STUDIES

Determinants of foreign direct investment in South East Asian countries: the role of infrastructure, human development, and economic freedom

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This study investigates the causal relationship between foreign direct investment (FDI) and its determinants in selected Southeast Asian countries, including China, Vietnam, Singapore, Malaysia, Indonesia, Thailand, and the Philippines, from 1990 to 2021. The determinants include infrastructure investment, economic freedom, human development, and economic growth. We examine these FDI determinants' short- and long-run dynamics by employing the Johansen cointegration technique and the Vector Error Correction Model (VECM). The empirical findings reveal varying long-term relationships between the FDI determinants across nations. Additionally, this study establishes the short-run causality between FDI and its determinants in these countries. The study advocates prioritising good governance and robust institutions in the context of policy development. In terms of regulatory framework, policymakers are urged to enhance economic liberalisation, invest in infrastructure, and develop human resources to promote FDI. By exploring these causal linkages, this study contributes to the literature, particularly in the context of Asia.

Introduction

Foreign direct investment (FDI) has significantly impacted the global economy in recent decades. Hence, FDI promotion has become a crucial priority in developing and emerging economies. China and the Association of Southeast Asian Nations (ASEAN) have recently attracted the highest levels of global FDI owing to their solid and consistent economic growth. The Chinese government has emphasised the rapid import of technology since the transition period began (Deng 2009). The central government aims to attract foreign investment to enhance productivity and competitiveness by leveraging indirect spillover effects and knowledge transfer. China provides tax benefits to encourage FDI, invests in infrastructure development, grants land-use privileges, and establishes trade zones. China's policies aim to establish the country as a leading destination for foreign investment (Nolan 1995). The ASEAN is composed of ten member states in Southeast Asia. It was established on 8 August 1967 (Narine 2008). The group has achieved a remarkable feat in attracting FDI due to the diverse and extensive market, abundant natural resources, cost-efficient labour, and improved infrastructure offered by its member nations. Moreover, ASEAN's commitment to achieving economic integration, upholding political stability, and cultivating a favourable business environment has made it an attractive destination for foreign investment (AlOmari–Ngo 2023). These regions are predicted to become among the world's top economies in the near future (Hou et al. 2021, Nguyen 2022). In the past, FDI has found China and Singapore highly appealing. Vietnam, Thailand, and Indonesia are becoming increasingly desirable locations for FDI. Consequently, the proportion of FDI in the overall capital inflows of ASEAN nations has increased significantly in recent years, contributing to economic growth (Nguyen–Yang 2020).

Previous studies demonstrated that FDI positively affects local businesses operating in the host country, boosting competitiveness, encouraging innovation and knowledge transfer, and enhancing societal welfare (Ajayi 2006, Antalóczy et al. 2022, De Mello 1999). However, the magnitude of such spillovers depends on various factors, such as the characteristics of the technology, the nature of the technology transfer, and the potential of the recipient economy to absorb it (Colen et al. 2008).

Prior research has found multiple variables affecting the inflow and attractiveness of FDI (AlOmari–Ngo 2023). However, findings in the Asian context are equivocal. Unlike in previous research, corruption is no longer employed as a substitute for measuring institutional quality. Currently, the primary factors believed to determine a country's capacity to attract FDI are economic freedom (the quality of economic institutions) and political stability (the quality of political institutions) (Alemu 2012, Nguyen 2022). In the context of China, previous studies have primarily focused on broad parameters that affect the influx of FDI, sometimes neglecting a comprehensive examination of infrastructure elements, indices of human development, and the impact of economic freedom (Hou et al. 2021, P. Zheng 2009).

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Existing literature on ASEAN-6 countries, which include Vietnam, Singapore, Thailand, Indonesia, Malaysia, and the Philippines, typically concentrates on each country individually. Nevertheless, a notable deficiency is observed in cross-country evaluations that assess and contrast the relative significance of infrastructure, human development, and economic freedom in these economies. By narrowing our focus, we offer a more targeted and comprehensive understanding of the factors influencing FDI in this region.

Therefore, the study raises the following research questions:

RQ1. What are the drivers of FDI inflows to Asian countries?

RQ2. Is the causal relationship between FDI and its determinants similar across countries?

This study examines the relationship between FDI, economic freedom, infrastructure, human development, and economic growth in seven Asian countries from 1990 to 2021. The VECM is employed to analyse the time-series data. Our study specifically focuses on exploring the determinants of FDI and the essential factors influencing investment promotion. Our objective is to provide insights into key elements such as infrastructure, economic freedom, and human development, which play pivotal roles in attracting FDI in the context of these nations.

The remainder of this paper is organised as follows. The brief literature provides an overview of the study. Then the data and methodological framework is presented, followed by the report and discussion of the empirical findings. Finally conclusions and limitations are presented.

Literature review

Role of FDI in host countries and home countries

FDI refers to the investment made by a foreign entity in a host country, which includes both tangible and intangible assets such as capital, technology, and a trained workforce (Dunning–Lundan 2008). The literature reveals the crucial role of FDI inflows for indigenous firms in host countries. For instance, FDI inflows intensify competition, support creativity, facilitate skill transfer, and enhance overall welfare (Ajayi 2006, De Mello 1999). Other scholars argue that knowledge and technology spillovers may encourage FDI firms to compete with businesses in adjacent industries. These adjustments can improve a country's technological infrastructure, level of economic competition, resource availability, and administrative skills (Javorcik 2004, Kokko 1992, Santangelo 2009). According to Pavlínek et al. (2017), spillovers across sectors can occur, for instance, when employees of a foreign company transfer to a domestically owned business, bringing their expertise, or when domestic businesses observe FDI enterprises in their fields and use the technology those companies use.

However, the occurrence of spillover effects is contingent on various conditions, such as the magnitude, type, and duration of investment, the local economy's ability to accommodate investment, and other relevant factors (Dunning–Lundan 2008, Farole–Winkler 2014, Lengyel–Leydesdorff 2015). Caves (1971) conceptualised the role of FDI into horizontal and vertical categories. Horizontal FDI refers to applying foreign market advantages to increase profitability, whereas vertical FDI involves using a host country's resources to promote growth. According to Javorcik (2004), vertical connections between foreign affiliates and domestic firms can amplify positive spillover effects. By contrast, horizontal spillovers result from transferring skills between employees or the acquisition of knowledge by domestic firms from FDI firms (Pavlínek et al. 2017). However, growing evidence suggests that the FDI-driven development model comes with persistent centre–periphery relationships, trade-offs, and limitations, ultimately jeopardising convergence goals and long-term resilience (Gál–Lux 2022).

Pavlínek (2012) identifies three categories of FDI linkages: developmental, dependent, and detrimental. Developmental links involve knowledge sharing, dependent links are short-term and do not work either way, and negative linkages occur when a foreign entity enters a market and affects domestic companies. According to Ayyagari–Kosová (2010), the effect of FDI is correlated with the timeframe. These scholars show that FDI has a crowding-out effect on domestic investment in the short term. However, it has a positive impact on local firms and long-term demand. From another perspective, Dunning (1993) identifies three motives for FDI: market-seeking, resource/labour-seeking, and efficiency-seeking. Scholars have indicated that the size of an economy attracts foreign investment flows, as this allows for economies of scale and sustainable demand. FDI is also pulled towards natural resources, cheap labour, and good infrastructure. Furthermore, it is motivated by the host countries' well-developed institutional and economic systems.

Impact of the determinants on FDI

Previous studies have identified various determinants of FDI. For instance, FDI is influenced by common determinants such as the host country's market size, potential in neighbouring markets, trade openness, infrastructure, economic development, human capital, resources, and inflation (Asiedu 2002, Bénassy-Quéré et al. 2007, Loree–Guisinger 1995). Furthermore, the quality of the business environment and domestic institutions is crucial for attracting FDI and ensuring the effectiveness of FDI-promoting policies (Quazi 2007, Tobin–Rose-Ackerman 2011). Dunning (2000) argues that the host country's locational and intra-firm benefits are crucial factors for foreign companies when making investment decisions. Therefore, providing distinctive and immovable assets such as infrastructure facilities is essential for attracting and retaining FDI in host countries. Based on an empirical study, Quazi–

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Mahmud (2006) find that economic freedom, degree of openness, economic prosperity, and human capital positively affect FDI in South Asia. Similarly, Asiedu (2006) confirms the roles of economic development, good infrastructure, an educated population, and openness in promoting FDI inflows.

Other scholars have shown that a developmental state involving active government engagement, strategic economic planning, and a long-term vision can substantially influence the inflow of FDI (Adarkwah 2021, Mudambi et al. 2013). According to Beeson (2004), a rational or developmental state is a government that actively intervenes in economic development rather than depending solely on market forces to allocate resources. This intervention may affect the direction and speed of economic development through direct intervention, which benefits FDI. Wint–Williams (2002) explain that developmental states frequently contribute to promoting economic expansion by focusing on specific industrial policies, allocating resources to strategic industries, and attracting foreign investors.

Relying on previous empirical literature, four key determinants of FDI are identified: economic growth, economic freedom, high-quality human capital, and good infrastructure.

The relationship between FDI and economic growth is based on neoclassical and endogenous growth models (Chanegriha et al. 2020). Neoclassical models suggest that FDI mainly contributes to short-term growth by strengthening domestic investment (Borensztein et al. 1998). By contrast, endogenous growth models propose a more comprehensive impact of FDI on economic growth. These studies suggest that spillover effects may counteract the negative impact of diminishing returns on capital (Chanegriha et al. 2020, Herzer et al. 2008). The empirical evidence indicates causality in the relationship between FDI and economic growth. Consequently, a nation's economic growth is considered a significant determinant of FDI inflows (Kamaly 2002). Muhammad–Mohammad (2012) demonstrate that FDI in Pakistan is affected by financial development, imports, and economic growth. Ahmad et al. (2018) state that economic growth can facilitate FDI inflows to ASEAN companies. Morshed–Hossain (2022) agree with this view by revealing that economic growth is a determinant of FDI inflows to Bangladesh.

Similarly, research has emphasised the significance of economic freedom as a crucial factor in attracting FDI. Therefore, a higher level of national economic freedom may lead to a more appealing business and investment environment, resulting in an increased FDI inflow (Azman-Saini et al. 2010, Bengoa–Sanchez-Robles 2003, Quazi, 2007). Economic freedom is influenced by the quality of institutions (QIs) (Pearson et al. 2012, Saini–Singhania 2018). Hence, a policy of economic freedom, coupled with high-quality institutions, can promote FDI inflows and national economic growth (Lu et al. 2020). By contrast, a less liberal economic policy in host countries may reduce inward FDI, as companies face additional costs (Bénassy-Quéré et al. 2007). Furthermore, the effect of economic freedom on FDI

varies by region. Singh–Gal (2020) demonstrate that economic freedom has a significant positive impact on FDI in specific geographic regions, including North and West Europe, South and East Asia, and Latin America, but does not significantly affect other regions.

Empirical studies consistently demonstrate that human capital development plays a crucial role in determining FDI inflows, which, in turn, foster economic growth. Lucas (1990) highlights the role of human capital in explaining variations in foreign investment across countries, as the purpose of MNEs is to seek skilled labour and robust infrastructure in host nations (Bengoa–Sanchez-Robles 2003, Noorbakhsh et al. 2001). This phenomenon demonstrates that the presence of skilled and knowledgeable human resources significantly influences the level of FDI. Fan–Hao (2020) highlight the influence of minimum wage rules and efficient tax measures on FDI movement.

Kheng et al. (2017) examine the correlation between human capital and FDI and identify substantial two-way causality. They suggest allocating more resources to education and training to improve the skills and knowledge of the workforce, enabling developing countries to adopt economic growth models driven by FDI (Agbola 2013, Miyamoto 2003, UNCTAD 2018). Generally, FDI's favourable influence on human capital development is acknowledged, although concerns have been expressed regarding its possible negative consequences on economic growth and income inequality.

Regarding the infrastructure–FDI association, scholars have categorised infrastructure into two key components: hard and soft. Hard infrastructure includes tangible elements, such as roads, airports, and telecommunications. Soft infrastructure encompasses market-oriented institutions and governance structures, collectively recognised as integral factors in attracting FDI (Bakar et al. 2012, Khadaroo–Seetanah 2009). The availability of a well-developed network of interconnectivity, access roads, and essential services such as telecommunications and transportation is crucial for attracting modern companies and entrepreneurs. Bakar et al. (2012) state that infrastructure availability decreases operational expenses and facilitates market expansion, establishing a conducive atmosphere for FDI. Zheng (2009) classifies infrastructure development as a public benefit, highlighting its substantial influence on private enterprises' cost structure and productivity.

The above literature has identified multiple variables that impact the FDI inflow and its attractiveness, including economic growth, economic freedom, human development, and infrastructure, which have been widely mentioned. Therefore, this study proposes the following hypotheses:

H0. Null hypothesis: economic growth, infrastructure, human development, and economic freedom do not affect FDI.

H1. Alternative hypothesis: economic growth, infrastructure, human development, and economic freedom affect FDI.

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Data and methodology

Data collection

This study uses annual time-series data for the dependent and independent variables from 1990 to 2021. Data on GDP, FDI, and infrastructure were collected from the world development indicators (WDI) of the World Bank. The human development index (HDI) data were obtained from the United Nations Development Program (UNDP). The index of economic freedom (IEF) data were collected from the Heritage Foundation & Wall Street Journal. Descriptions of the variables are presented in Table 1.

Table 1

Variables

Variable	Notation	Definition
GDP growth rate	GDP	GDP per capita growth rate (constant USD at 2010 prices)
Foreign direct investment	FDI	FDI as a percentage of GDP used as the dependent variable
Human development index	HDI	measure of the average achievement in key dimensions of human development
Economic freedom	ecofree	degree of economic freedom measured by state management capacity (IEF)
Infrastructure	infras	individuals using the internet (% population)

Data were gathered from seven Asian countries, namely, China, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam from 1990 to 2021. This selection was made because China and Southeast Asian nations are recognised as attracting FDI in Asia. China has become a notable FDI recipient due to its sizeable population, growing middle-income brackets, and rapid economic progress (Zheng–Sheng 2017). Southeast Asian nations have implemented investment-friendly policies and improved infrastructure and business environments to attract FDI (AlOmari–Ngo 2023).

A correlation matrix reveals diverse associations between FDI and other economic factors in five ASEAN countries and China. Although FDI typically shows positive associations with GDP and rather mixed associations with economic freedom, human development, and infrastructure, the magnitude and orientation of these associations vary considerably among countries, indicating the distinct economic dynamics present in each nation. The detailed results are shown in the Appendix.

Statistical method

The cointegration test and the VECM were used in this study. Before adopting the cointegration and VECM techniques, the stationarity of each time series must be

confirmed using econometric methodologies, since most macroeconomic data tend to exhibit non-stationarity. The cointegration strategy is used for non-stationary series; however, it necessitates that all variables in the system be integrated in the same order, I(d).

The initial stage of the study involved assessing the presence of non-stationarity in the dataset. Differencing can be used to transform non-stationary variables into stationary ones. The number of differences (d) required to achieve stationarity in the series defines the order of integration I(d). To accomplish this objective, the augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests were utilised to confirm the stationarity of the data series and ascertain the level of integration.

Second, if the data series being analysed are integrated in the same order, Johansen's cointegration test (1988) can be utilised to investigate the long-term (cointegrating) association between the selected variables. After determining a singular cointegration vector among the chosen variables, the VECM can be used to establish the Granger causal direction. The VECM enables modelling of the short- and long-term dynamics of the variables included in the model. Granger tests demonstrate that the presence of an error-correction representation implies cointegration. Hence, changes in the dependent variable are influenced by the level of disequilibrium in the cointegrating relationships and changes in other independent variables. The Granger representation theorem states that if the variables are cointegrated, their interactions can be described using a VECM.

Based on Kurbanov (2020), we recommend the following model:

$$\Delta FDI_t = a_1 + \beta_1 \Delta GDP_t + \beta_2 \Delta infras_t + \beta_3 \Delta ecofree_t + \beta_4 \Delta HDI_t + \gamma_1 {}^*(ECM_{t-1})c_1 + \gamma_2 {}^*(ECM_{t-1})c_2 + \varepsilon_{1t,}$$

where ΔGDP_t is the first difference of GDP at time t, ΔFDI_t is the first difference of FDI at time t, $\Delta infras_t$ is the first difference of infrastructure at time t, $\Delta ecofree_t$ is the first difference of economic freedom at time t; ΔHDI_t is the first difference of HDI at time t; $ECM_{t-1}c_1$ and $ECM_{t-1}c_2$ are the first lag of the error correction term for the first and second cointegrating re. In addition, A_1 is a constant, B_1–β_4 are the coefficients of the respective independent variables, γ_1 and γ_2 are the coefficients of the error correction terms for the cointegrating relationship, and E_{1t} is the error term at time t.

Findings and discussion

Unit-root test

Table 2 presents the results of the unit-root tests for the stationarity of all observations of the seven countries. The data were subjected to a unit-root process to verify the null hypothesis. Additionally, the results show that the probability value of the t-statistic for the general unit-root process is statistically significant at the 1%, 5%, and 10% levels. At the 1%, 5%, and 10% levels, both the ADF and PP tests

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display statistical significance. Consequently, the alternative hypothesis is accepted, and the null hypothesis is not supported. These findings suggest that the data are stable and statistically reliable for model use, and no unit root exists.

Table 2

The unit roots test (first differences)

Country	Variables	ADF test results	PP test results	Conclusion
China	GDP	−4.730101***	−4.132940**	stationary
	FDI	−3.655691*	−4.928361***	stationary
	infras	−3.692448*	−3.692448*	stationary
	ecofree	−5.080765***	−5.196713***	stationary
	HDI	−3.005385*	−7.265418***	stationary
Indonesia	GDP	−7.605644***	−9.43764***	stationary
	FDI	−5.807131***	−9.02472***	stationary
	infras	−8.013029***	−12.6752***	stationary
	ecofree	−5.728298***	−5.72829***	stationary
	HDI	−4.613151**	−20.8947***	stationary
Malaysia	GDP	−6.984435***	−15.48179***	stationary
	FDI	−3.819242**	−9.538901***	stationary
	infras	−3.472327**	−15.09144***	stationary
	ecofree	−5.560546***	−5.560546***	stationary
	HDI	−4.471573**	−10.31999***	stationary
Philippines	GDP	−7.884099***	−8.327101***	stationary
	FDI	−4.275274**	−4.310400**	stationary
	infras	−4.812175***	−8.109982***	stationary
	ecofree	−3.595148*	−3.616769*	stationary
	HDI	−4.512259**	−4.756589***	stationary
Singapore	GDP	−4.038401**	−8.47147***	stationary
	FDI	−4.263724**	−13.58964***	stationary
	infras	−6.298298***	−13.11850***	stationary
	ecofree	−4.100903**	−5.108726***	stationary
	HDI	−4.711566**	−18.33031***	stationary
Thailand	GDP	−7.311257***	−11.43570***	stationary
	FDI	−3.912619**	−11.67209***	stationary
	infras	−3.956529**	−14.15270***	stationary
	ecofree	−3.342587*	−3.309338*	stationary
	HDI	−4.794968***	−14.5577***	stationary
Vietnam	GDP	−3.944777**	−3.934748**	stationary
	FDI	−3.478942*	−2.881647*	stationary
	infras	−3.508065*	−9.88698***	stationary
	ecofree	−3.458781*	−3.428850*	stationary
	HDI	−4.026568**	12.79591*	stationary

Notes: the probabilities for Fisher tests are computed using an asymptotic chi-square distribution. All other tests assume asymptotic normality. *, **, and *** indicate significance at the 1, 5, and 10% levels, respectively.

Source: authors' calculation based on Eviews software.

Cointegration test

Table 3 summarises the results of the Johansen cointegration rank test, which indicates the presence of two cointegrating vectors at the 5% significance level. In other words, the null hypothesis of no cointegration is not supported for a rank of zero or less than or equal to (2), implying a long-term association among the variables. Therefore, the results support the alternative hypothesis, implying a long-term relationship between the variables in these seven Asian countries.

Table 3

Cointegration test results

Hypothesised	Eigenvalue	Trace statistic	Critical value 0.05	P-value
		China		
None *	0.761586	80.74831	79.34145	0.039
		Indonesia		
None *	0.833639	103.81	69.81889	0.0000
At most 1 *	0.745334	58.97008	47.85613	0.0032
		Malaysia		
None *	0.9789	185.5578	79.34145	0.0000
At most 1 *	0.902988	92.95381	55.24578	0.0000
At most 2 *	0.571104	36.96375	35.0109	0.0305
		Philippines		
None *	0.793348	88.11361	79.34145	0.0093
		Singapore		
None *	0.91372	102.3298	69.81889	0.000
		Thailand		
None *	0.875022	118.5349	79.34145	0.000
At most 1 *	0.713954	66.54453	55.24578	0.0037
At most 2 *	0.666714	35.25445	35.0109	0.0471
		Vietnam		
None *	0.928035	112.0373	69.81889	0.0000
At most 1 *	0.709612	51.51107	47.85613	0.0218
At most 2	0.456633	23.07072	29.79707	0.0426

Note: the trace test indicates two cointegrating equations at the 0.05 level.
* Denotes rejection of the hypothesis at the 0.05 level.

Model estimation

As the results confirmed the existence of a cointegrating vector, a VECM model was employed to ascertain the direction of long-term causation. The Granger representation theorem asserts that the data has valid error correction representations if a group of variables is cointegrated. Table 4 displays the findings from all hypotheses for both short- and long-run causality.

The results show no short-run causality between the independent and dependent variables in the Philippines or Malaysia. For other countries, short-run causality varies across variables. In Indonesia, short-term causality exists among infrastructure, human

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development, and FDI. Short-run causality is also observed between GDP, infrastructure, and FDI in Singapore and China. The results for Thailand support the short-term impact of infrastructure and human development on FDI in the short run. However, short-term causality between human development and FDI only exists in Vietnam.

The estimated coefficient of the lagged error term, *ECMt-1*, is negative and significant at the 5% level. This finding provides supplementary evidence supporting the existing long-term connection between the independent variables (i.e., *GDP, infras, ecofree,* and *HDI*) and the dependent variable (i.e., *FDI*). Therefore, the results of this study support the alternative hypothesis. These results highlight the significant effect of GDP on FDI. This relationship is statistically significant at the 5% level in specific nations, including Singapore and Thailand. The study shows that infrastructure significantly influences FDI in Malaysia, Singapore, Thailand, Vietnam, and China at the 5% significance level. Further, there is a significant impact of economic freedom on long-term FDI attraction in all seven countries. Finally, this study confirms the existence of long-term causality between HDI and FDI in all nations.

Table 4

Short-run causality results

Country	GDP → FDI	Infras → FDI	Ecofree → FDI	HDI → FDI
	H1	H2	H3	H4
China	−0.318211	−0.266507	−0.34615	−96.28226
	[−2.15370]*	[−3.7266]*	[−4.288]*	[−1.01798]
	accepted	accepted	accepted	rejected
Indonesia	0.08077	−0.294649	−0.16087	−194.5332
	[1.16487]	[−2.3978]*	[−1.5101]	[−3.2916]*
	rejected	accepted	rejected	accepted
Malaysia	0.621206	−0.512276	0.980932	−190.2773
	[1.58859]	[−1.91153]	[1.7163]	[−0.74101]
	rejected	rejected	rejected	rejected
Philippines	−0.050543	−0.01106	−0.04127	87.60414
	[−0.58933]	[−0.23401]	[−0.4849]	[1.18426]
	rejected	rejected	rejected	rejected
Singapore	0.6124	1.252019	0.24322	−342.2985
	[2.13412]*	[4.0689]*	[0.1746]	[−1.96517]
	accepted	accepted	rejected	rejected
Thailand	−0.085647	−0.417515	−0.01331	239.3021
	[−1.41779]	[−2.7245]*	[−0.0823]	[3.1630]*
	rejected	accepted	rejected	accepted
Vietnam	−0.672906	−0.087971	−0.12056	1068.384
	[−1.41876]	[−0.57337]	[−0.4312]	[2.2496]*
	rejected	rejected	rejected	accepted

Note: [ ] is error correction term. An asterisk (*) indicates significance at the 5% level, with acceptance or rejection of the null hypothesis based on this criterion.
* p<0.1; ** p<0.05; *** p<0.01.

Table 5

Long-run causality results

Country	GDP → FDI H1	Infras → FDI H2	Ecofree → FDI H3	HDI → FDI H4	ECT	C	χ2 sc	χ2 het	χ2 nor
China	0.823419	−0.3675	0.714082	230.3056	−0.540564	−43.30239	0.169	0.308	0.5485
	[5.35195]*	[−6.7267]*	[8.292]*	[1.45103]	(−0.11502)				
	accepted	accepted	accepted	accepted	[−4.69960]*				
Indonesia	0.078849	1.034816	−0.24773	1355.904	−0.150073	4.810154	0.344	0.574	0.2767
	[0.79374]	[1.79825]	[−1.0879]	[5.61070]*	(−0.05803)				
	rejected	rejected	rejected	accepted	[−2.58628]*				
Malaysia	0.118022	−0.539932	0.114313	−248.624	−0.904159	6.469374	0.568	0.553	0.2839
	[0.64260]	[−2.9673]*	[2.547]*	[−1.48280]	−0.30968				
	rejected	accepted	accepted	rejected	[−2.91967]*				
Philippines	0.102895	−0.05329	0.147781	−225.0884	−0.791416	−6.626474	0.786	0.116	0.1589
	[1.87142]	[−1.62239]	[5.567]*	[−4.7275]*	(−0.34931)				
	rejected	rejected	accepted	accepted	[−2.26566]*				
Singapore	−0.969628	−1.616074	4.494458	882.0299	−1.091843	−371.3221	0.388	0.805	0.3132
	[−4.15463]*	[−9.6474]*	[8.368]*	[5.33614]*	(−0.17304)				
	accepted	accepted	accepted	accepted	[−6.30977]*				
Thailand	−0.17735	0.434248	−0.35786	−195.5761	−2.122699	32.5688	0.738	0.460	0.0951
	[−2.60965]*	[11.1653]*	[−13.92]*	[−11.881]*	(−0.50128)				
	accepted	accepted	accepted	accepted	[−4.23460]*				
Vietnam	−0.650159	0.729616	−0.34602	−1055.934	−0.648283	17.36531	0.211	0.408	0.2461
	[−0.90920]	[3.06856]*	[2.043]*	[−2.4209]*	(−0.16983)				
	rejected	accepted	accepted	accepted	[−3.81731]*				

Note: values in [] represent t-statistics, and the calculated r-statistics are presented in parentheses.
* p<0.1; ** p<0.05; *** p<0.01; sc, het, and nor represent serial correlation, normality, and heteroscedasticity, respectively.

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Discussion

The study's results show causality between FDI and its determinants, including GDP, economic freedom, human development, and infrastructure, in seven Asian nations. These findings are consistent with those of Bayar–Omer (2016), who find causality between GDP per capita and FDI. Similarly, this study's results align with those of Singh–Gal (2020), Kheng et al. (2017), and (Asiedu 2006), who illustrate the impact of economic freedom, infrastructure, and human development on FDI inflows. Furthermore, the findings of the comparative analysis indicate that the influence of these pulling factors on FDI varies across nations and timeframes (see Table 6).

Table 6

Summary of the results

Country	GDP → FDI	Infras → FDI	Ecofree → FDI	HDI → FDI
	H1	H2	H3	H4
Short run				
China	accepted	accepted	accepted	
Indonesia		accepted		accepted
Malaysia				
Philippines				
Singapore	accepted	accepted		
Thailand		accepted		accepted
Vietnam				accepted
Long run				
China	accepted	accepted	accepted	accepted
Indonesia				accepted
Malaysia		accepted	accepted	
Philippines			accepted	accepted
Singapore	accepted	accepted	accepted	accepted
Thailand	accepted	accepted	accepted	accepted
Vietnam		accepted	accepted	accepted

First, a higher economic growth rate leads to higher FDI inflows in Singapore and China in the long and short run. However, no causality is observed between GDP and FDI in the Philippines, Indonesia, Malaysia, and Vietnam. These results may reflect differences in these countries' economic structures and policies. According to Tseng–Zebregs (2002), China's and Singapore's economic reforms attract foreign investment, supporting economic growth. This phenomenon may explain the positive long-term correlation between GDP and FDI. Mottaleb–Kalirajan (2010) explain that larger economies, such as China and Singapore, with their large domestic markets and potential for expansion, may attract more FDI, thus strengthening the GDP–FDI connection. By contrast, a smaller market size may constrain other economies'

GDP–FDI nexus (Anwar–Nguyen 2010). Further, institutional factors such as strong legal frameworks, ease of doing business, and property rights protection may attract foreign investors. Countries with strong institutions, such as China and Singapore, offer better investment environments (Tang et al. 2021). However, weaker institutional frameworks may reduce the impact of GDP on FDI in other countries (Alemu 2012); hence, a proactive government involvement, smart economic planning, and a forward-looking perspective can significantly impact the FDI influx (Adarkwah 2021, Mudambi et al. 2013). A government's strategic objective cultivates a milieu that investors may see as stable and provides a distinct trajectory for economic advancement (Wint–Williams 2002).

Second, the study indicates long-run causality between infrastructure and FDI in Malaysia, Singapore, Thailand, Vietnam, and China. However, this causality is not confirmed in Malaysia or Vietnam in the short term. These different outcomes can be attributed to several primary factors, such as the level of infrastructure development. Kirkpatrick et al. (2004) show that countries with higher degrees of infrastructure development tend to exhibit a stronger correlation between infrastructure and FDI. In contrast, countries with lower levels of infrastructure development, such as the Philippines, Vietnam, and Malaysia, may face constraints in attracting and utilising FDI through infrastructure (Bakar et al. 2012). This study aligns with Globerman–Shapiro (2002), who find that countries implementing proactive measures to encourage infrastructure investment, such as China and Thailand, create a more favourable climate for foreign investors.

Third, the study's results illustrate that economic freedom is the critical pulling factor for FDI inflows in most nations (except Indonesia) in the long run. In contrast, the short-term causality results do not support this relationship. These results align with Herrera-Echeverri et al. (2014), who reveal that the role of economic freedom has been explored over time. As mentioned above, economic freedom is reflected in institutional quality (Pearson et al. 2012, Saini–Singhania 2018). Consequently, when institutional issues such as regulatory frameworks, bureaucratic procedures, and legal systems improve, the positive effect of economic freedom on FDI becomes evident (Dikova–Witteloostuijn 2007). Similarly, Cui–Liu (2000) also affirm that FDI becomes more responsive to changes in economic freedom, as greater freedom creates a more favourable environment for business. According to Cebula et al. (2012), the positive correlation between economic freedom and FDI is initially weak but strengthens over time as governments become more consistent and predictable in their actions.

Finally, this study shows that human development is a major determinant of FDI inflows to Indonesia, Thailand, Vietnam, China, Singapore, and the Philippines. However, no causality is observed between human development and FDI in Malaysia. This variation can be explained in several ways. For instance, the divergence in results can be attributed to the skilled and productive workers in these nations. Adhisti (2017)

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find that skilled and productive labour forces attract foreign investors. Consequently, human capital development significantly impacts long-term FDI. Furthermore, significant investments in education, healthcare, and public services contribute to human development. This improvement may result in a well-educated workforce, adequate healthcare, and supportive social infrastructure, which can improve corporate operations and productivity, supporting higher FDI inflows (Masron–Abdullah 2010). According to Gentle (2017), companies aiming to align their investments with sustainability goals may choose to invest in countries ranked on the HDI.

Conclusion and policy implications

Despite the increasing role of FDI in economic development, limited research has been conducted on the causal links between FDI and its determinants in Asian economies. This study examines the determinants of FDI in seven Asian countries between 1990 and 2021. Doing so, the study addresses two research questions: RQ1. What are the drivers of FDI inflow to Asian countries? RQ2. Is the causal relationship between FDI and its determinants similar across countries? The study concludes that causality is observed between FDI and its determinants in Asian economies, including the host country's economic growth, resource investment (i.e., infrastructure and human development), and economic freedom. However, causality varies across nations and timeframes.

For instance, in the short run, FDI inflows to Asian nations are primarily motivated by resource-seeking activities such as infrastructure and human capital. However, the major factors influencing FDI in the long run are the host country's economic freedom and human capital. Furthermore, the findings of the comparative analysis do not apply equally to all countries, as they are at different stages of development and have pursued different policies, including investment promotion policies, to reach their current level of development. China and Singapore are typical examples of successful FDI attraction compared with other nations in the Asian region. Their success is attributed to the appeal of the Chinese and Singapore markets for international enterprises and the integration of promotion policies and incentives created by their governments. China and Singapore have successfully improved their attractiveness by granting tax benefits, investing in infrastructure development, granting land-use privileges, and establishing free trade zones.

This study provides policy insights that may be meaningful for policymakers in less-developed countries such as the Philippines, Indonesia, Malaysia, and Vietnam in their attempts to sustain FDI inflows. All determinants of FDI inflows are rooted in good governance and strong institutions. A government with good governance and strong institutions improves the political stability and efficiency of national policies regarding infrastructure and human capital development. It also nurtures the

investment environment by promoting economic freedom. To this end, the government plays a critical role. In China and Singapore, the role of the government is highlighted despite the differences in their approaches. While Singapore's developmental state exhibits numerous similarities to its East Asian counterparts, the Chinese developmental state integrates the CCP's ongoing coordination privileges. However, these differences do not affect the ultimate objective of attracting FDI inflow. Hence, Asian countries should prioritise these aspects as the primary background for adjusting their policies.

For instance, economic freedom and human development in the Philippines and Vietnam should be prioritised in the long term, as these factors promote FDI inflows. Economic freedom often relates to institutional issues, such as regulatory frameworks, bureaucratic procedures, and legal systems. In contrast, the HDI measures a country's quality of life and standard of living based on education, health, and income indices. Therefore, effective macroeconomic policies may increase FDI inflows.

By contrast, Indonesia's case reveals that investment in infrastructure should be concentrated in the short run, while investment in human capital should focus on the long run. The motives for FDI in Indonesia are mostly resource-seeking; hence, policymakers should provide preferential incentives for foreign companies, such as providing infrastructure systems and improving access to infrastructure for investors. Further, programmes for training and improving the labour force are also encouraged to attract foreign investors. These policy insights also apply to Vietnam.

In Malaysia, the combination of policies promoting an infrastructure system and improving economic governance should be considered, as infrastructure and economic freedom are essential for attracting FDI. In contrast, a diversification strategy would benefit China, Singapore, and Thailand.

This study contributes significantly to the current understanding of FDI determinants in Asian countries by offering novel insights and nuances. In particular, it establishes causal relationships between FDI and key determinants, including GDP, economic freedom, human development, and infrastructure across seven Asian nations. The study's findings align with prior research but add value by revealing the variation in causality over time and across countries. Economic growth influences FDI in Singapore and China, whereas institutional factors and infrastructure play crucial roles in attracting FDI in various contexts. Human development has emerged as a vital determinant in several countries. This comparative analysis underscores the heterogeneous effects of these factors on FDI across nations and offers a tailored policy perspective. This study emphasises the importance of good governance and strong institutions as foundational elements for attracting FDI in Asian economies. Detailed policy implications cater to specific needs, advocating the prioritisation of economic freedom, human development, and infrastructure based on each country's unique context and stage of development.

The study also acknowledges its limitations, suggesting avenues for future research. First, future studies should expand their scope to include other Asian

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nations. A broader sample may improve the representativeness of the study's results. This study also encourages future research to investigate the impacts of other determinants, such as trade and market size. Finally, the current analysis does not consider the role of controlling factors, such as the financial crisis and the Covid-19 pandemic. Further studies should consider exploring the effects of these factors.

Funding acknowledgement

Appendix

<div align="right">Table A1</div>

<div align="center">The correlation matrix</div>

	FDI	GDP	Ecofree	HDI	Infras
China					
FDI	1.0000				
GDP	0.7445	1.0000			
Ecofree	−0.8646	−0.6145	1.0000		
HDI	−0.6252	−0.5799	0.5303	1.0000	
Infras	0.0451	−0.3623	−0.1461	0.2225	1.000
Indonesia					
FDI	1.0000				
GDP	0.3434	1.0000			
Ecofree	0.3311	−0.0576	1.0000		
HDI	0.4227	0.1195	0.7110	1.0000	
Infras	0.2036	−0.3904	0.6679	0.4255	1.000
Malaysia					
FDI	1.0000				
GDP	0.6143	1.0000			
Ecofree	−0.2683	−0.2251	1.0000		
HDI	−0.2887	−0.2220	0.7646	1.0000	
Infras	0.0861	−0.1266	0.3651	0.0861	1.000
Philippines					
FDI	1.0000				
GDP	−0.0829	1.0000			
Ecofree	0.3136	−0.0304	1.0000		
HDI	0.2649	0.0202	0.7483	1.0000	
Infras	0.6052	−0.2353	0.4568	0.3508	1.000
Singapore					
FDI	1.0000				
GDP	0.2041	1.0000			
Ecofree	0.5428	−0.2123	1.0000		
HDI	0.5850	−0.2855	0.7752	1.0000	
Infras	0.4645	−0.3228	0.6402	0.6283	1.000
Thailand					
FDI	1.0000				
GDP	0.0981	1.0000			
Ecofree	−0.4825	−0.2466	1.0000		
HDI	−0.4289	−0.1617	0.7329	1.0000	
Infras	−0.1917	−0.0668	0.1048	−0.1799	1.000
Vietnam					
FDI	1.0000				
GDP	0.2477	1.0000			
Ecofree	−0.1857	−0.3890	1.0000		
HDI	0.1790	−0.0639	−0.0922	1.0000	
Infras	−0.2877	−0.5440	0.7109	−0.3304	1.000

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