

June 2022

## Would an India-US trade agreement be beneficial for India?

Neetu Kaushik

*City University of New York*, neetukaushik@gmail.com

Niloufer Sohrabji

*Simmons University*, sohrabji@simmons.edu

Follow this and additional works at: <https://digitalcommons.du.edu/irbe>

---

### Recommended Citation

Kaushik, Neetu and Sohrabji, Niloufer (2022) "Would an India-US trade agreement be beneficial for India?," *International Review of Business and Economics*: Vol. 7: Iss. 1, Article 1.

Available at: <https://digitalcommons.du.edu/irbe/vol7/iss1/1>

This Article is brought to you for free and open access by Digital Commons @ DU. It has been accepted for inclusion in International Review of Business and Economics by an authorized editor of Digital Commons @ DU. For more information, please contact [jennifer.cox@du.edu](mailto:jennifer.cox@du.edu), [dig-commons@du.edu](mailto:dig-commons@du.edu).

---

## Would an India-US trade agreement be beneficial for India?

### Cover Page Footnote

The authors are grateful for research support from Maria Soraghan. The authors would like to thank conference participants at the National Association of Business, Economics, and Technology conference, October 2020 for valuable feedback.

## **1. Introduction**

The purpose of this paper is to shed light on the benefits for India of a potential trade agreement with the U.S. India is part of a few bilateral and multilateral trade agreements, but has yet to sign a trade agreement with one of her most important trading partners, the U.S. Despite the lack of an official agreement and various disputes, trade relations between the two countries have progressed. Would a trade agreement deepen these trade ties? To address this, we examine trade effects of India's trade agreements.

We use two approaches to estimate changes in trade patterns due to trade agreements, by calculating the compound annual growth rate of trade flows and by estimating an enhanced Gravity model. The compound annual growth rate is a simple method to estimate growth of trade flows which allows for a greater number of countries and longer time period in our sample. However, it leaves out some important factors, such as the economic size of the trading partners and currency values, that can shed light on trade growth. These are included in the Gravity model which provides a more comprehensive analysis, albeit with a smaller sample (countries and time frame) because of lack of data availability. Our aim is to use both approaches to provide a more in-depth understanding of the impact of trade agreements on trade flows between India and her partners.

While both approaches have been used for various countries and the enhanced Gravity model has also been estimated for India, ours is the first one which studies the impact of all of India's trade agreements on her trade flows. Moreover, we also created a control group which allows us to compare pre- and post-agreement trade flows of India with her trade agreement partners to those with the control group. This eliminates external factors (such as the global recession) that could be driving trends in trade flows. Through our analysis we examine the differential impact on exports and imports and thus, on trade deficits. Our results show that participation in trade agreements raises India's trade, with imports rising more than exports. If an India-U.S. agreement leads to a similar trajectory, then India's trade surplus with the U.S. would decline and could potentially turn into a deficit in the future. This could also lead to an increase in overall trade deficits for India. It is noteworthy however, that both exports and imports rise following a trade agreement. This is important because a major component of India's exports to the U.S. are manufacturing goods, which can benefit growth and employment in India. Thus, we conclude that a trade agreement between India and the U.S. could be beneficial despite the potential deterioration of the country's trade position.

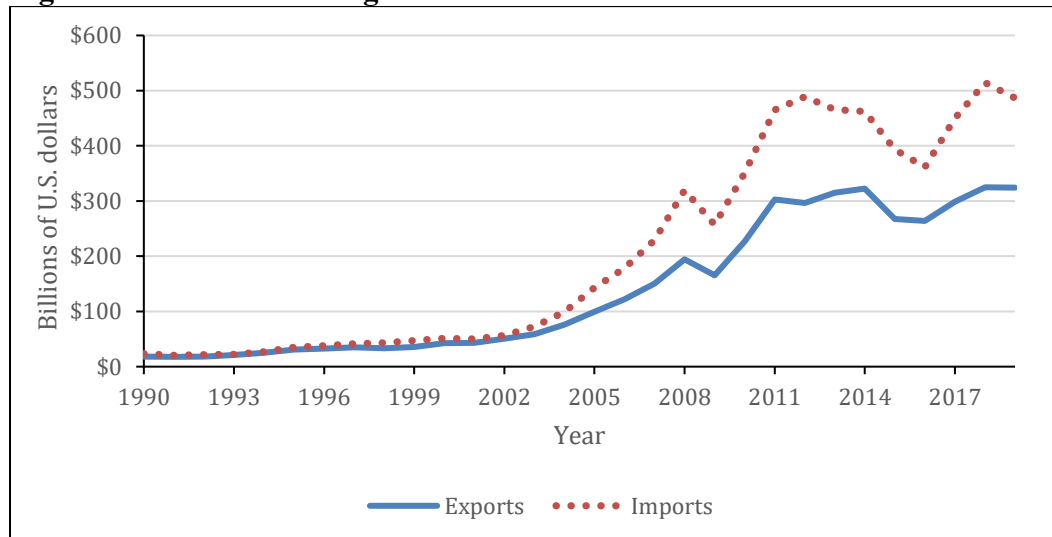
The paper is organized as follows: the next section provides a background on trade relations between India and the U.S. and section 3 examines relevant literature. Section 4 explains the methodological framework used in this paper followed by a discussion of the results. The last section concludes.

## 2. Background

In the mid-1980s, India faced balance of payment problems and experienced rising fiscal deficits. These twin deficits put tremendous pressure on the Indian economy and in 1991, India faced a major financial crisis with only enough foreign exchange to fund two weeks of imports and a near default on financial obligations. The crisis led to a severe depreciation of the rupee.

With tremendous pressure to address the issue, the government came up with an ambitious policy, Liberalization, Privatization, and Globalization (LPG) in early 1990s, designed to open up the economy to foreign trade and investment (Monga and Batra, 2019). This policy helped India recover from one of its major financial crises and further strengthen its ties with many countries. During the 1990s, exports and imports grew only slightly and remained mostly equal (Figure 1). In 1997 India faced sanctions from several developed nations because of India's nuclear testing resulting in another economic crisis (Morrow & Carriere, 1999). As a result, the newly formed BJP government initiated new economic reforms based on deregulation and outward-oriented trade policies. These policies had a dramatic impact, with India's trade growing significantly since the 2000s (Figure 1). Exports rose from about \$42 billion in 2000 to \$324 billion in 2019 while imports rose from \$51 billion to \$487 billion in the same period (Figure 1). Over the last two decades, India has continuously faced trade deficits with highs of about \$190 billion in 2012 and 2018 (Figure 1).

**Figure 1: India's trade of goods**

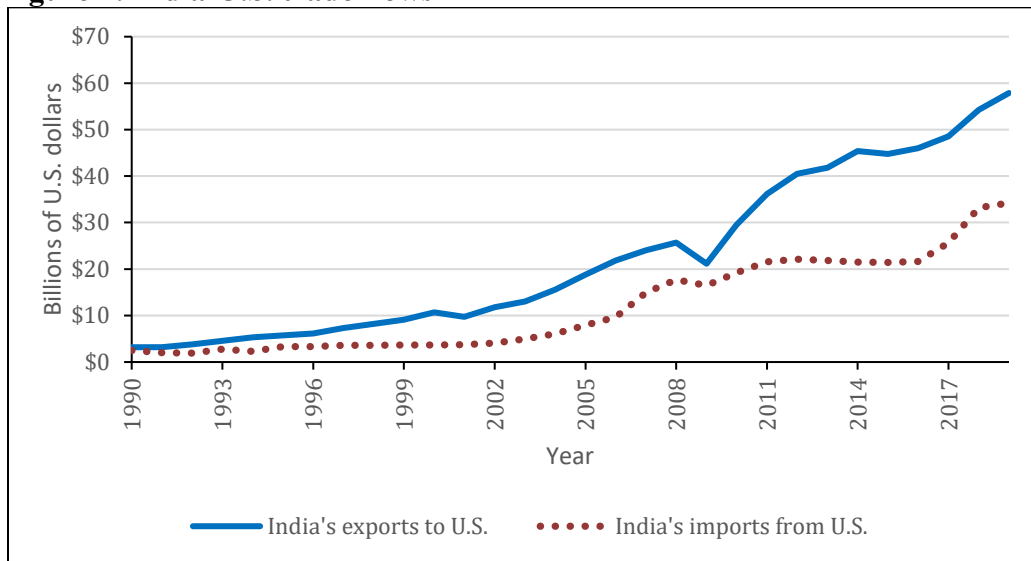


Data from Organization for Economic Co-operation and Development, retrieved from FRED, Federal Reserve Bank of St. Louis. Authors' graph.

India's trade relationship with the U.S. has become stronger since the 1990s although there are tensions. The most notable concerns are U.S. complaints of India's protectionary trade policies, which include high tariff rates and complicated licensing requirements (Council on Foreign Relations, 2020). Nevertheless, India and the U.S. are major trading partners.

Although India's overall trade balance is in deficit, India has enjoyed a trade surplus with the U.S. for several decades. Figure 2 maps India's exports of goods to, and imports of goods from, the U.S. since 1990. Exports have grown from over \$3 billion in 1990 to \$58 billion in 2019 and imports have risen from \$2.5 billion to \$34 billion in that same period (Figure 2). The trade surplus declined during the global financial crisis, but after 2010 has continued to rise and has been above \$23 billion over the last few years (Figure 2). Between 2010 and 2016, imports remained relatively constant at about \$21 billion annually, while exports continued to rise, exceeding \$46 billion in 2016 and widening the surplus over that period (Figure 2). Since 2016, imports have risen more rapidly, but increasing exports have led to only a small decline in the surplus (Figure 2).

**Figure 2: India-U.S. trade flows**



Data from Organization for Economic Co-operation and Development retrieved from FRED, Federal Reserve Bank of St. Louis. Authors' graph.

Manufacturing makes up most of the trade in goods and has been rising in value. Manufacturing exports increased from \$42 billion in 2015 to \$53 billion in 2019 and imports grew from \$18.5 billion to \$23 billion in the same period (Table 1). Manufacturing exports have accounted for over 91 percent of exported goods,

while the share of manufacturing imports has dropped from 86 percent in 2015 to 67 percent in 2019 (Table 1).

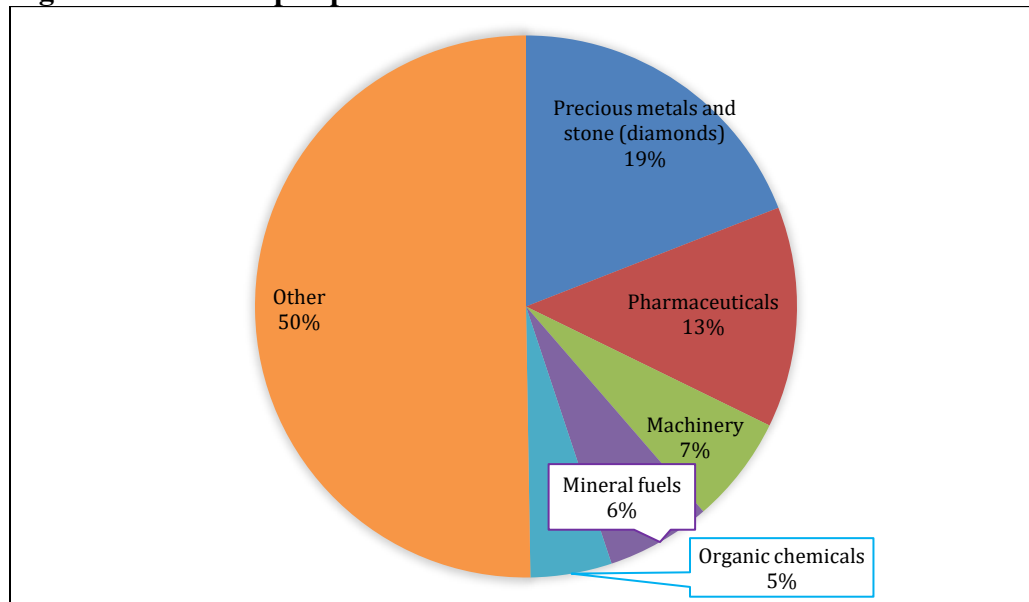
**Table 1: India-U.S. trade in manufacturing**

Year	India's exports to U.S. [percent of goods trade]	India's imports from U.S. [percent of goods trade]
2015	41.9 [93.53]	18.5 [86.05]
2016	43.1 [93.70]	18.8 [87.04]
2017	44.4 [91.55]	21.1 [82.42]
2018	50 [92.08]	24.5 [73.80]
2019	53 [91.85]	22.9 [66.76]

Notes: trade values are in \$ billions. Data from U.S. Trade Representative, Office of the United States Trade Representative. <https://ustr.gov/countries-regions/south-central-asia/india>. Authors' table.

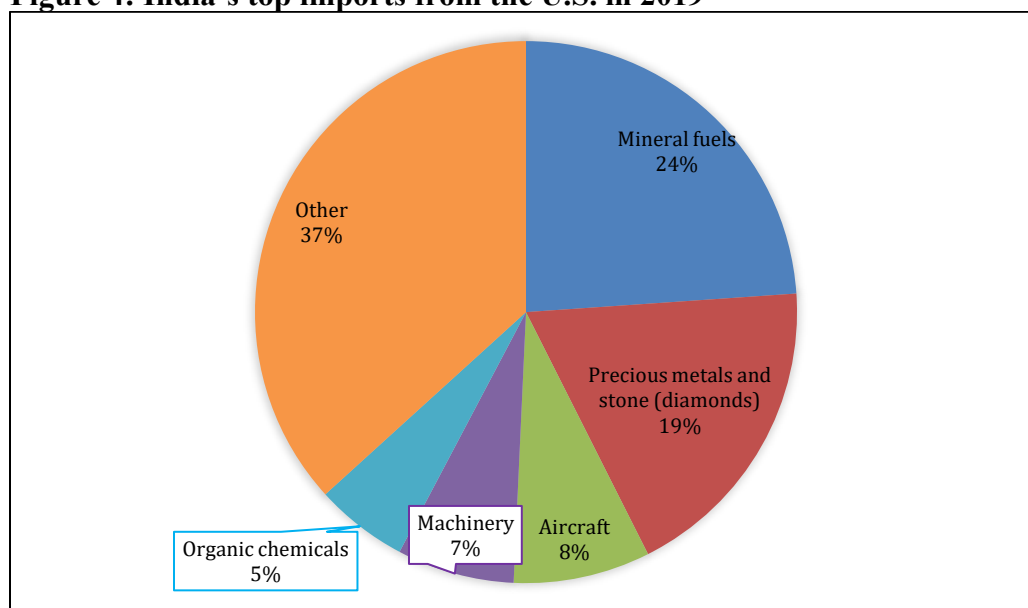
Figures 3 and 4 show India's top exports and imports with the U.S. in 2019. Four of the top five exports are also top five imports, including precious metals and stones (diamonds), machinery, mineral fuels, and organic chemicals. One major export (which is not a major import) are pharmaceutical goods and one major import (which is not a major export) are aircraft goods (Figures 3 and 4).

**Figure 3: India's top exports to the U.S. in 2019**



Notes: total value of India's exports to the U.S. are \$57.7 billion. Data from U.S. Trade Representative, Office of the United States Trade Representative. <https://ustr.gov/countries-regions/south-central-asia/india>. Authors' chart.

**Figure 4: India's top imports from the U.S. in 2019**



Notes: total value of India's imports from the U.S. are \$34.3 billion. Data from U.S. Trade Representative, Office of the United States Trade Representative. <https://ustr.gov/countries-regions/south-central-asia/india>. Authors' chart.

While our focus is on trade of goods, it is also useful to shed light on the trade in services between India and the U.S. as well as investment between the two countries. Services are an important, if smaller, component of trade while foreign investment can affect trade and thus, a country's overall balance of payments position. Table 2 shows that in 2019, India has a trade surplus in services with the U.S. and is a significant recipient of FDI from the U.S.

**Table 2: India-U.S. trade in services and FDI in 2019**

Year	Value	Sectors
India's services exports to the U.S.	\$29.7	Telecommunications, computer and information services, R&D, travel sectors
India's services imports from the U.S.	\$24.3	Travel, intellectual property (computer software, audio and visual related products, and transport sectors.
FDI from India in the U.S.	\$5	Professional, scientific, and technical services, manufacturing, and depository institutions
FDI in India from the U.S.	\$45.9	Professional, scientific, and technical services, manufacturing and wholesale trade.

Notes: value are in \$ billions. Data from U.S. Trade Representative, Office of the United States Trade Representative. <https://ustr.gov/countries-regions/south-central-asia/india>. Authors' table.

Overall, India and the U.S. share a strong trade and investment relationship and a trade agreement could further strengthen these economic ties. We examine relevant literature in the following section.

### **3. Related literature**

Our paper focuses on the impact for India of a potential trade agreement with the U.S. There is a vast literature on the impact of trade agreements between countries and can be broadly divided into two strands, one that focuses on simulating welfare/development impacts using computable general equilibrium models such as Global Trade Analysis Project (GTAP) modeling and the other that examines growth in trade and its implications. Our focus is on the latter strand of literature.

Chiasakul et al., (2010) analyzed the Thailand-Australia free trade agreement and Thailand-New Zealand economic partnership and found that Thailand's exports increased in almost all sectors except natural resources. Total exports from Thailand grew by almost 33 percent and 29 percent and imports to Thailand grew by 36 percent and 59 percent from Australia and New Zealand respectively Chiasakul et al., (2010). The greater increase in imports to the developing country was also confirmed by Busse et. al., (2000) who found that the EU gained more than Mexico from the EU-Mexico Preferential Trade Agreement. Likewise, Stellan & Danna-Buitrago (2017) find that the U.S. gained more than Colombia from the U.S.-Colombia Trade Promotion Agreement. Mitsuyo et al., (2015) find this to be the case for Japan's FTAs with Malaysia, Thailand and Indonesia although they find that these developing countries see a bigger gain in some sectors.

India-specific studies have included trade agreements with developed and other developing countries.<sup>1</sup> Jain (2019) found that with the implementation of the South Asian Free Trade Area or SAFTA, India's trade intensity and share has slightly improved with partnering members. However, Ciddikie, et. al., (2014), found that India's trade did not improve as expected after the implementation of SAFTA both in terms of volume and as a percentage of its global trade. India is also part of another multi-nation free trade agreement with ASEAN known as the ASEAN-India Free Trade Agreement (AIFTA). For the same agreement, Ratna and Kallummal (2013) also found no potential gains in important sectors such as agricultural, plantation, and fisheries and predicted even bigger challenges for labor intensive and non-organized sectors. Using the Gravity model, Chandran (2018) concluded that gains from AIFTA were likely to favor ASEAN, especially in the short-run and argued that to maximize benefits, India should expand its

---

<sup>1</sup> Fukase and Martin (2016) study the potential welfare effects of an India-U.S. trade agreement using GTAP.



scope to services and investments rather than just concentrating on goods. Similarly, Singh (2021) also found that AIFTA did lead to trade creation in both exports and imports, with the latter effect being greater.

Siddiqui and Sharma (2018) examined the effect of the Japan India Comprehensive Economic Partnership Agreement and found a differential impact of the agreement on India's exports. They found that agricultural products and minerals exports to Japan fell after the agreement and while pharmaceutical exports continued to grow, the growth after the agreement was less than before the agreement. Growth was seen in chemicals, automobiles, and machinery exports (Siddiqui and Sharma, 2018).

India's high trade deficit with South Korea (\$10 billion in 2016) suggests that the India Korea Comprehensive Economic Partnership Agreement favors South Korea (Press Trust of India). Taneja et. al., (2014) focused on another aspect of this agreement, the trade in services, and concluded that both countries can complement each other in service sectors such as Information Technology, transportation, construction, and audiovisual services which would be mutually beneficial in the global market.

Our paper analyzes the trajectory of India's trade due to trade partnerships. We estimate trade growth in two ways, using the compound annual growth rate (CAGR) analysis following Udbye (2015) and an enhanced Gravity model estimation. CAGR is a simple and straightforward method to calculate the changes in trade flows before and after an agreement and thus, allows us to broaden the scope of our estimation. We apply Udbye's (2015) CAGR study to India and *extend* this analysis to show the different ways that trade agreements can affect trade flows. We complement this analysis with an enhanced Gravity model estimation which has been used to study the impact of trade agreements (Frankel, 1997, and Frankel and Wei, 1993). Studies have been conducted on developing countries such as Bangladesh (Rahman, 2003), Iran (Kalbasi, 2001), Mongolia (Ganbaatar et al., 2021), and Southeast Europe (Christie, 2002). India-based Gravity model estimations have been conducted by Singh (2021), Chandran (2018), and Batra (2006). These studies have typically focused on one or two trade agreements. Our paper estimates the impact for all of India's trade agreements. This gives us a more comprehensive view of trade flows and the asymmetric effects of agreements on exports and imports which shed light on trade balances.

A comparison of pre- and post- agreement trade flows in the CAGR analysis and Gravity model estimation is useful to establish the role of trade agreements. However, the changes in trade flows could occur due to external factors unrelated to the trade agreement. To address this, we follow Udbye (2015) by creating a control group for comparison. An examination of pre- and post- agreement trade

flows of India with her trade agreement partners (treatment group) compared to the control group can help us better gauge the role played by a trade agreement.

We discuss the methodology in the next section.

#### **4. Methodology**

To examine the effects of trade agreements on India's trade we use two methods, the compound annual growth analysis (CAGR) and Gravity model estimation. For both studies, we have a treatment group (countries with which India has a trade agreement) which we compare to a control group (countries with which India does not have a trade agreement). From this list, we excluded all countries that are part of a trade agreement with India. For the CAGR analysis, we also exclude the U.S. from the control group and, separately analyze India-U.S. trade performance.

As noted by Udbye (2015), CAGR is straightforward and simple and is preferable to average growth rates because they "stabilize the trend and make comparisons more realistic." Similar to Udbye (2015) we compare the CAGR of trade flows between India and her trade-agreement partners in the post-agreement period to (a) CAGR of the same in the pre-agreement period and (b) CAGR of trade flows of the control group and the U.S. in the post-agreement period. A higher post-agreement CAGR of trade flows (compared with pre-agreement CAGR) would indicate that the agreement has promoted India's trade with that country or group of countries. However, the pre and post CAGR trade flows may differ due to external circumstances unrelated to the agreement, hence the comparison to the control group and the U.S.

We extend this analysis to include comparisons with the control group and U.S. in terms of pre-agreement and post-agreement period trajectory and in the magnitude of the shifts in trajectory. Thus, we also compare (c) the direction of change and (d) the magnitude of change in the CAGR of trade flows between India and her trade-agreement partners from pre-agreement to post-agreement period to the trajectory for the control group and the U.S.

We complement our CAGR analysis with a Gravity model estimation. The standard Gravity model links trade flows (exports and imports) to GDP levels (of the home country and trade partner), distance between the country and their trade partner, and exchange rates. GDP (of the home country and trade partners) measure productive capacity and income and thus are expected to have a positive relation with exports and imports. Distance, which serves as a proxy for the cost of transportation, is expected to have a negative relation with both exports and imports, because a higher cost would reduce trade flows. A depreciated currency is expected to promote a country's exports and reduce their imports. We also added another variable to capture the effect of a trade agreement on trade flows which is expected to increase exports and imports.

Thus, the equations to be estimated are given as:

$$\begin{aligned} Ex_{it} &= \beta_0 + \beta_1 GDP_{Ind_t} + \beta_2 GDP_{it} - \beta_3 Dist_i + \beta_4 Exch_{it} + \beta_5 DTA_{it} + \varepsilon_{it} \\ Im_{it} &= \beta_0 + \beta_1 GDP_{Ind_t} + \beta_2 GDP_{it} - \beta_3 Dist_i - \beta_4 Exch_{it} + \beta_5 DTA_{it} + \varepsilon_{it} \end{aligned}$$

Where  $Ex_{it}$  and  $Im_{it}$  are Indian exports to, and Indian imports from, the  $i$ th country, measured in U.S. dollars;  $GDP_{Ind_t}$  and  $GDP_{it}$  are real GDP (2015 dollars) for the home country (India) and  $i$ th country (India's trade partners) respectively;  $Dist_i$  is the distance in miles between India and the  $i$ th country; and  $Exch_{it}$  is the exchange rate measured as rupees per foreign currency. All these variables are in logarithm form.

The last variable,  $DTA_{it}$ , is an interactive term which equals  $Agreement_i * Post_t$ , where  $Agreement_i$  equals one when the  $i$ th country has a trade agreement with India (treatment group) and zero otherwise (control group), and  $Post_t$  equals one for the period after the trade agreement goes into effect and zero otherwise.

As discussed earlier, in the exports equation the distance variable has a negative coefficient, while other variables have a positive coefficient. For the imports equation, the coefficients for the distance and the exchange rate variables are negative, while the other variables have a positive coefficient.

## 5. Results

Our sample period is 1992-2019 for the CAGR analysis and 1996-2019 for the Gravity model estimation. The later starting year for the Gravity model estimation is due to lack of data. We end our analysis in 2019 to avoid the disruption in trade trends caused by the COVID-19 pandemic.

The treatment group (countries with which India has a trade agreement), excludes trade agreements that were in effect prior to our sample period, or only recently came into force, or are currently in consultation since we cannot compare pre- and post- period trade growth. Our sample includes India's trade agreements with Afghanistan, Chile, Japan, Malaysia, Singapore, South Korea, and Sri Lanka as well as with groups of countries, including the ten countries of the Association of South East Asian Nations (ASEAN-10), four countries of MERCOSUR, and the other seven members of the South Asian Association of Regional Cooperation (referred to as SAARC\*). These countries are part of the treatment group with details of agreements in Table 3.

From Table 3 we see that India has a free trade agreement with one country (Sri Lanka), two bilateral (Afghanistan and Chile) and one multilateral (Mercosur) preferential trade agreement, and four comprehensive economic cooperation/partnership agreements (Japan, Malaysia, Singapore, and South Korea). Afghanistan and Sri Lanka are part of a multilateral free trade area with

SAARC\* and Malaysia and Singapore are part of the multilateral trade in goods agreement with ASEAN-10.

**Table 3: Trade agreements with India**

Country/group	Type of agreement	Signed	In effect
Afghanistan	Preferential Trade Agreement	03-06-2003	05-13-03
Chile	Preferential Trade Agreement	03-08-2006	04-17-2007
Japan	Comprehensive Economic Partnership Agreement	02-16-2011	06-30-2011
Malaysia	Comprehensive Economic Cooperation Agreement	02-18-2011	08-01-2011
Singapore	Comprehensive Economic Cooperation Agreement	06-29-2005	08-01-2005
South Korea	Comprehensive Economic Partnership Agreement	08-07-2009	01-01-2010
Sri Lanka	Free Trade Agreement	12-28-1998	03-01-2000
ASEAN-10	Trade in Goods Agreement	01-01-2010	01-01-2010
MERCOSUR	Preferential Trade Agreement	01-25-2004	06-01-2009
SAARC*	Free Trade Area	01-06-2004	01-01-2006

Notes: Afghanistan and Sri Lanka are part of SAARC and Malaysia and Singapore are part of ASEAN. Our analysis includes both individual and group agreements for these countries. The Association of South East Asian Nations-10 (ASEAN-10) includes Brunei Darussalam, Cambodia, Indonesia, Lao, Malaysia, Myanmar, Singapore, Thailand, The Philippines, and Vietnam. The ASEAN-India Free Trade Agreement (AIFTA) includes three agreements, the Trade in Goods Agreement (2010), the Trade in Services in Agreement (2014), and the Investment Agreement (2014). We focus on the first agreement. MERCOSUR includes Argentina, Brazil, Paraguay, and Uruguay. SAARC\* includes Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka that along with India that are part of the South Asian Association of Regional Cooperation.

Data from Department of Commerce, Government of India website. Authors' table.

The control group (CG) is made up of those countries whose trade share exceeds one percent of India's total trade (in 2019). We exclude all countries that are part of the treatment group. The U.S. is part of the control group for the Gravity model, but we exclude it from that group for the CAGR analysis and analyze it separately. There are 26 countries (not counting the U.S.) in the CG whose collective share of exports and imports with India is approximately 47% and 62% respectively and these numbers rise to approximately 86% and 90% when we include the U.S. and trade agreement countries in our sample (Table 4).

**Table 4: Trade shares of control-group and U.S.**

	<b>Export partner share</b>	<b>Import partner share</b>
<b>Control-group members</b>		
Australia	0.92%	2.21%
Belgium	1.91%	1.95%
Canada	0.90%	0.81%
China	5.35%	14.28%
Egypt, Arab Rep.	0.82%	0.42%
France	1.68%	0.80%
Germany	2.65%	2.56%
Hong Kong, China	3.55%	3.63%
Iran, Islamic Rep.	1.19%	0.70%
Iraq	0.62%	4.61%
Israel	1.12%	0.35%
Italy	1.61%	0.98%
Kuwait	0.41%	1.91%
Mexico	1.16%	1.02%
Netherlands	2.76%	0.78%
Nigeria	1.14%	2.22%
Oman	0.64%	0.69%
Qatar	0.40%	1.99%
Russian Federation	0.89%	1.30%
Saudi Arabia	1.85%	5.64%
Spain	1.31%	0.35%
Switzerland	0.40%	3.70%
Turkey	1.42%	0.48%
United Arab Emirates	9.14%	6.33%
United Kingdom	2.72%	1.44%
Venezuela	0.07%	1.19%
U.S.	16.79%	7.29%

Notes: control-group (CG) members were selected based on countries with a trade (exports + imports) share of over one percent with India in 2019. The share of exports and imports are approximately 47% and 62% for the control-group (excluding the U.S.).

Data from World Bank, World Integrated Trade Solutions database. Authors' table.

Data for exports and imports is from UN Comtrade database, for trade shares of our control group from World Bank, World Integrated Trade Solutions database, for distance from GeoDist database, CEPII, and for all other variables in

our Gravity model from World Bank database. We discuss and analyze the results in the following subsections.

**a) Compound annual growth rate (CAGR) analysis**

We calculate the pre- and post- CAGR for India's trade with all countries in the sample (Tables 5-8) and summarize the results in Tables 9a and 9b for exports and imports respectively. If the trade agreement is with a group such as ASEAN, MERCOSUR, and SAARC, we calculate a trade-weighted average CAGR using export, import, and total trade shares from 2019 (World Bank, World Integrated Trade Solutions database).

**Table 5: CAGR for India's trade with Sri Lanka, Afghanistan, and SAARC\***

	EXPORTS			IMPORTS		
	Pre	Post	Δ	Pre	Post	Δ
Sri Lanka	7.72%	10.31%	2.59%	14.19%	17.45%	3.26%
CG	9.88%	11.57%	1.69%	14.76%	14.61%	-0.15%
U.S.	10.02%	9.22%	-0.80%	5.55%	13.31%	7.76%
Afghanistan	1.83%	12.79%	10.96%	15.70%	18.68%	2.98%
CG	10.87%	10.63%	-0.24%	5.51%	17.44%	11.93%
U.S.	9.24%	9.74%	0.50%	4.63%	12.03%	7.40%
SAARC*	14.95%	11.44%	-3.51%	23.96%	9.21%	-14.75%
Afghanistan	9.59%	12.53%	2.94%	21.65%	18.38%	-3.27%
Bangladesh	11.04%	12.09%	1.05%	19.45%	12.84%	-6.61%
Bhutan	29.97%	18.59%	-11.38%	35.98%	5.60%	-30.38%
Maldives	15.90%	9.35%	-6.55%	21.34%	5.46%	-15.88%
Nepal	18.16%	15.67%	-2.49%	22.83%	5.24%	-17.59%
Pakistan	18.25%	-0.29%	-18.54%	0.97%	-9.83%	-10.80%
Sri Lanka	14.91%	5.11%	-9.80%	29.42%	4.95%	-24.47%
CG	14.93%	7.18%	-7.75%	12.96%	8.48%	-4.48%
U.S.	10.81%	7.91%	-2.90%	9.52%	8.38%	-1.14%

Note: Cells shaded blue indicate an increase in the post-agreement compared to the pre-agreement period. Data from UN Comtrade database. Authors' table.

**Table 6: CAGR for India's trade with Singapore, ASEAN-10, and Malaysia**

	EXPORTS			IMPORTS		
	Pre	Post	$\Delta$	Pre	Post	$\Delta$
Singapore	13.51%	7.93%	-5.58%	15.88%	10.89%	-4.99%
CG	13.51%	7.94%	-5.57%	10.58%	13.09%	2.51%
U.S.	9.71%	8.24%	-1.47%	7.49%	10.05%	2.56%
ASEAN	17.29%	4.69%	-12.60%	20.48%	8.03%	-12.45%
Brunei	23.73%	10.34%	-13.39%	59.25%	10.87%	-48.38%
Cambodia	33.28%	12.82%	-20.46%	-1.30%	19.82%	21.12%
Indonesia	17.91%	-0.09%	-18.00%	30.06%	4.85%	-25.21%
Lao	42.72%	13.60%	-29.12%	-1.68%	-18.44%	-16.76%
Malaysia	16.90%	5.83%	-11.07%	14.45%	5.67%	-8.78%
Myanmar	19.94%	13.38%	-6.56%	13.07%	-7.64%	-20.71%
Philippines	14.49%	7.39%	-7.10%	21.10%	3.51%	-17.59%
Singapore	13.88%	1.71%	-12.17%	16.95%	7.45%	-9.50%
Thailand	10.50%	7.31%	-3.19%	23.18%	5.97%	-17.21%
Vietnam	28.75%	8.34%	-20.41%	11.00%	22.31%	11.31%
CG	15.25%	3.25%	-12.00%	18.18%	2.94%	-15.24%
U.S.	9.19%	8.69%	-0.50%	11.31%	6.22%	-5.09%
Malaysia	15.52%	6.49%	-9.03%	16.36%	-0.10%	-16.46%
CG	16.29%	0.92%	-15.37%	19.03%	0.36%	-18.67%
U.S.	11.21%	4.85%	-6.36%	12.04%	4.74%	-7.30%

Note: Cells shaded blue indicate an increase in the post-agreement period compared to the pre-agreement period. Data from UN Comtrade database. Authors' table.

In total we evaluate 28 cases, with seven bilateral trade agreements, and three multilateral trade agreements. There are 24 countries, four of which are part of both bilateral and multilateral trade agreements and are considered twice as they cover different periods. We find that of the seven bilateral trade agreements, a majority (five) have a lower CAGR in the post agreement period compared with the pre period for both exports and imports (Tables 9a and 9b respectively). These

tables also show that compared with the CG, a majority of countries have a higher CAGR for both exports and imports (four), have a similar trend from pre to post period (six and five for exports and imports respectively), and see a bigger improvement in the post period (five for exports and four for imports). The results show that the U.S. outperforms almost all countries on the three measures discussed above (Tables 9a and 9b).

**Table 7: CAGR for India's trade with MERCOSUR**

	EXPORTS			IMPORTS		
	Pre	Post	$\Delta$	Pre	Post	$\Delta$
MERCOSUR	32.06%	8.32%	-23.74%	14.91%	5.36%	-9.55%
Argentina	16.38%	8.91%	-7.47%	20.43%	12.24%	-8.19%
Brazil	35.50%	7.90%	-27.60%	11.15%	0.44%	-10.71%
Paraguay	18.31%	14.13%	-4.18%	8.44%	14.83%	6.39%
Uruguay	18.28%	11.77%	-6.51%	7.96%	10.27%	2.31%
CG	16.17%	5.02%	-11.15%	20.17%	4.73%	-15.44%
U.S.	10.49%	9.95%	-0.54%	14.85%	7.35%	-7.50%

Note: Cells shaded blue indicate an increase in the post-agreement period compared to the pre-agreement period. Data from UN Comtrade database. Authors' table.

**Table 8: CAGR for India's trade with Chile, South Korea, and Japan**

	EXPORTS			IMPORTS		
	Pre	Post	$\Delta$	Pre	Post	$\Delta$
Chile	19.81%	10.88%	-8.93%	44.31%	-3.80%	-48.11%
CG	15.19%	5.94%	-9.25%	17.28%	6.18%	-11.10%
U.S.	10.96%	7.93%	-3.03%	11.13%	7.16%	-3.97%
South Korea	17.88%	2.50%	-15.38%	18.35%	4.97%	-13.38%
CG	15.25%	3.25%	-12.00%	18.18%	2.94%	-15.24%
U.S.	9.19%	8.69%	-0.50%	11.31%	6.22%	-5.09%
Japan	5.94%	-1.65%	-7.59%	9.07%	1.43%	-7.64%
CG	15.73%	0.81%	-14.92%	18.51%	0.37%	-18.14%
U.S.	9.89%	5.72%	-4.17%	11.72%	4.97%	-6.75%

Note: There are no increases in post-agreement period compared to the pre-agreement period. Data from UN Comtrade database. Authors' table.



**Table 9a: Summary of CAGR results for exports**

Country/Group	v. self		v. CG / U.S.	
	pre	Post	$\Delta$ Trend	$\Delta$ magnitude
Sri Lanka	✓	✓/✓	~/✓	✓/✓
Afghanistan	✓	✓/✓	✓/~	✓/✓
Singapore	X	~/X	~/~	~/X
Malaysia	X	✓/X	~/~	✓/X
Chile	X	~/X	~/~	✓/X
South Korea	X	X/X	~/~	X/X
Japan	X	✓/X	~/~	✓/X
SAARC*	X	✓/X	~/~	✓/X
Afghanistan	✓	✓/✓	✓/✓	✓/✓
Bangladesh	✓	✓/✓	✓/✓	✓/✓
Bhutan	X	X/X	~/~	X/X
Maldives	X	✓/X	~/~	✓/X
Nepal	X	X/X	~/~	✓/✓
Pakistan	X	✓/✓	~/~	X/X
Sri Lanka	X	X/X	~/~	X/X
ASEAN	X	~/X	~/~	~/X
Brunei	X	X/X	~/~	X/X
Cambodia	X	X/X	~/~	X/X
Indonesia	X	X/X	~/~	X/X
Lao	X	X/X	~/~	X/X
Malaysia	X	✓/X	~/~	✓/X
Myanmar	X	✓/X	~/~	✓/X
Philippines	X	✓/X	~/~	✓/X
Singapore	X	~/X	~/~	~/X
Thailand	X	✓/X	~/~	✓/X
Vietnam	X	X/X	~/~	X/X
MERCOSUR	X	X/X	~/~	X/X
Argentina	X	✓/X	~/~	✓/X
Brazil	X	X/X	~/~	X/X
Paraguay	X	✓/X	~/~	✓/X
Uruguay	X	✓/X	~/~	✓/X

Notes: summary results from tables 5-8 for: (a) post v. pre; (b) post v. CG/U.S.; (c) pre to post trajectory v. CG/U.S., and (d) magnitude of change v. CG/U.S. ✓, X, and ~ indicates that the trade agreement country performs better, worse, or the same respectively.

**Table 9b: Summary of CAGR results for imports**

Country/Group	v. self	v. CG / U.S.		
	pre	Post	$\Delta$ Trend	$\Delta$ magnitude
Sri Lanka	✓	✓/X	✓/~	✓/X
Afghanistan	✓	X/X	~/~	X/X
Singapore	X	X/X	X/X	X/X
Malaysia	X	✓/X	~/~	✓/X
Chile	X	X/X	~/~	X/X
South Korea	X	✓/X	~/~	✓/X
Japan	X	✓/X	~/~	✓/X
SAARC*	X	X/X	~/~	X/X
Afghanistan	X	X/✓	~/~	✓/X
Bangladesh	X	X/X	~/~	X/X
Bhutan	X	X/X	~/~	X/X
Maldives	X	X/X	~/~	X/X
Nepal	X	X/X	~/~	X/X
Pakistan	X	X/X	~/~	X/X
Sri Lanka	X	X/X	~/~	X/X
ASEAN	X	✓/X	~/~	✓/X
Brunei	X	X/X	~/~	X/X
Cambodia	✓	X/X	✓/✓	✓/✓
Indonesia	X	X/X	~/~	X/X
Lao	X	X/X	~/~	X/X
Malaysia	X	✓/X	~/~	X/X
Myanmar	X	X/X	~/~	X/X
Philippines	X	X/X	~/~	X/X
Singapore	X	✓/X	~/~	✓/X
Thailand	X	X/X	~/~	X/X
Vietnam	✓	✓/X	✓/✓	✓/✓
MERCOSUR	X	✓/X	~/~	✓/X
Argentina	X	✓/X	~/~	✓/X
Brazil	X	✓/X	~/~	✓/X
Paraguay	✓	✓/X	✓/✓	✓/✓
Uruguay	✓	✓/X	✓/✓	✓/✓

Notes: summary results from tables 5-8 for: (a) post v. pre; (b) post v. CG/U.S.; (c) pre to post trajectory v. CG/U.S., and (d) magnitude of change v. CG/U.S. ✓, X, and ~ indicates that the trade agreement country performs better, worse, or the same respectively.

This analysis supports the benefits of a potential India-U.S. trade agreement. We complement this with the Gravity model estimation, which allows us to control for some important factors while analyzing the impact of trade agreements. We discuss our Gravity model estimation results in the next subsection.

### b) Gravity model estimation

As noted earlier, the sample for this estimation is similar to the one we use for our CAGR analysis but the period is restricted to 1996-2019 and a few countries are excluded due to unavailable data.<sup>2</sup> Our sample has 47 countries with about half (22) with trade agreements (at different periods). Some of the countries have a bilateral and multilateral trade agreement with India.

For countries with both a bilateral and multilateral trade agreement, the interactive trade agreement variable, *DTA*, equals one for periods following the first agreement. For robustness, we also estimate a second regression where the variable equals one for periods following the multilateral trade agreement. The results (not reported here) are very similar.

**Table 10: Gravity model results for exports and imports**

Variable	Exports		Imports	
	Coeff. [Robust SE]	p-value	Coeff. [Robust SE]	p-value
GDPInd	1.374* [0.083]	0.000	1.849* [0.236]	0.000
GDP	1.032* [0.101]	0.000	1.111* [0.167]	0.000
Dist	-1.259* [0.251]	0.000	-1.042* [0.346]	0.002
Exch	0.025 [0.047]	0.299	-0.109* [0.066]	0.051
DTA	0.278* [0.104]	0.004	0.424** [0.307]	0.084
Constant	-34.380 [2.996]	0.000	-51.984 [6.618]	0.000

Notes: We report two regression results (using Stata) for both exports and imports. For regression 1, *DTA* for countries that are part of both a bilateral and multilateral trade agreement equal one for periods following the first agreement and for regression 2, *DTA* equals one for periods following the multilateral agreement. To address serial correlation and heteroskedasticity, robust standard errors are reported. \*, \*\*, and \*\*\* indicate that the variables are statistically significant at 5 percent, 10 percent, and 15 percent respectively.

As expected, the size of the economies represented by real GDP for India and her trading partners, had a positive and statistically significant impact on exports

<sup>2</sup> Two countries with which India has a trade agreement (Afghanistan and Myanmar) and two countries with which India does not have an agreement (Qatar and Venezuela) are excluded due to incomplete data.

and imports (Table 10). The results show that domestic income elasticity of demand for India's imports are stronger than foreign elasticity of India's exports (1.849 v. 1.032), meaning that equal increases in GDP for India and her partners will widen the trade deficit. Distance had a negative and statistically significant impact on trade flows with a larger impact on exports than imports (Table 10). The variable, *Exch*, had the correct signs for exports (positive) and imports (negative) indicating that a depreciated currency promotes exports and hurts imports (Table 10). However, not only is the magnitude of the coefficient much larger for imports (-0.109 v. 0.025 for exports), we also find that the exchange rate is not a statistically significant determinant of exports indicating that currency changes only impact import flows.

Our main focus was on the impact on trade due to India's participation in a trade agreement. These results reinforce our CAGR analysis. We find that the variable, *DTA*, had a positive and statistically significant impact for both exports and imports at 5 percent and 10 percent level of significance respectively (Table 10). Growth in exports is estimated to increase by about 28 percent and growth in imports is expected to rise by 42 percent following a trade agreement. The magnitude of the coefficient for the trade flows indicates that India's participation in a trade agreement leads to greater growth in imports. This is likely related to pent up demand for foreign goods in India due to protectionism. This is also an indication that participation in a trade agreement will likely worsen India's trade deficits.

## **6. Conclusion**

There is no simple answer to the question, "would India benefit from a trade agreement with the U.S.?" Both the CAGR analysis and the Gravity model estimation suggest that trade flows are likely to increase due to a trade agreement. From the CAGR analysis we find that trade between India and her trade-agreement partners outperforms that of the control group. Notably, this is true for Japan, the only developed country with which India has a trade agreement. This case shows that an economic partnership between India and the U.S. may prove mutually beneficial, although we should be cautious about drawing conclusions from only one case. The Gravity model results also show higher levels of trade following an agreement. Unlike the CAGR analysis, these results include the U.S. as part of the control group. This is important because our CAGR analysis shows that trade agreement partners perform poorly compared with the U.S. Once we add other determinants of trade in the Gravity model, we find that trade agreement partners outperform the control group (which includes the U.S.).

While we see an increase in trade, we also find that the impact of participation in trade agreements is not symmetric across trade flows. This is confirmed by both the CAGR analysis and the Gravity model estimation. The latter gives us an

estimate of the differential impact of trade agreements on exports and imports. Participation in a trade agreement is associated with a 42 percent jump in imports compared with a 28 percent increase in exports. The 14-point difference in trade flows have important implications for India's trade deficits, which are already high as seen in Figure 2.

Over the last decade or more, India has had a trade surplus with the U.S. If the trajectory of the trade balance between the two countries, following a trade agreement, resembles the patterns observed in our sample, then we would expect to see a decline in the trade surplus for India with the U.S. By reducing the bilateral trade surplus, a potential India-U.S. trade agreement, could lead to an increase in overall trade deficits for India, which could exacerbate an already deteriorating overall trade position. However, trade deficits are not the only consideration. An increase in exports, especially manufacturing exports, which as noted earlier are a large component of India-U.S. trade, could yield benefits to overall growth and employment in India. Thus, a potential India-U.S. trade agreement *may* have a long-term benefit.

The trade of services and foreign investment ties between the countries further complicates our conclusions. Our results are based on trade of goods, but a trade agreement would also affect trade in services. Again, India has a trade surplus in services with the U.S., but if services trade follows the same pattern as trade in goods, then this trade surplus may also decline, further exacerbating India's overall trade position. On the other hand, India is the recipient of a high level of FDI from the U.S. and a trade agreement could lead to even further FDI inflows. In turn, this could strengthen production of exports as well as diversify the export sector. A future study could delve into the implications of trade agreement on foreign investment. In addition, further research into the most beneficial type of agreement, free trade agreement, preferential trade agreement, or economic partnership would also be useful.

## References

Batra, A. (2006). India's Global Trade Potential: The Gravity Model Approach. *Global Economic Review*. 35, 327-361.

<http://dx.doi.org/10.1080/12265080600888090>

Busse, M., Huth, M., & Koopmann, G. (2000). Preferential Trade Agreements: The Case of EU-Mexico. *Hamburg Institute of International Economics (HWWA) Hamburg*. Discussion Paper, No. 103.

<https://www.econstor.eu/bitstream/10419/19448/1/103.pdf>

Chandran, B.P. S. (2018). Trade Impact of the India-ASEAN Free Trade Agreement (FTA): An Augmented Gravity Model Analysis. *Munich Personal RePEc Archive*. MPRA Paper No. 84183. <https://mpra.ub.uni-muenchen.de/84183/>

Chiasakul, R., Khanti-Akom, C., & Wittayarungruangsi, S. (2010). The Economic Impact of the Thailand-Australia Free Trade Agreement (TAFTA) and the Thailand-New Zealand Closer Economic Partnership (TNZCEP). <https://www.gtap.agecon.purdue.edu/resources/download/4947.pdf>

Christie, E. (2003). Potential Trade in South-East Europe: A Gravity Model Approach. *SEER: Journal for Labour and Social Affairs in Eastern Europe*. 5(4), 81–101.

Ciddikie, M., Khan, A., & Akram, H. (2014). India's Trade Relationship with SAFTA Countries: A Review. *Journal of Indian Research*. (ISSN: 2320-7000) Vol.2, No.1, January-March, 46-58.

Council on Foreign Relations. (2020) *Council on Foreign Relations. United States*. [Web Archive] Retrieved from the Library of Congress, <https://www.cfr.org/annual-report-2020>

Morrow, D., & Carriere, M. (1999). The Economic Impacts of the 1998 Sanctions on India and Pakistan. *The Nonproliferation Review*. <https://www.nonproliferation.org/wp-content/uploads/npr/morrow64.pdf>

Fukase, E., & Martin, W. (2016). The Economic Potential of an India-US Free Trade Agreement. *Journal of Economic Integration*, 31(4), 774-816. <https://doi.org/10.11130/jei.2016.31.4.774>.

Frankel, J. A. (1997). Regional Trading Blocs in the World Economic System. *Institute for Internal Economics, Washington, D.C.*

Frankel, J. A., & Wei, S-J. (1993). Emerging Currency Blocs. *NBER*. Working Paper No. w4335, Available at SSRN: <https://ssrn.com/abstract=227026>. FRED, Federal Reserve Bank of St. Louis. <https://fred.stlouisfed.org/>

Ganbaatar, B., Huang, J., Shuai, C., Nawaz, A., Ali, M. (2021). Empirical Analysis of Factors Affecting the Bilateral Trade between Mongolia and China. *Sustainability*, 13(7), 4051. <https://www.mdpi.com/2071-1050/13/7/4051>

Jain, H. (2019). Implications of SAFTA for Indian Economy: Trade, Compatibility and Welfare Effects. *Foreign Trade Review*, 54(4):355-374. doi:10.1177/0015732519874218.

Kalbasi, H. (2001). The Gravity Model and Global Trade Flows. *Global Economic Modeling Conference, Washington DC*. ecomod2001/papers\_web/KALBASI.pdf

Mitsuyo, A., & Shujiro, U. (2015). Impacts of Japan's FTAs on Trade: The Cases of FTAs with Malaysia, Thailand, and Indonesia. *Research Institute of Economy, Trade and Industry, RIETI*. Discussion Paper Series 15-E-104. <https://www.rieti.go.jp/jp/publications/dp/15e104.pdf>

Monga, P., & Batra, S. C. (2019). Impact of LPG on Indian Economy. *Shodh Samiksha Aur Mulyankan* no. 41004, Available at SSRN: <https://ssrn.com/abstract=3367007>

Press Trust of India (PTI) New Delhi. India, South Korea Review Free Trade Agreement. *Business Standards*, June 18, 2016.

Rahman, M. (2003). A Panel Data Analysis of Bangladesh's Trade: The Gravity Model Approach. *5th Annual Conference of the European Trade Study Group (ETSG2003)*, Madrid, 11-13 September, 1-54.

Ratna, R.S., & Murali K.I. (2013). ASEAN-India Free Trade Agreement (FTA) and Its Impact on India: A Case Study of Fisheries and Selected Agricultural Products. *Foreign Trade Review*, vol. 48, no. 4, Nov. 481-497. doi:10.1177/0015732513504713.

Seshadri, V.S. (2016). India-Japan CEPA an Appraisal. *Research and Information System for Developing Countries (RIS)*. [https://ris.org.in/sites/default/files/India-Japan%20CEPA%20Report\\_2016.pdf](https://ris.org.in/sites/default/files/India-Japan%20CEPA%20Report_2016.pdf)

Siddiqui, A.A., & Sharma, N. (2018). Economic Partnership Between India and Japan – Comparative Trade and Sectoral Analysis. *International Journal of Business and Economics*, vol. 3, no. 1. pp. 42-65, <https://doi.org/10.5281/zenodo.2561443>

Singh, L.B. (2021). Impact of India-ASEAN Free Trade Agreement: An Assessment from the Trade Creation and Trade Diversion Effects. *Foreign Trade Review*, vol. 56, no. 4, Nov. pp. 400-414, doi:[10.1177/00157325211021503](https://doi.org/10.1177/00157325211021503).

Stellian, R. & Danna – Buitrage, J.P. (2017). Colombian Agricultural Product Competitiveness Under the Free Trade Agreement with the United States: Analysis of the Comparative Advantage. *CEPAL Review* No. 122.

Taneja, N., Nagpal, N.K., Ray, S. (2014). India-Korea CEPA: Harnessing the Potential in Services. Working Paper, No. 280, *Indian Council for Research on International Economic Relations (ICRIER)*, New Delhi.  
<https://www.econstor.eu/bitstream/10419/176298/1/icrier-wp-280.pdf>

Trasher, R., & Gallagher, K. (2008). Trade Agreements: Implications for Long-Run Development Policy. *The Pardee Papers*/No. 2/September 2008.

Udbye, A. (2015). How did the U.S. Free Trade Agreements fare? A Comparative Study of Export, Import and Bilateral Growth Rates for the Twenty Countries Before and After the FTA's. Submitted to the *Academy of International Business' US West Chapter Conference, Seattle, October, 2015*

UN Comtrade Database, United Nations Statistics Division. International Merchandise Trade Statistics. <https://comtrade.un.org/>.

USTR, United States Trade Representative, Office of the United States Trade Representative. <https://ustr.gov/>.