Southeast Asian Journal of Economics Vol.14(1), April 2026: 1-34
Received: January 5, 2023
Revision: January 9, 2024
Accepted: January 10, 2025

Determinants of Foreign Direct Investment in Thailand's Real Estate Market

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Abstract

Over the past decades, foreign direct investment has contributed positively to Thailand's economic growth, where a significant part of the investments made are allocated to the real estate sector. Thailand's real estate market has demonstrated enduring growth, witnessed by a remarkable surge from international buyers. The increase in tourism and attractive investment opportunities has turned Thailand into a preferred destination for foreign investment, which leads to an increase in foreign demand for accommodation. This study aims to explore the key factors that affected foreign direct investment in real estate activities in Thailand from 2008 to 2022 using the time series regression method. The estimation results reveal that market size GDP, condominium price, interest rates, and exchange rates are significant determinants of foreign direct investment into Thailand's real estate activities, while the number of tourists and labor wages have no impact. Therefore, Thailand should maintain a favorable investment environment, monitor the real estate market to stabilize house prices, control appropriate macroeconomic policies, and strengthen effective regulation of financial institutions and markets to attract more foreign direct investment into the real estate sector.

Keywords: foreign direct investment, Thailand, real estate market, property price, interest rates

1. Introduction

Over the past decades, Thailand has been one of the most successful countries for attracting foreign direct investment (FDI) and has recorded rapid and sustained growth rates in various diverse modern classifications. FDI has contributed positively to Thailand's economic growth, where and a significant part of the total investments made are allocated to the real estate industry. Since the beginning of 1990, almost 40% of net FDI was in the real estate sector, signaling a shift of FDI from the manufacturing sector to real estate (Haemputchayakul, 2001; Brimble & Techaratanawiroj, 2006). Real estate investment in Thailand has seen a boom in recent decades, attributable to business environment factors such as cost of living, minimum wage, and reasonable property prices and its increasing popularity as a tourist destination. The Thai government also has played an important role in pursuing numerous initiatives that aim to assist investors and eliminate unnecessary laws and regulations that are obstacles to business operations. This makes Thailand become one of the top choices for real estate investors worldwide.

During the COVID-19 pandemic, Thailand's real estate market faced many challenges due to negative global economic factors, foreigners moving back to their home countries, a lack of tourists visiting Thailand, cash in real estate prices, and a decline in domestic and international purchasing power. Amidst global economic challenges, Thailand's real estate sector managed to remain as a resilient and flourishing market. The government's infrastructure Eastern Economic Corridor (EEC) development project helped to recover the Thai economy, boosted investors' confidence, and attracted FDI for landed properties (CBRE Thailand, 2024). In addition, Thailand's well-established rental market, with stable property prices coupled with relaxed ownership regulations for foreigners, has attracted many foreign

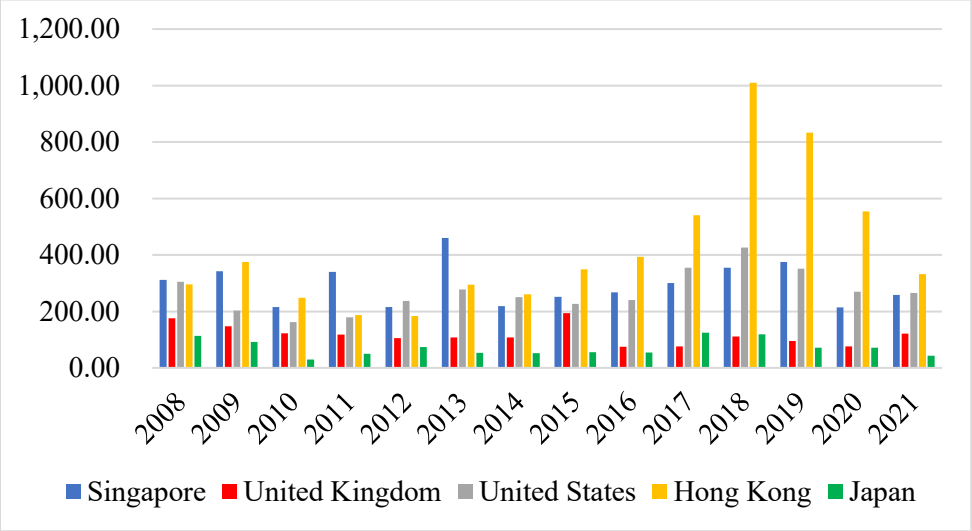
investors to choose Thailand as their dream home for investment seeking long-term returns.

After the COVID-19 pandemic, Thailand saw positive changes in real estate trends due to the recovery of the tourism industry, which has significantly boosted the housing demand in many cities and provinces. High purchasing power foreigners have invested in different types of property in Thailand, such as residential projects and office spaces (Zhai et al., 2024). Provinces like Chiangmai, Phuket, Pattaya, and Koh Samui have shown an increasing trend of foreign ownership of Thail real estate in the form of nominees (CBRE Thailand, 2023). The increasing demand for a second home in Thailand from Chinese customers has turned housing estates in Chiang Mai into Chinese communities (Lertpusit, 2023). Moreover, the rise of remote work and interest in vacation homes resulted in an increase in condominium sales in many cities like Bangkok, Phuket, and Pattaya (REIC, 2025). Many foreign buyers invest in Thai property for rent, residence, investment, and, most importantly, aiming for both rental yields and potential capital appreciation (CBRE Thailand, 2024). Some foreigners look toward purchasing condos in Thailand as a destination for a holiday home, and they rent out their homes when they are not residing in the country. Other foreign buyers seek to purchase condos in Thailand as an investment and aim to make them purely rental properties (Xu & Thaldumrong, 2018).

In recent years, Thailand's real estate market has demonstrated enduring growth witnessed by a remarkable surge from international buyers. The increase in tourism and attractive investment opportunities have turned Thailand into a preferred destination for foreign investment, which leads to an increase in foreign demand for accommodation (Teeramungcalanon & Rattanaprichavej, 2021). In 2021, the FDI inflows in the real estate activities of Thailand amounted to USD 1.4 billion. The majority of these inflows are from Hong Kong, the United States, Singapore, the United Kingdom, and Japan,

accounting for 22%, 18%, 17%, 8%, and 2%, respectively, of the total FDI in real estate (Figure 1).

Figure 1. Foreign direct investment (inflow) classified by country 2008–2021



Source: Bank of Thailand (2022)

There are many studies concerning the determinants of FDI into the home country. Countries expected to have a strong and stable economy are considered the most significant driver to foster or increase FDI flow (Chin et al., 2006). Some studies reveal that important factors such as technology or national reserves (Kinuthia & Murshed, 2015; Razmi & Behname, 2012), trade openness, stable exchange rate, and market size tend to have a positive impact on FDI inflows (Kinuthia & Murshed, 2015; Castiglione et al., 2012). Other studies show that factors like corruption rate, high economic risk, existence of poverty, or declination of the population are likely to have a negative impact on FDI flows (Kumari, 2014). Similarly, some studies employed different macroeconomic indicators to examine the determinants of FDI inflows into the real estate sector of different countries, namely gross domestic product, house price, interest rate, wage, tourists, and exchange rate (Rodríguez & Bustillo, 2010; Fereidouni & Masron, 2013; Hui & Chan, 2014; Farzanegan & Fereidouni, 2014; Chen, 2017; Scarlett, 2021).

Several studies have revealed that the real estate sector relates to the growth and development of an economy. The impact of FDI in the real estate sector tends to have a positive impact on the movement of domestic interest rates, the creation of new jobs, the creation of major inflows of funds, and the generation of new technology advancement. Meanwhile, foreign direct investment in real estate (FDIRE) also offers foreign and domestic investors various investment options for long-term returns (REALTORS, 2003; Mamata, 2011). In the case of Thailand, however, numerous studies have examined the determinants of FDI in Thailand (Anuchitworawong & Thampanishvong, 2015; Klaew et al., 2016; Janda & Nuangjamnong, 2021; Tungbenchasirikul & Sethjinda, 2022; Boonlua et al., 2022; Teeralertpanich, 2023), while no studies have focused on the determinants of FDI in the real estate sector of Thailand.

Given the growing amount of FDI in Thailand's real estate sector, examining factors affecting foreign real estate investment (FREI) in Thailand can provide a better understanding of Thailand's real estate market and support policymakers in their creation of effective policies that control capital outflows. Most importantly, this study will make a significant contribution as the topic of FREI in Thailand has not received much research attention. Thus, this study aims to explore the determinants of FREI in Thailand from 2008 to 2022 using the time series regression method as the data analysis approach. Empirical tests, including the Unit Root Test, Johansen Cointegration Test, Vector Error Correction Model, Impulse Response Function, and Variance Composition, are applied in the paper. In addition, gross domestic product (GDP) per capita, labor wage, condominium price, interest rates, exchange rates, and number of tourists are used as the main determinants of FDI into Thailand's real estate activities.

This paper is organized as follows: Section 2 discusses the existing literature on the relationship between Thailand's real estate market and FDI inflows; Section 3

discusses the methodology and describes the data used. Empirical results are presented in Section 4; and the conclusion is presented in Section 5.

2. Literature Review

In this section, studies on FREI in different countries will be outlined, followed by empirical studies on the determinants of FDI inflows in different countries and studies on the determinants of FDI in Thailand.

2.1 Research of FREI in Different Countries

In recent years, research on FREI has been a popular topic in different countries. Numerous studies investigate the determinants of FREI in different countries.

A study on Vietnam revealed that although FDI inflows led to economic growth by increasing manufacturing exports and creating employment, it also flows into the country's real estate, which was stimulated by the property market bubble (Nguyen, 2011). Another study on Spain's real estate market using time series data from 1990 to 2007 revealed that, besides the demand side, GDP per capita, tourism, and housing pricing were the relevant determinants of FREI (Rodriguez & Bustillo, 2010). Exploring the characteristics of foreign housing buyers in South Korea revealed that foreign housing investment in Seoul is closely associated with overseas Koreans due to high-potential investment returns (Kim et al., 2015). A study on 14 Malaysian States from 2004 to 2010 found that a higher level of foreign investment is concentrated in some large states like Kuala Lumpur and Penang. It also found that tourism and property purchase prices, and the well-being of local people, are important determinants of foreign investment in the real estate market (Gholipour, 2013). Determinants of FDI in the UK real estate market revealed that GDP and house price have a positive impact on FREI, while wage, land price, and tourism have a negative impact on FREI (Poon,

2007). A similar study to identify the factors that attract foreign investors in Taiwan's real estate market showed that operational risk, land cost, and national competitiveness are the determining decision factors for international investment (Lai & Fischer, 2007). The number of tourist arrivals and house rent are two significant determinants of FDI in the Turkish real estate sector, as house rent has a positive impact on real estate prices (Gholipour & Masron, 2011). A study on OECD countries revealed that FDI in real estate does not cause condo prices to rise and does not contribute to economic growth in the host country (Gholipour, 2014).

There are several studies on the determinants of FDI in China's real estate market. Foreign investors in China's real estate industry focus on return to capital, while appreciating conductive institutions, when choosing locations (He et al., 2011). A study using panel data from 35 major Chinese cities from 2002 to 2008 revealed that local and foreign demand have attracted foreign real estate developers (He & Zhu, 2010), while the cultural difference is an important factor that prevents foreign investors from entering China's real estate market (Fu, 2009). The impact of foreign investment on housing prices was investigated, revealing that household income was the most important factor influencing housing prices, with housing prices in bigger cities being more prone to increase (Kuang et al., 2011). As China increasingly opened its market, it led to a rising trend in foreign investment in the real estate market, GDP per capita, and the number of foreign real estate enterprises, which are important determinants affecting foreign investment in China's real estate market (Hui et al., 2014).

Some existing studies have shown that many economies have also experienced large FREI and an appreciation of house prices. A surge in capital inflows not only accelerates volatility in the real estate market but also raises the demand for property and consequently contributes to price change in the real estate market (Mihaljek, 2007; Guo & Huang, 2010). Capital inflows have contributed to asset price appreciations in

emerging Asian economies like Indonesia, the Philippines, South Korea, Malaysia, and Thailand (Kim & Yang, 2011). In the case of China, in the short run, an increase in housing prices tends to attract more foreign capital inflows, while in the long run, foreign capital inflows tend to drive up house prices (Song & Gao, 2007). Estonia experienced a real estate boom between 2000 and 2007 due to massive capital inflows (Brixiova, 2010). Similarly, a surge in capital flows was the main determinant that led to an increase in equity prices and stabilization of exchange rates in East Asia from 1990 to 1996 (Rajan & Siregar, 2002). Capital inflows into Thailand's real estate market tend to be associated with higher asset prices and lower lending rates and consequently lead to higher investment and higher output (Gharleghi, 2016). From the above literature, capital inflows provide a significant contribution to the price change of real estate. Although foreign investment is drawn to other countries for various reasons, there are still few studies that examine the factors affecting FREI, especially in Thailand.

2.2 Determinants of FREI Inflows

Some studies employed different macroeconomic indicators to examine the determinants of FDI inflows into the real estate sector, namely gross domestic product, house price, interest rate, wage, tourists, and exchange rate.

Although previous studies have shown that FREI may contribute to economic growth through an increase in employment and enhancement of technology transfer (Merlevede & Schoors, 2007; Vadlamannati & Tamazian, 2009), some studies have argued that economic growth is one of the most significant determinants of FDIRE. Higher economic growth would reflect the future potential of the market and hence would attract more capital inflows into the host country (Ramasamy & Yeung, 2010). Similarly, market size is a crucial factor that has a positive effect on FDI: When a country's economy grows, more business opportunities are created for foreign

investment, and investors' confidence is then boosted (Coughlin & Segev, 2000; Havrylchyk & Poncet, 2007; Fereidouni & Masron, 2013; Hui & Chan, 2014).

Economic growth is an important determinant of FDI, but property price is also another crucial factor that attracts FDI in the host country. In terms of house prices, previous studies have shown mixed results on the relationship between property prices and FREI. Increasing property prices in the host country can enhance the FREI of that country, as returns to capital are particularly important given that foreign investors face external uncertainties and business risks (Zhu et al., 2006; He et al., 2011). Some studies found a negative relationship between property prices and FREI (Rodríguez & Bustillo, 2010).

Another important determinant of FDI inflow is labor cost. Many studies have examined the relationship between FDI and labor cost and found that low labor cost will attract more FDI in the host country, while high labor cost will increase the amount of FDI deriving from the home country (Cheng & Kwan, 2000; Coughlin & Segev, 2000; He et al., 2009). Although higher wages seem to have a negative impact on FDI inflows, they can attract high-quality workers, as some studies have revealed a positive relationship between wages and FDI inflows (Zhao & Zhu, 2000). In addition, labor costs have a significant impact on FDI inflows; many international investors and multinational corporations are drawn to highly educated employees and a relatively low cost of labor.

Interest rates are another significant determinant, and they impose a negative impact on FDI inflows. When there is an increase in interest rates, the cost of borrowing money will increase and might hinder foreign investment in the host country (Rodríguez & Bustillo, 2010; Farzanegan & Fereidouni, 2014). Similarly, a country with low interest rates tends to attract more investors to take advantage of lower costs of financing to expand their operations abroad or seek investment opportunities

(Kyrkilis & Pantelidis, 2003). Since real estate investment heavily relies on debt financing, interest rates seem to be an important factor, as they will provide advantages to the home countries.

Many studies have shown that tourism is another crucial factor that can help attract FDI inflows. This is because the growth of inbound tourism has spillover impacts that promote FDI in the tourism industry and also promote FDI in non-tourism sectors (Chen, 2017). An increase in tourism revenues relative to GDP is expected to increase the FDI net inflows to GDP ratio (Scarlett, 2021). Other information about the host country, e.g., its regulatory environment, country competitors, work ethic, and culture, impacts investors' decisions. Therefore, tourism can contribute to the expansion of new FDI in the host country (Sanford & Dong, 2000).

2.3 Determinants of FDI in Thailand

Many studies employed different indicators to examine the determinants of FDI inflows in Thailand. Studies reveal that GDP, one-year lagged of infrastructure availability, and political events showed a positive and significant relationship with FDI inflow (Phuditshinnapatra et al., 2022), while trade openness and high severity of natural disasters show a negative relationship with FDI inflow in Thailand (Anuchitworawong & Thampanishvong, 2015). An increase in FDI will positively impact on manufacturing exports from Thailand to other countries. FDI is also complemented by manufacturing exports from source countries to Thailand (Wongpit, 2015). Another study reveals that the determinants of FDI on the economic growth in Thailand are significantly affected by human capital, economic, infrastructure, and policy-related factors (Boonlua et al., 2022), while the growth of market size and the increase of the average real wage have positive effects on FDI inflow (Daly & Tosompark, 2011). Although Thailand has been one of the best countries for foreign investment, there are still major challenges for FDI, such as the management of the Thai

government, the complexity of commercial law, and the problem of the marketing system (Klaew et al., 2016). Many foreign investors choose Thailand for investment due to market-seeking and efficiency-seeking motives (Janda & Nuangjamnong, 2021). Similarly, increases in total debt adversely affect total FDI inflows both in the short run and the long run (Teeralertpanich, 2023).

On the other hand, some studies examined the determinants of Thailand's outward FDI investment. They showed that macroeconomic indicators such as market size, foreign exchange rates, inflation, and bilateral trade agreements are the major determinants of Thailand's outward FDI investment (Chemsripong, 2021; Dejphanomporn & Liu, 2022).

Based on the previous literature, there is a substantial number of studies that examined the relationship between FREI and macroeconomic indicators. However, the study on FDI in the real estate sector of Thailand has not received much research attention. Moreover, none of the above-mentioned empirical studies focused on the determinants of FDI in the real estate sector of Thailand. To address this gap, this study will examine the key factors that affect FREI in Thailand from 2008 to 2022.

3. Research Methodology

The aim of this study is to examine the key factors that affected FREI in Thailand between 2008 and 2022 using quarterly data. To fulfill this objective, the time series regression method is used as a data analysis approach. The steps of the empirical test are as follows: 1) ADF Unit Root Process test, to examine the stability of the variables; 2) Johansen Cointegration test, to test whether there is a long-term relationship between variables; 3) Vector Error Correction Model, to determine the long-term relationships between variables and determine the short-term relationships between variables and the

adjustment of long-term equilibrium state deviation; 4) Impulse Response Function, to analyze economic growth; and 5) Variance Composition, to explain the contribution (or importance) of the change of a variable to another variable.

Unit-Root Test. In time-series analysis, unit root testing plays an important role in the integrational properties of data series to determine whether a time-series dataset is stationary or non-stationary. This study will perform three unit root tests, i.e., the Augmented Dickey-Fuller (ADF), Dickey-Fuller (DF), and Phillips-Perron (PP) tests, to ensure the reliability of time series analysis by confirming it is stationarity, which makes the data suitable for various time series models and analyses.

Johansen Cointegration Test. Cointegration is a technique used to test cointegrating relationships between several non-stationary time series data processes in the long term. There are many methods of testing for cointegration; however, this study used the Jonhansen Cointegraton test as the variables might possess several cointegrating relationships, and this test also allows for more than one cointegrating relationship.

Vector Error Correction Model. The VECM model is applied in the presence of cointegration. Not only it is used to analyze cointegrated variables or cointegrating relationships, but it is also a mechanism to understand the long-run as well as short-run behavior of the variables in the system. This paper uses the VECM model because some variables such as exchange rates and interest rates are cointegrated and might exhibit long-term relationships.

Impulse Response Function. The impulse response function is the most important application of the VECM model that helps to understand the dynamic behavior of variables in a system, it can help us to predict the effects of impulses or shocks on other variables' behavior over different periods.

Variance Decomposition. Variance decomposition can provide important insights about relationships between variables in a data set. It helps us determine which independent variables have the greatest impact on the dependent variables.

In line with the existing literature, this study will use GDP per capita, labor wage, condominium price, interest rates, exchange rates, and number of tourists as main determinants of FDI into Thailand's real estate activities (Table 1). First, foreigners tend to be interested in Thailand's real estate investments because average property prices in Thailand are considerably lower than those in the countries of potential investors. Moreover, foreigners tend to buy condominiums more than other types of residential property like houses and townhouses due to restrictions on foreigner land ownership. Thus, condominium price is a perfect indicator of FDI into Thailand's real estate activities. Second, Thailand has shown strong and consistent growth in recent years with a steady increase in property prices as demand continues to stay strong. A good economic outlook and a favorable foreign investment market would be another important factor in attracting foreign investment into Thailand. Third, for the past 13 years, low interest rates and depreciation of the Thai baht (THB) provided investment opportunities that attract FDI into Thailand. Hence, interest rates and exchange rates also play significant roles in attracting FDI inflows. Fourth, Thailand has always been one of the top destinations for foreign tourism. Many foreigners consider purchasing condos in Thailand for different reasons, e.g., rent, residence, or investment. Therefore, the number of tourists also impacts on FDI in Thailand's real estate market.

The calculate FDI flowing into Thailand, following equation is estimated as follows:

$$FDI_t = \beta_0 + \beta_1 GDP_{t-1} + \beta_2 PRICE_{t-2} + \beta_3 INT_{t-3} + \beta_4 EX_{t-4} + \beta_5 TOUR_{t-5} + \beta_6 WAGE_{t-6} + \varepsilon_{it} \quad (1)$$

Where the dependent variable is the measure of FDI that flows into Thailand real estate activities *i* in period *t*.

Gross Domestic Product (GDP). This variable is used to measure the level of economic development. As in most of the previous studies, GDP per capita is used as the measure, and it is expected to have a positive effect on FDIRE (Ren, 2012; Sun et al., 2002).

Condominium Price (PRICE). This variable represents the housing price index of condominiums. An increase in property price would increase foreign investment in the real estate sector of that country. Hence, we expect a positive relationship between the price and FRIRE (Rodríguez & Bustillo, 2010).

Interest Rate (INT). This variable uses a lending interest rate of the long-term, over 5 years, as the measure. When interest rates rise, it costs more for foreign enterprises to borrow money. Therefore, a higher long-term interest rate had a negative effect on foreign investment in real estate (Rodríguez & Bustillo, 2010).

Exchange Rate (EX). This variable represents the average exchange rate of THB against the USD in a year. Foreign investment in real estate is sensitive to exchange rates. When the currency of a host country appreciates, the cost of investing in that country increases, and foreign investment will be hindered. Therefore, we expect that EX has a negative effect on FDI (Sirmans & Worzala, 2003).

Tourists (TOUR). This variable represents the number of foreign tourist arrivals in a year. Tourism allows potential investors a first-hand experience with the host country's environment and provides information about investment opportunities available. Therefore, tourism can contribute to the expansion of new FDI in the host country (Sanford & Dong, 2000).

Minimum Wage (WAGE). This variable represents the average wage of workers. As Thailand's industries are labor intensive, including real estate industry, wage is one of the important components for the total cost of a company. Hence, we expect a negative relationship between wage level and FRIRE (Ren, 2012; Sun et al., 2002).

From the above studies, we postulate that macroeconomic indicators shall exert either a positive effect or a negative effect on FREI of Thailand.

Table 1. Variable definitions

Variables	Variable Definition	Source
FDI	Foreign Direct Investment into Real Estate Activities, Net Inflows	Bank of Thailand
GDP	Market Size	Bank of Thailand
PRICE	Condominium Price Index	CEIC
INT	Lending Interest Rates	CEIC
EX	Exchange Rate	CEIC
TOUR	No. of Foreign Tourist Arrivals	CEIC
WAGE	Average Wage of Staff and Workers	Bank of Thailand

4. Empirical Results

This section presents the descriptive statistics for all variables, followed by the empirical results on the determinants of FDI in Thailand's real estate market from 2008 to 2021.

4.1 Descriptive Analysis

Table 2 shows that the variables exhibit a wide variation in the sample period. Market size, a crucial factor in attracting FDI inflows, shows a minimum range of 2,342,870 THB to a maximum range of 4,337,937 THB with an average fluctuation of 3,372,987 THB. This implies that Thailand has achieved a high growth rate for the past

13 years. Condominium price, an important stimulant to attract FDI, is constantly increasing, with a wide range of 96.80 (minimum) in 2008 and 194.40 (maximum) in 2021. Another significant determinant, i.e., interest rates, shows a minimum range of 0.84% to a maximum range of 3.75%. Similarly, a constant increase in the minimum wage also varies from 194 THB in 2008 to 331 THB in 2021. Moreover, the exchange rate shows a minimum range of 29.80 THB to USD to a maximum range of 35.84 THB to USD. The above indicators show that Thailand's real estate activities are affected by a wide range of macroeconomic indicators. Therefore, the government should maintain a steady macroeconomic policy that helps to attract more investment inflows into real estate activities.

Table 2. Variable definitions

Variables	Observation	Mean	Std.Dev.	Minimum	Maximum
FDI	56	15,313.11	4,903.64	8,718.69	29,229.20
GDP	56	3,372,987.43	611,628.04	2,342,870	4,337,937
PRICE	56	148.30	31.04	96.80	194.40
INT	56	1.81	0.84	0.50	3.75
EX	56	32.47	1.69	29.80	35.84
TOUR	56	5,730,442.55	3,024,934	10,820.00	10,795,246
WAGE	56	280.13	50.27	194.00	331.00

4.2 Augmented Dickey-Fuller Unit Root Test (ADF)

In econometric theory, the stationarity test is the premise of time series data analysis. However, since some economic data are non-stationarity time series, it is necessary to perform a stationarity test. In this study, we will use the Augmented Dickey-Fuller, Phillips-Perron, and DF-GLS tests to test each variable in the model.

The Augmented Dickey-Fuller (ADF) test helps to determine whether a time-series dataset is stationary or non-stationary. The ADF equation is:

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \emptyset_1 \Delta y_{t-1} + \cdots + \emptyset_{p-1} \Delta y_{t-p+1} + \varepsilon_t \quad (2)$$

Where α is a constant, β is the coefficient on a time trend, and p is the lag order of the autoregressive process.

The Phillips-Perron (PP) unit root test deals with the serial correlation and heteroskedasticity in the errors. The test regression for the PP tests is

$$\Delta yt = \beta t + \pi y_{t-1} + \varepsilon_t \quad (3)$$

where ε_t is I(0) and may be heteroskedastic.

The DF-GLS unit root test performs a modified Dickey–Fuller t test for a unit root in which the series has been transformed by a generalized least-squares regression.

Table 3 shows that, after performing the stationarity test, all variables are stationary in their first difference; that is, they are *I*(1) series (integrated of order one), and since the absolute value of the test statistics is greater than the critical value at 5%, we reject the null hypothesis and conclude that the time series is stationary.

Table 3. Augmented Dickey-Fuller unit root test result

Variables	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
LnFDI	-2.209	-2.402	-1.675	-1.298
LnGDP	-1.912	-2.402	-1.675	-1.298
LnPRICE	-1.801	-2.402	-1.675	-1.298
LnINT	-1.713	-2.402	-1.675	-1.298
LnEX	-2.361	-2.402	-1.675	-1.298
LnTOUR	-1.991	-2.402	-1.675	-1.298
LnWAGE	-1.885	-2.402	-1.675	-1.298

Note: Null Hypothesis: There is a unit root.

Table 4. Phillips-Perron unit root test result

Variables	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
LnFDI	-0.188	-2.618	-1.950	-1.610
LnGDP	2.612	-2.618	-1.950	-1.610
LnPRICE	2.176	-2.618	-1.950	-1.610
LnINT	-1.536	-2.618	-1.950	-1.610
LnEX	0.120	-2.618	-1.950	-1.610
LnTOUR	-0.562	-2.618	-1.950	-1.610
LnWAGE	1.624	-2.618	-1.950	-1.610

Table 5. DF-GLS unit root test result

Variables	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
LnFDI	-2.248	-3.747	-3.145	-2.846
LnGDP	-2.966	-3.747	-3.145	-2.846
LnPRICE	-2.583	-3.747	-3.145	-2.846
LnINT	-2.714	-3.747	-3.145	-2.846
LnEX	-2.585	-3.747	-3.145	-2.846
LnTOUR	-2.321	-3.747	-3.145	-2.846
LnWAGE	-1.696	-3.747	-3.145	-2.846

Tables 4 and show that, after performing the PP test and DF-GLS unit root test, the absolute value of the test statistics is smaller than the critical value at 5%; therefore, we cannot reject the null hypothesis and conclude that the time series is non-stationary. The above three tests do not show similar results. The ADF test shows that the time series are stationary, whereas the PP test and DF-GLS test show that the time series are non-stationary. This paper will use the ADF results as the main result for the unit root test in order to proceed with further tests.

4.3 Johansen Cointegration Test

The stationarity test shows that lnFDI, InGDP, lnPRICE, lnINT, InEx, InTOUR, and lnWAGE are all first-order difference stationary series, indicating that there may be a cointegration relationship between variables (Table 6). This study will test the cointegration relationship of these variables by adopting the Johansen cointegration test through Trace statistic and Max-Eigen statistic. Table 6 shows a 5% critical value; we reject the null hypothesis since the value of the Trace statistics and the Max statistics are greater than the critical value. The above test indicates three cointegrating equations at the 0.05 level. Since the series is cointegrated, we can conclude that lnFDI, InGDP, lnPRICE, lnINT, InEx, InTOUR, and lnWAGE exhibit a long-run relationship.

Table 6. Johansen cointegrating test result

Series: lnFDI InGDP lnPRICE lnINT InEX InTOUR lnWAGE				
Unrestricted Cointegration Rank Test (Trace)				
Maximum Rank	Eigenvalue	Trace Statistics	0.05 Critical Value	0.01 Critical Value
None *		235.4491	124.24	133.57
At most 1 *	0.78312	155.9706	94.15	103.18
At most 2 *	0.65562	100.5383	68.52	76.07
At most 3 *	0.56845	56.8395	47.12	54.46
At most 4	0.46890	23.9341	29.68	35.65
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Maximum Rank	Eigenvalue	Max-Eigen Statistics	0.05 Critical Value	0.01 Critical Value
None *		79.4786	45.28	51.57
At most 1 *	0.78312	55.4323	39.37	45.10
At most 2 *	0.65562	43.6988	33.46	38.77
At most 3 *	0.56845	32.6988	27.07	32.24

At most 4	0.46890	13.6403	20.97	25.52

**Denotes rejection of the hypothesis at the 0.05 level*

4.4 Vector Error Correction Model (VECM)

As variables, lnFDI with InGDP, lnPRICE, lnINT, InEx, InTOUR, and lnWAGE are found to have a cointegration relationship; hence, we adopt the VECM to explore the determinants of FDI on Thailand's real estate market in the short- and long-run.

$$\Delta y_t = d + \Gamma_1 \Delta y_{t-1} + \Gamma_2 \Delta y_{t-2} + \cdots + \Gamma_{p-1} \Delta y_{t-p+1} + \Pi y_{t-1} + \mu_t, \quad t = p+1, \cdots n \quad (4)$$

Table 7. Cointegrating equations

Variables	Beta	Standard Error	T-Statistics	P-Value
lnGDP	-41.7081	5.1144	-8.1508	0.000
lnPRICE	-38.6577	4.5212	-8.5465	0.000
lnINT	2.9909	0.6155	4.8551	0.000
lnEX	13.0996	3.1233	4.1929	0.000
lnWAGE	0.8356	1.7466	0.4755	0.632
lnTOUR	-0.0464	0.1320	-0.3484	0.725

Note: Dependent Variable = lnFDI.

Table 7 reveals that, in the long run, gross domestic product (lnGDP) and condominium price (lnPRICE) have a positive impact on foreign direct investment (lnFDI), on average, all other things being equal. The coefficients are statistically significant at the 1% level. A percentage change in lnGDP and InPRICE will result in 41.70 and 38.65 increases in lnFDI, respectively. Interest rates (lnINT) and exchange rates (lnEX) have a negative impact on foreign direct investment (lnFDI), on average. A percentage change in lnINT and lnEX will result in 2.99 and 13.09 decreases in lnFDI, respectively. Wage of labor (lnWAGE) and number of tourists (lnTOUR) did not have an impact on foreign direct investment (lnFDI) as they are not statistically significant at the 1% level.

The error correction model not only reflects the long-term relationship, but also reflects the short-term relationship and the process of approaching from short dynamics toward a long run equilibrium. The error correction coefficients give the speed of adjustments within which the model will restore its equilibrium following any disturbances. The coefficient of error correction term with lnGDP and lnWAGE as dependent variables is positive and statistically significant, indicating that there is a convergence from short dynamics toward long-run equilibrium. The adjustment coefficients were both at 0.02 percent, toward long-run equilibrium in adjustments of the disequilibrium situation. In the case of lnFDI, lnPRICE, lnINT, lnEX, and lnTOUR, the adjustment coefficients are not significant, which indicates the lack of significant adjustments toward long-run equilibrium in any disequilibrium situation.

Table 8. VECM short-run coefficients

Variables	Beta	Standard Error	T-Statistics	P-Value
lnGDP(-1)	0.1624	1.0389	0.1563	0.876
lnPRICE(-1)	-2.0810	1.4026	-1.4798	0.139
lnINT(-1)	-0.7023	0.2375	-2.9562	0.003
lnEX(-1)	1.5685	1.3009	1.2056	0.230
lnWAGE(-1)	-0.4741	0.7224	-0.6563	0.511
lnTOUR(-1)	-0.0462	0.0486	-0.9497	0.343

Note: Dependent Variable = lnFDI.

Table 8 shows that, in the short run, interest rates (lnINT) have a short-run negative impact on foreign direct investment (lnFDI), on average. The coefficient is statistically significant at the 5% level. A percentage change in lnINT will result in a 0.7023 decrease in lnFDI. lnGDP, lnPRICE, lnEX, lnWAGE, and lnTOUR did not cause lnFDI in the short run, as they are not statistically significant at the 1% level.

4.5 The Impulse Response Functions

The impulse response function method is used to analyze how the change of one variable affects the change of another variable. It also describes the evolution of the variable of interest along a specified time horizon after a shock at a given moment. Based on the VECM model, this study will use the impulse response function to analyze the impact of lnGDP, lnPRICE, lnINT, lnEX, lnTOUR, and lnWAGE on Thailand's real estate market (Figure 2). The X axis represents the periods (quarters), while the Y axis shows the percentage variation. A one standard deviation shock to lnINT causes significant increases in lnFDI in period 1. From period 2, this positive response gradually declines until period 3, when it increases again and hits a steady state value in period 4. A similar situation occurs when a one-standard-deviation shock to lnEX causes significant increases in lnFDI in period 1 (Figure 3). From period 2, this positive response gradually declines until period 3, when it hits its steady state value. A standard deviation shock to InGDP, lnPRICE, lnTOUR, and lnWAGE all cause a negative impact on lnFDI in the short run. Therefore, an increase in interest rates and exchange rates will cause an increase in FDI.

Figure 2. Impulse Response Function of InFDI

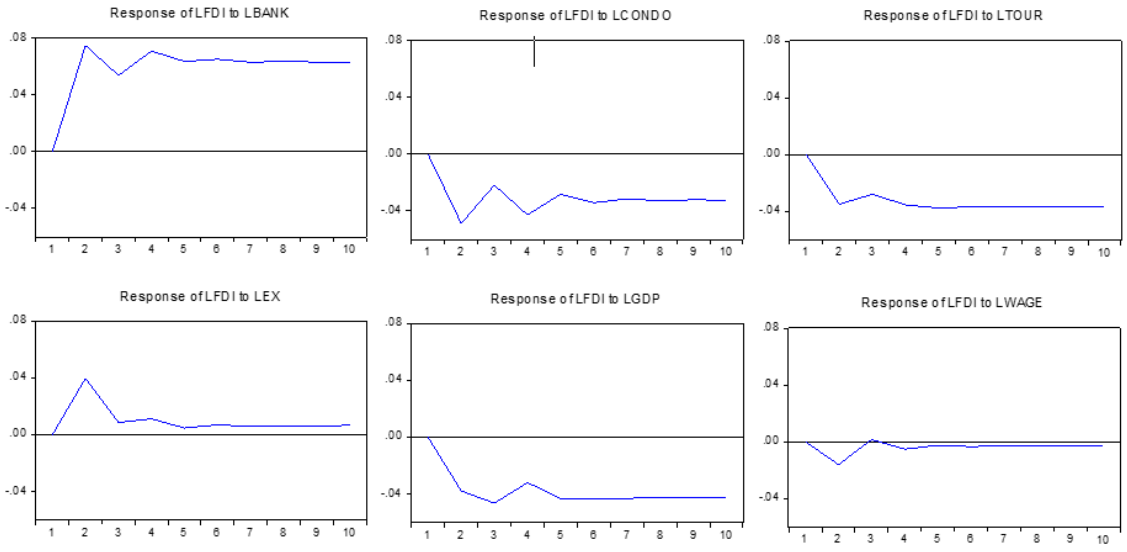
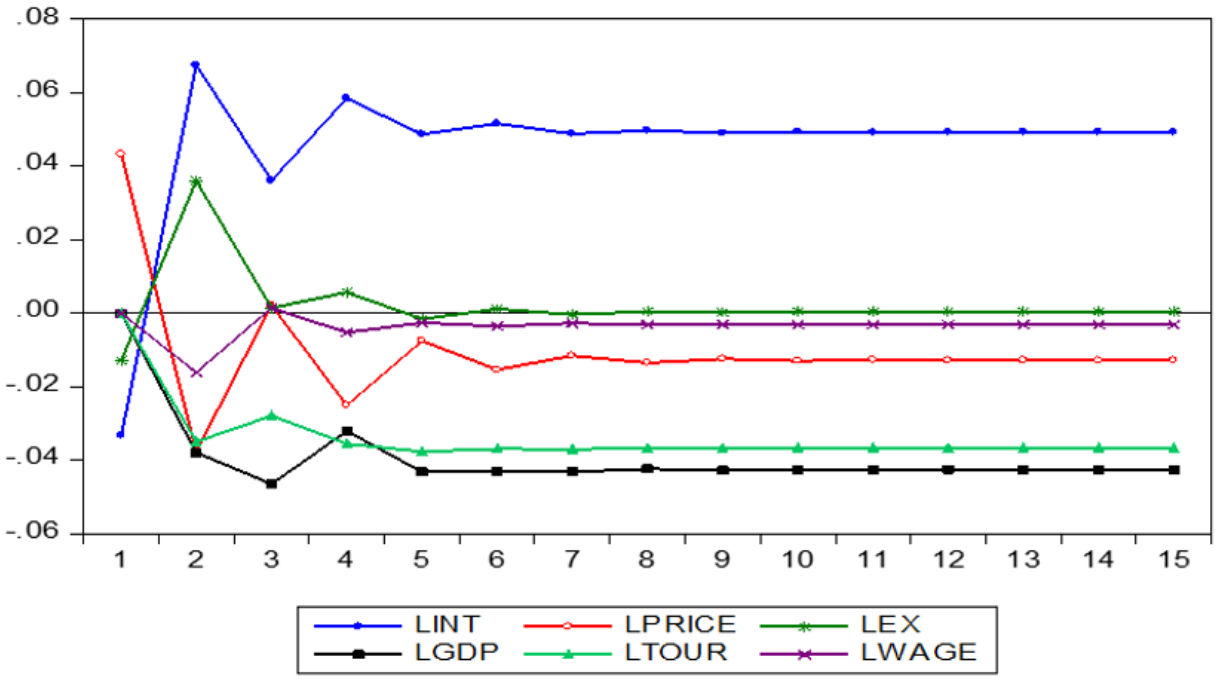


Figure 3. Response of LFDI to Cholesky One S.D. Innovations



4.6 Variance Decomposition

Variance decomposition is used to explain the contribution (or importance) of the change of one variable to the change of another variable and can analyze the contribution of each structural shock to the change of endogenous variables. This study will use the variance decomposition method to examine the contribution rate of the six variables in the VECM model to Thailand's FDI.

In Table 9, the X axis represents the periods (quarters), while the Y axis shows the percentage variation. In the short run, a 100% forecast error variance in FDI is explained by itself, as other variables do not have a strong influence. From the second period onward, the variance contribution of lnINT, lnPRICE, lnGDP, and lnTOUR to lnFDI increases, while lnEX and lnWAGE have the smallest contribution to lnFDI. In period 20, the variance contribution of lnFDI itself is above 58%, while the variance contributions of lnINT, lnPRICE, lnGDP, and lnTOUR to lnFDI are 20.3%, 5.5%, 8.8%, and 6.5%, respectively. Hence, lnINT has the strongest influence on lnFDI both in the short and long run.

Table 9. Variance decomposition of lnFDI

Period	S.E.	lnFDI	lnINT	lnPRICE	lnEX	lnGDP	lnTOUR	lnWAGE
1	0.235186	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.264423	82.13090	8.018097	3.424239	2.255500	2.048366	1.749543	0.373357
3	0.301558	79.22924	9.350950	3.158502	1.817851	3.951952	2.202112	0.289393
4	0.327072	73.65424	12.63662	4.398206	1.662822	4.321562	3.054892	0.271661
5	0.354021	71.00064	14.01702	4.392730	1.437349	5.177217	3.737885	0.237159
6	0.377141	68.32716	15.33542	4.701514	1.301027	5.865859	4.251110	0.217910
7	0.399629	66.62581	16.15207	4.806840	1.179477	6.393481	4.643509	0.198813
8	0.420515	65.14158	16.87816	4.958981	1.088738	6.787118	4.959961	0.185457
9	0.440590	63.99119	17.43049	5.048803	1.012275	7.125939	5.217497	0.173800
10	0.459691	63.00085	17.90880	5.140556	0.950033	7.404698	5.430700	0.164359
11	0.478073	62.17568	18.30792	5.211881	0.896675	7.640168	5.611474	0.156199
12	0.495753	61.45897	18.65552	5.276458	0.851086	7.841771	5.766922	0.149265

13	0.512836	60.83884	18.95605	5.330957	0.811347	8.017582	5.902024	0.143204
14	0.529362	60.29330	19.22060	5.379541	0.776542	8.171602	6.020518	0.137902
15	0.545391	59.81161	19.45416	5.422146	0.745734	8.307822	6.125323	0.133206
16	0.560960	59.38228	19.66235	5.460242	0.718308	8.429128	6.218665	0.129028
17	0.576110	58.99768	19.84882	5.494303	0.693722	8.537872	6.302320	0.125282
18	0.590871	58.65095	20.01694	5.525041	0.671565	8.635877	6.377721	0.121906
19	0.605272	58.33687	20.16922	5.552870	0.651490	8.724669	6.446031	0.118847
20	0.619338	58.05098	20.30784	5.578209	0.633219	8.805484	6.508206	0.116064

5. Conclusion and Policy Recommendations

Foreign direct investment has contributed positively to Thailand's economic growth, and a significant part of the total investments made is allocated to the real estate industry. Amidst the global economic challenges during the COVID-19 pandemic, Thailand's real estate sector managed to remain a resilient and flourishing market. In recent years, Thailand's real estate market has demonstrated enduring growth, witnessed by a remarkable surge from international buyers. As Thailand has a well-established rental market, stable property prices, and relaxed ownership regulations for foreigners, many foreign investors choose Thailand as their dream home for investment, seeking long-term returns.

Studies on the determinants of FREI have been explored worldwide, while studies on FREI in Thailand have not received much research attention. There are no studies that examine the factors affecting FREI, especially in Thailand. To fill in this gap, this study aimed to examine the key factors that affect FDI in real estate activities in Thailand from 2008 to 2022 using time series regression methods.

5.1 Conclusion

According to the long-term relationship, firstly, market size GDP and condominium price PRICE have a positive correlation with FDI, whereas interest rates

INT and exchange rates EX have a negative correlation with FDI. Thailand has always been one of the top three investment destinations in ASEAN, attracting a lot of foreign investors to invest, especially in the property market. The country has shown strong and consistent growth in recent years, with a steady increase in property prices as demand continues to stay strong. Since Thailand has a good economic outlook and a favorable foreign investment market, the steady growth in the property market of Thailand has been mainly driven by foreign investments. This result is in line with the previous studies that prove that higher economic growth would have a positive effect on FDI when a country's economy grows. More business opportunities are created for foreign investment, and investors' confidence is boosted (Coughlin & Segev, 2000; Havrylchyk & Poncet, 2007; Fereidouni & Masron, 2013; Hui & Chan, 2014).

Secondly, the demand for properties in Thailand is purely driven by foreign investors' intention of obtaining financial gains through investment. In recent years, purchasing property as an investment has been a good choice for many foreign investors, even though Thailand has seen a steady increase in property prices. Many foreign investors are inclined to buy Thai property as the average property prices in Thailand are considerably lower when compared with other countries. Therefore, increasing property prices in the host country can attract more foreign capital inflows, as returns to capital are particularly important since foreign investors face external uncertainties and business risks (Zhu et al., 2006; He et al., 2011).

Thirdly, interest rates and exchange rates also play significant roles in attracting FDI inflows. For the past 13 years, low interest rates and depreciation of the THB provided investment opportunities have attracted FDI into Thailand. The result is similar to a previous study that shows that when there is a decrease in interest rates, the cost of borrowing money will decrease and attract investment in the host country (Rodríguez & Bustillo, 2010; Farzanegan & Fereidouni, 2014).

According to the short-term relationship, the impulse response function shows that the effects of interest rates have a stronger effect than other macroeconomic variables. Similarly, the variance decomposition table also implies that interest rates contribute the most to an increase in FDI inflows. Therefore, a country with a low-interest rate tends to attract more investors to take advantage of lower costs of financing to expand their operation abroad or seek investment opportunities (Kyrkilis & Pantelidis, 2003). Since real estate investment heavily relies on debt financing, interest rates seem to be an important factor as they will provide advantages to the home countries.

5.2 Policy Recommendations

Thailand has been one of the critical beneficiaries of FDI among developing countries, and has recorded rapid and sustained growth rates in various diverse modern classifications. FDI has contributed positively to Thailand's economic growth, and a significant part of the total investments made is allocated to the real estate industry. From the above estimation results, this paper concludes that market size GDP, condominium price, interest rates, and exchange rates are significant determinants of FDI into Thailand's real estate activities. Thus, the result of this research may provide policy recommendations for Thailand.

Firstly, Thailand, as an open country, has been stimulating economic development by attracting a large amount of foreign investment. Economic development is one of the main drivers of the growth in foreign investment in Thailand's real estate market in recent years. Therefore, Thailand should maintain a favorable macroeconomic and investment environment that will attract more foreign capital and thus promote the smooth operation of the economy.

Secondly, the ups and downs of the economic operation of a country not only have a negative impact on the stable operation of the financial system, but also facilitate the excessive investment and financial turmoil of international capital. Governments should strengthen macroeconomic regulation and control to implement appropriate macroeconomic policies.

Thirdly, a number of foreign investors invest in Thailand's real estate properties for different purposes. When FDI increases, foreign investors will earn more money and then raise their investment in properties. This will stir up the property market. Therefore, while continuing to open the market to attract foreign investment, the Thai government should be aware of and monitor the real estate market carefully to stabilize housing prices.

Fourthly, Thailand's financial regulatory system should focus on risk management and strengthen market access conditions for financial institutions, and governments should strengthen effective regulation of financial institutions and markets.

In conclusion, although Thailand's real estate market has demonstrated enduring growth, witnessed by a remarkable surge from international buyers in recent years, Thailand should still maintain a favorable investment environment, monitor the real estate market to stabilize house prices, control appropriate macroeconomic policies, and strengthen effective regulation of financial institutions and markets to attract more FDI into the real estate sector.

Funding

This work was supported by Pridi Banomyong International College Research Fund, Pridi Banomyong International College, Thammasat University, under Grant [PBGR 03/64].

Disclosure statement

No potential conflict of interest was reported by the author(s).

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