

Empirical Study of India's Trade and Investment Relations with ASEAN Countries : Evidence from the Gravity Model Theory

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Abstract

The study aimed to identify the policy determinants impacting India's trade and investment relations with ASEAN countries using a gravity model in conjunction with panel data methodology. There were no missing values in the data set, so econometric techniques like the fixed effect model and the random effect model were applied, and based on the Hausman test estimates, the fixed effect model was selected for analysis purposes. The study's findings reported that the product of GDP was directly proportionate to trade, while the product of population was inversely proportionate. Distance was negative to work more on trade liberalization policies, as the coefficient of India's trade openness was positive but insignificant, reflecting the improvement in the transportation system. It was observed that India has needs, but they are insignificant compared to those of ASEAN countries. The findings regarding investment relations confirmed that the GDP of ASEAN countries, the urban population of ASEAN countries, the debt-to-GDP ratio of ASEAN countries, the saving-to-GDP ratio of ASEAN countries, and the Indian diaspora in ASEAN countries had a positive and significant impact on India's investment relations with ASEAN countries. The important contribution of this study is that it extended the application of the gravity model to the area of analyzing the investment relations between India and ASEAN countries.

Keywords : trade, investment, gravity model theory, fixed effect model, random effect model, product of GDP, product of population

JEL Classification Codes : F10, F13, F14, F15, F17

Paper Submission Date : May 23, 2022 ; **Paper sent back for Revision :** July 10, 2022 ; **Paper Acceptance Date :** July 30, 2022

In the post-World War II era, economic integration in the domain of international trade and investment has become vital for the welfare of the masses and the economic development of every nation. Economic interdependence among nations is a panacea for development; no nation can prosper in isolation. Trade and investment cooperation can affect economic growth in three ways: first, it can encourage the flow of resources from a low-productivity sector to a high-productivity sector (Feder, 1983); second, FDI tends to increase exports, which leads to the expansion of production activities due to the scales of the economies (Helpman &

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DOI : <https://doi.org/10.17010/aijer/2022/v11i3/172680>

Krugman, 1987); and third, trade and investment expose the economy to technological advancement, which leads to productivity and growth. Cooperation at the global or regional level has become a common feature of the present-day economic order. India has a strong history of economic, cultural, and civilizational linkages with the Southeast Asian region that dates back to the pre-Christian era. The traces of these linkages are still evident in their languages, customs, rituals, archaeological remains, architecture, and Sanskrit inscriptions (Ngaibakching & Pande, 2020).

ASEAN, as a regional organization, was established on August 8, 1967, with the motto “one vision, one identity, and one community” to promote peace, progress, and prosperity. The quest for economic development and spectacular economic growth among ASEAN nations were motivating factors for the beginning of India's economic engagement with ASEAN nations. India's economic relations with ASEAN countries evolved systematically under the aegis of the “Look East Policy” initiatives (1991). Trade and investment relations are important determinants of growth among nations (Ambatkar, 2001). The turning point in Indo-ASEAN economic relations was the signing of the ASEAN-India Free Trade Agreement (2009, Bangkok) and the ASEAN-India Trade in Services and Investment Agreement (2015, New Delhi). ASEAN is India's major trading partner as a regional trading group before the USA and China. The percentage shares of ASEAN countries in India's global trade, exports, and imports were 11.38%, 10.60%, and 11.91%, respectively, in 2019. India's share in global exports, imports, and total trade was 1.72%, 2.51%, and 2.12%, respectively; whereas ASEAN's share was 7.88%, 7.43%, and 7.65%, respectively, in 2019. Table 1 highlights India's trade performance with ASEAN countries and the share India and ASEAN countries have in global trade.

Apart from international trade, FDI is also considered one of the important determinants of economic globalization. FDI bridges the capital gap between domestic savings and investment. Table 2 reports that the share of ASEAN countries in India's FDI outflows was 4.47% in 2012, which increased to 6.64% in 2019. India's total FDI outflow was highest for Singapore among ASEAN countries, followed by Myanmar, Vietnam, Malaysia, Indonesia, the Philippines, Thailand, and Cambodia, while no investment was made in Laos or Brunei during 2019.

Table 1. India's Trade Performance with ASEAN Countries (Value in US\$ billion, 2019)

	Global	ASEAN	Brunei	Khm	Indonesia	Laos	Malaysia	Myanmar	Philippines	Singapore	Thailand	Vietnam	ASEAN's Share in Global Trade	India's Share in Global Trade
Trade	802.13	91.29	0.64	0.25	20.08	0.03	16.68	1.46	2.19	25.63	11.37	12.96	7.65	2.12
Exports	323.25	34.25	0.06	0.20	4.52	0.03	6.27	0.96	1.64	10.74	4.33	5.51	7.88	1.72
Imports	478.88	57.04	0.58	0.05	15.56	0.00	10.41	0.51	0.56	14.89	7.03	7.45	7.43	2.51

Source : Authors' Calculation, Data from UN COMTRADE.

Table 2. Analysis of FDI Outflows from India to ASEAN Countries

(Value in US\$ million)													
Year	Brunei	Khm	Indonesia	Laos	Malaysia	Myanmar	Philippines	Singapore	Thailand	Vietnam	ASEAN	World	% Share
2012	1.10	10.03	18.38	0.20	99.05	1.76	3.15	998.97	11.15	1.36	1145.14	25601.38	4.47
2019	0.00	0.09	13.09	0.00	21.17	102.78	12.81	1013.30	12.03	43.01	1218.27	18921.08	6.44

Source : Reserve Bank of India, Foreign Exchange Management (https://www.rbi.org.in/scripts/FS_PressRelease.aspx?fn=5)

Table 3. Analysis of the Economy Size of India and ASEAN Countries (Value in US\$ billion)

Years	Brunei	Khm	Indonesia	Laos	Malaysia	Myanmar	Philippines	Singapore	Thailand	Vietnam	ASEAN	India	World
1991	4.10	2.25	149.93	1.07	49.13	6.67	51.78	45.46	101.25	7.64	710.50	291.20	24166.73
% in	0.02	0.01	0.62	0.00	0.20	0.03	0.21	0.19	0.42	0.03	2.94	1.20	100.00
Global GDP													
2019	13.47	27.10	1119.09	18.74	364.68	74.28	376.82	374.40	544.26	261.92	6064.72	2889.95	87718.57
% in	0.02	0.03	1.28	0.02	0.42	0.08	0.43	0.43	0.62	0.30	6.91	3.29	100.00
Global GDP													
CAGR	4.34	9.30	7.44	10.76	7.42	8.99	7.35	7.82	6.19	13.45	7.96	8.54	4.71

Source : Authors' calculation, data from UNCTAD Stat.

India and ASEAN were home to 2.07 billion people, approximately 26.25% of the global population (World Bank), in 2021. Table 3 reports the size of the economies of India and ASEAN countries. The GDP of India and ASEAN countries was US\$ 291.20 billion and US\$ 710.50 billion, respectively, in 1991, which increased to US\$ 2889.95 billion and US\$ 6064.72 billion, respectively, in 2019. The combined GDP of India and ASEAN countries was 4.14% of the global GDP in 1991, which increased to 10.21% in 2019. Considering the combined size of the market and economy, the trade and investment engagement between India and ASEAN countries will be beneficial for each other.

The present study is unique for three reasons. First, it analyzes the impact of policy variables on India's trade and investment relations with ASEAN countries using the gravity model under the aegis of "Look East Policy" and "Act East Policy." Second, India's increasing role in the ASEAN region is maintaining the balance of power due to the rising US – China conflict over the South China Sea and East China Sea. India's emergence as an economic power and the increasing Chinese threat inspired South Asian countries and the Western world to hail India's presence in the region (Ngaibakching & Pande, 2020). Third, India and ASEAN jointly are big markets and economies with a large share in global trade and FDI. In this context, the empirical study of India's trade and investment relations with ASEAN countries is very significant.

Literature Review and Statement of the Problem

The theoretical support of research in the area of the gravity model was initially deficient, however, since the second half of the 1970s, several theoretical developments have appeared in the refinement of the gravity model (Martinez-Zarzoso & Nowak-Lehmann, 2003). Several empirical studies have contributed to the development of the gravity model, such as those by Anderson (1979), Bergstrand (1985), Helpman and Krugman (1987), Deardorff (1997), Anderson and van Wincoop (2003), and many others. The literature review has been divided into two parts: studies relating to the gravity model of trade and the gravity model of FDI. The review of some of the important studies has been presented as follows:

The study relating to gravity model estimates on trade by Bhattacharyya and Banerjee (2006) regarding Bangladesh's imports suggested that trade responds less than proportionally to size and more than proportionally to distance. Further, colonial heritage is still an important factor in determining India's trade. The population has more influence on trade than the per capita income of the trading partner. According to Kabir and Salim (2010), the gravity model results successfully explained the pattern of the bloc, which supported the gravity estimates conducted on other economic blocs. Regression estimates showed that the Linder hypothesis and Heckscher – Ohlin – Samuelson theorem explained the import and export patterns of BIMSTEC, respectively. Oh and Prasai (2012) investigated Nepal's export and import patterns from 1981 –2009. In the case of exports, the coefficient of

the product of GDP was positive and significant. The coefficients on GDP per capita, landlocked countries, and the WTO were negative but insignificant, while the Linder effect and SAARC coefficients were positive but insignificant.

The coefficient on distance was negative and significant, representing the expected sign. Regarding imports, the coefficient of the product of GDP, the Linder effect, SAARC membership, and WTO membership have a positive and significant effect, while GDP per capita, distance, and landlocked have a negative and significant effect. Tripathi and Leitão (2013) examined the results of the gravity model and observed a positive and significant effect of political globalization, cultural proximity, economic size, the common border, and distance on India's bilateral trade. The positive effect of distance on India's bilateral trade has not supported the previous findings. The results of an augmented gravity model (Kumar & Ahmed, 2015) have suggested that the size of GDP and population, among other factors, have a positive effect on export and import flows; whereas distance and tariffs have a negative effect on export and import flows of countries in South Asia. According to Lai and Bujang (2016), the estimated results indicated that the values of the coefficients of GDP per capita of partner countries, trade openness of partner countries, and the population of Malaysia had a positive and significant effect, while the GDP per capita differential, the inflation rate of Malaysia, exchange rate, and distance had a negative impact on Malaysia's exports. The study found that the GDPPC of the home country, the inflation rate of partner countries, the unemployment rate of both Malaysia and partner countries, the trade openness of Malaysia, and the population of partner countries had expected signs but insignificant values. Singh et al. (2018) empirically analyzed India's trade relations with SAARC countries. The study's findings validated that India's compound annual trade growth rate was higher during the pre-SAFTA period with all SAARC countries except Bangladesh. Singh, Kumar, and Kumari (2022), in research relating to INDO-BIMSTEC business relations, revealed that China's increasing trade relations with BIMSTEC countries is a threat to the INDO-BIMSTEC business relations. A study regarding India's gravity model analysis of trade with GCC countries by Singh, Kumar, Kumari, and Singh (2022) reported that India has trade potential with Bahrain and Kuwait, while India has overtraded with other GCC countries. The study's implications indicate that strong economic cooperation with GCC countries will boost Indian industry and offer a strategic edge internationally.

In a study relating to gravity model estimates on FDI by Manjeed and Ahmad (2007) regarding FDI and exports in developing countries, it was revealed that GDP, economic growth, domestic absorption, sustainable growth patterns, and exports positively affected FDI, while external debt, a lack of fiscal incentives, and the balance of payment deficit had a negative impact on FDI. Ang (2008) examined the determinants of FDI in Malaysia from 1960 – 2005. The market size and real GDP were found to significantly positively impact FDI inflows. The increase in the level of financial development, infrastructure development, and trade openness promoted FDI, while a higher corporate tax rate and appreciation of the real exchange rate appeared to discourage FDI inflows. Ismail et al. (2009) examined the effect of ASEAN economic integration on FDI. They revealed that the market and income per capita for the source and host countries were positively related to FDI. Sharma and Bandara (2010) found that a large domestic market, an open trade regime, a country in a regional bloc, and a similar language and culture tend to attract most of the FDI, but a surprisingly high level of knowledge capital does not attract investment. The findings also confirmed that countries that are economically stable and have strong institutional credibility tend to attract more investment compared to others. Kaur and Sharma (2013), regarding the determinants of FDI in India, found that GDP, foreign exchange reserves, long-term debts, and trade openness had a positive impact on FDI, while inflation and the exchange rate tend to have a negative impact on FDI. Morris and Jain (2016) conducted a gravity model analysis of determinants of outward FDI in OECD source countries and revealed that population size, per capita income, and distance explained variation in outward FDI stock to a considerable extent. Common language and colonial links also explained variation in outward FDI stock. The index of RCA bore a positive correlation with outward FDI. Dorakh (2020) conducted a gravity model analysis of FDI across the member states of the EU and verified that EU membership has had a positive and

significant impact on FDI from 1991 to 2017. With the expansion of the EU, more FDI came from EU members to the new EU members, and less came from non-EU members.

Based on the literature review of various studies, it is observed that there is a dearth of comprehensive studies on India's trade and investment relations with ASEAN countries using the gravity model theory. Since the issue is a vital one in the area of policy formulation, thus, the paper conducted an intensive analysis to overcome the research gap.

Objectives of the Study

Consequent to the review of previous studies and the title of the research work, the following objectives are developed to fill the research gap:

- To examine the policy determinants that influence India's trade relations with ASEAN countries using the gravity model theory.
- To identify India's trade potential and equilibrium in trade flows with ASEAN countries.
- To evaluate the policy determinants that influence India's outward foreign direct investment to ASEAN countries using the gravity model theory.
- To identify India's outward foreign direct investment potential and equilibrium in investment flows to ASEAN countries.

Research Methodology and Model Specification

Hypotheses of the Study

Corresponding to the objectives of the study, the following hypotheses are formulated:

- **H01** : The policy determinants have no significant impact on India's trade with ASEAN countries.
- **H02** : The policy determinants have no significant impact on India's outward foreign direct investment to ASEAN countries.

Scope of the Study

The study is based on a descriptive and causal research technique and uses secondary data to arrive at conclusions. There are various dimensions of economic relations, such as trade, investment, tourism, technological cooperation, etc., but the current research work is confined to studying only India's trade and investment relations with 10 ASEAN countries. The present study is conducted to investigate India's trade flows and trade potential with ASEAN over 28 years, that is, from 1991 – 2019, and India's investment relations in terms of India's FDI outflows to ASEAN countries for 8 years, that is, from 2012 – 2019 using the gravity model theory.

Econometric Model Specification for Trade Relations

The gravity model has its roots in Newton's Universal Law of Gravity, stating that the gravitational force is proportional to the product of two masses and inversely proportional to the square of the distance between them. For the first time, Tinbergen (1962) and Pöyhönen (1963) applied the gravity model in explaining the bilateral trade flows. According to this model, trade is directly proportionate to the product of the GDP of the origin country

and destination countries' GDP and inversely proportionate to distance. The gravity model of international trade can be expressed as :

$$T_{ij} = \alpha + \frac{GDP_i GDP_j}{D_{ij}^2} \dots\dots\dots (1)$$

Where, T_{ij} is the trade flow from the origin country i to the destination country j ; α is a constant term; GDP_i and GDP_j is the gross domestic product of country i and j ; and D_{ij} is the distance between country i and j . Taking the log of both sides of equation (2), we get:

$$\ln T_{ijt} = \alpha + \beta_1 \ln GDP_{it} + \ln \beta_2 GDP_{jt} - \beta_3 \ln D_{ij} + \epsilon_{ijt} \dots\dots\dots (2)$$

Anderson (1979) extended the gravity model by considering the population of the origin country and destination country as a part of the mass in the gravity equation, and trade volume is expected to be proportionate to the population. Further, the basic gravity equation (2) is extended by adding some new variables to get the augmented gravity model equation. The augmented gravity model uses two-panel data regression models: the fixed effect model and the random effect model. In the gravity model analysis, the time-invariant variables like distance, language, diaspora, and trading affinity have been taken, and the problem with the fixed effect model is that it can't directly estimate time-invariant variables as the inherent transformation wipes out such variables. Hausman's (1978) specification test is applied to test the null hypothesis stating that the random effect model is more appropriate than the fixed effect model. The estimate of the Hausman test suggests that the null hypothesis is rejected; hence, the fixed effect model is selected over the random effect model. Thus, two stages of regression are applied for gravity model analysis (Egger, 2002; Egger & Pfaffermayr, 2003; Filippini & Molini, 2003; Husain & Yasmin, 2015; Kaur & Nanda, 2011; Lai & Bujang, 2016; Martinez-Zarzoso & Nowak-Lehmann, 2003; Rahman, 2003; Rahman & Dutta, 2012).

The first stage of the regression equation used to estimate the impact of determinants on INDO-ASEAN bilateral trade is explained as under:

$$\ln (T_{ijt}) = \alpha + \beta_1 \ln(\text{China trade}_{jt}) + \beta_2 \ln(GDP_{it} * GDP_{jt}) + \beta_3 \ln(Pop_{it} * Pop_{jt}) + \beta_4 \ln(GDPPC_{it}) + \beta_5 \ln(GDPPC_{jt}) + \beta_6 \ln(GDPPC \text{ Differentail}_{ijt}) + \beta_7 \ln(TOP_{it}) + \beta_8 \ln(TOP_{jt}) + \beta_9 \ln(TOT_{jt}) + \beta_{10} \ln(ER_{ijt}) + \beta_{11} \ln(FDI_{it}) + u_{ijt} \dots\dots\dots (3)$$

where, i = India; $j = 1, 2, 3, \dots$ (ASEAN Countries); $t = 1991 - 2019$; $\ln$ = natural logs.

The second stage of the regression equation based on the fixed effect model is presented as under:

$$IE_{ij} = \beta_0 + \beta_{12} \ln(\text{Distance}) + \beta_{13} (\text{Language}) + \beta_{14} (\text{Diaspora}) + \beta_{15} (\text{Trading Affinity}) + u_{it} \dots\dots\dots (4)$$

where:

IE = Individual Effect, $\ln$: Natural log.

Measurement of Variables for Trade Relations

The variables selected in the research work for measuring the dependent, independent, and dummy variables based on previous studies, along with their expected signs, are presented in Table 4.

The second stage of the regression equation based on the fixed effect model is presented as under:

$$IE_{ij} = \beta_0 + \beta_{12} \ln(\text{Distance}) + \beta_{13} (\text{Language}) + \beta_{14} (\text{Diaspora}) + \beta_{15} (\text{Trading Affinity}) + u_{it} \dots\dots\dots (5)$$

Table 4. Expected Signs of Independent Variables for the Gravity Model

Variable	Description	Expected Sign	Past Studies
$ChTr_{jt}$	China's trade with ASEAN countries.	$\beta_1 < 0$	New Variable
$GDP_{it} * GDP_{jt}$	Product of GDP of India and ASEAN countries.	$\beta_2 > 0$	Husain & Yasmin (2015) ; Oh & Prasai (2012)
$Pop_{it} * Pop_{jt}$	Product of population of India and ASEAN countries.	$\beta_3 < 0$ or $\beta_3 > 0$	Kaur & Nanda (2011) ; Batra (2006)
$GDPPC_{it}$	GDP per capita of India.	$\beta_4 < 0$ or $\beta_4 > 0$	Lai & Bujang (2016)
$GDPPC_{jt}$	GDP per capita of ASEAN countries.	$\beta_5 < 0$ or $\beta_5 > 0$	Lai & Bujang (2016)
$GDPPC\ Diff.$	Absolute difference of per capita GDP between India and ASEAN countries.	$\beta_6 < 0$ or $\beta_6 > 0$	Batra (2006) ; Kaur & Nanda (2011) ; Oh & Prasai (2012)
TOP_{it}	Trade openness of India with the world.	$\beta_7 > 0$	Alam & Ahmed (2018) ; Lai & Bujang (2016)
TOP_{jt}	Trade openness of ASEAN with the world.	$\beta_8 > 0$	Alam & Ahmed (2018) ; Lai & Bujang (2016)
TOT_{ijt}	Terms of trade of India with ASEAN countries.	$\beta_9 < 0$ or $\beta_9 > 0$	New variable
ER_{ijt}	The exchange rate between India and ASEAN countries.	$\beta_{10} < 0$ or $\beta_{10} > 0$	Bahmani-Oskooee & Hegerty (2007) ; Eichengreen & Irwin (1995) ; Kandilov, (2008) ; Kaur & Nanda (2011) ; Sarin (2018)
FDI_{it}	Foreign direct investment flows in India.	$\beta_{11} > 0$	Anwar & Nguyen (2011) ; Gunawardana & Sharma (2010)
$Dist_{ijt}$	Distance from India to ASEAN countries.	$\beta_{12} < 0$	Batra (2006) ; Kimura & Lee (2006) ; Kumar & Ahmed (2015) ; Yean & Yi (2014)
$Lang_{ijt}$	Common language reduces transaction cost.	$\beta_{13} > 0$	Alam & Ahmed (2018); Batra (2006) ; De (2010) ; Kaur & Nanda (2011) ; Kumar & Ahmed (2015) ; Singh et al. (2018)
$Diaspora$	Indian people migrated to ASEAN countries.	$\beta_{14} > 0$	Alam & Ahmed (2018) ; Karayil (2007)
$Trading\ Affinity_{it}$	Average of more than 1% share of ASEAN countries in India's total trade.	$\beta_{15} > 0$	Alam & Ahmed (2018) ; Noland (2005) ; Pradhan (2006)

Note. $\beta < 0$ represents negative sign ; $\beta > 0$ represents positive sign.

where,

IE = Individual Effect, $\ln$: Natural log.

Variables like language, trading affinity, and diaspora are used as dummy variables, which take the value one. when certain conditions are satisfied, or zero otherwise.

Econometric Model Specification for Investment Relations

On the analogy of the gravity model of trade, the regression equation for investment is formulated as under:

$$\ln(I_{ijt}) = \alpha + \beta_1 \ln(GDP\ ASEAN) + \beta_2 \ln(GDP\ India) + \beta_3 \ln(Distance) + \beta_4 \ln(Urban\ Population\ ASEAN) + \beta_5 \ln(Exchange\ Rate) + \beta_6 \ln(FDI\ Openness\ ASEAN) + \beta_7 \ln(Debt-GDP\ ASEAN) + \beta_8 \ln(Debt-GDP\ India) +$$

Table 5. Expected Signs of Independent Variables for Investment Relations

Variable	Description	Expected Sign	Past Studies
<i>GDP ASEAN</i>	GDP of ASEAN countries.	$\beta_1 > 0$	Dorakh (2020) ; Manjeed & Ahmad (2007) ; Sharma & Bandara (2010)
<i>GDP India</i>	GDP of India.	$\beta_2 > 0$	Dorakh (2020) ; Manjeed & Ahmad (2007) ; Sharma & Bandara (2010)
<i>Distance</i>	Distance from India to ASEAN countries.	$\beta_3 < 0$	Dorakh (2020) ; Morris & Jain (2016)
<i>Urban Population ASEAN</i>	Percentage of Urban Population of ASEAN.	$\beta_4 > 0$	Manjeed & Ahmad (2007)
<i>Exchange Rate</i>	Exchange rate (India and ASEAN countries).	$\beta_5 < 0$ or $\beta_5 > 0$	Kaur & Sharma (2013) ; Manjeed & Ahmad (2007) ; Pan (2003)
<i>FDI Openness ASEAN</i>	Investment openness of India with the world.	$\beta_6 < 0$ or $\beta_6 > 0$	Buckley et al. (2007)
<i>Debt-GDP ASEAN</i>	Debt to GDP ratio of ASEAN countries.	$\beta_7 < 0$ or $\beta_7 > 0$	New variable
<i>Debt-GDP India</i>	Debt to GDP ratio of India.	$\beta_8 < 0$ or $\beta_8 > 0$	New variable
<i>Saving-GDP Ratio ASEAN</i>	Saving to GDP ratio of ASEAN.	$\beta_9 < 0$ or $\beta_9 > 0$	Manjeed & Ahmad (2007)
<i>Saving-GDP Ratio India</i>	Saving to GDP ratio of India.	$\beta_{10} < 0$ or $\beta_{10} > 0$	Manjeed & Ahmad (2007)
<i>Cost of Capital India</i>	Cost of capital in India.	$\beta_{11} < 0$ or $\beta_{11} > 0$	Banga (2003)
<i>Market Capitalization India</i>	Market capitalization in India.	$\beta_{12} > 0$	New variable
<i>Fiscal Deficit India</i>	Fiscal deficit of India.	$\beta_{13} < 0$ or $\beta_{13} > 0$	New variable
<i>Diaspora</i>	Indian people migrated to ASEAN countries.	$\beta_{14} > 0$	Alam & Ahmed (2018) ; Karayil (2007)
<i>Trading Affinity</i>	Average of more than 1% share of ASEAN countries in India's total trade.	$\beta_{15} > 0$	Alam & Ahmed (2018) ; Noland (2005) ; Pradhan (2006)

Note. $\beta < 0$ represents a negative sign. $\beta > 0$ represents a positive sign.

$$\beta_9 \text{Ln}(\text{Saving-GDP Ratio ASEAN}) + \beta_{10} \text{Ln}(\text{Saving-GDP Ratio India}) + \beta_{11} \text{Ln}(\text{Cost of Capital India}) + \beta_{12} \text{Ln}(\text{Market Capitalization India}) + \beta_{13} \text{Ln}(\text{Fiscal Deficit India}) + \beta_{14} \text{Ln}(\text{Diaspora}) + \beta_{15} \text{Ln}(\text{Trading Affinity}) + u_{ijt} \dots\dots\dots(6)$$

Measurement of Variables for Investment Relations

The variables selected in the research work for measuring investment relations and their expected signs are given in Table 5.

Analysis and Results

Gravity Model Analysis of India's Trade Relations with ASEAN Countries

The gravity model analysis of India's trade relations with ASEAN countries and trade potential is presented in this section. The empirical analysis and discussion are illustrated. Table 6 presents the results of the fixed effects model and the random effects model regarding the impact of determinants on India's trade relations with ASEAN countries. To choose the appropriate model, the null hypothesis stating that the random effects model is more appropriate than the fixed effects model is tested by applying the Hausman specification test.

Table 6. Estimated Results of Fixed Effect Model and Random Effect Model

Variables	Fixed Effect Model			Random Effect Model		
	Coefficient	t	P > t	Coefficient	z	P > z
<i>China Trade</i>	0.043	0.600	0.551	0.122	1.620	0.105
<i>Product of GDP</i>	1.177	7.630	0.000	0.992	8.110	0.000
<i>Product of Population</i>	-1.013	-1.700	0.090	-0.379	-2.930	0.003
<i>GDPPC India</i>	0.285	0.650	0.514	-0.202	-0.730	0.468
<i>GDPPC ASEAN</i>	-1.609	-7.400	0.000	-0.849	-6.630	0.000
<i>Linder</i>	0.064	1.430	0.155	0.027	0.580	0.559
<i>TOP India</i>	0.189	0.840	0.401	0.260	1.210	0.228
<i>TOP ASEAN</i>	0.220	2.700	0.007	0.345	4.340	0.000
<i>TOT</i>	0.367	3.900	0.000	0.324	3.370	0.001
<i>Exchange Rate</i>	0.047	0.450	0.650	-0.280	-4.500	0.000
<i>FDI Inflow</i>	0.054	1.020	0.307	0.010	0.200	0.844
_cons	7.556	0.610	0.544	-5.236	-1.540	0.124
R ²	0.3678			R ²	83.73	
F	259.61			Wald Chi ²	2460.09	
Prob > F	0.000			Prob > Chi ²	0.000	

Table 7. Hausman Specification Test Estimates

	---- Coefficients ----			
	(b) Fixed Effect	(B) Random Effect	(b - B) Difference	Sqrt (diag (V_b V_B)) S.E.
<i>China Trade</i>	0.043	0.122	-0.079	.
<i>Population</i>	-1.013	-0.379	-0.634	0.582
<i>GDP</i>	1.177	0.992	0.186	0.094
<i>GDPPC India</i>	0.285	-0.202	0.487	0.335
<i>GDPPC ASEAN</i>	-1.609	-0.849	-0.760	0.176
<i>GDP per capita Diff.</i>	0.064	0.027	0.037	.
<i>TOP India</i>	0.189	0.260	-0.071	0.064
<i>TOP ASEAN</i>	0.220	0.345	-0.125	0.018
<i>TOT</i>	0.367	0.324	0.043	.
<i>Exchange Rate</i>	0.047	-0.280	0.327	0.083
<i>FDI Inflow</i>	0.054	0.010	0.043	.

Test : Ho : Difference in coefficients is not systematic.

$$\chi^2(8) = (b - B)' [(V_b - V_B)^{-1}] (b - B)$$

$$= 149.73$$

$$\text{Prob} > \chi^2 = 0.000$$

Table 7 illustrates the Hausman specification test outcomes. The chi-square value is 89.31, with a corresponding *p*-value of 0.000, stating that the null hypothesis is rejected. Therefore, the analysis proves that a fixed-effect model strategy is more appropriate than a random-effect model strategy.

Table 6 reports that the f -value of the fixed effect model is 259.61, which is significant (p -value $0.000 < 0.05$), stating that the independent variables have a significant impact on India's trade with ASEAN countries. The coefficient of R^2 is 0.3678, which reveals that 36.78% of the variation in India's trade with ASEAN countries is explained by all independent variables, and for the remaining 63.22% discrepancy, there may be some other variables that are not included in the model.

The product of the GDP of India and ASEAN countries, which is the fundamental variable of the classical gravity model, has a positive and significant coefficient ($\beta_2 = 1.177$; p -value = $0.000 < 0.01$), which states that a 1% increase in the product of the GDP of India and ASEAN countries will tend to increase India's bilateral trade by 1.177% at the increasing rate, keeping other independent variables constant. The trade openness of ASEAN countries has a positive and significant ($\beta_8 = 0.220$; p -value = $0.007 < 0.01$) impact on trade, while India's trade openness has a positive and insignificant ($\beta_7 = 0.189$; p -value = $0.401 > 0.05$) impact on India's trade with ASEAN countries. Therefore, the study's findings confirm that the trade liberalization policies of ASEAN countries are more effective than those of India. To enhance trade with ASEAN countries, India needs to relax trade and non-trade barriers with ASEAN countries. The coefficient on terms of trade is found to be positive and significant ($\beta_9 = 0.367$; p -value = $0.000 < 0.01$), which indicates that with a 1% increase in terms of trade, India's bilateral trade flow will increase by 0.367%, holding other independent variables constant, however, at a decreasing rate.

In the model, the product of the population of India and ASEAN countries has a negative and significant ($\beta_3 = -1.013$; p -value = $0.090 < 0.10$) impact on India's trade with ASEAN countries. The analysis of the study indicates that with a 1% increase in the market size of ASEAN countries, India's bilateral trade will decrease by 1.013% due to the absorption effect at the increasing rate, however, the insignificant statistics do not support the proposition. The results of the present study are in line with previous studies conducted by Alam and Ahmed (2018), Batra (2006), Dinh et al. (2014), Kaur and Nanda (2011), Khayat (2019), Kimura and Lee (2006), Kumar and Ahmed (2015), and many others.

The analysis of China's trade with ASEAN countries reveals a positive and insignificant ($\beta_1 = 0.043$; p -value = $0.551 > 0.05$) impact on India's trade with ASEAN countries. This implies that with a 1% increase in China's trade with ASEAN countries, India's trade will tend to increase by 0.043%, keeping other independent variables constant at the decreasing rate. However, the insignificant finding does not support the hypothesis. The variables exchange rate ($\beta_{10} = 0.047$; p -value = $0.650 > 0.05$) and FDI inflows in India ($\beta_{11} = 0.054$; p -value = $0.307 > 0.05$) have a positive and insignificant impact on India's trade with ASEAN countries.

The GDP per capita has been used to examine the level of development of a country. Bergstrand's (1985) hypotheses suggested that if the GDP per capita of exporting country is positive, then the composition of trade flow involves capital-intensive products, and vice-versa, trade flows involve labor-intensive products. While for importing countries, a positive coefficient indicates that the composition of the trade flow consists of luxury goods; for the negative sign, the composition of the trade flow consists of necessary goods. The coefficient on GDP per capita for India carries a positive and insignificant impact ($\beta_4 = 0.285$; p -value = $0.514 > 0.05$), suggesting that the composition of trade flows from India to ASEAN countries mostly consists of capital-intensive goods. On the other hand, the negative and significant ($\beta_5 = -1.609$; p -value = $0.000 < 0.05$) coefficient of GDP per capita of ASEAN countries reports that the composition of trade flows from ASEAN countries to India is dominated by necessity goods.

The coefficient of GDP per capita differential determines the application of H-O or Linder theory in the case of Indo-ASEAN trade relations. The positive value of the coefficient shows that similar countries trade less than dissimilar ones and supports the H-O hypothesis; while the Linder hypothesis will be supported if there is a negative value of the coefficient explaining that similar countries trade more than dissimilar ones. The estimated result of the variable is positive and insignificant ($\beta_6 = 0.064$; p -value = $0.155 > 0.05$), suggesting that the H-O theory is better at explaining Indo-ASEAN countries' trade relations. The implication of the H-O theory confirms that countries with different levels tend to trade more compared to countries with the same level.

Table 8. Country-Specific Effects (Estimated Fixed Effects)

Country	Fixed Effect	Ranking of Trade Propensity	Distance	Language	Diaspora	Trading Affinity
Brunei	7.14	6	8.49	0	0	0
Cambodia	4.45	10	8.14	0	0	0
Indonesia	5.45	9	8.52	0	0	1
Laos	6.16	8	7.95	0	0	0
Malaysia	10.48	2	8.25	0	0	1
Myanmar	6.32	7	7.76	0	0	0
Philippines	7.57	5	8.47	1	0	0
Singapore	11.21	1	8.33	1	1	1
Thailand	9.02	3	7.98	0	0	1
Vietnam	7.76	4	8.01	0	0	0

Table 9. Cross-Section Regression Results of the Distance and Dummy Variables

(Dependent Variable is Country Specific Effect)			
	Coefficients	t	Sig.
(Constant)	21.313	0.921	0.399
Distance	-1.852	-0.646	0.547
Language	1.947	0.818	0.450
Diaspora	1.090	0.344	0.745
Trading Affinity	2.288	1.543	0.183
D.W = 1.726, R^2 = 0.566.			

Table 8 reports the country effect of ASEAN countries, where the positive value of country effects indicates a high propensity to trade, while the negative value indicates a low tendency to trade. The values of country effects in the case of all ASEAN countries are positive, which appears to reflect the high propensity to trade with India. The study confirms that among the ASEAN countries, Singapore has an increased tendency to trade with India, followed by Malaysia, Thailand, Vietnam, Philippines, Brunei, Myanmar, Laos, Indonesia, and Cambodia, respectively.

Table 9 reports the estimates obtained when the fixed effects from the model are regressed on the distance variable and dummies such as language, diaspora, and trading affinity, which are static over time and cannot be processed together with time-variant independent variables. The coefficient of distance (-1.852) carries the negative sign, as expected, however, the insignificant p -value (0.547) does not support the hypothesis. The coefficient on language (1.947), diaspora (1.090), and trading affinity (2.288) depict a positive correlation with India's trade with ASEAN countries, but the insignificant p -values do not support the hypotheses.

India's Trade Potential with ASEAN Countries

Table 10 explains the estimates of the speed of convergence in percentage, which can be classified into two groups, one characterized by an overtraded group with a positive sign and a second with a negative sign reflecting the trade potential. The findings of the speed of convergence reveal that India has convergence in trade or trade

Table 10. Speed of Convergence (Percentage)

Country	Average Growth Rate of Potential Trade	Average Growth Rate of Actual Trade	Speed of Convergence
Brunei	20.54	126.45	-83.75
Cambodia	19.29	20.39	-5.40
Indonesia	16.57	19.90	-16.75
Laos	18.85	24.46	-22.93
Malaysia	16.36	14.92	9.64
Myanmar	12.48	15.35	-18.70
Philippines	17.18	14.74	16.56
Singapore	14.39	15.71	-8.40
Thailand	15.42	15.62	-1.25
Vietnam	21.52	23.71	-9.26

Table 11. The Convergence of India's Actual Trade Towards Potential Trade

Model	Coefficients	t	Sig.
(Constant)	29.171	2.750	0.006
Difference Between Actual and Potential Trade	0.000	0.080	0.936
Durbin – Watson = 2.056, $R^2 = 0.000$.			

potential with all ASEAN countries except Malaysia and the Philippines. India has trade divergence with the Philippines and Malaysia, indicating that India has overtraded with these countries. The speed of convergence is highest for Brunei, followed by Laos, Myanmar, Indonesia, Vietnam, Singapore, Cambodia, and Thailand, respectively.

Table 11 reports the convergence of actual data toward potential trade. For convergence, the estimated coefficient should be negative and significant (Kaur & Nanda, 2011). The results of this model state that the coefficient of the independent variable is (0.000) and insignificant (p -value 0.936). Therefore, the study confirms that there is no convergence in India's trade with ASEAN countries, which means India's actual trade with ASEAN countries does not converse towards the estimated trade potential; thus, there is a lack of equilibrium between actual and potential trade.

Gravity Model Analysis of India's Investment Relations with ASEAN Countries

The gravity model analysis of India's outward foreign direct investment to ASEAN countries and investment potential is presented in this section. Table 12 reports the results of the fixed effect model and random effect model

Table 12. Estimation Results of Random Effect Model and Fixed Effect Model

Variables	Fixed Effect Model			Random Effect Model		
	Coefficient	t	$P > t$	Coefficient	z	$P > z$
GDP ASEAN	0.433	0.330	0.740	0.732	3.270	0.001
GDP India	3.272	0.730	0.471	3.480	0.740	0.459

<i>Distance</i>	0.000	(omitted)		-1.147	-1.560	0.119
<i>Urban population ASEAN</i>	8.973	1.100	0.274	1.825	1.970	0.049
<i>Exchange Rate</i>	-3.977	-2.550	0.013	-0.130	-1.760	0.079
<i>FDI Openness ASEAN</i>	0.279	0.850	0.398	0.345	1.160	0.246
<i>Debt-GDP ASEAN</i>	1.197	0.870	0.388	0.543	1.710	0.087
<i>Debt-GDP India</i>	-5.175	-0.270	0.790	5.593	0.280	0.781
<i>Saving GDP ASEAN</i>	0.285	0.980	0.329	0.568	2.290	0.022
<i>Saving GDP Ratio India</i>	-3.379	-0.500	0.618	-2.952	-0.420	0.673
<i>Cost of Capital India</i>	19.076	0.710	0.478	20.885	0.730	0.463
<i>Market capitalization India</i>	-1.536	-0.810	0.421	-0.755	-0.380	0.703
<i>Fiscal deficit India</i>	-2.037	-0.930	0.357	-1.741	-0.750	0.456
<i>Diaspora</i>	0.000	(omitted)		3.218	3.780	0.000
<i>Trading Affinity</i>	0.000	(omitted)		-0.482	-0.940	0.349
_cons	-95.336	-0.610	0.542	-114.371	-0.700	0.486
R^2			0.0085	R^2		0.8892
F			1.01	Wald χ^2		513.4
Prob > F			0.4513	Prob > χ^2		0.000

regarding the impact of determinants on India's FDI outflows to ASEAN countries. To discriminate between the two models, the null hypothesis stating that the random effect model is more appropriate than the fixed effect model is tested by applying the Hausman specification test.

Table 13. Hausman Test

	Coefficients			
	(b) Fixed Effect	(B) Random Effect	(b-B) Difference	Sqrt (diag (V_b V_B)) S.E.
<i>GDP (A)</i>	0.432865	0.731977	-0.29911	1.278952
<i>GDP(I)</i>	3.271671	3.480264	-0.20859	.
<i>Distance</i>	8.972908	1.825308	7.1476	8.069189
<i>Urban Population(A)</i>	-3.97656	-0.13023	-3.84632	1.554989
<i>Exchange Rate</i>	0.279459	0.345093	-0.06563	0.138516
<i>FDI Openness (A)</i>	1.19695	0.543424	0.653525	1.340038
<i>Debt-GDP (A)</i>	-5.17509	5.593406	-10.7685	.
<i>Debt-GDP (I)</i>	0.284642	0.568034	-0.28339	0.149441
<i>Saving GDP ratio (A)</i>	-3.37863	-2.95199	-0.42664	.
<i>Saving GDP ratio (I)</i>	19.07591	20.88458	-1.80867	.
<i>Cost of Capital (I)</i>	-1.53581	-0.75519	-0.78063	.
<i>Market Capitalization (I)</i>	-2.03721	-1.74094	-0.29627	.

Test : H_0 : Difference in coefficients is not systematic.

$$\chi^2 (12) = (b - B)'[(V_b - V_B)^{-1}](b - B).$$

$$= 14.14$$

$$\text{Prob} > \chi^2 = 0.2921.$$

Table 13 presents the findings of the Hausman test, which is applied to choose the most appropriate model between the fixed effect model and the random effect model. The chi-square value is insignificant (chi-square = 14.14, p -value = 0.2921 > 0.05), which suggests that the null hypothesis is accepted at the 5% level of significance. Hence, the Hausman test result proves that the random effect model is more appropriate than the fixed effect model in explaining the impact of determinants on India's outward FDI in ASEAN countries.

The analysis presented in Table 12 reveals the impact of determinants on FDI outflows from India to ASEAN countries based on the random effect model. The estimated value of the chi-square for the overall model is significant (chi-square = 513.4, p -value = 0.000 < 0.01), which rejects the null hypothesis at a 5% level of significance, stating determinants of FDI outflows from India to ASEAN countries have a significant impact. The coefficient of R^2 is 0.8892, which reveals that 88.92% of the variation in FDI outflows is explained by independent variables considered in the model, and the remaining 11.08% variation is caused by some other variables which are not included in the model, such as the system of political governance, members of common regional groupings, saving to GDP, domestic absorption, debt to GDP ratio, government consumption proxy of fiscal deficit, the population of India and ASEAN countries, indirect taxes, foreign exchange reserve, inflation, and foreign trade policy, etc.

The estimates of GDP of ASEAN countries ($\beta_1 = 0.732$, p -value = 0.001 < 0.05), the urban population of ASEAN countries ($\beta_4 = 1.825$, p -value = 0.049 < 0.05), the debt-GDP ratio of ASEAN countries ($\beta_7 = 0.543$, p -value = 0.087 < 0.1), saving GDP ratio of ASEAN countries ($\beta_9 = 0.568$, p -value = 0.022 < 0.05) and the Indian diaspora in ASEAN countries ($\beta_{11} = 3.218$, p -value = 0.000 < 0.05) have a positive and significant impact on FDI outflows from India to ASEAN countries. The implications of these findings indicate that with a 1% increase in GDP of ASEAN countries, urban population of ASEAN countries, saving - GDP ratio of ASEAN countries, and Indian diaspora in ASEAN countries, the increase in FDI outflows from India to ASEAN countries will tend to increase by 0.732%, 1.825%, 0.543%, 0.568%, and 3.218%, respectively, keeping other factors constant. The classical gravity model is based on the assumption that trade is inversely proportionate to distance; similarly, in the case of FDI, distance is also assumed to be inversely correlated with FDI.

The coefficient GDP of India ($\beta_2 = 3.480$, p -value = 0.459 > 0.05), FDI openness of ASEAN countries ($\beta_6 = 0.345$, p -value = 0.246 > 0.05), debt-GDP of India ($\beta_8 = 5.593$, p -value = 0.781 > 0.05), and cost of capital of India ($\beta_{11} = 20.885$, p -value = 0.463 > 0.05) bear positive signs, indicating that with a 1% increase in GDP of India, FDI of ASEAN countries and debt-GDP of India will tend to increase India's FDI flow to ASEAN countries. However, the insignificant p -values do not support the hypotheses.

The coefficient on the exchange rate is negative and significant ($\beta_5 = -0.130$, p -value = 0.079 < 0.05), indicating that with a 1% increase in the exchange rate, India's FDI outflows to ASEAN countries will decrease by 0.130%, at the decreasing rate, keeping other factors constant.

Saving to GDP of ASEAN ($\beta_{10} = -2.952$, p -value = 0.673 > 0.05), market capitalization of India ($\beta_{12} = -0.755$, p -value = 0.703 > 0.05), fiscal deficit of India ($\beta_{13} = -1.741$, p -value = 0.456 > 0.05), and trading affinity of India with ASEAN countries ($\beta_{15} = -0.482$, p -value = 0.349 > 0.05) have a negative impact on India's FDI outflow to ASEAN countries. However, the insignificant p -value does not support the hypotheses.

Table 14 highlights the results of the speed of convergence and divergence in percent. A negative sign indicates that there is a speed of convergence, while a positive sign shows the speed of divergence. The analysis reveals that India has investment potential with all ASEAN countries except Laos.

Table 15 describes the convergence of India's actual FDI outflows towards the potential outflows. The finding states that the coefficient of the explanatory variable is -0.035 and insignificant (p -value = 0.458). Therefore, the study confirms that there is the presence of convergence in India's outward FDI to ASEAN countries, which means India's actual investment to ASEAN countries converge towards the estimated investment potential; hence, there is equilibrium between actual investment and potential investment. However, the insignificant p -value does not support the hypothesis.

Table 14. Speed of Convergence

Country	Average Growth	Average Growth	Speed of Convergence
	Rate of Potential FDI Outflows	Rate of Actual FDI Outflows	
Brunei	4.03	-7.48	-153.90
Cambodia	12.92	-0.80	-1724.90
Indonesia	10.65	28.41	-62.53
Laos	7.70	2.73	182.42
Malaysia	-0.53	226.04	-100.23
Myanmar	8.95	181.72	-95.08
Philippines	2.33	32.17	-92.77
Singapore	3.71	6.41	-42.19
Thailand	5.66	24.94	-77.29
Vietnam	8.87	105.30	-91.57

Table 15. Convergence of India's Actual FDI Outflows Towards Potential FDI Outflows

Model	Coefficients	t	Sig.
(Constant)	61.232	2.907	.005
Difference Between Actual and Potential FDI Outflows	-0.035	-0.747	.458

Durbin – Watson = 2.067, $R^2 = 0.008$.

Conclusions and Policy Implications

The rationale of this research paper is to analyze the policy variables of India's trade and investment relations with ASEAN countries under the aegis of the “Look East Policy” in the changing global order. Jointly, India and ASEAN are big markets consisting of 2.07 billion people representing 26.25% of the global population and also one of the big economies with 10.21% of the global GDP. There are no missing values; so the data set is balanced panel data, and econometric techniques like the fixed effect model and random effect model are used for analysis. The results of the Hausman specification test suggest that in the case of analysis of trade relations with ASEAN countries, the fixed effect model is appropriate over the random effect model; while for analyzing the investment relations, the random effect model is appropriate over the fixed effect model.

The findings regarding India's trade relations with ASEAN countries reveal that the H01 is rejected, stating that the independent variable significantly impacts India's bilateral trade flows with ASEAN countries. Among the independent variables, the product of GDP, trade openness of ASEAN, and terms of trade of India have a positive and significant impact on India's trade relations with ASEAN countries. The product of the population and GDP per capita of ASEAN countries has a negative and significant impact on India's trade with ASEAN countries. Trade openness of India, the exchange rate of India, and FDI inflows in India have a positive but insignificant impact on India's trade with ASEAN countries. The coefficient on GDP per capita differential bears the positive sign, indicating that India's trade relations with ASEAN countries are determined by the Heckscher-Ohlin hypothesis, that is, countries with different levels of economic development trade more, and comparative advantages determine trade. The coefficient on GDP per capita of India carries a positive sign stating that India's trade with ASEAN countries mostly involves capital-intensive products; whereas, the negative coefficient on GDP per capita of ASEAN countries indicates that ASEAN countries' trade with India mostly consists of

necessity goods. The time-invariant variable distance inversely affects the trade; whereas dummy variables such as language, diaspora, and trading affinity positively affect the trade relations, however, the insignificant p -values do not support the proposition. To examine China's impact on INDO-ASEAN trade relations, it is confirmed that the increase in China's trade with ASEAN countries has a positive impact on INDO-ASEAN trade relations, but India should develop appropriate policies to harness this advantageous situation.

The study confirms that among the ASEAN countries, Singapore has a high propensity to trade with India, followed by Malaysia, Thailand, Vietnam, Philippines, Brunei, Myanmar, Laos, Indonesia, and Cambodia, respectively. The findings of the trade potential report that India has trade potential with all ASEAN countries except Malaysia and the Philippines. The analysis of the speed of convergence indicates that India has maximum trade potential with Brunei, followed by Laos, Myanmar, Indonesia, Vietnam, Singapore, Cambodia, and Thailand. The study also confirms that there is no presence of convergence in India's trade with ASEAN countries; hence, there is a lack of equilibrium between India's actual trade and trade potential trade with ASEAN countries.

The rejection of H02 suggests that the independent variables have a positive impact on India's FDI outflows to ASEAN countries. Among the policy variables considered in the study, the GDP of ASEAN countries, the urban population of ASEAN countries, the debt-GDP ratio of ASEAN countries, the saving-GDP ratio of ASEAN countries, and the Indian diaspora in ASEAN countries have a positive and significant impact on India's investment in ASEAN countries. GDP of India, FDI openness of ASEAN countries, debt-GDP of India, and cost of capital of India have a positive but insignificant impact on INDO-ASEAN investment relations. Though the impact of these variables is positive, yet policy support is required. The exchange rate inversely and significantly affects India's investment in ASEAN countries while distance, saving - GDP ratio of India, market capitalization of India, fiscal deficit of India, and trading affinity have an adverse impact on INDO-ASEAN investment relations, however, the insignificant findings do not support the hypotheses.

The study's findings also confirm that India has investment potential with all ASEAN countries except Laos. Cambodia has maximum investment potential, followed by Brunei, Malaysia, Myanmar, Philippines, Vietnam, Thailand, Indonesia, and Singapore. The study confirms that there is a convergence in India's outward FDI to ASEAN countries, which means India's actual investment to ASEAN countries converge towards the estimated investment potential; hence, there is an equilibrium between actual and potential investment.

The study's findings have significant policy implications for India's outward FDI to ASEAN countries. The policy variables relating to trade, such as population, GDP per capita, trade liberalization, exchange rate, and FDI inflow in India, do not support India's trade with ASEAN countries; hence, these require policy rethinking. Similarly, the policy variables relating to India's outward FDI, such as GDP, exchange rate, FDI openness, debt-GDP ratio, saving-GDP ratio, cost of capital, market capitalization, fiscal deficit, diaspora, and trading affinity, are not supportive of India's outward FDI to ASEAN countries; hence, these also require policy correction. Therefore, the study recommends that policymakers refrain from making such decisions that adversely affect the GDP growth rate and make the domestic environment unstable. Sharma and Bandara (2010) confirmed that countries with economic stability and strong institutional credibility tend to attract more investment than others. To harness trade potential with ASEAN countries, policymakers should strengthen strategic and diplomatic relations with ASEAN countries and reduce trade and non-trade barriers with ASEAN countries.

Regarding investment relations, it is recommended that India improve the governance of the capital market, manage the fiscal deficit, encourage savings, and provide incentives to the Indian diaspora in ASEAN countries. Department of Corporate Affairs, RBI, and SEBI, in collaboration, should make efforts to make improvements in capital market systems in conformity with developed nations. The banking system's governance should effectively infuse confidence among small investors.

This study also validates the gravity model theory for assessing the bilateral trade flows between the countries. The unique contribution of this paper is that it extends the application of the gravity model theory in analyzing the investment relations between India and ASEAN countries.

Limitations of the Study and Scope for Future Research

The present research work is based on secondary data. It is confined to analyzing India's trade and investment relations by considering 15 independent variables, each over the period from 1991 – 2019 and 2012 – 2019, respectively, using the gravity model. The study generates a huge amount of data, managing which was a challenge, and in analyzing the data, researchers' biases and overlooks may affect the study's outcome. The results of the gravity model cannot be generalized; however, these are useful for policy formulation. The study in the area of international financial management, specifically understanding India's trade and investment relations with ASEAN countries, has vast scope for future research. Eli Heckscher – Bertil Ohlin's theory, Staffan Linder's theory, and J.H Bergstrand's theory of international trade can also be extended to understand the Indo-ASEAN investment relations. The study's findings provide valuable inputs to policymakers in formulating economic and foreign policies specifically for the South Asian region. India's strong economic ties with ASEAN countries will help harness the trade and investment potential, promoting a stable and dynamic market in Asia. Therefore, building strong relationships has economic benefits and a strategic and diplomatic edge for both India and ASEAN countries.

Authors' Contribution

Dr. Raj Kumar Singh explored the idea of pursuing the study on India's trade and investment relations with ASEAN countries and developed the theoretical framework along with the research methodology. Jyoti Kumari extracted the research papers on the gravity model and drafted the literature review relevant to the study. Ajay Kumar and Yashvardhan Singh collected, edited, and coded the data. Dr. Raj Kumar Singh and Jyoti Kumari analyzed the data through MS Excel, SPSS, and STATA software, and Yashvardhan Singh prepared the tables and figures. Ajay Kumar and Jyoti Kumari wrote the rough draft of the research paper. Dr. Raj Kumar Singh finally edited the manuscript.

Conflict of Interest

The authors certify that they have no affiliation with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or material discussed in this manuscript.

Funding Acknowledgement

The authors received no financial support for this article's present research work, authorship, and/or publication.

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