 15 emerging countries and found that only real interest rate is significant and negatively affects the FDI inflows. Asiamah et al. (2019) discovered a significant inverse relationship of interest rate with FDI inflows. In the 10 member countries of ASEAN, the interest rate is also one of the factors affecting the FDI inflows (Ramdan et al., 2020; Bildiosta & Suhadak, 2018). Al-Eitan (2012) suggested that FDIs are influenced by interest rate and other financial, political, and economic risks. While Sasana and Fathoni (2019) indicated that interest rate did not affect the FDI inflow in some ASEAN countries, including Cambodia, Indonesia, Malaysia, Philippines, Thailand, and Vietnam.

Foreign Direct Investment and Foreign Debt

Ali et al. (2014) stated that financial risk in terms of high foreign debt could be a significant barrier in attracting FDI to a country. Ejigayehu (2013) explained that one of the ways on how

external debt may affect the economic growth is through the debt overhang effect wherein accumulated debt discourages investment, mainly the private investments because private investors anticipate an increase in tax by the government in order to pay the accumulated debt. Additionally, Ncanywa and Masoga (2018) claimed that foreign debt is used to fund public investment to stimulate economic growth.

According to Ali et al. (2014), foreign debt is considered as a support to the development process and enhances conducive environment and infrastructures to attract foreign investors when foreign debt is in the form of additional resources, financial, technical, and managerial requirements. However, results signified that efficient use of foreign debt could attract more FDI in the country. At the same time, empirical findings found that the variable foreign debt service has a significant negative impact on the FDI. Ostadi and Ashja (2014) showed that external debt has a significant negative effect on FDI and increased in foreign debt destroyed foreign investors' vision because it created negative expectations of the future economy of a country with high foreign debt (Tanna et al., 2018). This shows that increasing financial development can mitigate the negative influence of high foreign debt on FDI growth. Sissani and Belkacem (2014) determined which component matters most for the attractiveness of FDI inflows and concluded that financial risk factors, including foreign debt, may significantly influence the FDI. While Khrawish and Siam (2010) revealed a significant and positive relationship between FDI and economic and foreign debt. Balan (2019) examined empirical links between political risk, financial risk, and FDI in MENA countries from 1984 up to 2014. However, empirical findings showed that only variables of investment profile, religious tensions, and current account balance are the potential determinants of FDI inflows, excluding foreign debt, which was insignificant in the study.

Foreign Direct Investment and Current Account

Balan (2019) stated that current account balances are the potential determinants of FDI inflows. Jankovic and Yatrakis (2011) and Khrawish and Saim (2010) examined the economic and financial risk at the macro level on FDI and results indicated that current account balance has a significant positive impact on FDI. However, the current account is said to have a significant but negative effect on FDI (Ali et al., 2014). Kaur et al. (2012) showed a bidirectional causality between FDI and current accounts.

Additionally, Saidi et al. (2013) concluded that the current account deficit has a significant negative effect on FDI inflows of developing and developed countries. They observed that the deficit in current accounts is generally covered by imposing high taxes on domestic and foreign companies, which increases the cost of investment. Behera and Yadav (2019) mentioned that the deficit in current accounts is something that reflects an increase in net financial claims of foreigners. Contrary to that, Das (2016)

stated that the degree of openness to international trade reflects the tariff regime and other policy choices, which leads to a surplus in current accounts. Moreover, less restriction and more exposure to international trade tend to be relatively more attractive to foreign capital. Comparably, Saidi et al. (2013) asserted that trade openness has a significant positive impact on FDI inflows. Additionally, in MENA countries, lower risk points of current accounts are associated with higher volumes of FDI (Balan, 2019).

Foreign Direct Investment and Financial Crisis

Ucal et al. (2010) revealed that the financial crisis had a powerful influence on FDI and pointed out that before the financial crisis, there was an upturn in FDI inflows of the country. Furthermore, Stoddard and Noy (2015) confirmed that financial crises have a robust negative effect on inward FDI and that crises could also influence the decrease in the horizontal and vertical FDI value. The same conclusion was found to be true in Central and Eastern European Countries, wherein the GFC has amplified adverse effects within the countries (Dornean et al., 2012). Similarly, Lee and Brahmasrene (2020) claimed that a structural break occurred during GFC, leading to a shock of FDI inflows. Moon et al. (2010) identified that countries with higher FDI levels prior to the crisis experienced milder recession and a more gradual recovery. Moreover, the stabilising effect is found to be more robust for FDI-stock than for FDI-flow. Likewise, the GFC has also caused an adverse impact on its FDI inflows (Bano, Zhao et al., 2019). However, in a different circumstance, Kristjánsdóttir and Óskarsdóttir (2021) argued that, after the crisis, the country even became more attractive to FDI from investors in non-EU countries.

Ahmeti and Kukaj (2016) highlighted that FDI contributes by transferring new technology, marketing, and managerial skills, innovations, and best practices. However, the benefits, costs, and impacts of FDI can only be determined by the specific conditions of the countries involved in investing. However, Xaypanya and Paweenawat (2015) stated that the determinants of FDI could also vary in different zones in ASEAN regions due to the various economic development stages experienced by the countries.

Financial risks were found to have a significant effect on the FDI (Bildiosta & Suhadak, 2018; Kellard et al., 2018; Ismail, 2017; Ali et al., 2014). Under financial risk, FOREX, inflation rate, interest rate, and foreign debt were investigated. Findings showed that FDI has a significant negative relationship with the inflation rate, interest rate, and foreign debt, while FOREX has a positive relationship with the dependent variable. Kaur et al. (2012) found that by using the granger causality test, there is a bidirectional causality between FDI and current accounts. Correspondingly, Balan (2019) claimed that current account balances are the potential determinants of FDI inflows, and lower risk points of current accounts are associated with higher volumes of FDI. Lastly, the financial crisis has an inverse relationship with FDI.

RESEARCH METHODS

In this study, panel data were used to examine the relationship between financial risk and FDI in ASEAN from the periods 1995 - 2019. Krifa-Schneider and Matei (2010) based their study on the Fixed effect (FE) model and dynamic panel data model for understanding the relationship between political risk, business climate, and FDI empirically of 33 developing countries and transition.

This is a cross-country study that utilised eight ASEAN developing countries consisting of Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, and Vietnam. The United Nations emphasised that low-income economies and middle-income economies are referred to as developing economies based on World Bank's analytical classifications of GNI per capita during 2019. Accordingly, Cambodia, Laos, Myanmar, Philippines, and Vietnam were classified as lower-middle-income countries. On the other hand, Indonesia, Malaysia, and Thailand were under the upper-middle-income category. Timor-Leste was also considered a developing country in the region under the lower-middle-income category; however, it is not included in the study due to insufficient data.

In analysing the impact of financial risk, current accounts, and financial crisis on FDI of the developing countries in ASEAN, the equation in the study was derived from related studies (Saidi et al., 2013; Yusuf et al., 2020; Xaypanya & Paweenawat, 2015; Tsaurai, 2018) which led in estimating the following equation:

$$\text{FDI inflows} = \boldsymbol{\beta}_0+\boldsymbol{\beta}_1\text{Inflation Rate}_{it}+\boldsymbol{\beta}_2\text{Interest Rate}_{it}+\boldsymbol{\beta}_3\text{FOREX}_{it}+\boldsymbol{\beta}_4\text{Foreign Debt}_{it}+\boldsymbol{\beta}_5\text{Current Accounts}_{it}+\boldsymbol{\beta}_6\text{Financial Crisis}_{it}+e_{it} \quad (1)$$

Most of the data were obtained from the World Bank Time Series Data. However, due to incomplete reports in some periods, some data were also collected from the annual reports from the official government website of each country and other statistics websites such as Statista, IMF, and CEIC.

Unit Root Test

Most economic time series data have unit roots which show that their means and variances are not time-invariant. If this is the case, a univariate series is said to be non-stationarity and cannot be used for regression with other non-stationary univariate series because of the risk that their results may be spurious. The only exception to this rule is when the time series data of all variables have identical unit roots. The widely used unit root test is the so-called Augmented Dickey-Fuller (ADF) test:

$$\Delta x = \alpha_o+\alpha_1 t+\beta x_{t-i}+\Sigma\varphi\Delta x_{t-i}+\varepsilon_t \quad (2)$$

where the first difference of the series, Δx_t, is regressed against lagged of its original level series, time, and lagged values of itself. If the estimated value of β is more negative than MacKinnon critical values, the series is said to be stationary. Otherwise, it is non-stationary and therefore has a unit root. The augmented portion of the test is to

correct for any serial correlation in the variable.

Structural Stability Test

Structural stability test refers to the stability of the coefficients of a regression model between different time periods. In this study, such a test will be performed using the Chow Breakpoint Test. A structural change could mean a change in the intercept, a change in the slope coefficients, or a change in both the intercept and slope coefficients. Either way, the results would imply structural instability and the model therefore cannot be used for policy analysis and forecasting. The formula for testing the structural stability of the regression parameter involving time series data is as follows:

$$F = \frac{\left(RSS_R - RSS_{UR}\right)/k}{RSS_{UR}/\left(n_1 + n_2 - 2k\right)} \qquad (3)$$

where k is the number of regressors including intercept, n is the number of observations, RSS_R is the regression sum of squares restricted, and RSS_{UR} is the regression sum of squares unrestricted. If the computed F-statistic exceeds critical value, there is structural instability. Otherwise, the model is said to be structurally stable.

Test for Heteroskedastic Disturbances

If the variance of the regression residuals of the model is time varying, the parameters and their standard errors are said to be biased and inefficient. This condition is known as heteroskedasticity and if uncorrected could lead to wrong conclusions and decisions on the part of the investigator. To detect the presence of heteroskedastic disturbances in the residuals, the White Heteroskedasticity Test will be used.

$$u^2 = \alpha_o + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X^2 + \alpha_5 X^2 + X^2 + \alpha_6 X_1 X_2 + \alpha_7 X_1 X + /' \alpha_8 X_2 X_3 + v_t \qquad (4)$$

where u² is the squared regression residuals regressed against the explanatory variables, their squares, and cross products.

Optimal Lag Length

An efficient test in determining the optimal lag length is to minimise the Akaike Information Criterion (AIC) for each lag length on a trial-and-error basis. For the AIC, which is a popular test, the formula is as follows:

$$Ln\ AIC = (2k/n) + ln\ (RSS/n) \qquad (5)$$

where k is the number of regressors including intercept, n is the number of observations, and RSS is the regression sum of squares. After experimenting with an adequate number of lags in the model, the one which produces the smallest AIC would indicate the appropriate or optimal lag length.

Johansen Cointegration Test

In applying the Johansen Cointegration Test which consists of five options, although options 1 and 5 are avoided because of their explosive values which are not consistent with economic

realities, such options were utilised according to the Dickey-Pantula principle by beginning with the most restrictive (Option 2) down to the least restrictive (Option 4).

If the computed *trace statistics* and *maximum-eigenvalue statistics* exceed their critical values, then there is cointegration among the variables. The hypothesised relationships cannot be deemed spurious and therefore genuine equilibrium relationships existed.

Specification Error Test

The Ramsey regression equation specification error test (RESET) will be used to test whether non-linear combinations of independent variables help in explaining the dependent variable. This will also help determine if there is no misspecification error in the data used in the study.

A Specification error test is associated with the specification of the model regarding the inclusion of an irrelevant variable, the exclusion of relevant variable, or the functional form of the model. A Specification error creates biased or inconsistent regression estimators, and the inconsistency can still be there even when the sample observation increases. To determine the specification of the model, this study used the equation:

$$\hat{Y}_i = \hat{\beta}_1 + \hat{\beta}_2 X_{2i} + \hat{\beta}_3 X_{3i} + \gamma \hat{Y}_i^2 \quad (6)$$

Panel Regression Model

Considering the panel regression model, where is the unobserved time-variant heterogeneity across the countries i = 1, … n.

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 Z_i + u_{it} \quad (7)$$

The goal is to estimate which is the effect of on . Letting we obtain

$$Y_{it} = \alpha_i + \beta_1 X_{it} + u_{it} \quad (8)$$

Having individual specific intercepts , i = 1, … n, where each of these can be understood as the fixed effects of entity i, which is the fixed effects model as shown below,

$$Y_{it} = \beta_1 X_{1,it} + \cdots + \beta_k X_{k,it} + \alpha_i + u_{it} \quad (9)$$

where i = 1, …, n and t = 1, …, T. The are entity-specific intercepts that capture heterogeneities across countries. Region Fixed Effects is the entity-specific intercepts that capture heterogeneity across countries. The fixed effects (FE) model eliminates the effect of unobserved heterogeneity. But, with different levels of engagement in production and different sizes in countries, it is necessary to check heteroskedasticity problems and autocorrelation. In case that heterogeneity is present, random effects (variance components model) provides the option to consider heterogeneity across countries in the regression coefficients. That is,

$$Y_{it} = \beta_0 + \beta_1 X_{1,it} + \cdots + \beta_k X_{k,it} + \alpha_i + u_{it} \quad (10)$$

Before estimating the panel data, this study examined first whether Pooled OLS, Fixed Effects, or Random Effects

estimation process best describe the data.

DATA ALALYSIS AND DISCUSSION

This study used a panel of the eight ASEAN countries divided and analysed into two categories: lower-middle-income and upper-middle-income ASEAN countries from the period of 1995-2019. The lower-middle-income countries in the ASEAN region comprise Cambodia, Laos, Myanmar, Philippines, and Vietnam, while the upper-middle-income countries are Indonesia, Malaysia, and Thailand. The study administered a cointegration test shown in Table 1 to determine the solid evidence for long-run relationship (Kueh & Soo, 2020). Additionally, it utilised the Johansen cointegration method to examine the long-run and the short-run dynamics of the system, respectively (Siddiqui et al., 2013). As seen in Table 1, there are at most five cointegrating equations for lower-middle-income ASEAN countries.

Granger causality test results are presented in Table 2 for low-middle-income countries. First, there is evidence that FDI predicts external debt stock and inflation. Thus, there is unidirectional causality from FDI to external debt stock and FDI to inflation, showing that lower-middle-income ASEAN countries are susceptible to changes in FDI. In the empirical literature, the results regarding external debt are consistent with the study of Balan (2019); it stated that FDI inflows do granger cause external debt. Contrary to the findings of Asiamah et al. (2019), wherein it determined that there is only unidirectional causality from inflation to FDI, stating that it is inflation that causes FDI as inflation affects FDI

Table 1: Johansen Fisher Panel Cointegration Test for Lower-middle-income ASEAN countries

Sample: 1995- 2019
Included observations: 125
Trend assumption: Linear deterministic trend
Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesised No. of CE(s)	Fisher Stat. (from trace test)	Prob.	Fisher Stat. (from max-eigen test)	Prob.
None	294.1	0.0000	335.7	0.0000
At most 1	249.0	0.0000	145.3	0.0000
At most 2	139.8	0.0000	76.64	0.0000
At most 3	80.96	0.0000	48.05	0.0000
At most 4	43.73	0.0000	23.32	0.0096
At most 5	30.40	0.0007	28.78	0.0014
At most 6	15.93	0.1016	15.93	0.1016

Note. Calculations based on the data from the World Development Indicators by the World Bank database (1995 – 2019).

Table 2: Granger Causality Results for Lower-middle-income ASEAN Countries

Sample: 1995 - 2019

Null Hypothesis:		Prob.
LOGEXTERNAL_DEBT does not Granger Cause LOGFDI		0.1381
LOGFDI does not Granger Cause LOGEXTERNAL_DEBT	FDI → debt	0.0046
LOGFOREX does not Granger Cause LOGFDI		0.7180
LOGFDI does not Granger Cause LOGFOREX	No causation	0.9082
INTEREST_RATE does not Granger Cause LOGFDI		0.0988
LOGFDI does not Granger Cause INTEREST_RATE	Bidirectional	0.0289
INFLATION does not Granger Cause LOGFDI		0.1261
LOGFDI does not Granger Cause INFLATION	FDI → Inflation	0.0563
FINANCIAL_CRISIS does not Granger Cause LOGFDI		0.1264
LOGFDI does not Granger Cause FINANCIAL_CRISIS	No causation	0.6377
CURRENT_ACCOUNTS do not Granger Cause LOGFDI		0.4181
LOGFDI does not Granger Cause CURRENT_ACCOUNTS	No causation	0.5390

Note. Calculations based on the data from the World Development Indicators by the World Bank database (1995 – 2019).

by global and local shocks. Second, there appears to be a bidirectional causality between FDI and interest rate. The result is in consonance with the findings of Vidhya and Ahamed (2019). Despite that, results opposed the findings of Asiamah et al. (2019) revealed that FDI inflows and interest rates have unidirectional causality. Moreover, results found no causal relationship between FDI and FOREX, FDI and financial crisis, and FDI and current accounts, where local policies influence the direction of the variables.

This study utilised the PLS method and RE method for lower-middle-income ASEAN countries as shown in Table 3. The estimation results for the first under the financial risk variable, log FOREX, show that it has a significant positive relationship with FDI (Hoang, 2012; Boateng et al., 2015; Bano et al., 2019; Muhammad et al., 2014; Mostafa, 2020; Vidhya & Ahamed, 2019; Alba et al., 2010), which indicated that FOREX attract FDI inflows. Boateng et al. (2015) explained that an appreciation of FOREX would increase the investment expectation of increased future profits. Furthermore, Bano et al. (2019) stated that high FOREX will attract investors to invest as it minimises their production costs. The significant positive relationship of FOREX and FDI inflows is contrary to Musyoka (2018) and Lee and Brahmasrene (2020). Secondly, results for lower-middle-income countries have presented that the inflation rate is insignificant with FDI inflows, which appears to support the conclusion of Alshamsi et al. (2015) and Tsaurai (2018) that there is no significant relationship between the two variables. Thirdly, the interest rate has a significant negative relationship to log

Table 3: Estimation Results for Lower-middle income ASEAN countries

Dependent Variable: Log FDI

	Panel Least Squares		Panel EGLS (Period random effects)	
Variable	**1995 2019**	**Prob.**	**1995 2019**	**Prob.**
Constant	1.346855	0.5749	-6.060822	0.0287
Log External debt stock	0.851387	0.0000	1.128139	0.0000
Log FOREX	0.075889	0.0099	0.155410	0.0002
Interest rate	-0.071403	0.0001	-0.046809	0.0000
Inflation	-0.002229	0.7040	0.004177	0.2014
Financial crisis	0.309619	0.1747	0.293500	0.1262
Current accounts	-5.30E-11	0.0246	-4.14E-11	0.0013
R-squared	0.721067		0.861766	
F-statistic	50.84021		71.06914	
Prob(F-statistic)	0.000000		0.000000	
Hausman Test			57.59884	0.0000
Total panel (balanced) observations	125		125	

Note. Calculations based on the data from the World Development Indicators by the World Bank database (1995 – 2019).

FDI in lower-middle-income countries in the ASEAN region (Musyoka & Ocharo, 2018; Boateng et al., 2015; Mukhopadhyay & Das, 2019; Asiamah et al., 2019). Hoang (2012) explained that countries with low-interest rates may encourage investors to finance their investment activities in that certain country. Lastly, in lower-middle-income ASEAN countries, foreign debt or log external debt stock has exhibited a significantly positive relationship with log FDI (Ali et al., 2019; Khrawish & Siam, 2010). Ali et al. (2019) explained that foreign debt can be considered as an additional resource and be used to support the development process of the country to make it a more conducive environment that would attract foreign investors.

Current accounts have shown a significant negative relationship with log FDI which is consistent to Ali et al. (2014) that the current account is said to have a significant negative effect on FDI. This further implies that the negative impact indicates the deficit in the current account balance and many countries have tried to wrap this deficit generally through applying high tax rates on foreign and domestic companies which led to increased investment costs and a decrease in

FDI of the country. The result in this study is also consistent with Saidi et al. (2013) which concluded that the current account deficit has a significant negative effect on FDI inflows of the developing and developed countries.

The financial crisis is found to be insignificant with the FDI inflows in lower-middle-income countries in the ASEAN region. It is similar to Kristjánsdóttir and Óskarsdóttir (2021) that after the GFC, there was no significant effect on the flow of FDI in the country.

In terms of upper-middle-income countries (Indonesia, Malaysia, and Thailand), the empirical results are shown in Tables 4 to 6. Table 4 presents the cointegration test for the upper-middle-income ASEAN countries. According to Lee and Brahmasrene (2020), if there are one or more linear combinations among the variables, the time series variables may be cointegrated. And if variables are cointegrated, there exists a long-run relationship and a force to converge into long-run equilibrium among variables. Results have shown that there are at most five cointegrating equations.

Table 5 shows Granger causality results for upper-middle-income. Results showed that only the financial crisis has the unidirectional causality to FDI among the other variables. Furthermore, it was determined that there is no causation between FDI and current accounts, FDI and external debt stock, FDI and inflation, FDI and interest rate, and FDI and FOREX. The results are similar to Musyoka and Ocharo (2018), which revealed no causality

Table 4: Johansen Fisher Panel Cointegration Test for Upper-middle-income ASEAN countries

Sample: 1995 - 2019
Trend assumption: Linear deterministic trend
Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)

Hypothesised No. of CE(s)	Fisher Stat. (from trace test)	Prob.	Fisher Stat. (from max-eigen test)	Prob.
None	184.4	0.0000	195.6	0.0000
At most 1	149.2	0.0000	87.45	0.0000
At most 2	76.24	0.0000	44.62	0.0000
At most 3	39.78	0.0000	25.05	0.0003
At most 4	19.81	0.0030	13.36	0.0377
At most 5	12.01	0.0618	12.20	0.0576
At most 6	6.479	0.3717	6.479	0.3717

Note: Calculations based on the data from the World Development Indicators by the World Bank database (1995 – 2019).

Table 5: Granger Causality Results for Upper-middle-income ASEAN Countries

Sample: 1995 - 2019

Null Hypothesis:		Prob.
CURRENT_ACCOUNTS do not Granger-Cause FDI		0.5145
FDI does not Granger Cause CURRENT_ACCOUNTS	No causation	0.1834
LOG(EXTERNAL_DEBT) does not Granger Cause FDI		0.5345
FDI does not Granger Cause LOG(EXTERNAL_DEBT)	No causation	0.4500
FINANCIAL_CRISIS does not Granger Cause FDI	FC → FDI	0.0573
FDI does not Granger Cause FINANCIAL_CRISIS		0.5851
INFLATION does not Granger Cause FDI		0.1299
FDI does not Granger Cause INFLATION	No causation	0.5573
INTEREST_RATE does not Granger Cause FDI		0.3080
FDI does not Granger Cause INTEREST_RATE	No causation	0.3548
LOG(FOREX) does not Granger Cause FDI		0.2622
FDI does not Granger Cause LOG(FOREX)	No causation	0.9714

Note. Calculations based on the data from the World Development Indicators by the World Bank database (1995 – 2019).

from FDI to FOREX, FDI to real interest rate, and FDI to the inflation rate. While Kaur et al. (2012) and Siddiqui et al. (2013) found evidence of unidirectional causality between FDI and current accounts. Also, Asiamah et al. (2019); Ali et al. (2014), and Vidhya and Ahamed (2019) argued that there exists unidirectional causality with FDI and FOREX and interest rate. This can be attributed to the economic environment of the selected countries, especially in the upper-middle-income ASEAN countries.

Table 6 shows the estimation results for upper-middle-income ASEAN countries using the PLS method and the RE method. The result of upper-middle-income economies for FOREX and FDI is similar to the lower-middle-income economies using the PLS method. It also presented a significant positive relationship with FDI inflows that contradicts the findings of Musyoka (2018) and Lee and Brahmasrene (2020), which concluded that the two variables have a negative correlation. Moreover, the result is entirely different with lower-middle-income, for it revealed that inflation rate has a significant positive relationship with FDI. Similarly, Bano et al. (2018) and Al-Eitan (2012) found a positive relationship between inflation and FDI. RE method showed that inflation rate and FDI yielded a significant positive relationship, contrary to Mostafa (2020), Agudze and Ibahagui (2021), Boateng et al. (2019), Asiamah et

Table 6: Estimation Results for Upper-middle-income ASEAN countries

Dependent Variable: FDI

	Panel Least Squares		Panel EGLS (Period random effects)	
Variable	**1995 - 2019**	**Prob.**	**1995 - 2019**	**Prob.**
Constant	1.70E+10	0.0000	1.81E+10	0.0000
CURRENT_ACCOUNTS	-0.177604	0.0000	-0.135885	0.0004
LOG(EXTERNAL_DEBT)	-2.03E+08	0.0715		
EXTERNAL_DEBT			0.031062	0.0028
FINANCIAL_CRISIS	2.29E+09	0.1437	3.15E+09	0.0451
INFLATION	2.36E+08	0.0453	2.84E+08	0.0127
INTEREST_RATE	-1.30E+09	0.0000	-1.37E+09	0.0000
LOG(FOREX)	1.61E+09	0.0000		
FOREX			-466320.8	0.1716
R-squared	0.547149		0.623257	
F-statistic	13.69332	0.0000	13.64819	0.0000
Durbin-Watson stat	1.318192		1.643183	
Jarque-Bera Stat	0.712310	0.700364		
Hausman Test			5.862586	0.3198
Total panel (balanced) observations	75		75	

Note. Calculations based on the data from the World Development Indicators by the World Bank database (1995 – 2019).

al. (2019), and Sujit et al. (2020) that confirmed the inverse relationship of the two variables. For the interest rate, a significant negative relationship was the result for both methods. This is similar to the lower-middle-income category which produced significantly negative results between interest rate and FDI inflows. Contrary to Sasana and Fathoni (2019) which indicated that the interest rate did not affect the FDI inflow in some ASEAN countries. Lastly, log external debt stock has a significant positive relationship to FDI using RE method. Contrary to this, log external debt stock using the PLS method has a significantly negative relationship with the FDI inflows. This is similar to the findings of Ali et al. (2019), and Ostadi and Ashja (2014). Ali et al. (2019) explained the reason as to why a high foreign debt could be a barrier in attracting FDI and it is because theories say that when a country has more debt, the repayment of it becomes a problem, especially for developing countries. Hence, it will make the country less attractive for foreign investors leading

to a decrease in the FDI pattern. As expounded by Ostadi and Ashja (2014) that increasing foreign debt affects the foreign investors' vision and creates a negative expectation of the future economy.

Moreover, current accounts have a significant negative relationship to FDI using both methods. Financial crisis is insignificant to the FDI inflows using the PLS. However, using RE, the financial crisis has a significant and positive relationship to FDI. Kristjánsdóttir and Óskarsdóttir (2021) found that before the GFC, EU membership did not make Ireland's FDI more attractive for the investors in other EU countries, but after the crisis, EU membership made Ireland more attractive for FDI from other EU countries.

CONCLUSION AND IMPLICATION

FDI has played a leading role in promoting sustainable development, and it has been an essential source of capital and technology in the ASEAN region. Using the PLS method and RE method for lower-middle income ASEAN countries, this study concluded that foreign debt and FOREX have a significant positive relationship to FDI inflows. Furthermore, interest rate and current accounts have a significant negative relationship with FDI while inflation and financial crisis are both insignificant in lower-middle-income countries in ASEAN. Upper-middle-income ASEAN countries using the PLS method showed that current accounts, foreign debt, and interest rate have significant negative relationship to FDI while inflation and FOREX have significant positive relationship with FDI. Financial crisis is found to be insignificant for the upper-middle income countries as well. While using the RE method, results have shown that current accounts and interest rates have a significant negative relationship with FDI while foreign debt, financial crisis, and inflation have a significant positive relationship with FDI.

SEA has been considered one of the most successful emerging regions in export-led development in part through FDI. The region has also been a leading destination for multinational enterprises globally for at least three decades. In addition to this, FDI played a leading role in promoting sustainable development, and it has been an essential source of capital and technology in the ASEAN region. From the periods of 1995-2019, the interest rate is said to have a significant negative impact on FDI for both low-middle-income and upper-middle-income countries. High interest rates discourage investors from financing their investment activities in that particular host country. Thus, central banks should be more aggressive in lowering the interest rate to attract foreign investors. Moreover, private entities should also consider offering low interest rates. In terms of current accounts, the variable also showed a significant negative relationship with FDI for all the sample ASEAN countries in this study. Negative impact of current accounts to FDI indicates that there is a deficit. Many countries have tried to wrap this deficit generally through applying high tax rates on foreign and domestic companies which led

to increase in investment cost and decrease in FDI of the country. Instead, the government should focus on the supply-side policies to reduce the current account deficit and improve their competitiveness at the same time. With the supply-side policy, the public and private entities would attract FDI inflows due to low taxes and borrowing rates, which in return also helps in improving the economy's productive potential and ability to produce.

While the inflation rate has a varying result. For lower-middle-income countries, it has an insignificant effect on the FDI inflows. For upper-middle-income countries, it is found to have a significant positive relationship with FDI. Thus, it is encouraged those countries establish policies that maintain and stabilise inflation rates that can ensure FDI inflows. Foreign debt is found to have a significant positive relationship with FDI in lower-middle-income countries. While in upper-middle-income countries, foreign debt has an inverse relationship with FDI because high foreign debt could be a barrier in attracting FDI because the countries with high foreign debt could experience repayment problems which makes these countries less attractive for investors. Upper-middle-income ASEAN countries could utilise their foreign debt in a similar way as that of lower-middle-income countries. Furthermore, FOREX is found to have a positive relationship with FDI for both lower-middle-income countries and upper-middle-income ASEAN countries. Developing ASEAN countries should maintain and stabilise their favourable exchange rate.

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