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Why did India Pull Out of Regional Comprehensive Economic Partnership (RCEP)? A Gravity Explanation of the Indian Puzzle

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Abstract: India's decision to pull out from the Regional Comprehensive Economic Partnership (RCEP) was a surprise to analysts as RCEP is currently the most significant Free Trade Agreement (FTA). This paper examines the rationality of India's decision. We used gravity set-up and Poisson Pseudo Maximum Likelihood (PPML) estimator to analyse India's export and import data for nine sectors with 45 trading partners for the period 2001-2021. The results show that India's export is inelastic to tariff while import to India is elastic to tariff. Export remains positive despite tariff on Indian export while import declines with tariff imposed by India. This rationalizes India's decision to pull out from RCEP. At the sectoral level, tariff elimination reduces India's export of vegetables, food, minerals and chemicals, plastics and plastics goods. However, tariff elimination increases India's export of animal and animal food, leather, wood and wood products, textiles and foot ware. Tariff elimination increases import of vegetable, food stuffs, chemicals, plastic and leather to India. The sectoral results show that India has reason to doubt its gain from joining RCEP as the sectoral results are mixed and the overall gain might not be in favour of India.

Keywords: RCEP; India; FTA; Gravity Model; PPML; China

1. Introduction

1.1 Background:

The Regional Comprehensive Economic Partnership (RCEP) came into force on January 1, 2022. Currently 12 countries from the ASEAN and its regional partners have ratified RCEP. These are Australia, New Zealand, Brunei Darussalam, Cambodia, China, Japan, Laos, Malaysia, Republic of Korea, Singapore, Thailand and Vietnam[1)]. Countries yet to ratify are Philippines, Myanmar and Indonesia. RCEP is the world's largest Free Trade Agreement with member countries accounting for 2.3 billion of the world's population,$25.8 trillion of the World's GDP, $12.7 trillion of global trade, 31% of global Foreign Direct Investment (FDI) Flows as per the World Bank[2)]. The partnership has a strong significance to the region as it promises to add $245 billion and 2.8 million jobs to the regional economy by 2030[3)]. The initial idea of the partnership was proposed and backed by China at the 19th ASEAN summit in Bali in 2011 in response to the Trans-Pacific Partnership (TPP) backed by the United States[4)].

RCEP addresses several critical issues on international trade. These are- trade in goods, trade in services, investment, economic and technical cooperation, intellectual property, competition, dispute settlement. It intends to progressively eliminate (i) tariff and non-tariff barriers on trade in goods (ii) restrictions and/or discriminatory measures in trade in services[5)]. It also addresses the issues of investment climate, economic and technical cooperation, intellectual property, competition and dispute settlement measures[6)]. RCEP is expected to benefit sectors (agriculture, automotive and consumer electronics) with higher custom duties, improve market access through significant tariff cuts on traded goods and open at least 65% of all service sectors to increased foreign shareholding limits while compared to other existing FTAs, expanding the scope to include horizontal provisions on e-commerce and assistance to small and medium enterprises (SMEs)[7)].

1.2 The Indian Perspective

With nominal GDP of USD 2.9 trillion in 2021, India ranks as the 6th largest economy of the world and 3rd

largest in Asia[8]. By 2030, India's export is expected to reach USD 1 trillion[9]. Given its significance in global and regional trade, India was expected to be a major participant in RCEP. Its decision to pull out surprised analysts and RCEP founding members. Analysts such as Deb[10], Gaur[11], Palit[12], Ping[13] and Wicaksono[14] attributed this decision to protection of the domestic market. India's burgeoning trade deficit with China[15], experience from earlier FTAs with China and structural changes in the Indo-Pacific region followed by US's withdrawal from the TPP[14]. Figure 1 provides a historical account of the timeline of events.

Descriptive statistics show that even though India's export with China gradually increased to 6.52 % in 2020 as opposed to 3.36% in 2016 it has remained mostly unchanged for the rest of the countries. India's import to RCEP countries shows that the trend has remained mostly static with China's share of India's import standing at 17.3% in 2020 as opposed to 17.2% in 2016 (Table 1).

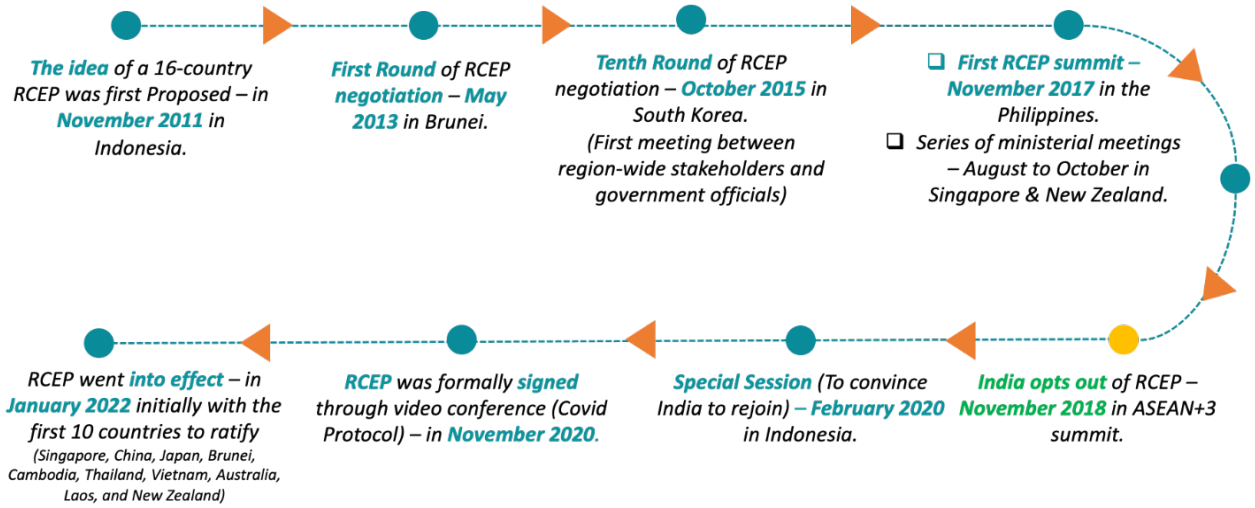

Fig 1: Historical Timeline of Events Leading to India's Withdrawal from RCEP

Between 2000 to 2019, the trade balance between Indian and China was positive for commodities but negative for technology intensive industries. It specifically shows a strong growth in downward movement of trade balance. This means rising import against export in high-skill and technology intensive manufactures. There is also rising import against export in medium and low skill manufactures as well as la bour intensive manufactures even though its share is low.

Overall, the import largely offsets export leading to rising trade deficit (Fig 2).

1.3 Research Objective

This paper examines the rationality of India's decision by using the gravity equation with country fixed-effects for both export and import to address for multilateral resistance. We specifically examined whether tariff on India's export and import along with FTA dummies can explain the rationality of India's withdrawal. If we find that after joining RCEP India's exports get more market access than import then India has made a mistake by not joining. Otherwise, India's decision to pull out is rational. Besides, the paper also examines, sectors that gain market and sectors that lose market in a discriminatory tariff withdrawal scenario.

Table 1: India's export and import trends with RCEP countries (in % share of total)

	Export (% share of total)					**Import (% share of total)**				
Country	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
China	3.36	4.20	4.93	5.14	6.52	17.2	16.2	15.4	15.3	17.3
Singapore	2.54	3.42	2.81	2.81	2.55	2.3	2.2	2.8	2.9	3.0
Malaysia	1.61	1.92	1.96	1.87	2.21	2.3	2.0	2.0	2.0	2.0
South Korea	1.42	1.55	1.59	1.50	1.63	3.4	3.6	3.2	3.2	3.3
Vietnam	2.29	2.68	2.02	1.65	1.62	0.9	1.0	1.4	1.5	1.5
Indonesia	1.22	1.32	1.51	1.44	1.60	3.2	3.6	2.9	2.8	3.0
Japan	1.56	1.60	1.55	1.52	1.54	2.5	2.2	2.3	2.5	2.5
Thailand	1.11	1.27	1.38	1.33	1.44	1.5	1.5	1.5	1.5	1.5

	Export (% share of total)					Import (% share of total)				
Country	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
Australia	1.19	1.29	1.21	0.96	1.32	3.6	4.2	3.8	3.2	3.1
Philippines	0.66	0.62	0.55	0.55	0.55	0.1	0.2	0.2	0.1	0.2
Myanmar	0.47	0.40	0.42	0.31	0.31	0.3	0.2	0.1	0.2	0.2
New Zealand	0.14	0.13	0.14	0.14	0.18	0.2	0.1	0.1	0.1	0.1
Cambodia	0.05	0.05	0.06	0.07	0.06	0.0	0.0	0.0	0.0	0.0
Brunei	0.02	0.02	0.02	0.03	0.02	0.1	0.1	0.1	0.1	0.1
Laos	0.01	0.02	0.01	0.01	0.00	0.1	0.1	0.0	0.0	0.0

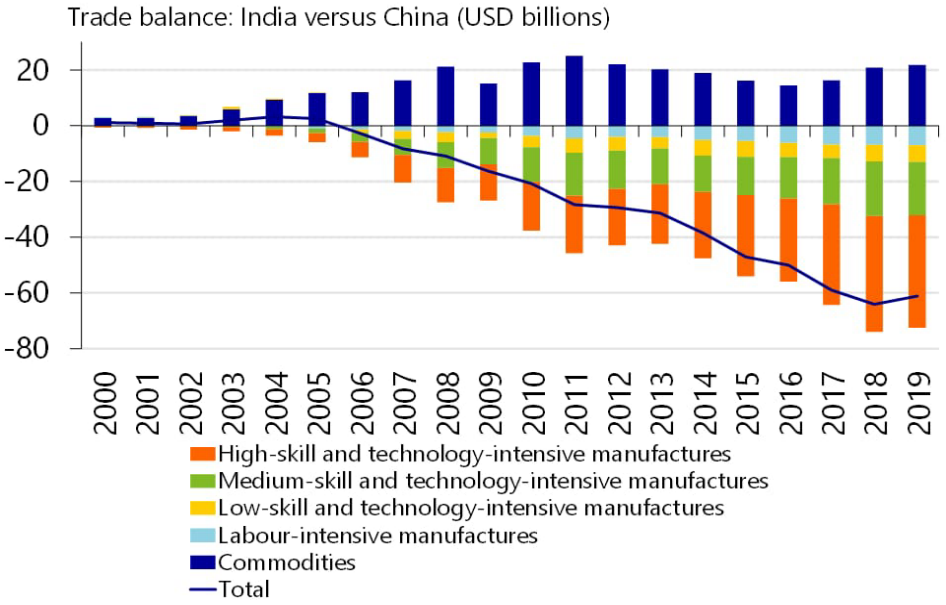

Fig. 2: Trade Balance-India vs China (USD Billions)

1.4 Recent Works

The recent works related to India's decision to pull out from RCEP can be divided into two school of thoughts based on the methodology applied. The first school of thoughts attempt to explain India's decision based on descriptive analysis of economic, legal and geo-political issues. Wang and Sharma examined the RCEP provisions that India did not want to comply with, along with the economic advantages of India in joining RCEP as opposed to its geo-political risks and attributed India's decision to India's interest in protecting the domestic market from Chinese import through strict Rules of Origin (ROO), supremacy of the state over RCEP on the data wealth generated by e-commerce, concern that India will lose its competitive advantage in dairy and dairy products to Australia and New Zealand with which India currently does not have any FTA[16]. Pramila Crivelli elaborated on the ROO and explained that high-intra regional trade values with significant preference margins could allow for substantial tariff savings and this could benefit small economies within RCEP[17]. Raghavan[18] and Bhutani[15] investigated the geo-political tensions with China, the economic threat and the unfavorable trade deficit. Sundaram looked at India's self-reliant agenda to enhance its manufacturing sectors and commented that India might return to RCEP once its self-reliant agenda is achieved[19]. In context of self-reliance Krishna explained the need for India to reform its policies which includes Trans Pacific Partnership, Labor regulations, environmental regulations, Intellectual Property Protection (IPP), operation of state-owned enterprises, unilateral liberalization, domestic reforms[20]. The school of thoughts that build on econometric analysis is still small, yet growing. Using Anderson and Wincoop's[21] structured gravity model Kumari, Fatma and Bharti[22] looked into trade creation and trade diversion effects of FTAs for India. They found that for almost all Indian FTAs, the coefficients are negative and significant. This indicates at trade diversion affecting domestic trade for the members of the particular FTAs. They also found that while internal trade is considered, India-Japan Comprehensive Economic Partnership Agreement (IJCEPA) had a negative impact on overall trade between India and Japan and concluded that Indian FTAs lead to adverse domestic effect and this explains India's hesitance in joining RCEP. Bhardwaj, Kumar and Dutta used trade indices to assess convergence of export similarities between two countries[23]. It shows

that India has no trade competition in its top 10 exports from member countries in any non-member countries.

Studies by Bhardwaj, Kumar and Dutta[23], Jain[24] and Mahadevan & Nugroho[25] have also explored India's loss from not joining RCEP. By using Revealed Comparative Advantage Index, two separate studies show India has a comparative advantage in several products. However, because it was unable to leverage this comparative advantage, the trade deficit with those nations increased in absolute terms. According to those papers' assessment of comparative advantage, India may ultimately benefit if they join RCEP. Other studies have indicated that India loses out by not joining RCEP in terms of GDP growth, export potential, technology and position in the global value chain. Some raised concern that leaving RCEP might adversely affect India's foreign direct investment and its capacity to negotiate with other trade giants[10].

1.5 Research Gap

In the political circle, India's decision to pull out from RCEP happened suddenly and it came out as a surprise to many but the corresponding research in the area of trade and investment is only emerging as soon as it happened. This paper fills the gap in the academic research particularly on RCEP and its relation to India. The India's decision was a surprise to many because it was an active participant in all the earlier proceedings of RCEP. Using two-dimensional panel data both by considering the partner dimension and commodity dimension this kind of work will aid the policy makers in running the day-to-day affairs of RCEP in the absence of a prominent country of South Asia. In the absence of India, RCEP has become a truly East Asian agreement.

Besides, there is literature gap in the area of disaggregated Gravity approach in determining gains and losses in trade for India due to withdrawal from RCEP. Tariff and sectoral effects on trade flow for India are not investigated in this regard. Our research contributes to the existing and emerging body of works on RCEP, India's decision to pull out from RCEP and the literature on international trade by explaining the impact of tariff withdrawal on export and import in one origin with multiple partner PPML fixed-effects gravity equation set-up where the origin and the partners are part of different FTAs. We also assess whether the signs of the gravity variables (distance, GDP, landlock, island nation) holds in such set-up. We undertook pure gravity analysis in addition to gravity with sectoral tariff for Indian import from partner and Indian export to partner. Our study provides insights to the sectoral level effect of FTAs that was explained through price indexes by Bhardwaj, Kumar and Dutta[23].

1.6: Organization of this paper

Section 2 includes a thorough literature review with emphasis on RCEP, the current literature, and a perspective on India's trade along with details on the models that can be used in the context of our research. Guided by the findings in section 2, we present the estimation model in section 3 which is followed by discussion and analysis of results in section 4. Section 5 provides our policy recommendations and conclusions.

2. Literature Review

In this literature review we first explore the different models that are used to analyze the impact of FTAs on bilateral trade and define the rationale for the use of gravity model in the context of our paper. We then deconstruct the gravity model by reviewing its recent applications in analyzing the impact of RCEP. Based on this review, we derive key deductions that guided us on constructing our model for the research.

Economists use ex-ante models like Software for Market Analysis and Restrictions on Trade (SMART), a partial equilibrium model that analyzes a single market, and Computable General Equilibrium (CGE), which analyzes all markets, to assess the effects of trade liberalization before implementing an FTA. Plummer, Cheong and Hamanaka[26] and Mathur, Arora and Bhardwaj[27] used SMART simulation to compare the benefits of RCEP and BRICS under a free trade area for goods and found that RCEP would benefit India more.

Park, Petri, Plummer used CGE model to construct three scenarios: US-China trade war, Comprehensive and Progressive Agreement on Trans-Pacific Partnership (CPTPP), and RCEP[3]. China will lose USD 515 billion from the trade war, USD 14 billion from CPTPP, and USD 127 billion from RCEP. India will gain USD 17 billion from US-China trade war but will lose USD 5 billion from CPTTP, and USD 7 billion from RCEP. Japan and South Korea are expected to gain USD 60 billion and USD 28 billion from RCEP, respectively. They concluded that India will lose USD 5 billion in exports due to RCEP by 2030. Plummer, Cheong and Hamanaka explains that the CGE models require extensive data and are prone to arbitrary selection of data by the researcher and hence these are sensitive to the assumptions; the most significant challenge however is the lack of time dimension in the CGE model[26]. The time dimension might be of significance for India in its decision to join RTA given the changes in trade patterns specifically with China in recent years as we have shown in table 1.

Several authors used GSIM to analyze RCEP's impacts on member countries. GSIM quickly and transparently analyzes global trade policy changes with minimal data and compilation[28]. Using GSIM, Nguyen & Le found that joining RCEP will slightly benefit Vietnam's apparel industry using GSIM[29].

Even though gravity model is generally used as an ex-post model[30], a large number of researchers have used it in the context of RCEP as an ex-ante partial equilibrium model. Marikan, Arip, Khan and Hamzah conducted a panel data analysis to analyze the impact of joining RCEP

on Malaysia's economy based on the traditional gravity model by incorporating the data of Malaysia and 15 RCEP countries (over the period of 1997 to 2018)[31]. By performing fully Modified OLS and Dynamic OLS, the study inferred that Malaysia will gain from increased Foreign Direct Investment (FDI) if it joins RCEP while the increased economic growth will sustain in the long run along with increased trade surplus.

Aprilianti provides insights into the advantages that Indonesia can gain by joining RCEP[32]. Employing a stochastic gravity model and utilizing the panel data of ASEAN+6 countries from 1990 to 2017, the study inferred that RCEP will accelerate Indonesia's growth. Pertinent to note that Park, Petri and Plummer who used a CGE model to analyze post-ante impact of RCEP, found that RCEP will add USD 4 billion to Indonesian economy by 2030[3].

Akram, Ghani and Ud Din used gravity model to determine Pakistan's trade prospects if it joins RCEP and examined how economy size, distance from partners, language, contiguity, and RCEP affect bilateral trade flow[33]. They used the gravity model to evaluate the time-dependence effect to address multilateral resistance. If Pakistan joins RCEP, export and import patterns will be similar and investment will increase. A thorough analysis was undertaken to investigate the benefit of Bangladesh from joining RCEP[34]. The study adapted the gravity equation of Feenstra to address multilateral resistance and used one period lag in their model[35]. The study used two-way fixed effects estimation along with the traditional gravity variables (GDP, population etc.) and dummy variables of important trade blocs for Bangladesh's trade flow (SAARC, BIMSTEC, SAPTA, APTA) including RCEP. Employing the data of Bangladesh's trade flow over the time ranging from 1972 to 2019 and by using Pooled OLS, 2SLS, and GMM estimators the study concluded that Bangladesh gains from its existing FTAs and its trade flow increases if we consider bilateral trade between Bangladesh and RCEP members.

Kumari, Fatma and Bharti investigated India's trading relationship with countries that are members of both the current FTAs and RCEP treaty and examined how FTAs affect India's domestic market using trade data from 1962 to 2019[22]. This study used an extended structural gravity model and PPML estimation. Time-dependent fixed effects of exporter and importer and pair effect were used to control multilateral resistance. To study trade diversion and creation, the authors extended the model. The trade diversion effect of all the aforementioned existing trade blocs of India was found after scrutinizing the trade within India separately. The authors concluded that India should not join RCEP because FTAs hurt its domestic market.

Liu, Wu and Yu used panel data of 16 countries from 2001 to 2016 and a traditional gravity model to examine how China's relationship with other RCEP countries affects RCEP and China's role in it[36]. The hybrid model and random method showed that RCEP members' industrialization and distance from partner countries are the main factors affecting trade. Chang, Huang, Shang and Chiang examined how RCEP and marine transport affect trade[37]. The study's gravity equation was estimated using PPML. The study considered EU, RCEP, and NAFTA FTA dummy variables for global trade data. The major findings showed that RCEP will boost trade with an improved marine transport system. RCEP had a greater impact than EU.

A key issue in the gravity model is the use of FTA as an exogenous treatment effect and researchers have argued that it is more endogenous than exogenous[38]. To address this problem, the synthetic control method (SCM) is proposed. SCM is found to be useful in ex-post analysis as benefits of FTAs take time to accrue and this requires that the unobserved confounders are allowed to vary over time. By using SCM in a gravity model involving 61 Latin American country pairs representing NAFTA, Mercosur, Group of Three, Andean Community and Central American Common Market for the period 1989-1996, Hannan[30] concluded that the trade agreements boosted exports in Latin America on average by 76.4% points over 10 years.

Building on these findings, we conclude that in context of analyzing India's decision to withdraw from RCEP, a fixed effect gravity model specification with RCEP dummy where it takes unity if the partner is an RCEP member and 0 otherwise, along with FTA dummies can explain the impact of tariff on Indian export and import and this can then be used as proxy measure to explain the rationale of India's decision. More specifically if we can prepare an estimation framework at sectoral level with sector specific bilateral tariff structure in the model that will provide in-depth direction about potential gain or loss in bilateral term with RCEP members in relationship with non-members.

3. Model, Methodology and Data

3.1 Model Specification

Trade flow in gravity model with its own one period lag effects coupled with population effect can be presented as follows:

$$TF_{INDjkt} = \frac{TF_{INDjkt-1}^{\delta 1} RGDPD_{INDkt}^{\delta 2} RGDPP_{jkt}^{\delta 3} Population_{INDt}^{\gamma 2} Population_{jt}^{\gamma 3} \varepsilon}{Distance_{INDj}^{\gamma 1}} \quad (1)$$

We deconstruct equation 1 into two models respectively for export by India and import to India to measure sectoral trade flow and fixed effects to capture multilateral resistance

In equation 1, TF (Trade Flow) is considered as our dependent variable between India and Partner countries of India. In the independent variable $RGDP_{Ind}$ refers to Real GDP of India over the time, RGDPP refers to Real GDP of partners countries of India over the time,

$Population_{Indt}$ refers to the population of India over the time, $Population_{jt}$ refers to population of India's partner countries over the time. $Distance_{Indj\ refers}$ to the distance between India and partner countries of India. Then we take two separate model for India to measure sectoral Trade Flow and Fixed Effects to capture multilateral resistance.

3.1.1For Export

$$Export_{INDjkt} = \mathrm{A}\frac{RGDPInd_{INDkt}^{\delta 2} RGDPP_{jkt}^{\delta 3} Population_{INDt}^{\gamma 2} Population_{jt}^{\gamma 3} \varepsilon}{Distance_{INDj}^{\gamma 1}} TariffPartner_{jkt}^{\partial} \quad (2)$$

In equation 2, Sectoral Export of India is considered as our dependent variable between India and Partner countries of India. On the right-hand side, A is a constant, $RGDP_{Ind}$ is Real GDP of India over the time, RGDPP is Real GDP of partner countries of India over the time, $Population_{Indt}$ is the population of India over the time, $Population_{jt}$ is the population of India's partner countries over the time. $Distance_{Indj}$ refers to the distance between India and partner countries of India. DX_{jt}^{∂} refers to export tariff by India's partner countries and ε is the error term.

3.1.2For Import

$$Import_{jINDkt} = \mathrm{A}\frac{RGDPInd_{INDkt}^{\delta 2} RGDPP_{jkt}^{\delta 3} Population_{INDt}^{\gamma 2} Population_{jt}^{\gamma 3} \varepsilon}{Distance_{INDj}^{\gamma 1}} TariffInd_{jkt}^{\partial} \quad (3)$$

In equation 3, Sectoral Import of India is considered as our dependent variable between India and Partner countries of India. On right hand side, A is a constant, $RGDP_{Ind}$ refers to Real GDP of India over the time, RGDPP refers to Real GDP of partners countries of India over the time, $Population_{Indt}$ refers to the population of India over the time, $Population_{jt}$ refers to the population of India's partner countries over the time. $Distance_{Indj}$ refers to the distance between India and partner countries of India. $TariffInd_{jkt}^{\partial}$ refers to import tariff by India to partner countries on specific sector and ε is the error term.

In econometric form, equation (1) can be expressed as:

$$lnTF_{INDjkt} = \delta_0 + \delta_1 lnTF_{INDjkt-1} + \delta_2 lnGDPD_{INDkt} + \delta_3 lnGDPP_{Jkt} + \gamma_1 lnDistance_{INDj} + \gamma_2 lnPopulation_{INDt} + \gamma_3 lnPopulation_{jt} + \varepsilon_{INDjkt} \quad (4)$$

Equation (4) is deconstructed to three models respectively to analyze export (equation 5), import (equation 6).

$$lnExp_{INDjkt} = \delta_0 + \delta_1 lnTF_{INDjkt-1} + \delta_2 lnGDPD_{INDkt} + \delta_3 lnGDPP_{Jkt} + \gamma_0 ExpTariff_{ijkt} + \gamma_1 lnDistance_{INDj} + \gamma_2 lnPopulation_{INDt} + \gamma_3 lnPopulation_{jt} + \gamma_4 RTA_j + \gamma_5 SAARC_j + \gamma_6 BIMSTEC_j + \gamma_7 SAFTA_j + \gamma_8 APTA_j + \gamma_9 RCEP_j + \gamma_{10} Landlock_{INDj} + \gamma_{11} Island_{INDj} + \mu_j + \lambda_t + \varepsilon_{INDjkt} \quad (5)$$

$$lnImp_{jINDkt} = \delta_0 + \delta_1 lnTF_{INDjkt-1} + \delta_2 lnGDPD_{INDkt} + \delta_3 lnGDPP_{Jkt} + \gamma_0 ImpTariff_{ijkt} + \gamma_1 lnDistance_{INDj} + \gamma_2 lnPopulation_{INDt} + \gamma_3 lnPopulation_{jt} + \gamma_4 RTA_j + \gamma_5 SAARC_j + \gamma_6 BIMSTEC_j + \gamma_7 SAFTA_j + \gamma_8 APTA_j + \gamma_9 RCEP_j + \gamma_{10} Landlock_{INDj} + \gamma_{11} Island_{INDj} + \mu_j + \lambda_t + \varepsilon_{INDjkt} \quad (6)$$

Where i=India; j=1, 2, 3, …, 45; k=1, 2, 3…, 9; t=2001,2002, …, 2021.This is a Fixed Effect (FE) specification. where μi represents country fixed-effects and λt represent time-specific fixed-effects.

The expected signs from the estimation are as follows: $\delta 1 > 0$; $\delta 2 > 0$; $\delta 3 > 0$; $\gamma 0 < 0$; $\gamma 1 < 0$; $\gamma 2 > 0$; $\gamma 3 > 0$; $\gamma 4 > 0$; $\gamma 5 > 0$; $\gamma 6 > 0$; $\gamma 7 > 0$; $\gamma 8 > 0$; $\gamma 9 > 0$; $\gamma 10 < 0$; $\gamma 11 < 0$; $\gamma 12 < 0$

The main parameter of interest is γ0. This parameter represents the tariff elasticity. If it turns out to be positive and significant it is an indication of inelastic tariff and if it is negatively significant it indicates elastic tariff. If the sign is negative it indicates that by tariff elimination the Indian market will be flooded with goods from RCEP members and it may hurt their domestic import competing sectors.

3.2 Econometric Methodology

We used Poisson Pseudo Maximum Likelihood Estimator (PPML) and checked the robustness of our results by comparing them with country and time fixed effects. The PPML method which was first introduced by Gourieroux, Monfort and Trognon[39] and was further explained in context of gravity model by Silva and Tenreyro[40] is a powerful tool to address the issue of zero trade flow while analyzing international trade flow by using gravity estimation[41]. Furthermore, it does not

require set-up cost and can be run using simple statistical software[41]. Fixed Effects (FE) and Random effects (RE) estimates fail to capture time-invariant variables like common language, common border and trade that we have analyzed in our model[34].

There are alternative econometric models available in the literature of trade flow modeling. Due to the nature of data for some partners of India the value of exports or imports may turn out to be zero-valued because very insignificant amount of flow may take place in particular months with a particular partner. This makes it difficult to express the coefficients to be expressed in logarithmic form to yield elasticity. Besides, the presence of heterogeneity is common in data. The advantage of using PPML is that it can account for heterogeneity and zero values in the data. Moreover, the PPML estimator does not require the dependent variable to follow a Poisson distribution. Gourieroux, Monfort, and Trognon[42] have shown that pseudo maximum likelihood methods produce consistent results even if the dependent variable does not strictly adhere to the Poisson distribution. Alternative log-linear based estimators have been criticized for producing inconsistent estimations on trade data[43,44].

3.3 Variables and Data

We pair India against 45 countries representing Africa, Asia, Australia/ Oceania, Europe, North America and South America (Table 2). The export and import data are sourced from UN Comtrade database. Data for gravity variables (RGDP, Distance, Population, Landlock and Island dummy) are sourced from the dynamic gravity data set V2.1. The FTA dummies (SAFTA, BIMSTEC, APTA, RCEP, RTA) are constructed based on WTO Regional Trade Agreement (RTA) database. Export and Import tariffs are constructed based on WTO tariff database (Table 3). is the 10 sectors that we analysed aer: 1: Animal and Animal Products 2: Vegetables 3: Food Stuffs 4: Minerals 5: Chemicals 6: Plastic and Plastic Goods 7: Leather 8: Wood and Wood Products 9: Textiles 10: Foot ware. The codes are based on Harmonized Commodity System Classification used by Comtrade. .

Table 2: Trading Partners of India

Continents	Countries
Africa	Afghanistan, Burundi, Ghana, Guinea Bissau, Mauritius, Mozambique, Nigeria, South Africa, Tanzania
Asia	Bangladesh, Bhutan, Brunei, Cambodia, China, Hong Kong, Indonesia, Iran, Iraq, Japan, Kuwait, Laos, Malaysia, Maldives, Myanmar, Nepal, Pakistan, Philippines, Qatar, Saudi Arabia, Singapore, South Korea, Sri Lanka, Thailand, UAE, Vietnam
Australia and Oceania	Australia, New Zealand
Europe	Belgium, Germany, Netherlands, Switzerland, UK
North America	US
South America	Colombia, Venezuela

Table 3: Variable definition and data source

Variable	Definition	Data Sources	Data Link
Export_IND	Dependent variable; India's export to partner countries (Billion USD)	UN Comtrade Database (Sector wise HS Code)	https://comtrade.un.org/data
Import_IND	Dependent variable; India's import from partner countries (Billion USD)	UN Comtrade Database (Sector wise HS Code)	https://comtrade.un.org/data
GDP_IND	Real Gross Domestic Product of India (Billion USD)	Dynamic Gravity Data-set V.2.1	https://www.usitc.gov/data/gravity/dgd.htm 0
GDP_Partner	Real Gross Domestic Product of India's Partners (Billion USD)	Dynamic Gravity Data-set V.2.1	https://www.usitc.gov/data/gravity/dgd.htm
Exp_Tariff	Most Favored Nation (MFN) Tariff on India by their partner countries when India exports their products	WTO Tariff Database	http://tariffdata.wto.org/ReportersAndProducts.aspx
Imp_Tariff	Most Favored Nation (MFN) Tariff for India's Partner countries by India when India import from them	WTO Tariff Database	http://tariffdata.wto.org/ReportersAndProducts.aspx

Distance	Distance between India and their partners	Dynamic Gravity Data-set V.2.1	https://www.usitc.gov/data/gravity/dgd.htm
Pop_Ind	Population of India in time	Dynamic Gravity Data Set V.2.1	https://www.usitc.gov/data/gravity/dgd.htm
Pop_Partner	Population of India and partner countries of India	Dynamic Gravity Data Set V.2.1	https://www.usitc.gov/data/gravity/dgd.htm
Landlock Dummy	No access to the ocean	Dynamic Gravity Data Set V.2.1	https://www.usitc.gov/data/gravity/dgd.htm
Island Dummy	Island countries	Dynamic Gravity Data Set V.2.1	https://www.usitc.gov/data/gravity/dgd.htm
SAFTA_Dummy	The South Asian Free Trade Area (SAFTA) signatory countries- value of unity if partner is a SAFTA member otherwise 0	WTO Regional Trade Agreements Database	https://rtais.wto.org/UI/PublicMaintainRTAHome.aspx
BIMSTEC Dummy	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) value of unity if partner is a BIMSTEC member otherwise 0	WTO Regional Trade Agreements Database	https://rtais.wto.org/UI/PublicMaintainRTAHome.aspx
APTA Dummy	Asia-Pacific Trade Agreement (APTA); value of unity if partner is an APTA member otherwise 0	WTO Regional Trade Agreements Database	https://rtais.wto.org/UI/PublicMaintainRTAHome.aspx
RCEP_Dummy	The Regional Comprehensive Economic Partnership (RCEP); value of unity if partner is an RCEP member (starting from 2012) otherwise 0	WTO Regional Trade Agreements Database	https://rtais.wto.org/UI/PublicMaintainRTAHome.aspx
RTA Dummy	A regional trade agreement (RTA) is a treaty between two or more governments that define the rules of trade for all signatories.	WTO Regional Trade Agreements Database	https://rtais.wto.org/UI/PublicMaintainRTAHome.aspx

Table 4: Estimation of aggregate export value and import value with and without RTA dummy- PPML Estimate

	With RTA				Without RTA	
PPML	With Tariff		Without Tariff			
lnExport_IND & lnImport_IND	[1]	[2]	[3]	[4]	[5]	[6]
lnDistance	-0.04*** (0.003)	-0.044*** (0.003)	-0.044*** (0.003)	-0.043*** (0.003)	-0.04*** (0.003)	-0.044*** (0.003)
lnGDP_IND	-0.12*** (0.046)	-0.095* (0.052)	-0.1* (0.053)	-0.098* (0.052)	-0.12*** (0.046)	-0.095* (0.052)
lnGDP_Partner	0.01*** (0.001)	0.008*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.01*** (0.001)	0.008*** (0.001)
lnPop_Partner	0.019*** (0.001)	0.024*** (0.001)	0.024*** (0.001)	0.024*** (0.001)	0.019*** (0.001)	0.024*** (0.001)
lnPop_Ind	0.868*** (0.286)	0.71** (0.323)	0.739** (0.333)	0.726** (0.327)	0.868*** (0.286)	0.71** (0.323)
RTA	-0.173*** (0.004)	-0.218*** (0.004)	-0.215*** (0.004)	-0.211*** (0.004)		

BIMSTEC	-0.045*** (0.005)	-0.05*** (0.005)	-0.052*** (0.005)	-0.051*** (0.005)	-0.045*** (0.005)	-0.05*** (0.005)
SAFTA	-0.057*** (0.006)	-0.07*** (0.007)	-0.064*** (0.007)	-0.062*** (0.007)	-0.057*** (0.006)	-0.07*** (0.007)
APTA	-0.065*** (0.005)	-0.052*** (0.005)	-0.054*** (0.005)	-0.053*** (0.005)	-0.065*** (0.005)	-0.052*** (0.005)
Landlock	-0.019*** (0.004)	-0.013** (0.005)	-0.016*** (0.006)	-0.015*** (0.005)	-0.019*** (0.004)	-0.013** (0.005)
Island	0.093*** (0.005)	0.1*** (0.005)	0.101*** (0.006)	0.099*** (0.005)	0.093*** (0.005)	0.1*** (0.005)
Tariff Partner	0.034*** (0.001)	-0.031*** (0.002)			0.034*** (0.001)	-0.031*** (0.002)
Constant	-1.276 (1.336)	-0.26 (1.508)	-0.464 (1.555)	-0.381 (1.525)	-1.276 (1.336)	-0.26 (1.508)
No. of parameters	13	13	12	12	13	13
N	9449	9450	9450	9450	9449	9450
Pseudo log-likelihood	-24344.245	-24859.792	-24843.172	-24894.85	-24344.245	-24859.792
R^2	0.46621649	0.3088262	0.2938641	0.29409185	0.46621649	0.3088262

Note: 1= Export with RTA and tariff, 2= Import with RTA and tariff, 3= Export with RTA without tariff, 4= Import with RTA without tariff, 5= export without RTA, 6= Import without RTA

4. Results

4.1 Aggregate Result

We start our analysis with the aggregate export and import with RTA dummies (Table 4). When we look at the aggregate results, we considered 6 equations- 4 with RTA as dummy and 2 without RTA. This was to address the multicollinearity arising from the use of RTA. Our results show that export from India remains positive despite tariff on Indian export while import to Indian declines with tariff imposed by India. This rationalizes India's decision to pull out from RCEP. At the aggregate level too, we see that the FTA dummies have negative signs when controlled for tariff (with or without tariff) (Table 6). This goes alongside the findings of other literature which shows that India has not gained from participating in FTAs. The result is mixed in the sense that sometimes it is elastic and sometimes it is inelastic for total trade flow with respect to RTA dummy.

4.2 Sectoral Results (Primary Estimations)

When we consider the PPML results (our primary estimator) for sectoral export we can observe that export decreases with rise in GDP of India for all the sectors. This is a surprising result even though the results are not significant for the sectors except for chemicals. This would require further assessment but a primary condition can be that India's domestic consumption increases with rising GDP which was not assessed in our model. However, if this proves to be the case then the argument placed by Kumari, Fatma and Bharti[22] that the domestic market effect is of significance to India will hold. If partner country GDP increases then export from India also increases for all the sectors and the results are significant for all sectors except for wood and wood products. The GDP results of India and partner countries may signify that India is to gain by joining an FTA if it can be proven that export market expansion is greater than the domestic market expansion which we presume to be the case given the difference in the significance level. We observe the usual signs for the rest of the gravity variables. Export increases for all sectors with the rise of population both in India and in partner countries, however the results are significant for partner country population but not for Indian population or the home country population. Export decreases with distance with the exception of wood and wood products, textiles and foot ware which subject to further scrutiny might show that the trading partners have inelastic trade relationship with India. The coefficients of landlock dummy and island dummy further establishes the issue of inelastic trade relationship or export for these sectors.

When tariff is imposed on Indian export, 5 sectors observe decline in value while 5 sectors still observe growth. These 5 sectors – animal and animal products (1), leather (7), wood and wood products (8), textiles (9) and (10) footwear can be asserted to have inelastic tariff-export relationship with trade partners. That means if India's tariff walls are removed due to RCEP these products will not get that much market access. Or India may not be that much enthusiastic about these sectors for

RCEP markets. In contrast, export declines with tariff on Indian export for minerals (4), chemicals (5), plastics and plastic goods (6) (Table 5). Or if India removes tariff these products will get more access in RCEP market. This finding is interesting because several analysts spoke about the lobby from India's agricultural sector as well as the lobby from the dairy industry[12] as influencing India's decision to pull out from RCEP. Our findings show that the concern from the agricultural sector might hold but the notion of dairy products might not hold as India enjoys growth despite tariff. To deconstruct this further we also look at the import data in subsequent analysis. Generally, the findings show that even at the sectoral level, India does not enjoy strong growth in export despite participating in FTAs which goes along with the findings of others like Kumari Kumari, Fatma and Bharti[22] who also showed that India does not gain from FTAs. Our findings also go along with the those presented by Jain[24] who analyzed India's proposed trade with RCEP nations using the Revealed Comparative Advantage (RCA) Index and concluded that India has a comparative advantage in many different products but has historically failed to take advantage. Our result provides mixed evidences of gain in 3 sectors but loss in 5 sectors of export if India decides to rejoin RCEP. However, these results should be considered with caution after adjusting for trade-weight.

The PPML results on import shows that with GDP growth of India, import declines but the results are insignificant (Table 6). Growth of partner country GDP increases import to India for all sectors and the results significant. This would validate India's concern about its rising trade deficit specially with China. When India imposes tariff, only three sectors observe decline in import- food, chemicals, and plastic. Whereas for animal, minerals, woods, textiles, and footwear there is growth despite tariff imposition. This again validates the concern of the lobby from agriculture that India might lose out if it joins RCEP (Table 5). That means that in 3 sectors India will be exploited by RCEP products whereas for 5 products the effects will be minimal. This result tells us that the decision to pull out has mixed implication for import and export for India. That means the result is ambiguous. It is expected to hurt some sectors and help others in the short run. The dynamic gain from RCEP if India rejoins in future cannot be totally ruled out.

4.3 Robustness of results

To address the issue of multilateral resistance we compared the export and import flow of India with fixed effects (Table 7) - we take two sets of fixed effects- (i) country fixed effect and time fixed effect. We compared the results of the fixed effect with and without tariff which is our variable of interest. We also further analyzed the country and time fixed effects under two scenarios – (i) with tariff and (ii) without tariff. Our results show that export to RCEP members declines under the scenarios of [1] trade without tariff [2] trade with tariff [4] country fixed effect on trade with tariff [5] Year Fixed Effect on trade without tariff [6] year fixed effect on trade with tariff. Fixed effect results follow the same sign of results without fixed effects. The case is similar for import. India's import to RCEP countries decline under all scenarios if we consider fixed effect and the pattern is same with or without fixed effect. The trends are similar for all trade agreements. Also, we observe that when partner imposes tariff, India's export still is positive which shows insensitivity of India's export to partner's tariff. On the other hand, when India imposes tariff, partner's import declines. This suggests that India's decision not to join RCEP is gainful for India as it is benefitting from its insensitivity to partner's tariff but sensitivity of its tariff on import from partner.

5. Conclusion and Policy Recommendation

India's decision to pull out from RCEP came as a surprise to analysts and RCEP negotiators as India was expected to be a major participant. Prior research explained India's decision to withdraw from RCEP to many factors which includes- India registered trade deficit with 11 of the RCEP countries in FY19[15], rejection of India's proposed three-tiered approach to tariff reduction and push from RCEP negotiators for tariff reduction while no agreement was reached on India's proposed auto trigger and snapback measures[15], India's agriculture lobby and concern about competition from international agricultural products[45] as well as lobby from dairy industry was also strongly against RCEP[12], Sino-centric effect as China granted deeper duty cuts to India's competitors, including Peru, Pakistan, Australia, South Korea and ASEAN, in its FTAs with them,[25]. While researchers with the use of gravity equation have explained the ex-ante impact of RCEP on India's domestic market and India's experience with prior FTAs, the sectoral level impacts have not been researched. Furthermore, PPML was not used as a method to analyze the impact.

By using PPML estimator in a partial equilibrium model involving gravity equation with fixed effects to control for multilateral resistance for India's export and import while paired with 45 nations for the period 2001-2021, we have shown that at the aggregate level India's export is inelastic to tariff while India can exert control on import with tariff. This shows India's decision not to join RCEP has merit. We have also further proven the earlier research findings that FTAs generally were not beneficial for India. Our findings hint that with GDP growth India's domestic market expands more than its export market which is an important justification for India's protection measures for its domestic market and if India join RCEP then Indian market might get exploited by products from China.

With GDP growth India's domestic market expands more than its export market proving the importance of India's protection measures for its domestic market. Our

findings also prove that India's trade flow with RCEP countries are mostly negative. At the sectoral level, some sectors would have gained from joining RCEP as these sectors observe growth despite tariff while the import for them decline. The sectoral level analysis hint at the importance to analyze the sectoral impact further using the method explained by Krugman, Obstfeld and Melitz[46] to measure scale effect and selection effect. If it can be proven that India will have scale effect whereby firms are able to expand their production then it would be politically motivating but if it shows that selection effect will be in place then it might not be politically motivating as India's government may not want to achieve growth at the cost of small and medium enterprises. It would be relevant to extend the current work further and assess the results on other RCEP countries if the same model is applied. This will provide further validity on the impact of RCEP and its variance between countries. The usual limitations of not capturing the dynamic effect of customs union still remains unanswered. Gravity captures only partial equilibrium approach and static effect of forming a customs union among RCEP member nations including India.

India feels that trade creation will be minimal by joining RCEP. This kind of scenario may not be true for other South Asian countries, which are maintaining close links both with China and India in terms of their trading and investment relationships. Each country willing to join this agreement should conduct a detailed study of potential trade creation and trade diversion. No country should just follow a large moderately open economy like India. Their perspective and baskets are different from others.

Table 5: PPML Estimations Result for Export Value

PPML	**Sectors**									
LnExp	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
LnGDP_IND	-0.151	-0.208	-0.188	-0.105	-0.259**	-0.064	-0.066	-0.027	-0.065	-0.001
	(o.178)	(0.148)	(0.164)	(0.114)	(0.135	(0.087)	(0.115)	(0.114)	(0.095)	(0.080)
LnGDP_Partner	0.022***	0.018***	0.016***	0.010***	0.019***	0.006***	0.007***	-0.022	0.004***	0.010
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
LnPop_IND	1.189	1.541*	1.329	0.745	1.786**	0.473	0.491	0.225	0.477	0.065
	(1.119)	(0.925)	(1.025)	(0.718)	(0.851)	(0.546)	(0.719)	(0.711)	(0.596)	(0.500)
LnPop_Partner	0.016***	0.020***	0.028***	0.031***	0.026***	0.027***	0.018***	0.018***	0.021***	0.018***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
lnDistance	-	-	-	-	-0.068***	-	-	0.020***	0.032***	0.007
	0.094***	0.103***	0.079***	0.029***	(0.009)	0.049***	0.065***	(0.007)	(0.005)	(0.005)
	(0.013)	(0.011)	(0.013)	(0.008)		(0.005)	(0.007)			
Landlock	-	-	-	-	-0.027**	-	0.045***	0.005	0.007	-0.004
	0.084***	0.030***	0.032***	0.040***	(0.014)	0.024***	(0.009)	(0.011)	(0.010)	(0.007)
	(0.013)	(0.012)	(0.012)	(0.012)		(0.008)				
Island	0.060***	0.100***	0.1348**	0.102***	0.110***	0.112***	0.086***	0.128***	0.075***	0.087***
	(0.027)	(0.015)	(0.016)	(0.014)	(0.016)	(0.011)	(0.016)	(0.015)	(0.009)	(0.012)
Tariff Partner	0.039***	-0.005	-0.005	-	-0.046***	-	0.027***	0.027***	0.062***	0.021***
	(0.005)	(0.005)	(0.011)	0.042***	(0.007)	0.010***	(0.006)	(0.006)	(0.004)	(0.003)
				(0.013)		(0.004)				
RCEP	-	-	-	-	-0.327***	-	0.283***	-	-0.005	-
	0.150***	0.180***	0.191***	0.130***	(0.016)	0.357***	(0.012)	0.177***	(0.015)	0.217***
	(0.013)	(0.011)	(0.017)	(0.014)		(0.009)		(0.014)		(0.010)
BIMSTEC	0.018	-0.035**	-0.019	-0.032**	-0.047***	-	-	-	-	-
	(0.013)	(0.016)	(0.014)	(0.016)	(0.018)	0.112***	0.056***	0.078***	0.038***	0.070***
						(0.009)	(0.018)	(0.013)	(0.011)	(0.009)
SAFTA	-	-	-	0.083***	-	-	-	0.020	0.061***	0.032***
	0.064***	0.119***	0.084***	(0.018)	0.0818***	0.193***	0.225***	(0.014)	(0.011)	(0.010)
	(0.024)	(0.020)	(0.022)		(0.019)	(0.011)	(0.016)			
APTA	-	-0.025*	0.053***	-0.065	-0.057***	-0.015	-	-	-0.020*	0.010
	0.169***	(0.014)	(0.013)	(0.018)	(0.016)	(0.010)	0.098***	0.138***	(0.011)	(0.009)
	(0.011)						(0.016)	(0.016)		
Constant	-2.724	-4.176	-3.215	0.648	-5.102	1.092	0.944	1.577	-0.151	2.416
	(5.227)	(4.312)	(4.782)	(3.355)	(3.980)	(2.549)	(3.349)	(3.305)	(2.775)	(2.326)
N	944	945	945	945	945	945	945	945	945	945
R^2	.3252	.3235	.2982	.3874	.4947	.7730	.6529	.5637	.5034	.7111
Pseudo log-likelihood	-2429.94	-2393.79	-2410.97	-2327.86	-2437.14	-2357.83	-2428.92	-2407.91	-2384.24	-2375.13

Note(s): Partner = destination country, IND = origin country. Sector 1: Animal and Animal Products Sector 2: Vegetables Sector 3: Food Stuffs Sector 4: Minerals Sector 5: Chemicals Sector 6: Plastic and Plastic Goods Sector 7: Leather Sector 8: Wood and Wood Products Sector 9: Textiles Sector 10: Foot wear

Source(s): Own calculation
Robust Standard Errors in parentheses
***p < 0.01, **p < 0.05, *p < 0.1

Table 6: PPML Estimation Results for Import Value

PPML import	**Sectors**									
LnImp	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
LnGDP_IND	-0.144 (0.168)	-0.204 (0.143)	-0.164 (0.159)	-0.120 (0.111)	-0.255** (0.120)	-0.050 (0.083)	-0.047 (0.115)	-0.040 (0.098)	-0.057 (0.087)	-0.013 (0.075)
LnGDP_partner	0.020*** (0.003)	0.018*** (0.002)	0.014*** (0.002)	0.011*** (0.002)	0.017*** (0.002)	0.005*** (0.001)	0.005*** (0.001)	0.001 (0.001)	0.005*** (0.001)	0.002 (0.001)
LnPop_IND	1.044 (1.059)	1.510* (0.899)	1.182 (0.993)	0.822 (0.695)	1.771** (0.753)	0.391 (0.516)	0.358 (0.719)	0.296 (0.609)	0.392 (0.546)	0.128 (0.467)
LnPop_Partner	0.013*** (0.004)	0.020*** (0.003)	0.028*** (0.003)	0.028*** (0.003)	0.022*** (0.003)	0.025*** (0.002)	0.022*** (0.003)	0.021*** (0.002)	0.032*** (0.002)	0.021*** (0.002)
LnDistance	-0.054*** (0.012)	-0.103*** (0.010)	-0.067*** (0.012)	-0.025*** (0.008)	0.009 (0.009)	-0.036*** (0.005)	-0.073*** (0.009)	-0.011* (0.006)	-0.015*** (0.006)	-0.014*** (0.005)
Landlock	-0.120*** (0.014)	-0.024** (0.012)	-0.032*** (0.012)	-0.042*** (0.012)	-0.021* (0.011)	-0.027*** (0.008)	0.050*** (0.010)	0.008 (0.008)	0.017** (0.009)	0.002 (0.007)
Island	0.054*** (0.017)	0.098*** (0.015)	0.138** (0.015)	0.092*** (0.013)	0.081*** (0.013)	0.109*** (0.010)	0.091*** (0.016)	0.125*** (0.015)	0.083*** (0.010)	0.090*** (0.012)
Tariff_IND	0.073*** (0.008)	-0.015 (0.014)	-0.037*** (0.006)	0.030*** (0.005)	-0.287*** (0.017)	-0.0459*** (0.046)	0.012 (0.060)	1.131*** (0.041)	1.272*** (0.048)	0.625*** (0.035)
RCEP	-0.085*** (0.015)	-0.169*** (0.014)	-0.203*** (0.014)	-0.054*** (0.012)	0.007 (0.020)	-0.395*** (0.009)	-0.323*** (0.012)	-0.060*** (0.009)	0.068*** (0.011)	-0.167*** (0.007)
BIMSTEC	-0.039*** (0.010)	-0.026 (0.016)	-0.029** (0.013)	-0.017 (0.015)	0.058*** (0.021)	-0.114*** (0.011)	-0.056*** (0.018)	-0.071*** (0.009)	-0.036*** (0.012)	-0.065*** (0.007)
SAFTA	0.030*** (0.030)	-0.128*** (0.020)	-0.052*** (0.021)	0.098*** (0.018)	0.025*** (0.018)	-0.160*** (0.011)	-0.236*** (0.019)	-0.047*** (0.013)	-0.036*** (0.014)	-0.014 (0.010)
APTA	-0.124*** (0.012)	-0.028** (0.014)	0.054*** (0.012)	-0.075*** (0.018)	-0.091*** (0.016)	-0.011 (0.010)	-0.087*** (0.016)	-0.143*** (0.014)	-0.018* (0.010)	0.010 (0.008)
Constant	-2.247 (4.945)	-3.988 (4.189)	-2.522 (4.629)	-1.146 (3.254)	-5.522 (3.519)	1.882 (2.405)	1.846 (3.352)	-0.329 (2.827)	-1.456 (2.549)	1.011 (2.175)
N	944	945	945	945	945	945	945	945	945	945
R^2	.3769	.3247	.3201	.3915	.5797	.7926	.6403	.6642	.5494	.7367
Pseudo log-likelihood	-2424.93	-2400.41	-2412.18	-2334.77	-2419.31	-2361.69	-2441.25	-2392.76	-2388.73	-2377.81

Note(s): Sector 1: Animal and Animal Products Sector 2: Vegetables Sector 3: Food Stuffs Sector 4: Minerals Sector 5: Chemicals Sector 6: Plastic and Plastic Goods Sector 7: Leather Sector 8: Wood and Wood Products Sector 9: Textiles Sector 10: Foot wear
Source(s): Own calculation
Standard Errors in parentheses
***p < 0.01, **p < 0.05, *p < 0.1

Table 7: Robustness Analysis: Multilateral Resistance through Fixed Effects

	Export						**Import**					
PPML	[1]	[2]	[3]	[4]	[5]	[6]	[1]	[2]	[3]	[4]	[5]	[6]
lnDistance	-0.0443***	-0.0398***	0.0207	0.0213	-0.0442***	-0.0397***	-0.0434***	-0.0438***	0.0202	0.0235	-0.0433***	-0.0437***
	(0.003)	(0.003)	(0.023)	(0.026)	(0.003)	(0.003)	(0.003)	(0.003)	(0.022)	(0.022)	(0.003)	(0.003)
ln GDP_IND	-0.100	-0.120**	0.0143	0.0125	0.0177**	0.0185***	-0.0982	-0.0948	0.0140	0.0148	0.0174**	0.0184**
	(0.053)	(0.046)	(0.046)	(0.037)	(0.006)	(0.005)	(0.052)	(0.052)	(0.045)	(0.044)	(0.006)	(0.006)
ln GDP_Partner	0.00890***	0.0104***	-0.000763	-0.000704	0.00956***	0.0112***	0.00873***	0.00843***	-0.000748	-0.000828	0.00939***	0.00906***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
ln Pop_IND	0.739*	0.868**	0.0304	0.0355			0.726*	0.710*	0.0299	0.0349		
	(0.333)	(0.286)	(0.290)	(0.236)			(0.327)	(0.323)	(0.284)	(0.280)		
ln Pop_Partner	0.0243***	0.0194***	-0.00700	-0.00684	0.0240***	0.0189***	0.0238***	0.0245***	-0.00685	-0.00764	0.0235***	0.0241***
	(0.001)	(0.001)	(0.009)	(0.008)	(0.001)	(0.001)	(0.001)	(0.001)	(0.009)	(0.008)	(0.001)	(0.001)
Land Lock	-0.0157**	-0.0186***	0.0130	0.423***	-0.0145**	-0.0172***	-0.0154**	-0.0127*	0.0129	0.0110	-0.0142**	-0.0115*
	(0.006)	(0.004)	(0.082)	(0.078)	(0.006)	(0.004)	(0.005)	(0.005)	(0.080)	(0.084)	(0.005)	(0.005)
Island	0.101***	0.0929***	0.104*	0.518***	0.101***	0.0928***	0.0988***	0.100***	0.102*	0.0969*	0.0987***	0.100***
	(0.006)	(0.005)	(0.048)	(0.042)	(0.006)	(0.005)	(0.005)	(0.005)	(0.047)	(0.047)	(0.005)	(0.005)
RCEP	-0.215***	-0.173***		-0.406***	-0.214***	-0.172***	-0.211***	-0.218***	-0.00426	-0.00218	-0.210***	-0.217***
	(0.004)	(0.004)		(0.036)	(0.004)	(0.004)	(0.004)	(0.004)	(0.052)	(0.051)	(0.004)	(0.004)
BIMSTEC	-0.0517***	-0.0450***	-0.0236	-0.0240	-0.0517***	-0.0450***	-0.0507***	-0.0498***	-0.0232	-0.0232	-0.0507***	-0.0498***
	(0.005)	(0.005)	(0.020)	(0.031)	(0.005)	(0.005)	(0.005)	(0.005)	(0.019)	(0.023)	(0.005)	(0.005)
SAFTA	-0.0636***	-0.0572***	-0.0274	-0.466***	-0.0628***	-0.0563***	-0.0623***	-0.0705***	-0.0271	-0.0203	-0.0615***	-0.0697***
	(0.007)	(0.006)	(0.093)	(0.061)	(0.007)	(0.006)	(0.007)	(0.007)	(0.091)	(0.093)	(0.007)	(0.007)
APTA	-0.0543***	-0.0648***	-0.00262	-0.00291	-0.0549***	-0.0654***	-0.0532***	-0.0525***	-0.00253	-0.00378	-0.0537***	-0.0530***
	(0.005)	(0.005)	(0.038)	(0.032)	(0.005)	(0.005)	(0.005)	(0.005)	(0.037)	(0.038)	(0.005)	(0.005)
Tariff_Partner		0.0344***		0.0350***		0.0344***		-0.0311***		-0.0340***		-0.0310***
		(0.001)		(0.001)		(0.001)		(0.002)		(0.002)		(0.002)
RTA			-0.00419									
			(0.053)									
Constant	-0.464	-1.276	2.457	2.299*	2.973***	2.759***	-0.381	-0.260	2.487	2.481	2.992***	3.042***
	(1.555)	(1.336)	(1.379)	(1.133)	(0.103)	(0.090)	(1.525)	(1.508)	(1.353)	(1.331)	(0.101)	(0.100)
Observations	9450	9449	9450	9449	9450	9449	9450	9450	9450	9450	9450	9450
R^2	0.294	0.466	0.493	0.655	0.294	0.467	0.294	0.309	0.493	0.508	0.295	0.309

Pseudo Log Likelihood	-24843.2	-24344.2	-24234.9	-23756.1	-24841.2	-24341.5	-24894.9	-24859.8	-24300.0	-24260.4	-24892.9	-24857.9

Note: [1] trade without tariff [2] trade with tariff [3] country fixed effect on trade without tariff [4] country fixed effect on trade with tariff [5] Year Fixed Effect on trade without tariff [6] year fixed effect on trade with tariff
Source(s): Own calculation, Standard Errors in parentheses
***p < 0.01, **p < 0.05, *p < 0.1

Conflict of Interest Statement

The authors declare no known conflict of interest in this project.

Data Availability Statement

The dataset and the do file have been submitted and made available to the reviewers for replication

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