Determinant Factors and Foreign Direct Investment in Malaysia: Cointegration and Causality Analysis

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Abstract

This research attempts to examine the determinants of FDI in Malaysia. The infrastructure, market size, exchange rate and inflation rate are considered independent factors that impact the FDI in this research. Yearly data from 1991 to 2020 was sourced from World Bank. The ARDL model was used to test the cointegration and causal relationship between the determinants and FDI. Based on the results, the infrastructure has positively influenced the FDI in the long and short-run. The impact of market size, exchange rate and inflation rate on FDI is statistically insignificant in the long-run. However, the market size and exchange rate have a significant short run relationship with FDI but none between the inflation rate and FDI. This research provides decision-making insights for investors, policymakers and practitioners. It plays a vital role in formulating FDI related policy in Malaysia. Despite facing limitations, this research concluded with some recommendations for future research.

Keywords: FDI, Determinant Factors, ARDL

1. Introduction

In this rapidly developing process of globalization, foreign direct investment (FDI) is a crucial component (OECD, 2009). According to Shaari et al. (2012), foreign investors make international investments to expand product markets, increase returns and benefit from economies of scale. Furthermore, Hamood et al. (2018) stated that FDI also entails investing foreign cash in projects run by investors in another country. It is also an international strategy that involves purchasing and generating assets in another country to establish a physical presence (Shaari et al., 2012).

FDI is a frequently studied topic in economics. Many researchers and government officials see FDI as a strategy to boost the economy (Shaari et al., 2012; Ahmad et al., 2015; Hamood et al., 2018). FDI can establish direct, reliable and long-lasting ties between economies. FDI promotes the exchange of knowledge and technology across nations. Additionally, it gives the host country's economy a chance to expand the distribution of its goods in foreign markets. FDI is a significant source of capital for a variety of host and home countries, in addition to positively impacting the growth of international trade (OECD, 2009). As a result, many governments worldwide, particularly in developing countries, implement laws and policies that encourage foreign investment (Meivitawanli, 2021).

FDI has been recognised as crucial to the country's remarkable economic grow in boosting export growth, transferring technology and offering new job opportunities (Fazidah, 2013). Foreign companies have a well-known image in the global market, reducing the need for local businesses to invest in resources and time to gain access to the international market. Combining technology transfer and

decreased unemployment rates through job creation and economic progress is another essential feature of FDI (Hamood et al., 2018).

The manufacturing sector in Malaysia receives the majority of FDI, which is driven by projects connected to electronics (Lee et al., 2011; Ismail, 2001). Most foreign investors come from Japan and Asia's freshly industrialised economies. As a result, local labour must complete new projects or expand existing firms when international investors engage in Malaysia. These more essential production requirements will result in an immediate rise in labour demand, which is more elastic than capital and an indirect increase in output distribution. (Lee et al., 2011).

The industrial sector dominated FDI flow as the economy transitioned from agricultural to industry (Yusoff et al., 2000). The overall value of exports increased dramatically, reaching 73.5% in 2002. Furthermore, Malaysia's manufacturing sector has created many employment opportunities (Wong, 2005). The share of FDI in industrial exports has quickly increased (Sulong & Harjito, 2005). Meanwhile, Malaysia's market orientation toward the economy, well-developed infrastructure, and a highly-human capital base comprised of educated, multilingual workers have made it one of the region's and the world's most significant beneficiaries of FDI (Lean, 2008). Thus, the determinants are vital in attracting FDI to Malaysia.

Nonetheless, as shown in Figure 1, FDI in Malaysia fluctuated from 1991 to 2020. It was 0.6% in 2001 and 0.1% in 2009, with the two being the lowest. In addition, since 2016, FDI in Malaysia has shown a downward trend. This is caused by cost competition, minimum wage from other countries, and political uncertainty. This could be a factor in Malaysia's FDI underperformance. FDI inflows to both services and manufacturing declined.

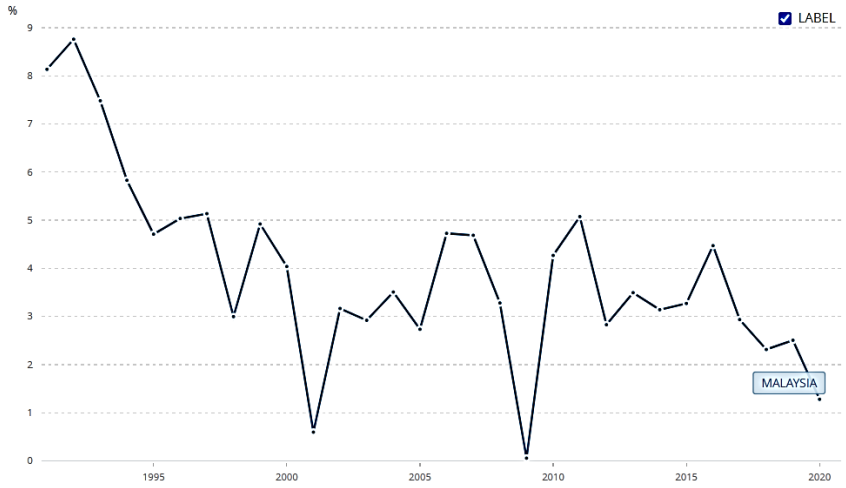


Figure 1: Net Inflows of Foreign Direct Investment (FDI) (% of GDP) in Malaysia from 1991 to 2020
Source: World Bank Data

The declining pattern of FDI since 2016 has been a serious concern among many researchers and policymakers. Many researchers have spent considerable attention studying the drivers of FDI because it is considered a growth determinant (Fazidah, 2013; Ahmad et al., 2015). Understanding the determinants influencing its ability to attract more FDI to Malaysia is necessary. This research aims to investigate the determinants of FDI in Malaysia. The infrastructure, market size, exchange rate and inflation rate are the chosen determinants of FDI in this research.

The organisation of this paper is divided into five sections. Section 2 reviews the theoretical and empirical literature, Section 3 explains the data and methods of analysis used, Section 4 reports the empirical findings and discussion and Section 5 offers conclusion.

2. Literature Review

Foreign Direct Investment (FDI) plays a crucial role in fostering economic growth in both developed and developing nations. Numerous studies have explored the determinants of FDI, highlighting how macroeconomic factors such as GDP, inflation, exchange rates and infrastructure significantly influence FDI inflows. Additionally, global events such as COVID-19 pandemic have drawn attention to how external shocks interact with domestic conditions to shape investment patterns. Since the end of World War II, FDI has become a vital component of the international economy. Theoretical research has enhanced our understanding of the behaviour of economic agents at both micro and macro levels, contributing to new fields in economic theory. This review adopts Dunning's eclectic paradigm as its foundational framework.

Dunning's eclectic paradigm, also known as the Ownership-Location-Internalization (OLI) model, was introduced in a series of works (Dunning, 1973; 1980; 1993) and remains a cornerstone in FDI theory. It explains why firms engage in foreign investment by examining three key advantages: ownership, location, and internalisation (Suleiman et al., 2015). Ownership advantages refer to firm-specific assets such as patents or trademarks. Location advantages consider host country factors that make local production attractive, while internalisation advantages arise when firms prefer internal production over licensing due to transaction costs. The OLI framework continues to underpin many empirical studies on FDI, especially in developing economies (König, 2003).

According to Dunning (1993), FDI is driven by market-seeking, resource-seeking, and efficiency-seeking motives. These are influenced by factors such as ownership advantages, market size, transportation and factor costs, institutional frameworks, and macroeconomic indicators like exchange and inflation rates (Faeth, 2009). Exchange rate appreciation can reduce profitability, while high inflation signals macroeconomic instability, both of which deter FDI inflows.

Infrastructure is a recurring determinant of FDI. Soto and Martinez-Cobas (2024), focusing on Latin America, found that countries with robust transportation and telecommunications infrastructure, particularly electricity access, attract more FDI. Similarly, Kirkpatrick et al. (2004) emphasised the role of reliable and affordable infrastructure—telecommunications, energy, water, and transportation—in supporting sustainable development in developing countries. Weak infrastructure limits connectivity to the global economy and hinders FDI attraction (Ahmad et al., 2015; Owusu-Manu et al., 2019).

Malaysia exemplifies the importance of infrastructure in attracting FDI. Fazidah (2013) notes the country's success in developing infrastructure, while Bakar et al. (2012) argues that quality infrastructure lowers investors' costs and raises returns. These findings are supported by Ahmad et al. (2015) and Jaiblai and Shenai (2019), who found that infrastructure significantly attracts FDI to Malaysia.

Infrastructure also impacts the ease and cost of business operations. As Chan et al. (2014) and Khadaroo and Seetanah (2008) explain, inadequate infrastructure increases operational costs, discouraging foreign investment. Conversely, effective public infrastructure, especially transportation, lowers startup costs and improves FDI attractiveness (Erenberg, 1993; Shahbaz et al., 2020).

In the digital age, infrastructure extends to information and communication technology (ICT). ICT reduces transaction and transportation costs, improves data flow and enhances productivity. Its availability is crucial for global competitiveness and domestic growth, particularly in less developed countries (Addison & Heshmati, 2003; Gholami et al., 2006). In Malaysia, enhanced telecommunications infrastructure has a strong positive effect on FDI—Ahmad et al. (2015) estimate that a 1% increase in telecommunications investment results in a 0.66% increase in FDI. However, findings on the relationship between infrastructure and FDI are mixed. Fazidah (2013) found a negative relationship, which Hamood et al. (2018) attribute to the use of limited infrastructure proxies—such as development spending that excludes communications and utilities.

Market size is another critical factor in FDI decisions. It represents the demand potential in a host country and is often measured by GDP or GDP per capita (Sajilan et al., 2019; Tri et al., 2019; Hamood et al., 2018). A larger market size typically attracts FDI, as foreign firms seek to exploit scale economies and consumer demand (Hoang & Bui, 2015). For instance, Hamood et al. (2018) report that a 1% increase in market size leads to a 4.6% rise in FDI inflows to Malaysia.

FDI has been integral to Malaysia's development, accounting for a significant portion of fixed capital formation in the 1990s and around 8% of GDP more recently. Market expansion and brand recognition are key profitability factors for multinational corporations (MNCs) (Hamood et al., 2018). MNCs benefit more from local sales than exports, making host countries with larger markets more appealing (Shahrudin et al., 2010). Still, some studies, like Sin et al. (2017), suggest market size may be less influential when FDI is export-oriented (Agarwal, 1980; Shahrudin et al., 2010).

Exchange rates also influence FDI by affecting production costs and asset prices. A depreciation of the host currency lowers local wages and asset costs, thus increasing the attractiveness of FDI (Hasan, 2004; Osinubi & Amaghionyeodiwe, 2017; Okonkwo et al., 2021). This enhances locational advantages and increases returns on investment (Takagi & Shi, 2011; Anuchitworawong & Thampanishvong, 2015). However, the effect of exchange rate movements can vary depending on the industry and investment motives (Xing & Zhao, 2008). Some studies find that currency appreciation may also attract FDI by enhancing purchasing power and facilitating domestic market entry (Farrell et al., 2004; Lily et al., 2014; Sasana & Fathoni, 2019).

Inflation, typically seen as a reflection of macroeconomic instability, can deter FDI. Stable, low inflation boosts investor confidence by indicating sound fiscal and monetary policies (Hoang & Bui, 2015; Hong & Ali, 2020). Conversely, high inflation reduces the value of assets, increases uncertainty and undermines investor confidence (Khan & Mitra, 2014; Sajilan et al., 2019). However, Hamood et al. (2018) observed a positive relationship between inflation and FDI in Malaysia, suggesting that higher prices can lead to higher returns if firms pass rising costs onto consumers (Yolanda, 2017).

Comparative studies further illustrate FDI patterns. Chattopadhyay et al. (2022) examined BRICS nations and found that both horizontal (market-seeking) and vertical (cost-seeking) motives shape FDI. Their study highlighted the uneven impact of COVID-19 on FDI, with Brazil suffering significantly more than other members. Key determinants included market size, human capital and corruption, reinforcing the need for policy reforms.

Lee et al. (2024) analysed FDI determinants across 178 countries, categorising them into economic, social and institutional factors. Economic indicators such as GDP and trade openness were dominant in developing countries, whereas social factors like education and infrastructure were more influential in developed economies. Institutional quality, however, had a limited impact in both contexts. The authors advocate for policy strategies tailored to a country's level of development. Zaharum et al. (2024) examined FDI determinants in Malaysia from 1992 to 2021, revealing that GDP, inflation and exchange rates positively affect FDI, while real interest rates, trade openness and unemployment exert negative influences. The study highlights the importance of stable macroeconomic conditions and recommends policies to lower interest rates, manage trade openness and reduce unemployment to enhance FDI inflows.

In a focused analysis of Chinese FDI in Indonesia, Mansur (2023) found that higher wages reduce FDI, while moderate inflation has a marginally positive effect. Exchange rates and export values were not significant drivers. The study recommends inflation control and wage policy reforms to attract Chinese investment.

Infrastructure again emerges as a pivotal factor in Soto and Martinez-Cobas' (2024) Latin America study, which reveals that while electricity access strongly attracts FDI, there is a saturation point beyond which additional transportation investments yield diminishing returns. The study also warns that

liberalisation policies might inadvertently reduce regional FDI by increasing competition among neighbouring countries.

Multiple studies, including Ang (2008), support the importance of market size, financial development, trade openness and infrastructure in driving FDI to Malaysia. While higher corporate taxes and currency appreciation deter FDI, macroeconomic uncertainty may sometimes attract risk-tolerant investors seeking high returns.

In sum, the literature underscores the multifaceted relationship between FDI and macroeconomic variables. Core determinants include GDP, inflation, exchange rates, trade openness and infrastructure. Effective policy interventions—particularly those promoting macroeconomic stability, infrastructure development and favourable market conditions—are essential to attracting and sustaining FDI, especially amid global uncertainties like the COVID-19 pandemic.

3. Methodology

This research mainly focuses on five variables: infrastructure (INFRA), market size (MS), exchange rate (ER), inflation rate (IR) and FDI. FDI is categorised as the dependent variable, while infrastructure, market size, exchange rate and inflation rate are independent variables. Yearly time series data from 1991 to 2020 were collected from the World Bank. Fixed telephone subscriptions were used to represent the infrastructure. The exchange rate is measured as local currency unit per US dollar. The GDP per capita was used as a proxy for market size, which determines the demand of the host country's population for output. These variables were transformed into logarithmic (L) form to approximate normal distribution.

The model applied in this research is based on the Dunning's model (Dunning, 1993). The hypothesis may be expressed as follows:

$$LFDI = f(LINFRA, LMS, LER, LIR) \quad (1)$$

In linear form, the model can be specified as follows:

$$LFDI_t = \alpha + \beta_1 LINFRA_t + \beta_2 LMS_t + \beta_3 LER_t + \beta_4 LIR_t + \varepsilon_t \quad (2)$$

where LFDI is log of FDI, LINFRA is log of infrastructure, LMS is log of market size, LER is log of exchange rate, LIR is log of inflation rate and Ɛ is random error term.

The data analysis begins with stationarity checking. Dickey-Fuller Generalized Least Squares (DF-GLS) was used in this research to assess if the variables series have a unit root (non-stationary) or do not have a unit root (stationary). The DF-GLS test is considered more robust compared to traditional unit root tests such as Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) in term of power and small sample size. The DF-GLS test has much more potency when an uncertain mean or trend is present (Elliott et al*.,* 1996). While the KPSS test is different from commonly used tests like ADF and PP because its null hypothesis predates stationarity. The null hypothesis for DF-GLS is that the variable series has a unit root or non-stationary.

After the stationarity check, the data analysis is continued with the cointegration test using the Autoregressive Distributed Lag (ARDL) approach. In modelling the relationship, unlike the conventional cointegration methods such as Engle-Granger and Johansen, the ARDL can deal with variables integrated at different levels of stationarity, I(0) and I(1), and robust to a small sample size. The general model for ARDL is as follows:

$$y_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{p} \psi_i y_{t-i} + \sum_{j=1}^{k} \sum_{l_j}^{q_j} \beta_j \, l_j x_j t - l_j + \varepsilon_t \quad (3)$$

where ε_t is error term, α_0 is constant term and α_1, ψ_i, $\beta_j l_j$ are the coefficients associated with a linear trend, lags of y_t, and lags of the k regressors $x_j t$. ARDL cointegration methods can be used if the underlying variables have a long-run relationship. The optimal lag length (k) is determined using an appropriate selection criterion, such as Akaike Information Criterion (AIC), Schwarz Bayes Criterion (SBC), or Hannan-Quinn Criterion (HQC) (Nkoro & Uko, 2016).

After determining the existence of the long-run cointegration relationship, the analysis proceed with modelling dynamic error correction model (ECM) based ARDL. The ECM solves problems like spurious relationships from non-stationary time series data by integrating short-run dynamics with long-run equilibrium while preserving long-run information (Shrestha & Bhatta, 2018). The ECM of the ARDL model for FDI can be written as follows:

$$\Delta \mathrm{LFDI_t} = \beta_0 + \sum_{\mathrm{i=1}}^{\mathrm{p}} \beta_{1\mathrm{i}} \Delta \mathrm{LFDI_{t-i}} + \sum_{\mathrm{i=0}}^{\mathrm{p}} \beta_{2\mathrm{i}} \Delta \mathrm{LINFRA_{t-i}} + \sum_{\mathrm{i=0}}^{\mathrm{p}} \beta_{3\mathrm{i}} \Delta \mathrm{LMS_{t-i}} + \sum_{\mathrm{i=0}}^{\mathrm{p}} \beta_{4\mathrm{i}} \Delta \mathrm{LER_{t-i}} + \sum_{\mathrm{i=0}}^{\mathrm{p}} \beta_{5\mathrm{i}} \Delta \mathrm{LIR_{t-i}} + \alpha_1 \mathrm{ECT_{t-1}} + \varepsilon_{\mathrm{t}} \quad (4)$$

Although the above ECM model can be structured into multivariate equations for short-run causality analysis, this current research only focuses on models with FDI as the dependent variable. In practice, Granger causality is often studied for bivariate processes. However, different conclusions may be drawn when more than two variables are considered. If more than two variables exist, the non-causal relationship conditions will become more complicated (Song & Taamouti, 2018). Hence, the Granger causality test is a statistical hypothesis test used to determine whether one-time series may forecast another. The hypothesis will be rejected if the probability value is less than any levels of significance, i.e. 1%, 5% or 10% (Wei, 2016).

The robustness of estimated coefficients is tested using diagnostic tests. The modelling strategy being utilised determines the type of diagnostic test. The standard diagnostic tests include tests for serial correlation, normality, heteroscedasticity and stability test. The serial correlation is classified into pure and impure autocorrelation (Yang et al., 2020). When the uncorrelated observation of the erroneous term is broken in the correctly defined equation, pure autocorrelation ensues. Impure autocorrelation appears when serial correlations in the model are due to specification problems or improper functions. This research will use the Lagrange multiplier test (LM test) for serial correlation. The hypothesis of the serial correlation test is that the residual series has no serial correlation. When the p-value is less than 1%, 5%, or 10%, the null hypothesis will be rejected indicating the presence of serial correlation.

Furthermore, heteroscedasticity is defined as the variance of the term of error varying depending on whatever observation or the values of the independent variables is being discussed. As defined, heteroscedasticity is a problem when one variable's variability differs from the value range of the second variable that predicts it (Yang et al., 2020). The White test, Breusch-Pagan LM test, Harvey-Godfrey LM test, Glesjer LM test, Park LM test and Goldfeld-Quand test can all be used to detect heteroscedasticity (Joe et al., 2016). The White test for heteroscedasticity is employed in this research. The null hypothesis is that the variance of the residual series is homoscedastic. Rejecting the null hypothesis when the p-value is less than 1%, 5%, or 10%, indicating heteroscedasticity. Furthermore, a normality test determines whether the residual series has a normal distribution. According to Sujianto (2009), the normality distribution test is a test to determine whether the distribution of the residual series is normal.

The Cumulative Sum of Recursive Residuals (CUSUM) and CUSUM of Squares tests were employed to determine the stability of the coefficients and variances of the model (Brown et al. (1975). The parameters are stable if the CUSUM and CUSUM of Squares plots are within the upper and lower 5% of significance lines (Yang et al., 2020). Movement outside the 5% significance lines indicate unstable parameters or variances. If the residual variance is relatively stable, the cumulative sum of squares is usually near the 5% significance lines (IHS Global Inc., 2013).

4. Findings and Discussion

Table 1 shows the unit root test results based on DF-GLS. In general, the test produced mixed results of I(0) and I(1). The LFDI and LIR were stationary at the level, while the rest were stationary at the first difference. Hence, the test results imply that the ARDL model is the appropriate model for estimation since the variables are a mixture of I(0) and I(1).

Table 1: Unit Root Test Results

Test Type	Variables	Level		First Difference	
		Intercept	Trend and Intercept	Intercept	Trend and Intercept
DF-GLS	LFDI	-4.5861***	-5.3229***	-	-
	LINFRA	-0.7571	-2.36	-2.3656**	-2.5744
	LMS	-0.4215	-1.885	-4.4414***	-4.6045***
	LER	-1.0096	-1.7345	-3.9388***	-4.2168***
	LIR	-1.9748 **	-3.0859*	-	-

Notes: All variables are transformed into logarithm form (L). *, **, ***, represents the rejection of null hypothesis at 10%, 5%, and 1% level of significance. FDI = foreign direct investment, INFRA = infrastructure, MS = market size, ER = exchange rate, IR = inflation rate.

Table 2 shows the results of the bounds test to cointegration. The optimal ARDL lags for this model are (2,0,3,1,0), which were automatically selected based on the lowest Schwarz Bayesian Criterion (SBC) value. The bound test shows that the F-statistic is greater than the upper bound critical value at a 5% significance level. This result implies that long-run cointegration exists among the dependent and independent variables in the model.

Table 2: Cointegration Bounds Test Result

Critical F-Statistics	Lower Bound	Upper Bound
90%	2.7838	4.0268
95%	3.4343	4.8699
Computed F-statistics	F=8.9006**	

Notes: ** represents the rejection of null hypothesis at 5% level of significance.

The estimated long-run coefficients are shown in Table 3. The results show that only infrastructure is statistically significant at the 10% significance level, influencing the FDI with a positive coefficient. A 1% increase in infrastructure will increase the FDI by 2.07% indicating a positive relationship between infrastructure and FDI. This finding is consistent with several past studies by Bakar et al. (2012), Ahmad et al. (2015), and Owusu-Manu et al. (2019). Efficient telecommunications services in Malaysia will facilitate the entry of domestic and foreign private capital and technological skills, thereby attracting more inflows of FDI into Malaysia.

Table 3: Estimated Long-Run Coefficient

Regressor	Coefficient	Standard Error	T-Ratio	P-Value
LINFRA	2.0676*	1.0997	1.8801	0.078
LMS	-0.24817	0.32765	-0.75744	0.460
LER	-1.7686	1.2009	-1.4727	0.160
LIR	-0.11500	0.25867	-0.44458	0.663
INPT	-27.1743*	14.7382	-1.8438	0.084

Notes: All variables are transformed into logarithm form (L). *, **, ***, represents the rejection of null hypothesis at 10%, 5%, and 1% level of significance. INPT = intercept, INFRA = infrastructure, MS = market size, ER = exchange rate, IR = inflation rate.

While in the short-run, the infrastructure also showed a positive and statistically significant effect on FDI in Malaysia as shown in Table 4. This means Malaysia with higher levels of infrastructure are more likely to attract more FDI since a higher infrastructure level would allow foreign investors to operate at their optimal efficiency level. Therefore, infrastructure plays a crucial role in FDI in the short and long-run.

On the other hand, the results showed that the market size (MS) proxied by GDP implied a negative impact on the FDI but no evidence of a significant relationship. This showed that MS does not directly impact FDI in the long-run. Based on previous studies, GDP per capita, GDP growth rate and real GDP are usually used as proxies for the market size. Thus, different proxies might yield different results. The result in the present study is supported by Sin et al. (2017), in which GDP per capita is insignificant influences the FDI inflows in Malaysia. In addition, both the exchange rate (ER) and inflation rate (IR) are also statistically insignificant in influencing the FDI. This empirical result is in line with studies by Lily et al. (2014) and Ezeoha and Cattaneo (2012).

Table 4: Dynamic Error Correction Model

Regressor	Coefficient	Standard Error	T-Ratio	P-Value
ΔLFDI (-1)	0.34603**	0.13862	2.4963	0.022
ΔLINFRA	1.9678*	1.0113	1.9458	0.067
ΔLMS	16.6439***	2.9336	5.6736	0.000
ΔLMS(-1)	-4.6080***	1.1500	-4.0070	0.001
ΔLMS(-2)	3.1905**	1.3545	2.3558	0.030
ΔLER	17.9516***	4.0531	4.4291	0.000
ΔLIR	-0.10945	0.24121	-0.45374	0.655
ECT(-1)	-0.95172***	0.17414	-5.4652	0.000

Notes: All variables are transformed into logarithm form (L). *, **, ***, represents the rejection of null hypothesis at 10%, 5%, and 1% level of significance. FDI = foreign direct investment, INFRA = infrastructure, MS = market size, ER = exchange rate, IR = inflation rate, ECT = error correction term. Δ is the first difference operator and figures in ( ) represent the lag structure.

Further short-run relationship analysis using the dynamic ECM model based on the ARDL framework indicate that infrastructure (INFRA), market size (MS) and exchange rate (ER) showed significant impact on FDI in the short-run (Table 4). The MS impact vary according to the coefficient values at different lags. The exchange rate was found to have significantly positively impacted FDI in the short-run. When Malaysian ringgit depreciates, the wealth of foreign investors increases and the cost of investing in the country of origin's currency decreases, allowing them to finance more investments. From this result, we can conclude that the long-run relationship between exchange rates and FDI is insignificantly negative but is significantly positive in the short-run.

Table 5: Causality Test

Variables	Chi-Square	P-value
dLINFRA	3.7861	0.052
dLMS	41.0682	0.000
dLER	19.6170	0.000
dLIR	0.20588	0.650

Notes: All variables are transformed into logarithm form (L). FDI = foreign direct investment, INFRA = infrastructure, MS = market size, ER = exchange rate, IR = inflation rate.

Nevertheless, the result of the inflation rate stated that the relationship is insignificant, indicating no significant effect of the inflation rate on FDI in Malaysia. This is because inflation affects the entire economy, so other variables may influence the relationship between inflation and FDI flows, leading to the insignificant effect of the inflation rate on FDI. The other variables, such as the rising foreign exchange rate, cause consumers to buy cheaper domestic goods, which increases aggregate demand and prices. Hence, the increase in the exchange rate will increase the inflation rate. Therefore, the effect of the inflation rate is insignificantly negative to FDI in the short and long-run. Furthermore, the error correction term (ECT) coefficient is negative and significant at the 1% significance level confirming the existence of cointegration from bounds test result. The coefficient value of the ECT is -0.95 indicating the deviations from the equilibrium level of FDI will be adjusted and corrected at a fast pace for about 95% in the next period.

In addition to empirical results shown in Table 4, further short-run analysis based on the Granger causality test (Table 5) reconfirmed the results that indicate the infrastructure (INFRA), market size (MS) and exchange rate (ER) have significant relationships with FDI, but insignificant for inflation rate. These results indicate that the behaviour or movement of FDI is significantly predicted by the behaviour or movement in the infrastructure, market size and exchange rate. These findings are consistent with past studies by Ahmad et al. (2015), Shahrudin et al. (2010), Osinubi and Amaghionyeodiwe (2017) and Khan and Mitra (2014).

The diagnostic test results of the residual series for ARDL model include serial correlation, normality and heteroscedasticity are shown in Table 6. The test results show no serial correlation and no heteroscedasticity in this model since the null hypothesis of no serial correlation and no heteroscedasticity, respectively, cannot be rejected because the p-value is insignificant. Besides that, the normality test implies that the residual series is normally distributed. In conclusion, these results show that the model is adequate and is free from serial correlation and heteroscedasticity problems, and also, the residual series is normally distributed.

Table 6: Diagnostic Tests for ARDL Model

Diagnostic Test	Test Statistics
Serial Correlation	$\chi^2 = 0.15802$ (0.691)
Normality	$\chi^2 = 2.9838$ (0.225)
Heteroscedasticity	$\chi^2 = 0.11799$ (0.731)

Notes: Figures in ( ) are p-values.

Furthermore, the CUSUM and CUSUM of Squares tests were used to determine the stability of the model's parameter by using the total of recursive residuals, as shown in Figures 1 and 2. The CUSUM and CUSUM of Squares tests imply that the blue line lies within the red and green lines, which are the 5% upper and lower significant lines, indicating the stability of the coefficients and variances, respectively, of the model during the sample period.

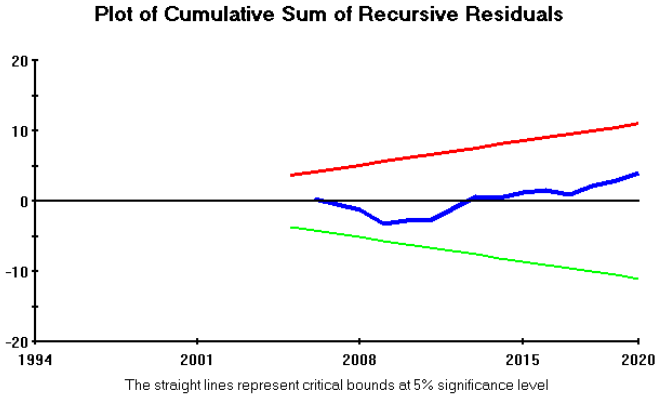


Figure 1: CUSUM Test

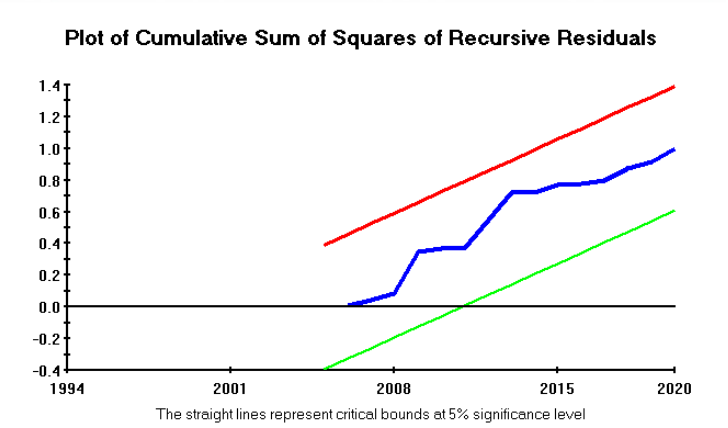


Figure 2: CUSUM Square Test

5. Conclusion

This study examined the key determinants of foreign direct investment (FDI) in Malaysia, focusing on infrastructure, market size, exchange rate and inflation. The findings reveal that infrastructure has a significant positive impact on FDI in both the short and long run. Conversely, market size, exchange rate and inflation are statistically insignificant in the long run. However, market size and exchange rate demonstrate a significant short-run relationship with FDI, while inflation remains insignificant in both time frames.

These results provide valuable insights for investors, policymakers, and institutions such as Bank Negara Malaysia and the federal government. Infrastructure—particularly telecommunications—emerges as a critical factor in attracting FDI. As Malaysia continues to prioritise digital connectivity and communication infrastructure, it is essential that both public and private sectors invest in research and development to provide high-quality, cost-effective services. In addition to telecommunications, continued investment in transport infrastructure (e.g., roads and railways) is necessary to further enhance Malaysia's appeal to foreign investors.

Although market size and exchange rate are not long-term drivers of FDI, their short-run significance suggests that macroeconomic stability and consistent currency policies are important for attracting investment. Measures such as maintaining sustainable economic growth, minimizing exchange rate volatility, offering tax incentives, strengthening financial institutions and ensuring social stability can further support FDI inflows (Tang et al., 2014).

The study also highlights the short-run positive, but long-run negative influence of the exchange rate on FDI. This implies a nuanced role for monetary policy. Central bank interventions, such as interest rate adjustments, can help manage exchange rate dynamics. Historical policy actions, such as the 1998 Ringgit peg under Dr. Mahathir Mohamad, illustrate the potential impact of such measures on currency stability and investor confidence.

Moreover, stakeholder decisions regarding market entry strategies play a significant role in shaping FDI flows. The choice of investment modes, such as wholly owned subsidiaries or joint ventures, depends on perceived risks, growth potential and institutional environments. In uncertain or fragmented markets, firms that successfully achieve economies of scale can lower marginal costs and improve performance.

To conclude, infrastructure is the most influential determinant of FDI in Malaysia, while market size and exchange rate exert important short-run effects. Policymakers and stakeholders must consider these

dynamics when formulating strategies to attract and sustain FDI, thereby contributing to Malaysia's long-term economic growth and competitiveness.

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