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The impact of trade openness on FDI inflows in Asian emerging economies

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Abstract. *In many countries, foreign direct investment is becoming one of the most significant components of economic development. The Asian emerging market is regarded as one of the best places to invest. Many governments have taken steps to deal with international trade to attract more foreign direct investment and open up their economies by implementing several progressive policies and creating a free trade zone. The main objective is to examine the impact of trade openness on foreign direct investment inflows in Asian emerging economies by employing the Panel-Pooled Mean Group Autoregressive Distributed Lag (PMG-ARDL) model and examining the direction of the causality between trade openness and FDI inflows using the Granger causality test period from 1996 to 2019. To examine the impact of trade openness on FDI inflows, we employed potential determinants of FDI such as GDP, population size, inflation, mobile telephone subscriptions, gross fixed capital formation, and total reserve as control variables in the model. As a result, trade openness has a positive and statistically significant impact on FDI inflows in the long run, but there is no significant relationship between trade openness and FDI inflows in the short run. The Granger causality test indicated that Asian emerging countries have a unidirectional causal relationship and that the causality runs from trade openness to foreign direct investment. In line with the findings, it is better to promote strong open trade policies to improve the investment climate in each country to attract more FDI into the region.*

Keywords: FDI, Trade openness, Asian emerging economies, PMG/ARDL model, Granger causality test.

Introduction

Foreign direct investment (FDI) is a concept that describes a country's long-term investment in another country (Musau, 2010). There are several advantages of FDI for the economy of the receiving country. FDI has been shown to play a key role in promoting economic growth, boosting a country's technological level, and creating new jobs, all of which have a major impact on the growth of developing countries (Blomström & Kokko, 2003; Rathnayaka Mudiyanselage et al., 2021). It has also been shown that FDIs promote developing countries' connections to the international economy and increase the capital available for investment, resulting in higher economic growth (Agrawal, 2015). The increasing relevance of foreign direct investment (FDI) in the international economy reflects countries' efforts to attract foreign investment. Developing countries, emerging economies, and countries in transition are increasingly considering FDI as a source of economic development, modernization, rising incomes, and job creation (Organization for Economic Co-operation and Development, 2002). Since several foreign investors are aware that Asia is an important geographic region with natural resources for international trading operations, Asia is an attractive destination for foreign direct investment.

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The Asian emerging market is viewed as one of the best places to invest foreign capital. Asia is the world's largest foreign direct investment destination, accounting for more than 30% of total inflows in 2019 (United Nations Conference on Trade and Development, 2020). Many researchers discovered that Southeast Asia, with rapidly increasing FDI, has played a role in this development (Sjöholm, 2013). FDI inflows from Southeast Asia accounted for more than 80% of total inflows in 2019. FDI remained the region's economic engine in 2019, with FDI increasing 5% to a new peak of $156 billion. The expansion was supported by large amounts of investment, mainly from Singapore, Indonesia, and Vietnam. India has received the largest foreign direct investment in South Asia (United Nations Conference on Trade and Development, 2020). China and Singapore also received a sizable share of the region's FDI inflows (World Bank, 2020a).

Many economic and non-economic factors influence FDI. According to the determinants of FDI, as mentioned in previous studies and theories, market size, trade openness, exchange rate, inflation, labor force size, and governance factors such as corruption control, political stability, rule of law, and others can influence foreign direct investment. The study focused on how international trade influences FDI. In many previous empirical studies, the Asian countries have been analyzed as separate countries and as different groups of countries. Our research has been conducted for the years 1996–2019 using the country-level data processed through regression analyses (PMG/ARDL model). Multiple empirical studies in single-country case studies or other regions have examined the relationships between trade openness and foreign direct investment. As an example, Zaman et al. (2018) have employed fixed effect and pooled ordinary least square methods to examine the panel data for measuring single country effects, group effects, and time effects of trade openness on FDI inflows in Asian countries, namely; India, Iran, and Pakistan, covering the period from 1982 to 2012. In the results, they found that trade openness encouraged FDI flows to the selected Asian countries. To examine the effects of trade policy openness on FDI inflows in Sub-Saharan Africa, they have employed the panel technique of the Generalized Method of Moments approach. As a result, policy openness affects FDI inflows positively (Cantah et al., 2014).

A study by Kandiero and Chitiga (2006) examined the whole economy and separately examined three sectors: primary, manufacturing, and services trade openness, which all had an impact on FDI in Africa. Because of the GMM, increased trade openness in the whole economy and services encourages FDI and in the primary sector, which discourages FDI in Africa. Using a sample of developing economies from 1990 to 2008, this study investigates the impact of trade openness on attracting FDI inflows. It provides a direct test of causality between FDI inflows, trade openness, and other key factors across Latin America, Asia, Africa, the Commonwealth of Independent States, and Eastern Europe. Eight different indicators were used to measure trade openness. The major empirical findings of the panel regression analyses showed that trade openness contributes positively to FDI inflows in developing economies in the long run (Liargovas & Skandalis, 2012).

Güriş and Gözgör (2015) examined the relationship between trade openness and FDI inflows in Turkey using Granger causality analysis and found that the direction of the causality runs from trade openness to FDI inflows in the sample period of 1986-2010. A study by (Sazali et al., 2018) investigated the causal links between trade openness and FDI inflows in Malaysia. As the results of the Granger causality test showed, there was a unidirectional causality; the direction of causality ran from trade openness to FDI, and trade openness positively influences inward FDI. To identify the causal links between trade openness and FDI inflows in Romania, Rathnayaka Mudiyanselage et al. (2021) employed the ARDL bound test and Granger causality test. They found that trade openness negatively influences inward FDI in Romania, and the result of the Granger

causality test indicated that Romania has a unidirectional relationship between trade openness and FDI.

In the study, we seek to answer the following question: is there any impact of trade openness on foreign direct investment inflows in Asian emerging economies? The objective of the present paper is to identify the impact of trade openness on FDI inflows into Asian emerging economies, namely, Bangladesh, China, India, Malaysia, Pakistan, Philippines, Singapore, South Korea, Sri Lanka, Thailand, and Vietnam, primarily focusing on the economic determinants of FDI.

Literature review

The level of FDI in a host country is influenced by many factors. Several different studies have identified the determinants of inbound FDI concerning different countries and different regions. A brief review of the literature related to the variables of interest considered in this study is provided in the following discussion.

Many factors affect FDI inflows. One of the most commonly affected explanatory variables in the literature is international trade. Many governments have taken steps to deal with international trade to attract more FDI and open up their economies by implementing several progressive policies. In the literature, there are several different indicators of international trade. The sum of imports and exports normalized by gross domestic product is the most common and convenient measurement (Kandiero & Chitiga, 2006; Liargovas & Skandalis, 2012; Cantah et al., 2014; Zaman et al., 2018; Rathnayaka Mudiyanselage et al., 2021). The high trade openness ratio indicates that the host country's trade barriers for products and services have been gradually decreased or removed. The rate of trade openness of a country is essential to attracting FDI inflows. References (Kandiero & Chitiga, 2006; Demirhan & Masca, 2008; Cantah et al., 2014; Güriş & Gözgör, 2015; Sazali et al., 2018; Zaman et al., 2018; Asiamah et al., 2019; Sajilan et al., 2019) have found a positive relationship between trade openness and FDI flows. Kariuki (2015), and Rathnayaka Mudiyanselage et al. (2021), have found a negative relationship between trade openness and FDI flows. In addition, Ho et al. (2013), Jaiblai and Shenai (2019), and Wickramarachchi (2019) found an insignificant relationship between trade openness and FDI flows.

In numerous empirical studies, gross domestic product, gross national product, GDP per capita income, GDP growth, and population size are used as proxies for market size. Large domestic markets tend to attract higher FDI because they produce substantial production and consumption advantages. References (Ranjan & Agrawal, 2011; Güriş & Gözgör, 2015; Aziz & Mishra, 2016; Sazali et al., 2018; Asiamah et al., 2019; Sajilan et al., 2019; Wickramarachchi, 2019) have found a positive and significant relationship between market size and FDI flows. Some empirical studies found that market size as an insignificant determinant of FDI flows (Quazi, 2007; Wickramarachchi, 2019). However, Tahmad and Adow (2018) found that market size has a negative impact on FDI in Sub-Saharan economies. It indicated that smaller markets relate to higher FDI inflows. Market size is proxied by population size, which also has a mixed relationship with FDI flows. Seref Akin (2010) and Anyanwu (2011) indicated that population encourages inflows of FDI. Luu et al. (2018) indicated that population growth has no significant impact on inward FDI.

The rate of inflation is another factor that influences FDI inflows. The consumer price index measures inflation, which is defined as an increase in the average price level over time. The instability of the investment climate may be exacerbated by macroeconomic instability, and foreign investors' confidence in host countries may be diminished. In general, lowering domestic inflation could boost economic growth and attract FDI to the country. The majority of empirical studies

have identified a negative relationship between inflation and inflows of foreign direct investment (Ranjan & Agrawal, 2011; Phung, 2016; Wickramarachchi, 2019). Inflation has an insignificant relationship with FDI inflows (Azam & Lukman, 2010; Anyanwu, 2011; Alshamsi & Hussin, 2015). According to some studies, there is a positive and significant relationship between inflation and FDI inflows (Tahmad & Adow, 2018; Asiamah et al., 2019; Sajilan et al., 2019).

One of the key factors that can influence inward FDI into the host country is infrastructure quantity and quality. Telephones, internet access, and water supply, as well as gross capital formation, and gross fixed capital formation, are all indicators of infrastructure. Infrastructure development boosts investment productivity; hence, infrastructure quality is a major factor in FDI flows. Infrastructure proxied by telephone subscriptions has a positive and statistically significant relationship with inward FDI (Wafure & Nurudeen, 2010; Alemu, 2012; Kariuki, 2015; Tahmad & Adow, 2018). However, some studies found that infrastructure is an insignificant determinant of FDI inflows (Anyanwu, 2011). High gross capital formation indicates a country's spending potential and hence has a significant impact on FDI inflows. Kariuki (2015) discovered a positive relationship between gross fixed capital formation and FDI inflows, whereas Ranjan and Agrawal (2011) indicated that gross capital formation cannot explain the variation of FDI inflows in BRIC countries. Total reserves include monetary gold, special drawing rights, IMF member reserves held by the IMF, and foreign exchange reserves under the supervision of monetary authorities (World Bank, 2020b). There is a positive and statistically significant relationship between the total reserve and FDI inflow (Khachoo & Khan, 2012).

Methodology

The impact of trade openness on FDI in emerging Asian economies was investigated using panel data analysis in this study. The sampling period and countries were chosen based on the availability of annual data starting in 1996 and ending in 2019, the last year for which data was available. Bangladesh, China, India, Malaysia, Pakistan, Philippines, Singapore, South Korea, Sri Lanka, Thailand, and Vietnam are all represented in a balanced dataset. The econometric software package E-Views 10 was used for this analysis.

Table 1. Variable description

Variable	Unit/Proxy
Foreign Direct Investment Net Inflows (FDI)	Current USD
Trade Openness (TOP)	(Export+Imports)/GDP
Gross Domestic Product (GDP)	Current USD
Population Size (POP)	Population, total
Inflation (INF)	Consumer price index- annual %
Mobile cellular subscriptions (MOB)	Per 100 people
Gross fixed capital formation (GCF)	Current USD
Total Reserves (RES)	Current USD

Source: Authors' own research based on WDI, 2020.

The functional form model specification equation is shown in (1) below.

$$FDI_{it} = f(TOP_{it}, GDP_{it}, POP_{it}, INF_{it}, MOB_{it}, GCF_{it}, RES_{it}) \quad (1)$$

The above functional form can be specified in the following econometric model equation (2) below:

$$LFDI_t = \beta_0 + \beta_{1i}TOP_{it} + \beta_{2i}LGDP_{it} + \beta_{3i}LPOP_{it} + \beta_{4i}INF_{it} + \beta_{5i}MOB_{it} + \beta_{6i}LGCF_{it} + \beta_{7i}LRES_{it} + \varepsilon_{it} \quad (2)$$

Where, β_{1i} to β_{7i} are the slope coefficients and ε_{it} is the white noise error term, the subscript i=1,…,11 represents the country index, and the subscript t=1996, …,2019 represents the year.

The ARDL equation can be written as follows (3):

$$\Delta LFDI = \beta_0 + \beta_1 LFDI_{i,t-1} + \beta_2 TOP_{i,t-1} + \beta_3 LGDP_{i,t-1} + \beta_4 LPOP_{i,t-1} + \beta_5 INF_{i,t-1} + \beta_6 MOB_{i,t-1} + \beta_7 LGCF_{i,t-1} + \beta_8 LRES_{i,t-1} + \sum_{i=1}^{\rho} \beta \Delta LFDI_{i,t-1} + \sum_{j=1}^{\rho} \delta \Delta TOP_{i,t-j} + \sum_{j=1}^{\rho} \gamma \Delta LGDP_{i,t-j} + \sum_{j=1}^{\rho} \pi \Delta LPOP_{i,t-j} + \sum_{j=1}^{\rho} \varphi \Delta INF_{i,t-j} + \sum_{j=1}^{\rho} \sigma \Delta MOB_{i,t-j} + \sum_{j=1}^{\rho} \vartheta \Delta LGCF_{i,t-j} + \sum_{j=1}^{\rho} \tau \Delta LRES_{i,t-j} + \mu_i + \varepsilon_{it} \quad (3)$$

In time-series econometrics analysis, the panel unit-root test is used to avoid spurious regression. We tested the variables for unit root using the Levin, Lin, and Chu (LLC), Im, Pesaran, and Shin (IPS), Fisher Chi-square (ADF), and Fisher Chi-square (PP) tests.

We employed the Akaike information criterion (AIC) for the optimal lags, including constant and trend terms. If the result of the Kao panel cointegration test for the null hypothesis of no cointegration is rejected at a 1% significant level. This indicates that all the variables considered for the empirical analysis are cointegrated and their short-run and long-run relationship can be estimated using the panel ARDL Model.

Results and discussions

Table 2 represents the unit root test results in the level and first difference, indicating that LFDI, TO, LGDP, LPOP, LGCF, and LRES variables are non-stationary in the level except for INF and MOB variables. Therefore, some variables are stationary at the level, and other variables are stationary at the first difference.

All variables, it is concluded, have a mixed order of integration. After checking the stationary property of the variables, we have employed PMG/ARDL techniques. The PMG/ARDL technique can be employed whether the variables are I (0) or I (I) or a mix of both, while none of the variables is I (2).

Table 2. Stationarity test of variables

Variable	Level			
	LLC	IPS	ADF-Fisher	PP-Fisher
LFDI	-1.51	-1.38	39.3	53.78
TO	-0.01	0.72	19.13	19.33
LGDP	0.44	4.07	9.18	2.09
LPOP	-7.22	-2.03	45.68	433.32
INF	-5.85*	-5.44*	68.14*	82.20*
MOB	-2.08**	1.70	21.16*	19.87
LGCF	1.55	3.77	8.15	4.01
LRES	-3.96	-0.40	26.61	25.16

Variable	First Difference			
	LLC	IPS	ADF-Fisher	PP-Fisher
LFDI	-7.49*	-9.59*	125.01*	610.12*
TO	-11.48*	-11.26*	144.43*	148.86*
LGDP	-8.02*	-6.72*	85.73*	92.04*
LPOP	-3.26*	-2.94*	40.84*	46.68*
INF	-16.46*	-16.89*	213.04*	863.56*
MOB	-3.33*	-4.48*	56.88*	50.52*
LGCF	-6.29*	-5.86*	74.52*	53.78*
LRES	-8.68*	-8.88*	114.99*	119.35*

Note: *, **, and *** denote statistically significant values at the levels of 1%, and 5%, respectively.
The software E-Views 10 was used to calculate LLC, IPS, ADF-Fisher, and PP-Fisher.
Source: Researchers' calculation using E-Views 10.

In the study, we examined the Kao cointegration test to examine the equilibrium relationship among the variables. Table 3 represents the results of the Kao cointegration test.

Table 3. Panel cointegration test results

ADF (AIC)	t-Statistics	Probability
	-9.2834	0.0000*
Residual Variance	0.3880	
HAC Variance	0.2067	

Note: * denote statistically significant values at the levels of 1% respectively.
Source: Researchers' calculation using E-Views 10.

The results of the Kao panel co-integration test in Table 3 strongly reject the null hypothesis of no co-integration between variables at a 1% significance level, indicating the existence of a co-integration relationship between the observed variables. Therefore, we can estimate the short-run and long-run relationships using the Panel ARDL Model.

Table 4. PMG/ARDL long-run estimation results

Variable	Coefficient	t-value	P-value
TO	0.0059	3.3151	0.0011*
LGDP	0.0076	0.0178	0.9858
LPOP	-0.2195	-0.1670	0.8676
INF	0.0714	9.3328	0.0000*
MOB	-0.0014	-0.6631	0.5082
LGCF	1.0123	3.6282	0.0004*
LRES	0.2643	2.0691	0.0402**

Note: *, **, and *** denote statistically significant values at the levels of 1%, 5%, and 10%, respectively.
Source: Researchers' calculation using E-Views 10.

As the results show, increased trade openness is one way to attract FDI. According to the study, the inflation variable has a statistically significant and positive impact on foreign direct investment inflow in Asian emerging countries. The result implies that when the INF of the Asian emerging countries increases by one unit, the foreign direct investment inflow will increase by about 7.14%. In reference (Tahmad & Adow, 2018; Asiamah et al., 2019; Sajilan et al., 2019), the

same conclusions were obtained, implying that inflation has a positive and statistically significant relationship with foreign direct investment. As a proxy for infrastructure, we used fixed capital formation mobile cellular subscriptions (per 100 people) in the study. The LGCF variable has a positive and statistically significant impact on FDI inflows, but mobile cellular subscriptions (per 100 people) have no such impact in the long term. The result implies that when the LGCF of Asian emerging countries rises by 1%, the inflow of foreign direct investment rises by 1.01 percent. This outcome is consistent with the findings of this empirical research by Kariuki (2015). As a result, when the total reserves of Asian emerging countries increase by 1%, the inflow of foreign direct investment will increase by 0.2643 percent. The result is in line with the empirical study (Khachoo & Khan, 2012).

In the long run, the LGDP, LPOP, and MOB variables have no impact on foreign direct investment. It shows that gross domestic product, the population size of the host country, and infrastructure are proxied by mobile cellular subscriptions (per 100 people). These variables are unable to explain the volatility of FDI inflows over time. These results are consistent with other research. Some studies indicate that market size is an insignificant determinant of FDI inflows (Quazi, 2007; Wickramarachchi, 2019). Luu et al. (2018) indicated that population growth has no significant impact on inward FDI. A similar insignificant relationship between telecommunication infrastructure and inward FDI was found by (Anyanwu, 2011). As the overall results of the coefficient values suggest, trade openness affects FDI inflow at a low level.

Table 5. PMG/ARDL short-run estimation results

Variable	Coefficient	t-value	P-value
ECT(-1)	-0.7595	-7.5886	0.0000*
D(TO)	0.0068	0.7098	0.4789
D(LGDP)	0.7533	0.5459	0.5859
D(LPOP)	41.9502	1.3101	0.1921
D(INF)	-0.0017	-0.0818	0.9349
D(MOB)	0.0100	0.9353	0.3510
D(LGCF)	1.0116	0.8658	0.0639**
D(LRES)	0.1131	0.3765	0.7071
C	-5.2881	-6.9344	0.0000*

Note: *, **, and *** denote statistically significant values at the levels of 1%, 5%, and 10%, respectively.

Source: Researchers' calculation using E-Views 10.

Table 5 shows the short-run relationship between trade openness and FDI inflows in Asian emerging countries with the other determinants of FDI. However, in line with the study's primary objective, our main variable (trade openness) is not statistically significant at any significant level in the short run. With a coefficient of 1.0116, gross fixed capital formation has a positive and statistically significant impact on foreign direct investment inflow in the short run. The result implies that when the LGCF of Asian emerging countries rises by 1%, the inflow of foreign direct investment rises by 1.01 percent. This result is consistent with the findings of this empirical research (Khachoo & Khan, 2012).

Furthermore, in the short run, the LGDP, LPOP, INF, MOB, and LRES variables have no impact on foreign direct investment. The Vector Error Correction parameter in the Pooled Mean Group panel ARDL model is -0.7595, according to the results of the Pooled Mean Group panel ARDL model. It is negative and statistically significant at the 1% level, indicating that 76% of the disequilibrium from the previous year was corrected this year.

Table 6. The results of the Dumitrescu–Hurlin panel granger causality test

Null Hypothesis	W-Stat.	Zbar-Stat.	Prob.
TO does not homogeneously cause LFDI	4.3181	2.6249	0.0087***
LFDI does not homogeneously cause TO	2.3796	0.1445	0.8851

Note: *, **, and *** denote statistically significant values at the levels of 1%, 5%, and 10%, respectively.
Source: Researchers' calculation using E-Views 10.

Throughout the period, the Dumitrescu-Hurlin Granger causality test revealed a unidirectional causal relationship between trade openness and FDI inflows in Asian emerging countries. It also showed that the causality ran from trade openness to foreign direct investment.

Conclusion

Foreign direct investment is a crucial component of an open and effective international economic system and a major catalyst for economic development. International trade, both, influences many economic activities around the world directly and indirectly, in the globalized period. To achieve higher economic development, governments attempt to open their trade sectors to the rest of the world every day, implementing a variety of open-door policies, trade integration, and activities to promote trade. The major objective of this research has been to examine the impact of trade openness on FDI inflows into Asian emerging market economies in an attempt to grant policy suggestions to responsible trade policymakers in the public and private sectors. At the same time, we can identify potential variables that influence FDI inflows into Asian emerging countries, such as gross domestic product, the population size of the host country, inflation, mobile phone subscriptions, gross fixed capital formation, and total reserves. During the study period, which was from 1996 to 2019, the study examined 11 Asian emerging market economies for which data was available.

In theory, trade openness can either positively, negatively, or insignificantly impact FDI inflows. Previous studies have also found that trade openness has a mixed impact on FDI inflows in different regions and countries. The findings from the PMG/ARDL model confirmed a positive and statistically significant relationship between trade openness and FDI inflows in the long run. However, trade openness is not statistically significant at any significant level in the short run. The findings showed that while emerging market economies in Asia are more open to trade, they have also become attractive FDI destinations. Furthermore, the Dumitrescu-Hurlin Granger causality test indicated that Asian emerging countries have a unidirectional causal relationship between trade openness and FDI inflows throughout the period. It also indicated that the causality ran from trade openness to foreign direct investment inflows. Based on the findings, it is better to promote strong open trade policies in order to increase the investment climate in Asian emerging economies. In the case of Asian emerging countries with increased trade openness, the study contributes to the existing literature by providing empirical evidence of the trade openness effect on FDI positively in the long run.

The study's primary limitation is that it leaves out crucial variables that explain the variation of foreign direct investment inflows. We omitted some of the most important economic variables, such as taxation, human capital, natural resource availability, and the exchange rate, as well as non-economic factors such as corruption control, rule of law, and regulatory quality. The number of parameters to be estimated grows as the number of observations decreases and the number of regressors with lagged values increases, resulting in an error message indicating an insufficient number of observations or a near-singular matrix, as well as data unavailability in some of the

Asian emerging countries in the sample countries. We had to omit some of these Asian emerging countries. The period was selected because for the years before 1996, some of the variables used in the model were not available for most countries. We recommend future research, to include potential non-economic factors (control of corruption, rule of law, etc.) that influence foreign direct investment inflows. There is also a need to examine how sector-specific trade openness, such as manufacturing, services, and agriculture, influences FDI inflows in Asian emerging economies.

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