*JATI-Journal of Southeast Asian Studies,* Volume 31(1), June 2026, 29-52
ISSN1823-4127/eISSN 2600-8653

# THE DETERMINANTS OF FOREIGN DIRECT INVESTMENT FLOWS TO THAILAND

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DOI: https://doi.org/10.22452/jati.vol31no1.3

## Abstract

Foreign direct investment (FDI) has played a vital role in Thailand's industrialisation and economic growth. This study examines the determinants of FDI inflows in Thailand over the period 1990–2019, focusing on natural resources, political risk, labour force, financial development, market size, and macroeconomic stability. The Autoregressive Distributed Lag (ARDL) approach is employed to estimate the long-run and short-run relationships, while the Toda–Yamamoto causality test examines causal linkages among the variables. The results reveal that natural resources and financial development have positive and significant effects on FDI inflows, whereas political risk exerts a significant negative effect. In contrast, labour force, market size, and macroeconomic stability do not significantly influence FDI during the study period. The findings highlight the importance of strengthening political stability, deepening financial sector development, and sustainably managing natural resources to enhance Thailand's investment attractiveness and support long-term economic growth.

**Keywords:** *foreign direct investment, Thailand, ARDL model, Toda-Yamamoto causality, political stability*

## INTRODUCTION

Foreign direct investment (FDI) is widely recognised as a key driver of economic growth and development, particularly in emerging and developing economies. Besides providing capital, FDI facilitates technology transfer, enhances human capital, generates employment, and improves productivity, thereby promoting industrialisation and economic integration into global value chains (Bouoiyour, 2007; Pradhan, 2009; Bekmurodova, 2020; Al-Kasasbeh et al., 2022). Although global FDI increased substantially (Figure 1) from the early 1990s, investment flows have remained volatile due to financial crises, geopolitical uncertainty, and changing economic conditions, underscoring the importance of understanding the factors that influence FDI inflows (UNCTAD, 2024).

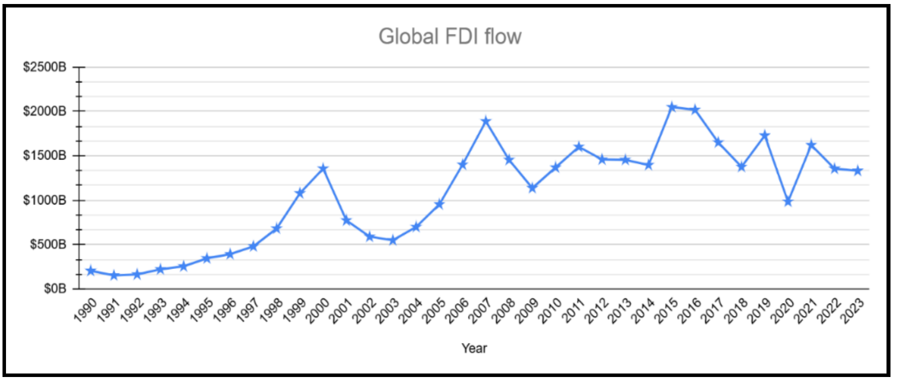



**Figure 1: World Trend of FDI Flow**
**Source: World Investment Report (2024).**

Asia has consistently attracted a significant share of global FDI owing to its expanding markets, improving infrastructure, and favourable investment climate (UNCTAD, 2017). Within the region, Thailand has emerged as an important investment destination because of its strategic geographical location, well-established manufacturing sector, strong industrial base, and integration into regional production networks (Chayawisan, 2015; Montes & Cruz, 2020; Sasana & Fathoni, 2019). These advantages have enabled Thailand to become a major production hub for multinational enterprises operating within the ASEAN region.

The literature suggests that FDI decisions are influenced by a combination of economic and institutional factors. Market size, macroeconomic stability, financial development, labour availability, infrastructure quality, trade openness, and government investment incentives are among the most frequently identified determinants of FDI (Sharma & Kaur, 2013; Bekmurodova, 2020; Nazir et al., 2022; Setyadharma & Fadhilah, 2021). In addition, participation in regional economic agreements such as the ASEAN Free Trade Area (AFTA) has strengthened Thailand's integration into global markets by reducing trade barriers and enhancing investment opportunities (Sasana & Fathoni, 2019).

Despite these favourable conditions, Thailand experienced considerable fluctuations in FDI inflows during 1990–2019. Intensifying competition from neighbouring economies, the prolonged middle-income trap, institutional reforms, episodes of political instability, and external shocks such as the 1997 Asian Financial Crisis and the 2008 Global Financial Crisis affected the country's investment climate. Nevertheless, several studies suggest that Thailand's strong industrial foundation, export-oriented manufacturing sector, and strategic position within ASEAN have continued to attract multinational enterprises despite periodic political uncertainty (Liu & Dejphanomporn, 2018).

Although numerous studies have examined the determinants of FDI, empirical findings for Thailand remain mixed, particularly regarding the roles of political risk, financial development, labour force characteristics, and macroeconomic stability. Consequently, further empirical investigation is warranted to identify the key factors influencing FDI inflows into Thailand.

This study therefore examines the determinants of FDI in Thailand over the period 1990–2019. Specifically, it investigates the long-run relationships and causal linkages between FDI and selected macroeconomic and institutional variables, namely natural resources, political risk, labour force, financial development, market size, and inflation. The analysis employs the Autoregressive Distributed Lag (ARDL) model and the Toda–Yamamoto causality test, underpinned by the Ownership–Location–Internalisation (OLI) paradigm, institutional theory, and the market-size hypothesis. The findings contribute to the literature on FDI determinants in emerging economies and provide useful policy implications for enhancing Thailand's investment competitiveness and promoting sustainable economic growth.

## LITERATURE REVIEW

The determinants of FDI are commonly explained by the eclectic Ownership–Location–Internalisation (OLI) paradigm, which emphasises location-specific advantages such as natural resource endowment, political stability, labour availability, market accessibility, and institutional quality in influencing investment decisions (Dunning, 1977). Complementing this perspective, neoclassical and Keynesian theories argue that FDI supplements domestic savings, facilitates technology transfer, and enhances economic growth (Blonigen & Piger, 2014).

Natural resource availability remains an important determinant of resource-seeking FDI, particularly in extractive industries. Countries endowed with abundant natural resources tend to attract greater foreign investment, especially in mining and resource-based sectors (Asiedu, 2006). In Thailand, substantial reserves of gypsum, zinc, tungsten, gold, and tin, together with favourable institutional conditions, have contributed to attracting resource-oriented investment (Nguyen, 2021).

Political risk is another widely recognised determinant of FDI because political stability reduces uncertainty associated with policy reversals, expropriation, and social unrest (Busse & Hefeker, 2007; Campos & Kinoshita, 2008). Stable political institutions generally encourage foreign investment by improving investor confidence (Jongwanich & Kohpaiboon, 2008). Although Thailand has experienced recurring political instability, its strong industrial base and strategic location within ASEAN have continued to support FDI inflows, reflecting investors' confidence in the country's long-term economic prospects (Bank of Thailand, 2024).

Labour force characteristics also influence FDI decisions. Human capital theory suggests that a skilled labour force enhances productivity and attracts foreign investment (Becker, 1964). Empirical evidence indicates that countries with educated and cost-effective labour markets receive higher FDI inflows (Noorbakhsh et al., 2001). In Thailand, labour costs have remained attractive to manufacturing and service investors (Nguyen et al., 2021; Paitoonpong & Chalamwong, 2012). Nevertheless, structural challenges, including skill mismatches, low labour productivity, and an ageing workforce, may constrain future investment, particularly in technology-intensive industries (Bank of Thailand, 2024).

Financial development plays a crucial role in attracting FDI by improving access to finance, lowering transaction costs, and supporting private investment. Cross-country evidence confirms a positive relationship between financial development and FDI inflows (Alfaro et al., 2004). In Thailand, financial liberalisation and credit market development have strengthened the investment climate, although some studies argue that multinational firms rely more heavily on external financing than domestic financial markets (Sahu & Dash, 2021; Organisation for Economic Co-operation and Development [OECD], 2021).

Market size, commonly measured by gross domestic product (GDP), is another important determinant of market-seeking FDI because larger markets provide greater demand and economies of scale (Markusen & Venables, 1998). GDP growth has consistently been found to encourage FDI inflows (Chakrabarti, 2001), while Thailand's expanding manufacturing and service sectors have continued to support investment despite moderate income levels. In addition, macroeconomic stability, reflected by low inflation and stable exchange rates, remains an important consideration for foreign investors (Culem, 1988). Thailand's prudent fiscal and monetary policies have also contributed to maintaining investor confidence despite external economic shocks (Wongpit, 2013).

Although previous studies have identified political, economic, financial, and structural factors as important determinants of FDI in Thailand, several research gaps remain. Many studies examine these factors individually or employ conventional estimation techniques that do not adequately capture both long-run equilibrium relationships and short-run causal dynamics. Moreover, relatively few studies comprehensively analyse Thailand's FDI determinants over the period 1990–2019, which encompasses major structural changes, including the Asian Financial Crisis, the Global Financial Crisis, increasing regional competition, and Thailand's transition to middle-income status.

To address these gaps, this study examines the effects of political risk, natural resources, labour force, financial development, market size and inflation on FDI inflows into Thailand using the Autoregressive Distributed Lag (ARDL) model and the Toda–Yamamoto causality approach. By analysing the pre-pandemic period from 1990 to 2019, the study provides updated empirical evidence on both the long-run and causal determinants of FDI, thereby contributing to the literature and offering useful policy implications for sustaining Thailand's investment competitiveness.

## METHODOLOGICAL AND EMPIRICAL FRAMEWORK

### *Model Development*

This study employs the Autoregressive Distributed Lag (ARDL) approach to examine the determinants of FDI in Thailand. Unlike conventional cointegration techniques such as those proposed by Engle and Granger (1987) and Johansen and Juselius (1990), which require all variables to be integrated of the same order, the ARDL approach accommodates variables integrated of order I(0) and I(1), making it particularly suitable for small samples (Pesaran et al., 2001; Paul, 2014; Nkoro & Uko, 2016).

In addition, the ARDL model provides robust and consistent estimates with limited observations and allows a general-to-specific modelling approach that helps address autocorrelation issues (Charemza & Deadman, 1997; Murthy & Okunade, 2016). This study as such applies the ARDL bounds testing procedure developed by Pesaran et al. (2001) to examine both the long-run and short-run relationships among the variables after confirming their integration properties using the Augmented Dickey–Fuller (ADF) unit root test. The ARDL model is specified as follows:

$$FDI_t = \beta_0 + \beta_1 NRS_t + \beta_2 PST_t + \beta_3\, LBR_t + \beta_4\, FDV_t + \beta_5\, GDP_t + \beta_6\, INF_t + \epsilon_t$$

Where:

$FDI_t$ = Foreign direct investment at time t

$NRS_t$ = Natural resources at time t

$LBR_t$ = Labour at time t

$PST_t$ = Political stability at time t

$FDV_t$ = Domestic credit to the private sector at time t

$GDP_t$ = Gross domestic product at time t

$INF_t$ = Inflation at time t

$\beta_0$ = the intercept or the constant of the model

$\beta_1$ to $\beta_6$ = slope of coefficient of the explanatory variables in the model

$\varepsilon_t$ = error term

In order to minimise the effect of heteroscedasticity time series, we employed a natural logarithm of a variable by converting all variables in log form which is denoted as ln.

$$LFDI_t = \beta_0 + \beta_1 LNRS_t + \beta_2 LPST_t + \beta_3\, LLBR_t + \beta_4\, LFDV_t + \beta_5\, LGDP_t + \beta_6\, LINF_t + \epsilon_t$$

***Unit Root Test***

Examining stationarity is crucial in time-series analysis, as it helps determine whether the variables are stable over time or need to be transformed. This is vital for producing valid regression results and avoiding misleading conclusions. This study applies Phillips-Perron unit root test to assess the stationarity of the variables. The findings from these tests guide the appropriate use of the Auto-Regressive Distributed Lag model in analysing the key drivers of FDI for Thailand.

***Lag Lengths Selection Criteria Results***

Selecting the appropriate lag length is a crucial step in estimating a Vector Autoregression (VAR) model because all variables are treated as endogenous. An incorrect lag specification may lead to biased estimates, invalid policy inferences, and inaccurate impulse response functions and variance decompositions (Braun & Mittnik, 1993). Overestimating the lag length increases forecast errors, whereas underestimating it may result in autocorrelated residuals (Lütkepohl, 1993). Furthermore, the forecasting performance of VAR models is highly sensitive to the selected lag length (Hafer & Sheehan, 1989). To determine the lag length, the unrestricted VAR lag order selection criteria are used. Based on the Chi-square hypothesis, the appropriate maximum lag for a VAR model *t* is as follows:

$H_0$: Coefficients on lag L are jointly zero
$H_1$: Coefficients on lag L are not jointly zero

The optimal lag length is determined using standard information criteria, including the Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Hannan–Quinn (HQ), with the preferred model selected based on the lowest criterion value. In this study, the SIC is adopted because of its efficiency in selecting parsimonious VAR models.

***Auto-Regressive Distributive Lag (ARDL) Approach to Cointegration***

This study applies an ARDL technique to investigate the long-run relationship, as well as endogenously assess the short-term and dynamic linkages between FDI and its explanatory variables. According to Pesaran et al., (2001), the ARDL approach involves estimating the long run relationship between variables. Following Pesaran et al., (2001), ARDL model for this study can be expressed as follows:

$$\Delta LNFDI_t = \alpha_0 + \sum_{i=1}^{n} \alpha_i \Delta LNFDI_{t-i} + \sum_{i=0}^{n} \alpha_i \Delta LNGDP_{t-i} + \sum_{i=0}^{n} \alpha_i \Delta LNINF_{t-i} + \sum_{i=0}^{n} \alpha_i \Delta LNLBR_{t-i} \sum_{i=0}^{n} \alpha_i \Delta LNNRS_{t-i} + \sum_{i=0}^{n} \alpha_i \Delta LFDV_{t-i} + \sum_{i=0}^{n} \alpha_i \Delta LPST_{t-i} + \beta_1 LFDI_{t-1} + \beta_2 LGDP_{t-1} + \beta_3 LLBR_{t-1} + \beta_4 LNRS_{t-1} + \beta_5 LFDV_{t1} + \beta_6 LPST_{t-1} + \beta_7 LINF_{t-1} + \varepsilon_t \ldots\ldots (2)$$

Where:

LFDI: log foreign direct investment.
LGDP: log real GDP
NRS: log natural resource abundance
INF: log domestic annual inflation rate
LFDV: log financial development level.
LLBR: log total labour force; and
LPST: log political stability index.

The optimal lag orders of the ARDL models are chosen by using Schwarz Info Criterion (SIC). Cointegration tests are conducted to test the joint hypotheses through Wald F-statistics by comparing it with the critical values as tabulated by Pesaran et al., (2001). The null and alternative hypotheses to be tested are as follows.

$$H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0 \quad \ldots\ldots\ldots\ldots \quad (3)$$

(There is no long-run cointegration)

$$H_1 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0 \quad \ldots\ldots\ldots\ldots \quad (4)$$

(There is a long-run cointegration)

The lagged level variables have a long-run relationship if the null hypothesis is rejected i.e. when their F-statistics is higher than upper bound critical value. If the F-statistics is lower than the lower bound, then the null hypothesis ($H_0$) cannot be rejected and there should be no cointegration in the long-run. In the instance where it is between lower and upper bound critical value, this would create an inconclusive inference. It assumes that at this condition, the order of integration of each variable is known (or otherwise). The long run coefficient values are estimated in the third-step conditional ARDL long-run model of LFDI determinants which is expressed as follows:

$$\Delta LFDI_t = \alpha_0 + \beta_1 LFDI_{t-1} + \beta_2 LGDP_{t-1} + \beta_3 LLBR_{t-1} + \beta_4 LNRS_{t-1} + \beta_5 LFDV_{t-1} + \beta_6 LPST_{t-1} + \beta_7 LINF_{t-1} + \varepsilon_t \quad \ldots\ldots\ldots\ldots \quad (5)$$

We use ARDL bounds testing approach introduced by Pesaran et al. (2001). The ARDL approach has gained widespread recognition because it accommodates variables integrated of order I(0) and I(1), provided none is integrated of order I(2) (Pesaran et al., 2001). Compared with conventional cointegration techniques, the ARDL model offers several advantages. It produces reliable estimates in relatively small samples (Nkoro & Uko, 2016), estimates both short-run and long-run relationships simultaneously within a single-equation framework. Furthermore, unlike the Johansen and Juselius (1990) approach, the ARDL model distinguishes between dependent and explanatory variables and estimates the long-run relationship using ordinary least squares (OLS) once the optimal lag length has been determined, thereby reducing potential endogeneity and autocorrelation problems (Pesaran et al., 2001).

***Error Correction Model***

ECM is a useful test for both short-run and long-run developments where ECM links the adjustment of next year with its equilibrium following no such information can be lost in the process of that change.

General ECM Equation is as follows:

$$\Delta Y_t = \beta_0 + \sum_{\{i=1\}_i^{\{n\}\beta_{\Delta X_{\{t-i\}}}}} + \gamma ECT_{\{t-1\}} + \varepsilon_t \text{ .............................. (6)}$$

Where:

$\Delta Y_t$ : Change in the dependent variable.

$\Delta X_{t-i}$ : Change in the independent variable(s) at lag i.

$\beta_0$ : Constant Term

$ECT_{t-1}$ : Error Correction Term, representing the deviation from long-run equilibrium.

$\gamma$ : Coefficient showing the speed of adjustment (should be negative for stability).

$\epsilon_t$ : Error term.

Lastly, the dynamic error correction model is ascertained from the ARDL bounds test, which indicates the long-run information lost through differencing by including the estimated lagged error correction model. Hence the short-run ECM is presented as follows:

$$\Delta FDI_t = \alpha_0 + \sum_{i=1}^{n} \alpha_i \, \Delta LFDI_{t-i} + \sum_{i=0}^{n} \alpha_i \Delta \, LGDP_{t-i} + \sum_{i=0}^{n} \alpha_i \Delta LLBR_{t-i} + \sum_{i=0}^{n} \alpha_i \Delta LNRS_{t-i} + \sum_{i=0}^{n} \alpha_i \Delta LFDV_{t-i} + \sum_{i=0}^{n} \alpha_i \Delta LPST_{t-i} \; \sum_{i=0}^{n} \alpha_i \Delta LINF_{t-i} + \varphi_i ECM_{t-i} + e_t \text{ ........... .......... (7)}$$

The coefficient $\varphi_i$ associated with ECM shows the speed of adjustment toward the equilibrium and it is expected to be statistically significant and negative.

***Toda- Yamamoto Causality***

Finally, the Toda–Yamamoto (1995) Granger causality test is employed to examine the causal relationships between FDI and its determinants. Compared with the conventional Granger causality test (Granger, 1969), the Toda–Yamamoto approach is more robust because it can be applied to variables with different orders of integration, including cointegrated series, without requiring prior tests for stationarity or cointegration. This reduces potential biases arising from pre-testing and provides more reliable inference.

The Toda–Yamamoto procedure evaluates whether past values of an independent variable improve the prediction of a dependent variable by augmenting a vector autoregressive (VAR) model with additional lags. This enables the identification of unidirectional, bidirectional, or no causal relationships among the variables (Granger, 1969; Toda & Yamamoto, 1995).

$$Y_t = \Upsilon_0 + \sum_{i=1}^{n} \vartheta_i \; Y_{t-1} + \ldots \vartheta_p \; Y_{t-p} + \sum_{i=1}^{n} \mathrm{p} \, X_{t-1} + \ldots \mathrm{p}_q X_{t-q} + \varepsilon_t \quad \ldots\ldots\ldots\ldots (8)$$
$$X_t = \Upsilon_0 + \sum_{i=1}^{n} \vartheta_i \; X_{t-1} + \ldots \vartheta_p \; X_{t-p} + \sum_{i=1}^{n} \mathrm{p} \, Y_{t-1} + \ldots \mathrm{p}_q Y_{t-q} + \mathrm{u}_t \quad \ldots\ldots\ldots (9)$$

We identify the presence of relationship in the form of either unidirectional or bidirectional or the absence of any relationship (no causal relationship) through null hypothesis that $Y$(t) does not Granger-cause $X$(t). The Toda and Yamamoto (1995) method of Granger causality test can be efficient when we encounter varying order of the integration and the sample size under study is small. We can also employ this method when the order of integration does not exceed the true lag length of the model. This approach also allows one to perform test directly on the coefficients of the levels of VAR, which enables us to reduce the risk of wrong identification of the integration order in a series in the presence of cointegrating relationship.

The VAR system to execute Toda Yamamoto approach in Granger causality test can take the following form:

$$\begin{pmatrix} FDI_t \\ GDP_t \\ LBR_t \\ NRS_t \\ FDV_t \\ PST_t \\ INF_t \end{pmatrix} = \begin{pmatrix} \psi_0 \\ \tau_0 \\ \delta_0 \\ \gamma o \\ €o \\ \phi o \\ £o \end{pmatrix} + \sum_{i=0}^{k} \begin{pmatrix} \psi_{1i} & \psi_{2i} & \psi_{3i} & \psi_{4i} \\ \tau_{1i} & \tau_{2i} & \tau_{3i} & \tau_{4i} \\ \delta_{1i} & \delta_{2i} & \delta_{3i} & \delta_{4i} \\ \gamma_{1i} & \gamma_{2i} & \gamma_{3i} & \gamma_{4i} \\ €_{1i} & €_{2i} & €_{3i} & €_{4i} \\ \phi_{1i} & \phi_{2i} & \phi_{3i} & \phi_{4i} \\ £_{1i} & £_{2i} & £_{3i} & £_{4i} \end{pmatrix} \begin{pmatrix} FDI_{t-i} \\ GDP_{t-i} \\ LBR_{t-i} \\ NRS_{t-i} \\ FDV_{t-i} \\ PST_{t-i} \\ INF_{t-i} \end{pmatrix} +$$
$$\sum_{j=1}^{dmax} \begin{pmatrix} \psi_{1j} & \psi_{2j} & \psi_{3j} & \psi_{4j} \\ \tau_{1j} & \tau_{2j} & \tau_{3j} & \tau_{4j} \\ \delta_{1j} & \delta_{2j} & \delta_{3j} & \delta_{4j} \\ \gamma_{1j} & \gamma_{2j} & \gamma_{3j} & \gamma_{4j} \\ €_{1j} & €_{2j} & €_{3j} & €_{4j} \\ \phi_{1j} & \phi_{2j} & \phi_{3j} & \phi_{4j} \\ £_{1j} & £_{2j} & £_{3j} & £_{4J} \end{pmatrix} \begin{pmatrix} FDI_{t-j} \\ GDP_{t-j} \\ LBR_{t-j} \\ NRS_{t-j} \\ FDV_{t-j} \\ PST_{t-j} \\ INF_{t-j} \end{pmatrix} + \begin{pmatrix} \mathcal{E}_{1t} \\ \mathcal{E}_{2t} \\ \mathcal{E}_{3t} \\ \mathcal{E}_{4t} \\ \mathcal{E}_{5t} \\ \mathcal{E}_{6t} \\ \mathcal{E}_{7t} \end{pmatrix} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (10)$$

Where m is the maximal order of integration, p is the optimal lag length of explanatory variables such as NRS, PST, LBR, GDP, INF, FDV and dependant variable FDI, and Ɛ is the error term.

The null hypothesis of non-causality between variables, against the alternative hypothesis is given by:

$H_0$: $ln$FDI$_{it}$ does not Granger cause $ln$NRS$_t$, $if \; \beta i = 0$
$H_1$: $ln$NRS$_{it}$ does not Granger cause $ln$FDI$_t$, $if \; \beta i \neq 0$

The Toda–Yamamoto methodology involves estimating a Vector Autoregression model in levels, with an additional lag added to account for the highest integration order among the variables. Causality is then evaluated using the Modified Wald statistics, which follows a chi-square distribution. Key advantages of the Toda–Yamamoto method include its flexibility to work with mixed data properties, robustness against model misspecification, and suitability for small datasets and macroeconomic studies. These features make the Toda–Yamamoto approach a preferred choice for dependable causality testing in empirical research.

The results obtained from ADF test indicates that the maximum order of integration is 1, which can be written as $d_{max}=1$. The Toda–Yamamoto causality test as such requires adding two extra lags for every variable. We use the HJC, AIC, SC and HQ techniques to ascertain the optimal lag length due to superiority of these measures since all lag selection indicators are similar ($k$=5). It is important to note that in study involving small sample below 60, AIC can emerge to be superior compared to other information criteria (Lutkepohl, 1991; Liew, 2004).

## Data Source

This study uses annual time series data from 1990-2019 extracted from World Development Indicators (WDI) online database for all variables.

The study employs secondary annual time series data on Foreign Direct Investment (FDI), Natural Resources (NRS), Political Stability (PST), Labour Force (LBR), Financial Development (FDV), Market Size (GDP), and Inflation (INF). Data for dependent and all explanatory variables except political stability (PST) are obtained from the World Development Indicators (WDI) for a period of 30 years from 1990 to 2019.

However, for the variable political stability (PST), political risk index is used as proxy. The data is extracted from the International Country Risk Guide (ICRG) (n.d.). PST is an index comprising 12 indicators of political stability namely government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religion in politics, law and order, ethnic tensions, democratic accountability and bureaucratic quality.

## RESULTS

This study investigates the long-run and short-run relationships between several variables building on the conceptual framework outlined in the previous section. This begins by performing a correlation analysis to understand the underlying relationships between the variables. Then a trend analysis is performed to identify any fluctuations in the variables over time. To assess the long-run and short-run relationships, the ARDL model is utilised. The causal relationships is further examined between the variables using the Toda-Yamamoto Granger Causality test, which provided insights into the direction of the causal links (Ruranga et al., 2020). Thereafter diagnostic tests are performed to ensure the reliability, stability, and absence of spurious results in the model.

***Correlation Matrix Analysis***

The correlation coefficient is a useful tool to understand the strength of the relationship between variables. Pearson correlation is a widely used method to measure the linear association between two continuous variables that follow a normal distribution. In Table 1, the correlation matrix is presented for all given variables; NRS is highly correlated with INF and LBR; LBR is highly correlated with GDP and INF. Similarly, GDP is high corelated with INF. The magnitude of the relevant coefficient indicates the strength and the direction of the relationships.

**Table 1: Correlation Matrix**

| Correlation | **LFDI** | **LNRS** | **LPST** | **LLBR** | **LGDP** | **LINF** | **LNFDV** |
|---|---|---|---|---|---|---|---|
| **LFDI** | 1 | | | | | | |
| **LNRS** | 0.729 | 1 | | | | | |
| **LPST** | -0.349 | -0.483 | 1 | | | | |
| **LLBR** | 0.755 | 0.891 | -0.451 | 1 | | | |
| **LGDP** | 0.578 | 0.670 | -0.680 | 0.851 | 1 | | |
| **LINF** | 0.741 | 0.811 | -0.504 | 0.976 | 0.904 | 1 | |
| **LFDV** | -0.179 | -0.519 | 0.373 | -0.184 | -0.001 | -0.071 | 1 |

Note: LFDI= Foreign direct investment; LNRS= Natural resources; LLBR= Total labour force; LPST= Political stability; LNFDV= Financial development level; LGDP= Gross domestic product; LINF= Inflation.

***Trend Analysis***

There are often fluctuations in time series data with decreasing or increasing trends. To conduct trend analysis on a series before unit root testing, one must determine whether it has a unit root. During unit root testing, trend analysis can be used to determine if the series is stationary or if there is a trend to be considered.

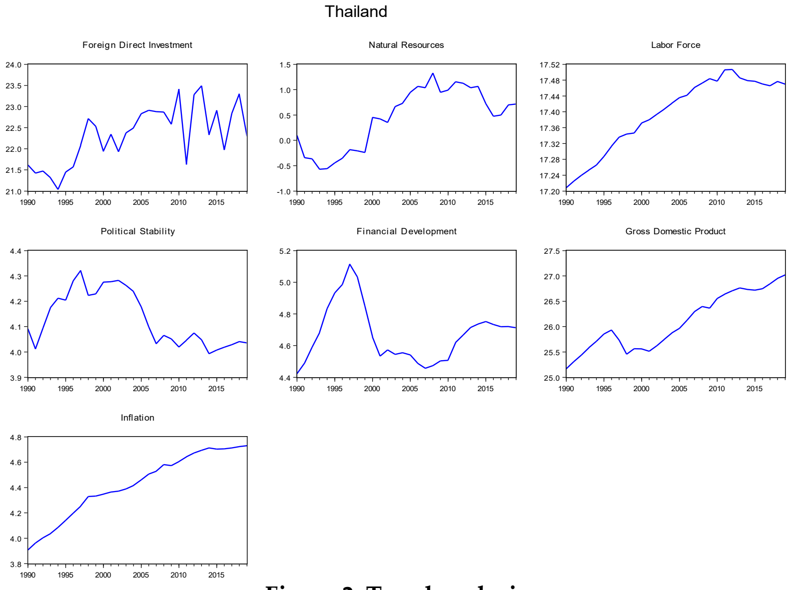



**Figure 2: Trend analysis**

The graphs (Figure 2) show that the variables fluctuate around their mean without a clear upward or downward trend. Therefore, the unit root test was conducted without a trend and intercept to determine whether the series are stationary.

### *Unit Root Test*

Unit root (non-stationary) tests for a time series indicates that if a shift in time does not affect the shape of distribution, which means the time series is stationary – for example presence of unit roots are one reason why non-stationarity might occur. This means that those tests are said to have low statistical power.

By testing the series for stationarity at different levels namely at I(0) and the first difference I(1), the unit root test is conducted based on the properties of the series. Following Dibooglu and Enders (1995) the unit root test is conducted with the Schwartz Info Criterion. Table 2 displays the Phillips-Perron unit root test results.

**Table 2: Phillips-Perron Unit Root Test**

| Order (0/1) | Model Assumptions | Value | LFDI | LNRS | LLBR | LPST | LNFDV | LGDP | LINF |
|---|---|---|---|---|---|---|---|---|---|
| I (0) | No Trend & Intercept | t-Stat | 0.27 | -0.74 | 2.71*** | -0.31 | -0.34 | 2.66*** | 4.14 |
| I (1) | No Trend & Intercept | t-Stat | -11.96*** | -5.69*** | -2.63*** | -4.65*** | -2.49** | -2.97*** | -2.03* |

Notes: ***, **, * denotes statistical significance at the 1%, 5% and 10% levels respectively

Based on the results displayed in Table 3, it seems that the data is mostly stationary at a mixed level of order. Some variables are stationary at I(0) and some at I(1). Considering the stationary unit root results for series at the mixed level of order of integration (0 and 1), ARDL is assumed to be a suitable model for estimation (Alam & Adil, 2019). Therefore, the present study uses the ARDL model to explore the long-run and short-run associations between the variables studied.

***Lag Lengths Selection Criteria Results***

The lag length is determined as a prerequisite before testing whether long-run relationships exist. The unrestricted VAR lag order selection criteria is used to determine the lag length. An asterisk indicates lag in an unrestricted VAR model, with a smaller value indicating a better criterion. The VAR lag order selection criteria are summarised in Table 3. The optimal lag orders of the ARDL models are chosen by using Schwarz Info Criterion (SIC).

**Table 3: Lag Order Selection**

| Lag | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|
| 0 | NA | 0.000 | -9.585 | -9.252 | -9.483 |
| 1 | 303.712 | 0.000 | -21.271 | -18.606 | -20.456 |
| 2 | 87.043* | 1.34e-19* | -24.466* | -19.470* | -22.939* |

Note: * indicates lag order selected by the criterion, LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion

***Cointegration Test Results***

Following the lag length selection criteria, we employed the ARDL technique to ascertain whether there is a cointegration. Based on Narayan (2004), ARDL bounds test result presented in Table 4 below suggests that there is a long-run relationship between the variables in Thailand because the F-statistic is 8.408 and significant at 1% significance level, which is higher than the critical value of the upper limit (5.691) revealing that there is a long-run relationship among the variables studied.

**Table 4: Bounds Test Results**

| F-Statistics | Significance level | Bounds Critical values | |
|---|---|---|---|
| | | I (0) | I (1) |
| 8.408 | 10% | 2.334 | 3.515 |
| | 5% | 2.794 | 4.148 |
| | 1% | 3.976 | 5.691 |

Note: Critical values for the bounds test: Case II: restricted intercept and no trend at 1%, 5% and 10% levels (Narayan, 2004).

***Long Run Estimates***

After confirming the existence of a long-run relationship, or cointegration, among the variables, we utilise the ARDL specification to calculate the long-run coefficients, which are presented in Table 5. We found NRS and FDV positively affect FDI inflow while PST negatively affect FDI inflow to Thailand.

**Table 5: Long-run Estimates**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| LNRS | 0.552** | 0.248 | 2.225 | 0.040 |
| LPST | -1.587** | 0.703 | -2.256 | 0.038 |
| LLBR | 3.941 | 3.921 | 1.005 | 0.329 |
| LGDP | -0.218 | 0.282 | -0.771 | 0.451 |
| LINF | -0.814 | 1.543 | -0.527 | 0.605 |
| LNFDV | 0.709* | 0.384 | 1.846 | 0.082 |

Notes: ****, **, * denotes statistical significance at the 1%, 5% and 10% levels respectively. LNFDV=financial development, LINF=inflation, LGDP=gross domestic product, LLBR=labour force, LNRS= natural resources, LPST= political stability*

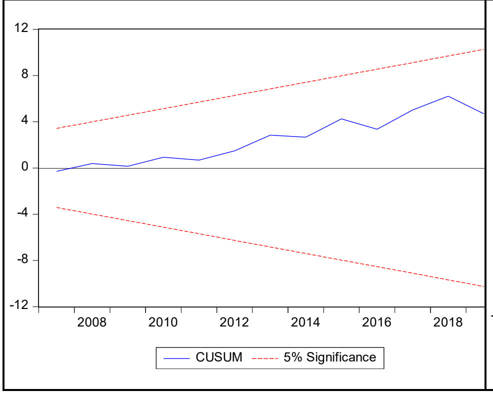
***Short-run Dynamics (Error Correction Model)***

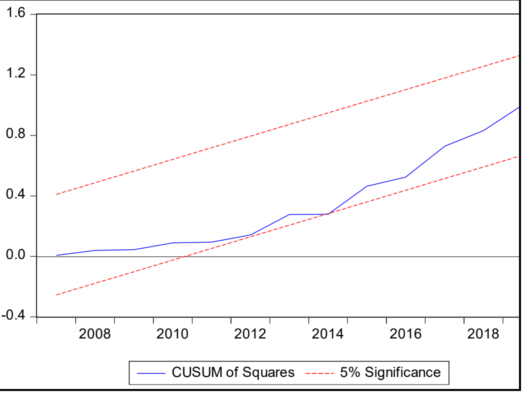
The Error Correction Model (ECM) examines the short-term relationship between variables while maintaining the long-term information by adding the error correction term in the model. The error correction term (ECT) in ECM indicates how quickly FDI inflows return to their normal level after temporary disruptions. A negative and significant ECT value shows the adjustment rate, where larger negative numbers mean faster corrections. The coefficient for ECT indicates that the speed of adjustment to be high (-1.08) and significant at 1% indicating that the Thai economy is fast to adjust to economic shocks (Table 6).

**Table 6: Short-run ARDL test estimates for Thailand**

| **Thailand** | | | | |
|---|---|---|---|---|
| Dependent Variable: D (LFDI), Method: Least Squares<br>Sample (adjusted): 1990 2019, included observations: 28 after adjustments | | | | |
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **Prob.** |
| Δ(LNNRS) | 3.250*** | 0.367 | 8.863 | 0.000 |
| Δ (LNPST) | -5.636*** | 1.325 | -4.253 | 0.001 |
| Δ (LNLBR) | -16.670*** | 5.889 | -2.831 | 0.014 |
| Δ (LNLBR(-1)) | 34.556*** | 5.683 | 6.081 | 0.000 |
| Δ (LNGDP) | 1.431*** | 0.508 | 2.816 | 0.015 |
| Δ (LNGDP(-1)) | -4.344*** | 0.702 | -6.190 | 0.000 |
| Δ (LNCPI) | -16.897*** | 3.054 | -5.532 | 0.000 |
| **ECM (-1)** | **-1.086*****| **0.112** | **-9.716** | **0.001** |
| R-squared | 0.894 | Adjusted R-squared | 0.858 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| S.E. R | 0.265 | | AIC | | | 0.415 | |
| Sum sq. resid | 1.402 | | SIC | | | 0.795 | |
| Log-likelihood | 2.193 | | D-W stat | | | 2.667 | |
| **Diagnostic tests results** | | | | | | | |
| ΔLFDI | Ram-sey | Arch | White | Breusch-Pagan-Godfrey | Harvey | LM | Jarque-Bera |
| F-stat | 0.015 | 3.937 | 2.683 | 2.166 | 2.469 | 2.807 | 0.489 |
| Probability | 0.903 | 0.058 | 0.0419 | 0.086 | 0.056 | 0.103 | 0.782 |
| CUSUM | | | | CUSUM SQUARE | | | |




Notes: *** denotes statistical significance at the 1%.

## Diagnostic Test Results

Several diagnostic tests were conducted to assess the robustness of the estimated model (Table 6). The Ramsey RESET test confirmed the absence of functional form misspecification, while the CUSUM and CUSUMSQ tests indicated parameter stability, as the statistics remained within the 5% critical bounds. The Breusch–Godfrey LM test found no evidence of serial correlation, and the Breusch–Pagan–Godfrey, White–Harvey, and ARCH tests confirmed the absence of heteroscedasticity. Finally, the Jarque–Bera test indicated that the residuals were normally distributed. Overall, the diagnostic results confirm that the estimated model is stable, well specified, and suitable for empirical analysis.

## Toda-Yamamoto Causality Results

The Toda-Yamamoto causality analysis offers valuable insights into the dynamic relationships between FDI and key explanatory factors, including natural resources, political stability, labour force, market size, macroeconomic stability, and financial development. The empirical findings are summarised below (Table 7), with a focus on the causal linkages, directionality, and statistical significance.

**Table 7: Causality Test for Thailand**

| Null hypothesis | T-statistics | K+Dmax | P-value | Decision |
|---|---|---|---|---|
| LFDI ≠> LNRS | 1.734 | 3 | 0.187 | Unidirectional Causality |
| LNRS ≠> LFDI | 7.292*** | 3 | 0.006 | |
| LFDI ≠>LPST | 0.099 | 3 | 0.752 | No Causality |
| LPST ≠> LFDI | 1.178 | 3 | 0.277 | |
| LFDI ≠> LLBR | 1.033 | 3 | 0.309 | No Causality |
| LLBR ≠> LFDI | 0.308 | 3 | 0.578 | |
| LFDI ≠> LGDP | 0.070 | 3 | 0.790 | No Causality |
| LGDP ≠> LFDI | 0.355 | 3 | 0.550 | |
| LFDI ≠> LINF | 4.188** | 3 | 0.040 | Unidirectional Causality |
| LINF ≠> LFDI | 0.256 | 3 | 0.1330 | |
| LFDI ≠> LFDV | 0.068 | 3 | 0.409 | No Causality |
| LFDV ≠> LFDI | 2.669 | 3 | 0.102 | |

Notes: ***, **, * denotes statistical significance at the 1%, 5% and 10% levels respectively.

## DISCUSSION

This study found that the NRS determines FDI in Thailand as predicted. According to the results, an increase in Natural Resources (NRS) by 1% leads to a 0.55% increase in FDI in Thailand. Thailand is endowed with more than 40 mineral types, including tin, tungsten, gold, zinc, and gypsum, making it an important producer of industrial and metallic minerals in Southeast Asia (Department of Mineral Resources, 2021; United States Geological Survey, 2025). These mineral reserves present substantial opportunities for foreign investors to be involved in extraction, processing, and value-added industries.

Political stability is widely regarded as an important determinant of FDI because political uncertainty increases investment risk and may discourage foreign investors. However, evidence for Thailand suggests a more nuanced relationship. Despite recurring political instability, including military coups and changes in government, Thailand has remained an attractive destination for FDI due to its strong industrial base, strategic location, and well-developed production networks (Liu & Dejphanomporn, 2018). Recent data from the Bank of Thailand (2024) also indicate that FDI inflows have remained resilient despite periods of political uncertainty.

Thailand's participation in regional trade agreements, favourable investment environment, and competitive manufacturing sector have continued to attract multinational corporations, particularly from Japan and China, with investment decisions driven largely by long-term market potential rather than short-term political events (Liu & Dejphanomporn, 2018). Nevertheless, political instability cannot be disregarded entirely, as studies have shown that political conflicts may reduce investor confidence and increase downside risks to capital inflows (Nguyen et al., 2020; Luangaram & Sethapramote, 2020). Overall, while political stability remains relevant, Thailand's economic fundamentals and strategic advantages appear to play a more influential role in sustaining FDI inflows.

The labour force variable has a positive but statistically insignificant effect on FDI inflows in Thailand. This finding may reflect structural challenges in Thailand's labour market, including an ageing population, skill mismatches, and relatively low labour productivity, which reduce its attractiveness to foreign investors in technology-intensive industries (Kettanurak, 2025; Nunti & Somboon, 2024).

Although Thailand has traditionally benefited from an abundant labour force, rising labour costs and increasing competition from neighbouring economies such as Vietnam and Cambodia have weakened its comparative advantage in labour-intensive production. Furthermore, Thailand's relatively modest performance in the Global Talent Competitiveness Index highlights continuing challenges in workforce quality and talent development (INSEAD, 2022).

These findings suggest that improving human capital through education and skills development, increasing labour productivity, promoting digital capabilities, and encouraging broader labour force participation are essential to strengthening Thailand's long-term competitiveness and enhancing its ability to attract high-quality FDI. A skilled labour force helps domestic firms make better use of technology transferred by foreign multinational enterprises as human capital is the most influential channel for absorbing foreign R&D spillovers (Kwark & Shyn, 2006).

The LGDP variable for Thailand is negative however it is insignificant. While Thailand's economy is sizable, with a GDP of around $543 billion in 2022, its market size alone does not exert a significant influence on attracting FDI. This is partly because Thailand's per capita income of $7,800 in 2022 lags behind regional competitors like Malaysia and South Korea, reducing the appeal of its consumer market for foreign investors focused on sectors dependent on consumer spending.

Additionally, Thailand's aging population and labour force constraints pose challenges, limiting the potential of its market size to attract foreign investment. While Thailand's economy is diverse, economic inequality and regional disparities constrain the full utilisation of its market potential. Furthermore, Thailand faces intense competition from neighbouring countries like Vietnam and Indonesia, which offer lower labour costs and more favourable investment incentives, reducing the significance of its market size in drawing foreign investors.

In 2022, Thailand attracted about $10 billion in FDI, with much of this going into sectors like automotive, electronics, and tourism. However, these industries are more influenced by factors such as infrastructure quality and targeted government incentives, rather than the sheer size of the domestic market alone. Ultimately, while Thailand's sizable economy does have a positive impact on attracting FDI, other elements like labour costs, competitive pressures, and investment-friendly policies tend to play a more significant role in drawing foreign capital into the country.

For Thailand, the predicted coefficient for INF is negative but insignificant. The country's moderate inflation, typically between 1-3%, has little impact on FDI. The nation's diverse economy, robust manufacturing and automotive industries, and government incentives like tax breaks and investment promotions, help mitigate any concerns inflation may raise for foreign investors. While inflation may slightly influence investor sentiment, factors such as market size, infrastructure, and political stability have a much greater influence on FDI decisions. In 2022, Thailand attracted around $10.5 billion in FDI, indicating its broader economic and policy landscape continues to make it an attractive investment destination, with inflation playing only a minor role.

Financial development has a positive and statistically significant effect on FDI inflows in Thailand, with a coefficient of 0.709. This finding is consistent with previous studies that identify financial development as an important determinant of FDI by improving financial intermediation and the overall investment climate (Gholizadeh Keykanloo et al., 2020; Sahu & Dash, 2021). Although multinational enterprises often rely on internal funds or international capital markets rather than domestic credit, a well-developed financial system enhances investor confidence and facilitates business operations. In addition, Thailand's strong integration into regional value chains, favourable investment policies, and participation in ASEAN have further supported FDI inflows, particularly in the manufacturing, electronics, and automotive sectors (Organisation for Economic Co-operation and Development [OECD], 2021).

The Toda–Yamamoto causality results reveal a unidirectional causal relationship from natural resources to FDI and from FDI to inflation, while no significant causal relationships are found between FDI and the remaining explanatory variables. These findings suggest that, despite the importance of financial development in the long run, other structural factors may constrain Thailand's ability to attract FDI. This is reflected in Thailand's relatively modest FDI performance compared with regional peers, indicating the need for continued structural and policy reforms to enhance the country's investment competitiveness.

In recent years, the Thai government has strengthened its efforts to attract high-quality FDI through the Thailand Board of Investment (BOI) Investment Promotion Strategy 2023–2027, which emphasises investment in high-value industries such as electric vehicles (EVs), semiconductors, digital technologies, biotechnology, renewable energy, and the Bio-Circular-Green (BCG) economy (Thailand Board of Investment, 2022). The strategy also provides enhanced tax incentives, investment facilitation measures, and support for research and innovation to improve Thailand's investment competitiveness (Thailand Board of Investment, 2022). In addition, the continued development of the Eastern Economic Corridor (EEC) is intended to strengthen Thailand's position as a regional hub for advanced manufacturing, technology, and sustainable investment (UNCTAD, 2025).

## CONCLUSION

This study investigated the determinants of FDI in Thailand for the period of 1990-2019 using ARDL approach. The study underscores the importance of country-specific dynamics in shaping FDI inflows, providing valuable insights into how economic, political, and financial factors interact to influence FDI decisions. The results show that natural resource, political stability and financial development play a significant role in attracting FDI inflows into Thailand. However, other explanatory variables were statistically insignificant. The error correction model shows a strong adjustment which indicates that Thailand economy responds promptly toward equilibrium following economic shocks reflecting its resilience. Overall, the outcome of this study confirms the fact that Thailand’s FDI inflows is motivated by structural and resource endowment rather than pure economic indicators.

Based on statistical findings we suggest that the Thai government should strengthen vocational and technical education programs to identify skill gaps specifically in high-tech industries and digital transformation. This need to be followed by regulatory framework to encourage downstream extraction and processing of mineral and energy products which may enhance the Thailand’s natural resource value. Besides that, Thailand needs to focus on macroeconomic variable by stabilising inflation and exchange rate which is pivotal in investors decision to ensure long run economic sustainability. More importantly, transparency in policymaking, efficiency in bureaucracy and consistency in policies and regulations are pivotal in attracting FDI in the long run. This, followed by enhancement in capital market and regional linkages of financial institutions may derive financing option for investing firms. Future research may explore other FDI related aspects including sustainability, environmental and digitalisation.

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How to cite this article (APA):

Hindu, R. C. (2026). The determinants of foreign direct investment flows to Thailand. *JATI-Journal of Southeast Asian Studies*, *31*(1), 29-52.

Date received: 6 June 2026 Date of acceptance: 30 June 2026