

Original Article

Intra- Regional Trade Practices by Using Gravity Model: A Study on India and Srilanka

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Abstract: *The study increases the economic and trade ties between India and Sri Lanka, focuses on their trade interactions, and advances intra-regional trade and integration. This essay aims to empirically examine the effects of bilateral commerce between Sri Lanka and India. The information was gathered from the World Bank's World Governance Indicators, World Development Indicators, ARIC, Ministry of Commerce and Industry, and for the years 2000 to 2019. The gravity model, which is frequently used to estimate international trade flows with explanatory factors and policy implications for innovative variables or parameters affecting bilateral trade flows, will be applied for intra-regional trade to analyse India and Sri Lanka's trade with BIMSTEC members. Dependent variables are the estimation of trade costs that are undertaken with bilateral trade as the dependent variable. An independent variable is GDP (Gross Domestic Product) per capita, Distance, border, and common language. The statistical method and tool known as OLS (Ordinary Least Square) is used to calculate the coefficient of gravity model variable in log-linear linear form. The empirical results imply that intra-regional trade between Sri Lanka and India is positive. This essay makes the case that both nations' governments ought to implement some targeted policies to promote regional economic integration. For the advantage of their economies, these nations should have a greater political understanding of one another.*

Keywords: *Bilateral Trade, BIMSTEC, Gravity model, Intra-regional trade.*

I. INTRODUCTION

Economic intra-regional cooperation mainly entails understanding one another and working together to maximise mutual gain. It is the process by which nations in a particular region work together to minimise or remove specific obstacles to the free flow of goods, people, or capital across international borders. India has “Neighbourhood First” policy with Sri Lanka and has given special priority to their relationship which is more than 2,500 years of shared legacy with culture, religion, intellectual and Linguistic. The work is based on the health and economic impact of India’s cooperation at the time of the COVID-19 pandemic expressed by Rajapaksa (HT dated 26-09-2020). This essay primarily focuses on the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), which promotes intra-regional trade and FDI in Asia. The BIMSTEC organization, which has members from all of South and Southeast Asia, seeks to serve as a link between the two sub-regions of Asia.

A) Objective

The study looks into the countries of Sri Lanka and India's trading relations. Trade flows evaluate the effects of economic integration on the socioeconomic environment of intraregional trade between Sri Lanka and the BIMSTEC countries from 2000 to 2019. The study is structured as follows. After the literature review in section 2 study Intra- trade relations of India and Sri Lanka and Gravity Model, section 3 studies research methodology focuses on Socio- economic relations of India-Sri Lanka, Economic relations of India- Sri Lanka, Sample description and Data sources, Hypothesis, Model and Data description. Section 4 focuses on Data analysis and results of empirical findings of the study. Section 5 discusses the findings based on conclusion, implications of findings and scope for future research.

B) The Rationale of the Study

The studies mostly ascertained the determinants of Indo- Sri Lanka relations whether Political relations, Commercial relations, Cultural relations, Free trade agreement and socio- economic relations but few studies have discussed the intra-regional trade relations between India- Sri Lanka. This study was conducted with the main aim i.e to evaluate the Intra- trade relations of India and Sri Lanka by using export- import, total trade, major export- import commodities, and bilateral trade with BIMSTEC countries using Gravity model. Empirical evidence is used to overcome the research gap in this paper. This study provides a framework to formulate policies that helps India- Sri Lanka to gain their mutual trade. Most of the studies have ascertained the determinants of ASEAN countries, South Asia, and South East Asia but a smaller number of studies on the Gravity model in the BIMSTEC. Peris. Tui (2021) has explained gravity model for South Asian countries. There are many previous studies those examined gravity Model, we found wang xu and badman P.ryan (2016) Deardroff (1995) examined



gravity model on bilateral trade, P. Dembatapitiya and J. Weerahewa (2015) examined gravity model on South Asia countries and Batra. Amita (2016) estimated the gravity model on bilateral trade on 146 countries.

There is a need to discuss the India- Sri Lanka relationship using Gravity model variables with BIMSTEC countries. The Past literature observed that no such discussion earlier India- Sri Lanka relationship with BIMSTEC countries using Gravity model variables.

II. LITERATURE REVIEW

In this section of the paper, we go over earlier research that is pertinent to the intra-trade interactions between India and Sri Lanka as well as the gravity model. As per reading different theories by different authors certain studies discuss below:

A) Studies Based on Intra- Trade Relationship of India and Sri Lanka

Studies with a Sri Lankan focus Depending on the factors used and the size of the study's sample, ASEAN countries can be further divided. According to V.R. Panchamukhi (1993), a set of recommendations makes it easier for India and Sri Lanka to cooperate economically. To finance research that will result in a well-defined set of recommendations that will make it easier for India and Sri Lanka to cooperate economically, in conjunction with the governments of India and Sri Lanka. The studies come from Orland. According to Brian (2008), growing trade and investment have helped to improve bilateral ties between India and Sri Lanka, and India also offers favourable political and strategic advantages. Jyotsna and N.U.K sherwani (2018) in their words says that India, Sri Lanka, and Thailand are showing leading financial and trade indicators in the BIMSTEC countries. Economic freedom has an impact on bilateral trade flows throughout a ten-year period between the United States and 122 different nations, according to Sonora.J.Robert (2013). Indicators of institutional strength and trade reform policies for the 15 members of the Economic Community of West African States (ECOWAS) for data from 1984 to 2006. For the period 1984–2006 (Economic Community of West African States), Assane.D. And Chiang. P. Eric (2014) collected data on trade reform policy and institutional quality from 15 nations.

B) Studies Related to Gravity Model of Bilateral Trade

Population, Distance, Border, Language, Comcol, and Landlocked using Panel Data with OLS were all mentioned in several studies based on the impact of the Gravity model using various factors and approaches, according to Batra (2016). Wang.xu & B. Ryan (2016) use panel data, OLS, GLS with fixed random effects, GMM (Hausmen test) to explain the Gravity model with variables GDP, exchange rate, Distance, common border, and common language. P. Dembatapitiya and J. Weerahewa (2015) use panel data and OLS to examine the impact of various trading formats on bilateral commerce in South Asia with the variables distance, border, language, comcol, landlocked, island, RTA, and political regime. In their 2008 analysis of the rapid trade integration that occurred between CSEECs and the Euro area over the previous ten years, Bussiere, Fidrmuc, and Schnatz calculated bilateral trade flows with variables such as distance, territory, border, language, FTA, EU, NAFTA, CEFTA, and ASEAN using various methods such as OLS, fixed effects, and random effects. Melitz (2007) provides an explanation of the analysis of north-south bilateral trade flows using the variables GDP, Distance, Common Border, North-South Difference, Common Language, Currency Union, FTA, Common Country, and Ex-Colony. Lee and Park (2007) investigated the best regional trade agreements for East Asia and bilateral trade flows, using panel data, OLS with fixed effects, and random effects to control for variables like GDP, GDP per capita, distance, common border, common language, common coloniser, and participation in a currency union, tariff, trade facilitation, and FTA membership. Elliott (2007) used panel data and OLS to analyse trade flows in the Caribbean Sea with the variables population, distance, and CARICOM market union membership.

III. RESEARCH METHODOLOGY

This paper will discuss the major socio-economic indicators of India and Sri Lanka, Economic relations with BIMSTEC countries, Trade relations of India with Sri Lanka, India's export to Sri Lanka and India's Import with Sri Lanka, the Sample description and data sources, Null hypothesis and the model and data description.

A) Major Socio- Economic Indicators of India and Sri Lanka

The Comparative major socio-economic indicators, India and Sri Lanka are shown in this part of the research. Sri Lanka has been mired in turmoil amid surging inflation, and an economic crisis that has left the country it needs to import fuel and food. India has not been spared from global economic shocks as well. But it is better placed among large economies to handle the situation. As per a recent report by the UN, India is projected to grow by 6.4% in 2022. (TimesofIndia.com/may20,2022, New Delhi).

As global economic power gradually shifts to Asia, this region receives increased attention as never before in the evolving global economic landscape. Some important socio-economic indicators, India and Sri Lanka countries are given below:

Table 1: Comparative Major Socio-Economic Indicators, India and Sri Lanka Countries

Description	Indicators	INDIA	SRILANKA
Population	Millions	1339.180	20.877
Population growth rate	%	7.0	3.2
GDP growth rate	%	6.68	3.31
Literacy	%	69.3	91.9
HDI ranking	Rank	130	76
Life expectancy	Years	68.8	75.5
Land Area	Sqm.	2973190	62710
Unemployment Rate	%	2.7	4.2
Poverty rate	%	21.9	4.1

Source: UNCTAD <https://unctadstat.unctad.org/CountryProfile/GeneralProfile/en-GB/004/index.html>, data accessed on 17 January 2020

B) Economic Relations with BIMSTEC Economies

Sri Lanka's and India's economic difficulties are unrelated to one another. India is handling global difficulties better than Sri Lanka, which has been heading in the wrong direction. The nation expanded at an average rate of 6.2% between 2010 and 2016, serving as an example for emerging market economies. The World Bank now expects the economy to expand by 2.4% this year, down from 3.5% in 2021. (TimesofIndia.com/may20,2022, New Delhi).

India has been developing at the quickest rate among major countries and has made a strong recovery from its Pandemic downturn. From an earlier estimate of 7.8%, the RBI reduced its economic growth projection for the current fiscal year to 7.2%. (TimesofIndia.com/may20,2022, New Delhi).

C) Trade Relations of India With Sri Lanka

Since the colonial period, the relationship between India and Sri Lanka has been linked through language, religion, and cultural activities. The Indo- Sri Lanka, has long political and commercial ties in the field of education, culture, defense, and development, and also Sri Lanka is the foremost priority of India for the purpose of trade and investment. After liberalization in 1990 bilateral trade between India and Sri Lanka was growing. Sri Lanka and India countries have discussed signing a Comprehensive Economic Partnership Agreement (CEPA) bilateral FTA which includes service sectors like tourism, computer software, advertising, financial and non-financial services, health, hotel, retail services and tourism.

It will help to create employment opportunities. The 83% of exports through FTA in Sri Lanka's exports as compared to imports which are 13% of imports (Oil, Vehicles, Transport Equipment, Pharmaceuticals, Agricultures, etc., are major imports from India and in Sri Lanka's 'negative list'). Therefore, in recent years deficit of the FTA has fallen. The trade gap can be narrowed by FTA in Sri Lanka and helped to contribute towards equitable and balanced growth of bilateral trade between countries. India is one of the countries among the top ten improvers globally and the business environment has improved at a fast pace. In the global economy, India's economic prospects are promised. There is a need for going ahead with economic prospects which benefit the bilateral relationship between, India and Sri Lanka in a positive direction.

Table 2 is showing total trade of India with Sri Lanka from 2009 to 2019. Sri Lanka has ranked between 30 to 40 for total trade in India. The Export to India by Sri Lanka shows fluctuating trends with the lowest export 2,188.01 million USD in 2009-10 and the highest 6,703.72 million USD in 2014-15.

Table 2: Total Trade of India with Sri Lanka from 2009 to 2019 (value in USD million)

Year	Rank	Export	Import	Total Trade	Trade balance
2009-10	39	2,188.01	392.19	2,580.20	1,795.81
2010-11	35	3,507.50	501.73	4,009.23	3,005.78
2011-12	35	4378.79	637.43	5016.23	3,741.36
2012-13	40	3,983.87	625.81	4,609.68	3,358.06
2013-14	38	4,534.35	666.93	5,201.27	3,867.42
2014-15	30	6,703.72	756.17	7,459.89	5,947.55
2015-16	32	5,310.75	742.79	6,053.54	4,567.96
2016-17	39	3,913.15	602.20	4,515.35	3,310.95
2017-18	40	4,476.46	772.63	5,249.09	3,703.83
2018-19	36	4,710.21	1,488.40	6,198.60	3,221.81

Source: Government of India, Ministry of commerce and Industry, department of commerce, Export- Import data, <https://commerce-app.gov.in/eidb/iecnttopn.asp> accessed on 15-04-2020

India and Sri Lanka's total trade, exports, imports, and trade balance are examined in Figure 1. With Sri Lanka, India's overall trade, trade balance, and imports are all fluctuating as a result of rising trends. India and Sri Lanka's exports are growing at an increasing rate.

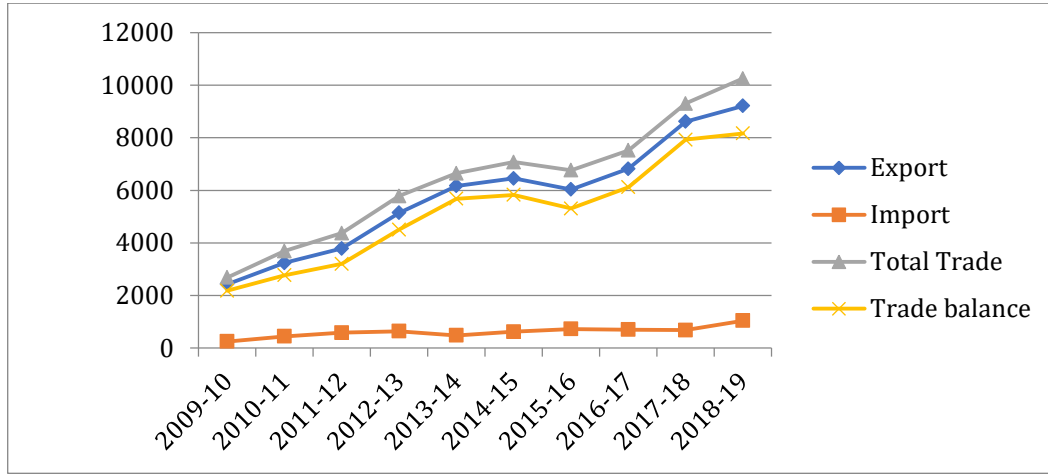


Figure 1: Total trade, Trade balance, Exports and Imports of India with Sri Lanka

a. India’s Exports to Sri Lanka:

Table 3 is showing the major commodities exported to Sri Lanka from India for the year 2017-18, and 2018-19 and the percentage of growth. The percentage growth highest for export to Sri Lanka from India is HS86 Railway or tramway Locomotives rolling- stock and parts thereof; Mechanical shows increase growth from 1.72 million USD in 2017-18 to 28.81US\$ million in 2018-19 which is 1,575.17 percent. The percentage growth lowest export to Sri Lanka from India is HS29 Organic Chemicals from 23.32 million USD in 2017-18 to 29.70 million USD in 2018-19 which is 27.38 percent. All the exported commodities for the year 2018-19 in comparison to 2017-18 are showing increasing growth. The total item exported, to Sri Lanka from India is showing an increasing growth percentage which increase from 4,710.21 million USD in 2018-19 to 4,476.46 million USD in 2017-18, which is 5.22percent. The total items exported to World from India are showing increasing growth from 303,526.16 million USD in 2017-18 to 3, 30,078.09 million USD in 2018-19and a growth percent is 8.72percent. The percentage share of export is 1.4270percent in 2018-19 and 1.4748percent in 2017-18 of all commodities exported to Sri Lanka divided by India’s total exported commodities from the world.

Table 3: Major Commodities Export from India to Sri Lanka (Value in USD million)

S.No.	HS Code	Commodity	2017-18	2018-19	% Growth
1.)	02	Meat and Edible Meat Offal	0.00	0.01	482.35
2.)	11	Product of the milling Industry; Malt; Starches; Inulin; Wheat Gluten	4.78	6.97	45.99
3.)	17	Sugars and Sugar Confectionery	27.58	136.49	394.80
4.)	24	Tobacco and manufactured tobacco substitutes	1.66	21.06	1,167.38
5.)	29	Organic Chemicals	23.32	29.70	27.38
6.)	47	Pulp of wood or of other fibrous cellulosic material; waste and scrap of paper or paperboard	0.15	0.26	72.76
7.)	50	Silk	0.19	1.60	741.02
8.)	58	Special woven fabrics; tufted textile fabrics; Lace; Tapestries; Trimmings; Embroidery	12.30	17.40	41.52
9.)	60	Knitted or Cocheded fabrics	138.20	173.66	25.66
10.)	66	Umbrella, sun umbrellas, walking- sticks, seat- sticks, whips, riding- crops and parts thereof	0.10	0.43	337.04
11.)	69	Ceramic Products	25.93	36.23	39.76
12.)	85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers and parts	111.52	127.64	14.45

13.)	86	Railway or tramway Locomotives rolling- stock and parts thereof; Railway or tramway track fixtures and fittings and parts thereof; Mechanical	1.72	28.81	1,575.17
14.)	89	Ships, Boats and Floating structures	188.75	674.06	257.12
15.)	91	Clocks and watches and parts thereof	1.40	2.27	62.30
Total of 15 Items plus other Items exported from India to Sri Lanka			4,476.46	4,710.21	5.22
India's Total			303,526.16	330,078.09	8.75
% share			1.4748	1.4270	

Source: Ministry of Commerce and Industry, Department of Commerce <https://commerce-app.gov.in/eidb/ecntcom.asp> accessed 12-04-2020

b. India's Import with Sri Lanka

Table 4 is showing the major commodities which are imported from, Sri Lanka to India for the year 2017-18, and 2018-19 and the percentage of growth. The percentage growth highest of Import from Sri Lanka by India is HS89: Ships, Boats, and Floating Structures are 2,723.91percent which shows an increase in growth from 22.76 million USD in 2017-18 to 642.64 million USD in 2018-19. The percentage growth lowest, of imports from Sri Lanka by India is HS40 Rubber and articles thereof from 28.49 million USD in 2017-18 to 31.47 million USD in 2018-19 is 10.45 percent. All the commodities for the year 2018-19 as compared to the previous year 2017-18 are showing increased growth. The total items imported in India is showing a growth of percent 92.64percent from Sri Lanka which is increasing from 1,488.40 million USD in 2018-19 to 772.63 million USD in 2017-18. The total items are showing a growth percent of 10.42percent imported from the World to India which is increasing from 465,580.99 million USD in 2017-18 to 514,078.42 million USD in 2018-19. The percentage share is 0.2895percent in 2018-19 and 0.1659percent in 2017-18 of all commodities imported from Sri Lanka divided by India's total imported commodities from the world.

Table 4: Major Commodities Imported from Sri Lanka to India (Value in USD million)

S.No.	HS Code	Commodity	2017-18	2018-19	% Growth
1.)	03	Fish and Crustaceans, Molluscs and other aquatic Invertebrates	0.22	0.71	219.11
2.)	11	Products of the milling industry; Malt, starches; Inulin; wheat Gluten	9.57	10.65	11.24
3.)	15	Animal or vegetable fats and oils and their cleavage products; Pre Edible fats; animal or vegetable wax	0.98	12.41	1,165.15
4.)	18	Cocoa and Cocoa Preparations	2.68	3.39	26.50
5.)	30	Pharmaceutical Products	0.50	2.23	345.39
6.)	33	Essential oils and resinoids; Perfumery, Cosmetic or toilet Preparations	7.59	10.56	39.05
7.)	40	Rubber and articles thereof.	28.49	31.47	10.45
8.)	50	Silk	0.01	0.02	62.28
9.)	52	Cotton	0.68	2.02	198.47
10.)	55	Man- made Staple Fibres	1.86	11.09	494.77
11.)	62	Articles of Apparel and clothing accessories, not knitted or Crocheted	21.64	51.70	138.93
12.)	73	Articles of Iron or Steel	1.42	7.98	462.46
13.)	84	Nuclear reactors, Boilers, machinery and mechanical appliances; parts thereof	9.15	52.50	473.79
14.)	89	Ships, Boats and Floating Structures	22.76	642.64	2,723.91
15.)	90	Optical, Photographic Cinematographic measuring, checking Precision, Medical or Surgical Inst. And Apparatus parts and accessories thereof;	1.52	6.32	316.49
Total of 15 items plus other items imported from Sri Lanka			772.63	1,488.40	92.64
India's Total			465,580.99	514,078.42	10.4
% Share			0.1659	0.2895	

Source: Ministry of Commerce and Industry, Department of Commerce <https://commerce-app.gov.in/eidb/ecntcom.asp> accessed on 14-04-2020

D) The Sample Description and Data Sources:

Due to the lack of data, the data period range for the sample study is limited to 2000 to 2019. The empirical research uses data from the seven BIMSTEC nations of Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand. The

World Development Indicators (WDI), the Asia Regional Integration Centre (ARIC), the Asian Development Bank (ADB) Database, the World Bank Data Bank, and the UNCTAD database all provided the data for the variables.

E) Variables used for the Study:

The following variables are used to study for research purposes:

a. Dependent variables

The estimation of trade costs for the dependent variables undertaken from bilateral trade. The trade for Bilateral Trade includes Export and Import countries. The variables for bilateral trade between Sri Lanka as *s* and BIMSTEC countries as *j*. The dependent variable is denoted as T_{sj} .

b. Independent variables:

The flow of independent variables in trade between countries *s* and *j*, while the independent variable is for GDP, Distance, border, common language, and landlocked. The information was collected between 2000 and 2019. The following is an explanation of the many independent variables utilised in the gravity model

1) Gross Domestic Product (GDP) Per Capita at the current US dollar

Sohn. C.H. (2005) explains GDP per capita as the purchasing power of exporting and importing countries. The GDP per capita is calculated at the current US dollar for the country *s* as GDP_{st} and *j* countries as GDP_{jt} measures the size of the economy. The GDP is calculated for Sri Lanka and BIMSTEC countries for percentage growth.

2) Distance

Distance is calculated between country *s* and *j* measured trade goes by air not by sea or land. *s* and *j* in Kms have calculated distances between countries as D_{sj} .

3) Border

s and *j* are calculated $Border_{sj}$ as a dummy variable, if share common border then unity is one and zero if not share common borders.

4) Common Language

This variable may increase transaction costs when the language of trading partners is not known. $Lang_{sj}$ is a dummy variable which is one when countries share a common language otherwise zero.

5) Landlocked

$Landlocked_{sj}$ is calculated as one when the trading partner is landlocked and zero when if not.

IV. DATA ANALYSIS AND RESULTS

An explanation which is based on techniques and results of data analysis to connect to objectives/hypotheses.

A) Null Hypothesis

- 1) H_0 : The GDP per capita of BIMSTEC has a negative impact on bilateral trade.
- 2) H_0 : Distance has a beneficial impact on bilateral trade.
- 3) H_0 : Dummy factors have a favourable impact on bilateral trade.

B) The Model and Data Description:

There are numerous studies that analyse trade patterns and interactions using the gravity model of bilateral trade flows. Different scholars, including Egger (2000, 2002), Baltagi et al. (2003), and Serlenga and Shin (2007), described similar studies on bilateral trade flows of the Gravity Model. The following Gravity Model of BIMSTEC Countries to estimate Bilateral Trade is explained below.

The empirical estimation of impact of selected variables of BIMSTEC countries is GDP_{sj} , D_{sj} , $Border_{sj}$, $Lang_{sj}$, $landlocked_{sj}$, FTA_{sj} . The empirical estimation of the impact of selected bilateral Trade Indicators of BIMSTEC countries on import and export, we use the following empirical models:

$$T_{ij} = \alpha_0 + \alpha_1 GDP_{it} * GDP_{st} + \alpha_2 D_{ij} + \alpha_3 Border_{sj} + \alpha_4 Lang_{sj} + \alpha_5 Landlocked_{sj} + \mu_{sj}$$

Where *s* and *j* denote countries and T_{sj} denotes the value of bilateral trade between countries *s* and *j*.

T_{ij} is bilateral trade between countries *s* and *j*

GDP_{sj} is gross domestic product of countries *s* and *j*

D_{sj} is the bilateral distance between countries *s* and *j*

$Border_{sj}$ is the common or shared border between countries *s* and *j*

$Lang_{sj}$ is the official language between countries *s* and *j*

Landlocked_{sj} is the number of landlocked between countries s and j
 μ_{sj} is a normally distributed error term and the myriad other influences on bilateral trade which is equal to 0.

The impact of patterns and behaviour on intra-regional trade between Sri Lanka and BIMSTEC countries is assessed using the equation above. Trade in imports and exports between two countries is the dependent variable in the equation. GDP, Distance, Border, Official Language, and Landlocked are independent variables that will be estimated for bilateral trade and are collected data as a dummy variable that assumes a value of 0/1 based on the number of nations in a trading pair in the equation.

Table 5: Statistical calculations

Min.	1 st Quartile	Median	3 rd Quartile	Max.
0.207	0.0422	0.0053	0.0595	0.1637

Table 6: Estimates of Gravity Model for Bilateral Trade (2000- 2019)

Parameters	Estimated values of the Coefficients
Ln GDPit	0.948 (0.001)***
Ln GDPjt	0.410 (0.001)***
Ln Dij	- 3.80 (0.001)***
Borderij	- 0.78 (0.001)***
Langij	- 0.14 (0.001)***
Landlockedij	- 0.78 (0.001)***
Constant	12.16 (0.001)***
R sq. overall	0.971

Source: Author's calculations

Note: P- values in Parentheses (P <0.05*, P < 0.01 **, P < .001***)

V. DISCUSSION OF THE FINDINGS

The discussion on findings by comparing and contrasting with previous research for the study to locate present research by the researcher.

A) Gravity Model: Empirical Evidence

The Gravity model is a method and tool used frequently to estimate global trade flows with explanatory variables and policy implications for new variables or parameters affecting trade flows. The used statistical tools and techniques give results accurate model variables Washington S. Karlaftis MG, Mannering, FL (2003).

The statistical method and tool known as the OLS (Ordinary Least Square) is used to calculate the coefficient of gravity model variables in log-linear form. This technique helps researchers to analyze and evaluate policies using modeling and methodology to calculate gravity model.

In this study Gravity model equation is based on Breusch- pegan test value where null Hypothesis is constant or Homoscedasticity residual P- value > 0.05: Accept H0. The result of Breusch- Pegan test is BP= 10.39 and P- value = 0.1092, null hypothesis is rejected. It shows no hetroscedasticity in the residual of the model. Panel data for OLS with pooled coefficients and other estimations are calculated for the period 2000-2019. We use Ri386 3.5.0 software technique for the above-mentioned equations. The bilateral trade which is represented as Tij is the dependent variable shown in Table 6. All independent variables are shown with statistical results. The P- value is less than 0.05 (P<0.05) which shows the fit model and it means independent variables have a significant influence on the dependent variable. The overall R2 is 0.971 means the model fitted at the 97percent, of the variation in the data. The number of variables is n=6 for time (t= 20) and the total number of observations is 120. The GDP per capita for both Sri Lanka (GDPit) and other BIMSTEC countries (GDPjt) are estimated positive and significant at 1 percent. The GDP per capita coefficient of the home country is high as compared to, other

BIMSTEC countries as given by Kimura and Lee (2006). It shows Sri Lanka not only exports more goods and services but also imports more goods and services. The estimation coefficient, of the distance variable, is negative and significant at 1% which explains transportation costs is one of the trade barrier in bilateral trade flows as given in the findings of Herrera (2013) and in the words of Batra.A (2004) "Distance is the proxy of transportation costs which is needed for delivering commodities in a particular time, synchronized cost which is punctuality, combine of many types of input to avoid production resistor in factories and transaction costs included finding trading opportunities, these costs are, inversely related to trade." The distance between countries sharing borders and trading partners found always negative and significant in the case of bilateral trade (Ledermen.D, Olarreaga .M and Soloaga. I (2009). The Border is showing negative but significant at 1% as shown in Baier et.al (2007) and Carrere (2006). Kirkpatrick and Watanabe (2005) were showing the border is negative and insignificant of sub- Sahara Africa in their estimation. The dummy variable official language is showing a negative coefficient but is also significant at 1%. The Official language was found not consistent with studies of other countries (Wang.Xu and Badman.R, 2016). The interpretation of official language estimated inconsistent results as estimated by other countries. In Sri Lanka and BIMSTEC countries, people speak similar official languages but in smaller areas. The landlocked variable is showing negative but significant at 1 percent. This variable explains whether the country has a seaport or not. It means that when the country has no sea transport directly it may automatically reduce trade between countries because of the high cost of transportation and a port harbor in the sea will facilitate an increased volume of trade Arifai.S & Hastiadi .F(2018).

VI. CONCLUSION AND IMPLICATIONS OF THE STUDY

The conclusion is the summary of the study and also explains the implications of the study.

A) Conclusion

The research studies presented that there is a trade relationship between, Sri Lanka and India growing. The ISFTA may steer significant improvement in bilateral trade between two countries. Both countries boarded by forming new areas of trade and development. In terms of commerce and investment, as well as technology transfers, information sharing, and skill development, Sri Lanka and India are taking their commercial partnerships to new heights in a chirpy, expansive, and emotive manner. A growing economic and commercial cooperation exists between the two nations. The overall bilateral trade between India and Sri Lanka has significantly increased as a result of the India-Sri Lanka Free Trade Agreement (ISFTA). Prime Minister Modi demonstrated outstanding leadership during the COVID-19 pandemic, according to Prime Minister Mahinda Rajapaksa, with a new vision and objective, a cooperative connection, and aid to nations in the Bay of Bengal region. Both the countries agreed on bilateral relations and new fresh opportunities and their leaders expressed their willingness to work together during the period of COVID-19. India has shown their support and Commitment to Sri Lanka for health and economy in this pandemic (Ministry of external affairs, India (2020)," Sri Lanka and India have trade complementarities that's increased significantly. Both countries have dynamic trade relationship potential and promise for future trade relations. Sri Lanka is one of the nations where India wants to invest first. India can engage in a wide range of industries, including retailing of petroleum products, healthcare facilities, telecommunications, vanaspati, copper, and other metals, as well as real estate, telecommunications, hospitality and tourism, banking and financial services, IT, and food processing, to name a few. The most popular tourism destination for Sri Lanka is India, which is expanding quickly. To encourage the facilitation of commerce, investment, industrial exchanges, and cooperative economic connections between two countries. The trading potential between India and Sri Lanka is greatest for goods like animal feed, furniture, and parts thereof, as well as bedding, mattresses, mattress supports, cushions, and other filled furniture. As a result, bilateral cooperation in important fields like agriculture, education, health, science and technology, tourism, telecommunications, autos, apparel, banking and financial services, and space is improved.

This research has presented the intra- trade relationship between Sri Lanka and India by using the Gravity model with few variables and export Import commodities between these south Asian countries. There are many more things that remain to be included in improving this research. completed and many reaction possibilities that can be used in improving this research. There are a number of research points that can be included are presented as suggested below.

- 1) This research may give a comparison with other organizations like SARRC, ASEAN, and BRICS.
- 2) It would also be interesting to choose more variables other than those taken in this research like population, more organizations can be included like ASEAN, ASEAN +3, and culture.
- 3) Another aspect to consider in future work is to use the Revealed comparative advantage (RCA) method, Trade Complementarities, and Trade intensity of these countries.

B) Implications of Findings:

The study's conclusions could have some ramifications for Sri Lanka's and India's future bilateral ties. The findings have certain implications are

- 1) There are connectivity issues these are important via strengthening ports. It was discovered that India looking at Sri Lanka for the export market. Therefore, transport facilities will help to trade goods manufactured to keep engaged both countries in a higher intra- industry trade.
- 2) India must take specific actions to enhance the enabling environment, such as enabling the opening of letters of credit, quick customs clearance, and other financial facilities that must be established in the near future. Non-tariff obstacles should also exist to facilitate quick trade with minimal corporate loss.
- 3) Labelling in three languages is necessary for export to Sri Lanka. Concern should be given to concerns including certification, packaging specifications, country of origin laws, labour migration, and cost considerations.
- 4) Sri Lanka and India are required to develop infrastructure facilities that boost trade ties.

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