

Have Indian Deep trade agreements achieved their Export potential- Implications for the future

Leena Ajit Kaushal

Management Development Institute Gurgaon, India

Keywords

Trade agreements, export, India

Abstract

The present study investigates the export potential of India's deep & shallow trade agreements over the last two decades by employing stochastic frontier gravity model. The analysis investigates if the level of integration matters. The study further explores if the deep trade agreements supported Indian trade during pandemic times. The study finds that India's deep trade agreements have achieved only 32 percent efficiency over the period of study and have not promoted exports, unlike the shallow trade agreements even during the pandemic.

Introduction

The number of trade agreements (TA) has increased significantly in recent years. More than a third of global trade takes place due to such accords. India has been actively involved in regional and bilateral trade negotiations to diversify and develop its exports while ensuring access to the raw materials needed to boost domestic value-added manufacturing. The growth of Regional Trade Agreements has been a characteristic of the global trading system since the mid-1990s (RTA). The number of RTAs has increased sharply since 1992. The standard economic rationale is that intra-RTA trade should be expanded. If the claim is correct, the level of trade between member countries should be raised. Empirical investigations, on the other hand, show the contrary. Many studies have found that RTAs have failed to generate considerable intra-trade. According to Pant & Sadhukhan (2000), demand and supply considerations are more essential for India's exports than the RTA's pure trade creation or diversion effects. India has embraced regionalism as a building component for trade liberalization as a rapidly growing economy. Before 2000, India primarily concentrated on South Asian countries by signing bilateral free trade agreements, such as one with Sri Lanka in 1998. It bolstered the South Asian Association for Regional Cooperation (SAARC) governments' push for a South Asian Free Trade Agreement (SAFTA). When India authorized Afghanistan's membership in the SAARC in 2003, despite domestic resistance, its political goals were apparent (Pant 2010). After the year 2000, India's priority shifted to forming Comprehensive Economic Cooperation Agreements (CECAs) with Singapore (2005), ASEAN Free Trade Agreements (FTAs) with ASEAN (2009), and Japan Comprehensive Economic Cooperation Agreements (CECAs) (2011). India did not have a bilateral reciprocal preferential trade agreement in 1995. However, it was a member of the Asia-Pacific Trade Agreement (APTA), South Asia Preferential Trade Arrangement (SAPTA), and the Global System of Trade Preferences (GSTP). After 2000, India began negotiating PTAs, beginning with the signing of framework agreements in 2003. India now has bilateral PTAs with Afghanistan (2003), Thailand (2004), Chile (2007), and Nepal (2007). (2009). Like other developing countries, India has been rushing to sign RTAs (FTAs and PTAs) and other deeper economic cooperation agreements to prevent being shut out of important markets.

India's trade performance is insignificant; despite having FTAs and PTAs because India raises tariffs or non-tariff barriers on intermediate goods, the goods that enter India are mainly used to manufacture goods India exports. Any increase in the price of these products raises production expenses and reduces our exports. We further weaken our competitiveness by raising the cost of these crucial inputs, which are already hampered by high transportation, financing, and power costs. India can use incentive structures to ensure exports have higher relative profitability than the rest of the economy. Among the incentive structures were subsidised bank credit, export targets related to long-term financing, export subsidies, and R&D incentives. Export promotion, rather than import substitution, appears to be the driving force behind prosperity in Asia.

On the other hand, India was unable to recreate this export- and investment-led economic strategy. Despite having the inherent strength and ability to achieve considerably more, India's share of global trade in goods was only 2%, according to the WTO. While the services sector has performed well, manufacturing and export growth has been uneven. Manufacturing's share of GDP and employment stayed constant between 1990 and 2020. To boost exports and growth, we must encourage our domestic manufacturing industry. Over the last few years, some significant policy actions have been taken in this direction. First, reducing the corporation tax rate to 22% for all businesses and 15% for new manufacturing businesses will boost domestic production. For the first time, introducing Production-Linked Incentive (PLI) schemes in several critical sectors incentivizes production rather than inputs. These schemes will aid the domestic industry is growing in size and scale. Only by putting a strong focus on exports will the economy be able to recover quickly.

Numerous export policy reforms have been implemented to improve the quality of export commodities and raise global awareness of the "Made in India" brand. Trade agreements in the form of bilateral or multilateral Preferential Trade Agreements (PTA) or Free Trade Agreements (FTA) have become a vital tool for executing the liberalization policies adopted by the Indian government. Such measures assist member countries in maximizing trade efficiency and reaching their trade potential. The present study employs the stochastic frontier (SF) gravity model to assess the effects of deep and shallow trade agreements on India's export potential and efficiency from 2002-2020 and notably during the COVID-19 epidemic. The CEPII variable categorizing RTAs by type, i.e., deep and shallow, is based on actual WTO data. Deep agreements are customs unions and free trade agreements that contain an economic integration pact, whereas economic integration, free trade, and partial scope agreements are all classified as shallow. The fundamental assumption behind the SF model is that no economic agent can exceed the ideal "frontier" that represents its potential and that deviations from this extreme imply individual inefficiencies. As a result, potential refers to the maximum amount of trade that can be done in a frictionless trade situation. In contrast, trade efficiency relates to the extent of the realized trade potential. The findings would provide information about the efficacy of various RTA that may be useful for the policymakers in India, who are currently negotiating various FTAs, in the post-COVID time.

Brief about Trade Agreements

Currently, India has 15 TA¹ with various countries/ regions, namely, Japan, South Korea, Singapore, countries of the Association of Southeast Asian Nations (ASEAN) region, and the South Asian Free Trade Agreement (SAFTA) (see Table 1). Within the broad category of RTAs, agreements are further distinguished as follows.

A free trade agreement is an agreement between two or more countries that creates a free trade area. This includes easing international trade restrictions between the countries involved, i.e., reducing or eliminating import duties and tariffs. A preferential trade agreement is a trade agreement between countries that lowers tariffs and other barriers to certain products. The fundamental difference between an FTA and a PTA is that a preferential trade agreement can be unilateral. In other words, PTA is exemptions on trade restrictions from one country to another, without the other country necessarily reciprocating, whereas FTAs require reciprocity. FTAs usually cover services, investments, movement of capital, provisions of goods and people, and trade, removing both tariff and non-tariff barriers to trade. PTA provides preferential market access by reducing import duties on limited quantities of goods. The concept of shallow and deep integration is initially proposed by Lawrence (1996). Shallow RTA is only trade liberalization, including removing trade barriers.

In contrast, deep integration "proceeds by removing boundary constraints" (Lawrence 1996, p. 8). Deep RTA has many provisions, including investment, labour, environmental and intellectual property rights. Agreements identified by CEPII as economic integration agreements, free trade agreements and preferential trade agreements are classified as shallow. In contrast, customs unions and free trade agreements that include an economic integration agreement are classified as deep agreements.

Although preferential tariff clauses are found in almost all trade agreements, most PTAs today cover a wide range of topics besides tariffs, such as services, investments, intellectual property protection, and

¹ The study considers bilateral, preferential & free trade agreements, collectively referred to as TA & used interchangeably throughout the paper.

competition policy. Domestic rules are involved in these policy areas (or behind-the-border measures). The agreements are "deeper" in some of these new areas, either because they obligate members to greater levels of market integration than the WTO or because some policy prerogatives are transferred from the national to the supranational level (e.g., the creation of regional standards). Deep integration results in more Trade openness, enhancing policy spillovers, as collective decisions are more effective than unilateral decisions. Deep integration agreements also encourage trade in specific industries. It promotes a global production network requiring a governance framework and reduced tariffs. Since it is challenging to modify domestic regulations to favour only specific trade partners if these agreements primarily result in changes to domestic regulations.

India has deep RTAs with Japan, Malaysia, Singapore, Republic of Korea and ASEAN while shallow agreements with Afghanistan, Bhutan, Chile, Nepal, Sri Lanka, Thailand, SAFTA, APTA, MERCOSUR and GSTP.

Theoretical framework and methodology

The Stochastic Frontier Gravity Model technique analyzed by Kalirajan (2007) in his trade analysis is used in this paper using data from various sources to estimate India's export potential with its 153 trading partners from 2002 to 2020. Table 1 below shows the variables used in this study and the sources from which they are derived.

Table 1: List of Variables

Variable	Definition	Unit of measurement	Source of data
Exports _{jit}	The total exports of India to 153 trading countries	USD Millions	Ministry of Commerce and Industry,GOI
GDP _{it}	Nominal Gross Domestic Product of India's export partner country	USD at constant prices (2015) in Millions	UNCTAD
GDP _{jt}	Exporting country India's Nominal Gross Domestic Product	USD at constant prices (2015) in Millions	UNCTAD
DistCap _{jit}	The geographical distance from India's capital to India's exporting partner country's capital	Kilometres	CEPII Database
REER	Real Effective Exchange rate (Indian currency per US\$)	-	OECD
V _{it}	Randomly distributed error term having mean value of 0 and random variance σ^2	-	-
U _{it}	The non-negative term, which has a truncated normal distribution capturing the domestic exports constraints of India	-	-

Using secondary data, the conventional gravity model has been successful and popular in explaining bilateral trade flows between countries (Yotov et al., 2016). Isard (1954) was the first to apply the traditional gravity model to international trade, arguing that higher GDP and shorter distance between countries will boost bilateral trade flow. The Stochastic Frontier Gravity specification is estimated as follows:

$$\ln Exports_{jit} = \alpha + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 RegQual_{it} + \beta_4 RegQual_{ij} + \beta_5 \ln DistCap_{ji} + \beta_6 [EXR_{jt}/EXR_{it}] + \beta_7 \ln FDI_{j(t-1)} + \beta_8 RTA + V_{it} - U_{it}$$

where \ln represents the natural logarithm

Exports_{jit} represents the total exports from country j (India) to country i for the time period t

GDP_{it} represents Nominal GDP (current US \$) of the importing country i during the time period t

GDP_{jt} represents Nominal GDP (current US \$) of the exporting country j during the time period t

$DistCap_{jit}$ represents distance between the capitals of country j & country i

REER Real Effective Exchange Rate (export based.) (Indian currency per US\$)

$RegQual_{it}$ represents regulatory quality of the importing country

$RegQual_{jt}$ represents regulatory quality of the exporting country

FDI_{jt-1} is the lagged FDI inflows (in current US \$) into country j during the time period $t-1$

V_{it} is the conventional error term with $N(0, \sigma_v^2)$ at period t

U_{it} is one-sided error term which has observation specific mean and variance of its pre-truncated distribution

i is the importing country, j is the exporting country India and t is the time indicator (annual).

Stochastic frontier models enable the analysis of technical inefficiency within production functions. Production units (firms, regions, countries, etc.) are assumed to use standard technology and reach the frontier when they produce the maximum output for a given set of inputs. Inefficiencies can result from structural issues, market imperfections, or other factors that cause countries to produce less than their maximum attainable output (Mastromarco, 2008). Actual output falls below the potential level (the production frontier) as a result of inefficiency, and production costs rise above the minimum level (that is, the cost frontier) (Wang, 2008). SF models have been reformed and developed over time to assess empirical efficiency estimations in the fields of production (Rahman, Mia, & Bhuiyan, 2012), environmental sustainability (Liu et al., 2020), international trade (Rahman, 2010), consumption (Baltas, 2005), power distribution (Leite et al., 2020) and education (Titus & Eagan, 2016) among others. (Titus & Eagan, 2016). The study uses the SF gravity model to capture the technical inefficiency effects of trade agreements on Indian exports based on previous studies (Paudel et al., 2020; Nguyen, 2020; Atif et al., 2019). The model can estimate the technical change in the stochastic frontier and time-varying technical inefficiencies if the inefficiency effects are stochastic (Battese & Coelli, 1995).

The gravity model of international trade states that the trade volume between two countries is proportional to their economic mass and indicates their relative trade frictions. It is anticipated that the distance between the two countries will have a negative impact on merchandise trade (Matallah et al., 2021; Le, 2017). In industries whose transportation costs are less than 4% of the total value, more than 80% of exports take place (Glaeser & Kohlhase, 2004). Therefore, it is expected that increasing distance will have a negative impact on competitiveness and trade when using the distance variable as a proxy for transportation costs.

The GDP of India demonstrates that a high-income level in an exporting country leads to a high production level, which increases the availability of goods for export. The importing country's GDP demonstrates that a high level of income in the importing country suggests higher imports. As a result, the coefficient for both variables is expected to be positive (Kaur & Nanda, 2010; Majeed and Ahmad, 2006; Nguyen, 2010). The REER is the weighted average of NEER adjusted for the domestic-to-foreign price ratio (RBI Bulletin 2005). The negative elasticity of export demand concerning REER implies that real rupee appreciation has a negative impact on Indian exports. (Sharma, 2003; Malhotra & Kumari, 2016; Sato et al., 2020).

FDI has the potential to boost the host country's exports by increasing productivity through capital and technology transfers and improving the competency and quality of the regional workforce (Bezuidenhout et al., 2021; Sultanuzzaman et al., 2018). The regulatory aspect is at the core of today's trade agreements (TAs) (Dau et al., 2021). The regulatory quality statistics compiled by the Heritage Foundation are analyzed and compared to interpret each country's regulatory landscape. The variable does not traditionally play a role in determining trade; nevertheless, in light of the growing significance of institutional quality, it is anticipated that the variable will play a role in determining trade potential. In line with Kumar and Prabhakar's (2017) findings, the current analysis assumes that the higher regulatory quality of importing countries may benefit India's export potential. According to the study's findings, the quality of India's regulatory framework also positively influences the country's exports.

Our principal goal is to evaluate the impact of trade agreements on India's export efficiency. The study considers all the RTAs mentioned above (Table 1). The study looks into the impact of agreements based on their level of integration, such as shallow and deep agreements. The study also considers whether trade in RTAs was more resilient during the Covid-19 downturn.

Table 1: List of RTAs

Agreement	Inception Year	PTA Type
Asia Pacific Trade Agreement (APTA)	1976	Partial Scope Agreement (PSA) and Economic Integration Agreement (EIA)
India- ASEAN	2010	Free Trade Agreement (FTA) and Economic Integration Agreement (EIA)
Global System of Trade Preferences (GSTP)	1989	Partial Scope Agreement (PSA)
MERCOSUR	2009	Partial Scope Agreement (PSA)
South Asian Free Trade Agreement (SAFTA)	2006	Free Trade Agreement (FTA)
India Sri Lanka	2000	Free Trade Agreement (FTA)
India Malaysia	2011	Free Trade Agreement (FTA) and Economic Integration Agreement (EIA)
India Singapore	2005	Free Trade Agreement (FTA) and Economic Integration Agreement (EIA)
Japan India	2011	Free Trade Agreement (FTA) and Economic Integration Agreement (EIA)
India Korea	2010	Free Trade Agreement (FTA) and Economic Integration Agreement (EIA)
India Bhutan	2006	Free Trade Agreement (FTA)
India Afghanistan	2003	Partial Scope Agreement (PSA)
India Chile	2007	Partial Scope Agreement (PSA)
India Nepal Treaty of Trade	2009	Partial Scope Agreement (PSA)
India Thailand	2004	Partial Scope Agreement (PSA)

Empirical Findings & Discussion

Due to the substantial correlation between GDP and the FDI inflow variable, the study employs the exporting country's GDP growth (GDPgr) rather than GDP. To estimate the stochastic frontier production function, the FDI variable is lagged by one year, assuming that the impact of FDI on the manufacturing and export sectors is not immediate.

The findings in Table 2 demonstrate that the market size of India's trading partners significantly influences the country's total exports. The findings also show a statistically significant positive relationship between exports and the GDP rate in India. As a result, increased domestic production serves the foreign market as well. Furthermore, it appears that inward FDI has a significant positive impact on Indian exports. India's manufacturing industry currently accounts for 14-17 per cent of the country's GDP. The manufacturing sector, on the other hand, has enormous potential to become a growth engine for India's economic and export progress by establishing a globally competitive manufacturing hub supported by foreign investment and leveraging the country's advantages in raw materials, manufacturing skills, and entrepreneurship (Kelkar & Kalirajan, 2021; Joumard et al., 2020).

Physical distance negatively and statistically significant impact India's total trade. It emphasises that transportation costs remain a significant issue in global trade. Findings exhibit a significant negative association between REER and Indian exports, consistent with the theoretical relationship of exchange rate appreciation negatively impacting exports.

The regulatory quality reflects the government's perception of developing and enforcing policies that protect private-sector participants while promoting development. Price controls, government regulations, investment freedom, ease of doing business, taxation, trade-related policies, and protectionism are all regulatory qualities. The study assumes that importing countries' regulatory quality will significantly facilitate India's merchandise exports. However, the results show that, contrary to our expectations, regulatory quality in partner countries is promising but does not significantly improve exports. This study backs up Kumar and Prabhakar's (2017) findings, which show that while improved regulatory quality in

the importing country makes it easier for Indian exporters to do business, it does not significantly increase imports because it also strengthens the private sector, possibly by attracting FDI.

Furthermore, increased technical regulations in importing countries may impede cross-border trade by prescribing requirements for packaging, marking and labelling, and procedures for demonstrating compliance, among other things, which tend to increase costs for businesses. These costs are borne more frequently by exporting firms through trade barriers. Such barriers are not always deliberate; they result from regulatory differences and contradictions. This necessitates nations to weigh the imposed regulations that facilitate or impede trade with the host countries (UNCTAD,2003). Pre-market harmonisation and mutual recognition allow products legally manufactured and marketed in one country to enter another, assuming both countries accept the standards of the other. Stevens (1993; Nottage et al., 2019).

Moreover, the regulatory quality in India has a significant negative impact on exports. Despite improving its ranking on various indices, India's export performance is unsettling policymakers and industry. India has the fifth - largest economy, but it is the 19th largest merchandise exporter and the eighth largest exporter of commercial services. According to the EXIM report (2020), significant trade barriers are caused by India's regulatory framework, making business difficult. Good regulatory practices, on the other hand, could efficiently address operational bottlenecks. This would let policymakers stay informed about potential operational issues and the policy's influence on exports. In addition, to ensure a robust regulatory mechanism, coordination between the various regulatory bodies is also essential (BIRAC, 2016).

Table 2: Stochastic Frontier Model Estimations

<i>Variables</i>	<i>RTA</i>	<i>FTA/PTA</i>	<i>Shallow RTAs & Deep RTAs</i>
Frontier			
<i>GDP_{Exporting Country}</i>	1.100*** (0.093)	-1.150(0.093)	1.180***(0.092)
<i>GDP_{Importing Country}</i>	0.889*** (0.011)	0.889*** (0.011)	0.824***(0.013)
<i>DistCap_{jit}</i>	-0.566***(0.040)	-0.566***(0.040)	-0.767***(0.035)
<i>REER</i>	-0.002(0.001)	-0.002**(0.001)	-0.002(0.001)
<i>FDI_{jt}(t-1)</i>	0.063*(0.038)	0.286(1.362)	0.072*(0.037)
<i>RQ_{Exporting Country}</i>	-1.299***(0.256)		-1.367***(0.255)
<i>RQ_{Importing Country}</i>	0.128(0.028)	-0.063*(0.038)	0.010(0.032)
<i>Constant</i>	-1.286***(1.362)	1.299**(0.256)	-1.826***(1.093)
<i>Inefficiency</i>		0.128(0.028)	
<i>RTA</i>	-0.761***(0.92)	-	-
<i>FTA</i>		-1.430***(0.272)	-
<i>PTA</i>		-1.566** (0.270)	-
<i>Shallow RTA</i>	-	-	-1.815***(0.667)
<i>Deep RTA</i>	-	-	0.841** (0.387)
<i>Constant</i>	2.166***(0.840)	1.952*(0.752)	0.753***(0.192)
<i>Observations</i>	2783	2783	2783
<i>Sigma Squared</i>	0.661(0.419)	0.573(0.324)	0.560***(0.143)
<i>Log-Likelihood</i>	-4966.222	-4765.832	-4950.087

Note: Figures in brackets are standard errors of the estimates; *** refers to significant at the 1% level; ** refers to significant at the 5% level; and * refers to significant at the 10% level

Findings reveal that India's RTAs both FTA and PTAs have significantly promoted Indian exports. However, deep trade agreement has not reduced technical inefficiency of Indian exports. The study further finds that RTAs achieved 42% of TE vis-à-vis 26 % among non-RTA partners. FTAs and PTA achieved 46% and 42% TE, respectively. Further categorizing RTAs into deep and shallow reveal that deep agreements overall (2002-2020) achieved 50% TE vis-à-vis 43 % in the case of shallow agreements (Fig.1). However, since 2010, the TE of export has been more pronounced under shallow TA (54%) vis-à-vis deep (50%). Data further suggest that only 26% of export transpires through the RTA route, with shallow RTA comprising a higher share, i.e., 68%, compared to deep agreements, i.e., 32% (Fig. 2), suggesting deep TA has much-untapped potential for India to exploit.

Figure:1 Average Technical Efficiency of Exports

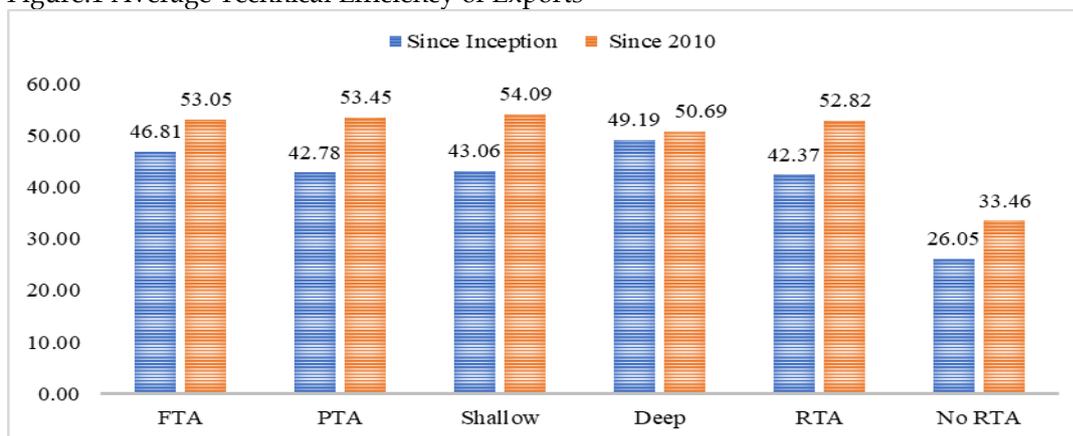
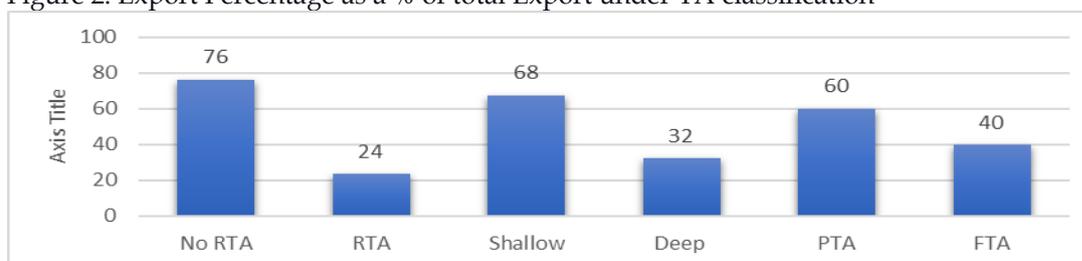


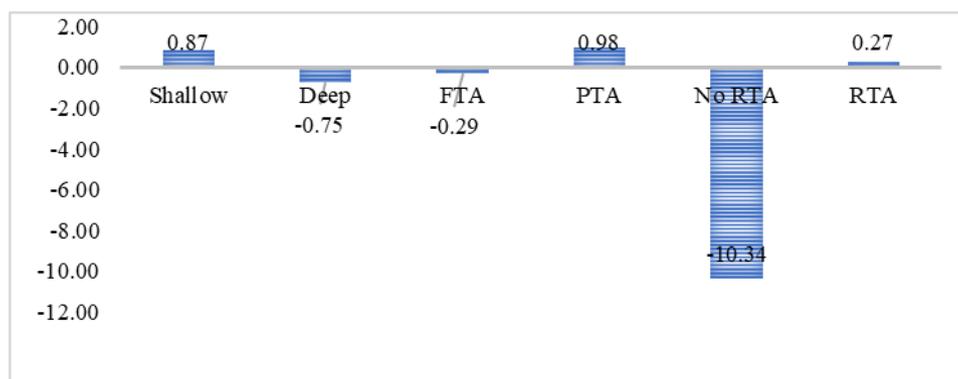
Figure 2: Export Percentage as a % of total Export under TA classification



In the ongoing trade agreements talks with several nations (US, UK, EU, Australia, and Canada), Indian policymakers are negotiating for deeper trade agreements. The study suggest that the negotiations should be diligently planned to include tariff and non-tariff matters related to India's successful sectors such as agriculture, textile, pharma, leather and various service sectors so that India can export information, financial, medical, tourist, and insurance services to partner nations. Unlike the earlier deep agreements, the newer ones should not result in more imports and exports. India has successfully signed the Comprehensive Economic Partnership Agreement (CEPA), a deep agreement with UAE to facilitate economic growth. The partnership will facilitate the easy flow of investments for both traditional, i.e., SMEs and non-traditional capital, including start-ups and the digital sector. With the signing of the India-UAE CEPA, one of the fastest agreements negotiated between any two countries and India's first complete FTA signed with any country in the decade, India and UAE are standing at a significant inflection point in history. The Indian Government's emphasis is on export promotion in this agreement. It is expected to benefit from preferential market access provided by the UAE, covering over 97% of its tariff lines which account for 99% of Indian exports to the UAE in value terms. UAE is India's third-largest trading partner and second-largest export destination after the USA. The CEPA is expected to enhance this robust trade relationship between the two countries and could boost merchandise trade to \$100 billion over the next five years, against \$29 billion in 2019-20. It is also expected that the CEPA would generate 1 million jobs across multiple labour-intensive sectors, among other things, gems and jewellery, textiles, leather, footwear, furniture, agriculture and food products, plastics, engineering goods, and pharmaceuticals, medical devices, and sports goods (Barad & Singhania, 2022).

During the COVID-19 pandemic (2020), India's total exports declined by 7%, which was inevitable given the global trade disruption. Intra-RTA trade has been more resilient over this period. In comparison to non-RTA trade (-10.34 %), India's exports to RTA partners performed better (+0.27 %) (Fig.3). PTAs (+0.98%) and shallow trade agreements (+0.87%), as opposed to deep trade agreements (-0.75%) and FTAs (-0.29%), helped India mitigate the fall in exports (Fig. 3). The findings corroborate with UNCTAD's (2021) results, indicating that deep trade agreements were more impactful in mitigating trade downturn in developed nations but had a heterogeneous impact across developing countries.

Figure 3: Average Export Growth in 2020



Conclusion

The trade under RTA has shown more resilience during the COVID-19 downturn. It exemplifies one of the goals of governments creating RTAs i.e., to reduce trade volatility. Findings suggest shallow TAs have significantly promoted India's exports vis-à-vis deep TAs. Deep trade deals with ASEAN, South Korea, and Japan have been viewed as harmful to India while significantly benefiting trading partners. Previous FTAs focusing more on products than services, which are India's strengths, have contributed to trade imbalances. Trade literature considers deep TA an essential tool for regional institutional integration. Well-designed deep agreements support policy collaboration among countries, lower trading costs, and increase international commerce and investment, economic growth, and social welfare (Maliszewska et al., 2018; Mattoo et al., 2017). Deep TA, on average, enhances goods trade by more than 35%, services trade by more than 15%, and GVC integration by more than 10% (World Bank, 2018). The study suggests that India must aggressively negotiate for deep integrated RTAs with developed nations who are eagerly looking forward to China plus one policy. The ongoing talks with developed nations will undoubtedly help encourage exports and promote India as a global export hub, provided Indian policymakers also interlink nations' foreign trade policy with FDI and industrial policies.

References

- Atif, R. M., Mahmood, H., Haiyun, L., & Mao, H. (2019). Determinants and efficiency of Pakistan's chemical products' exports: An application of stochastic frontier gravity model. *PloS one*, 14(5), e0217210.
- Balistreri, E. J., Maliszewska, M., Osorio-Rodarte, I., Tarr, D. G., & Yonezawa, H. (2018). Poverty, welfare and income distribution implications of reducing trade costs through deep integration in eastern and Southern Africa. *Journal of African Economies*, 27(2), 172-200.
- Baltas, G. (2005). Exploring consumer differences in food demand: a stochastic frontier approach. *British Food Journal*.
- Battese, G. E., & Coelli, T. J. (1995). A model for technical inefficiency effects in a stochastic frontier production function for panel data. *Empirical economics*, 20(2), 325-332.
- Bezuidenhout, H., Mhonyera, G., Van Rensburg, J., Sheng, H. H., Carrera Jr, J. M., & Cui, X. (2021). Emerging market global players: the case of Brazil, China and South Africa. *Sustainability*, 13(21), 12234.
- Dau, L. A., Moore, E. M., Doh, J. P., & Soto, M. A. (2021). Does global integration stimulate corporate citizenship? The effect of international trade agreements and regulatory quality on state and private firm adoption of CSR standards. *Journal of International Business Policy*, 1-25.
- Glaeser, E. L., & Kohlhase, J. E. (2004). Cities, regions and the decline of transport costs. In *fifty years of regional science* (pp. 197-228). Springer, Berlin, Heidelberg.
- Isard, W. (1954). Location theory and trade theory: short-run analysis. *The Quarterly Journal of Economics*, 305-320.
- Joumard, I., Arriola, C., & Dek, M. (2020). Challenges and opportunities of India's enhanced participation in the global economy.
- Kalirajan, K. (2007). Regional cooperation and bilateral trade flows: an empirical measurement of resistance. *The international trade journal*, 21(2), 85-107.
- Kaur, S., & Nanda, P. (2010). India's export potential to other SAARC countries: A gravity model analysis. *Journal of Global Economy*, 6(3), 167-184.

Kelkar, R., & Kalirajan, K. (2021). Has India achieved its potential in merchandise exports? *Journal of the Asia Pacific Economy*, 26(2), 271-292.

Krishna Barad & Abhishek Singhanian, 2022. Decoding India-UAE CEPA: Can it provide the roadmap for \$100 billion in trade over the next 5 years? *Economic Times*, available at: <https://economictimes.indiatimes.com/small-biz/trade/exports/insights/decoding-india-uae-cepa-can-it-provide-the-roadmap-for-100-billion-in-trade-over-the-next-5-years/articleshow/91249354.cms>

Kumar, S., & Prabhakar, P. (2017). India's trade potential and free trade agreements: a stochastic frontier gravity approach. *Global economy journal*, 17(1), 20160074.

Lawrence, R. Z. (1996). "Regionalism, Multilateralism, and Deeper Integration, Washington, Brookings Institute;" "Emerging Regional Arrangements: Building Blocks or Stumbling Blocks?" , dans R. O'Brien. *Finance and the International Economy*, 5, 22-35.

Le, T. H. (2017). Does economic distance affect the flows of trade and foreign direct investment? Evidence from Vietnam. *Cogent Economics & Finance*, 5(1), 1403108.

Liu, J., Wang, X., & Guo, J. (2021). Port efficiency and its influencing factors in the context of pilot free trade zones. *Transport Policy*, 105, 67-79.

Majeed, M. T., Ahmad, E., & Khawaja, M. I. (2006). Determinants of exports in developing countries [with comments]. *The Pakistan Development Review*, 1265-1276.

Malhotra, N., & Kumari, D. (2016). Determinants of Exports in Major Asian Economies. *Journal of International Economics* (0976-0792), 7(1).

Mastromarco, C. (2008). Stochastic frontier models. *Department of Economics and Mathematics-Statistics, University of Salento*.

Matallah, M. A. A., Benmehaia, M. A., & Benmebarek, A. (2021). Agricultural exports and potentials of Algeria: an econometric investigation through gravity model. *International Journal of Economic Policy in Emerging Economies*, 14(3), 319-335.

Mattoo, A., Mulabdic, A., & Ruta, M. (2017). Trade creation and trade diversion in deep agreements. *World Bank Policy Research Working Paper*, (8206).

Nguyen, D. D. (2020). Determinants of Vietnam's rice and coffee exports: using stochastic frontier gravity model. *Journal of Asian Business and Economic Studies*.

Nottage, L., Malbon, J., Paterson, J., & Beaton-Wells, C. (2019). ASEAN consumer law harmonisation and cooperation: Achievements and challenges.

Pant, M. "Regional Trading Arrangements and Developing Countries: Understanding the Phenomena." *International Studies* 47(2-4) (2010): 187- 203.

Pant, M., Sadhukhan, A. "Does Regionalism Hinder Multilateralism: A Case study of India." *Journal of Economic Integration* 24(2) (2009): 222-247.

Rahman, K. M. M., Mia, M. I. A., & Bhuiyan, M. K. J. (2012). A stochastic frontier approach to model technical efficiency of rice farmers in Bangladesh: An empirical analysis. *The Agriculturists*, 10(2), 9-19.

RBI bulletin, 2005. Available at:

https://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=7129

Sato, K., Shimizu, J., Shrestha, N., & Zhang, S. (2020). New empirical assessment of export price competitiveness: Industry-specific real effective exchange rates in Asia. *The North American Journal of Economics and Finance*, 54, 101262.

Sharma, K. (2003). Factors determining India's export performance. *Journal of Asian Economics*, 14(3), 435-446.

Stevens, C. (1993). Harmonization, Trade, and the Environment. *International Environmental Affairs*, 5(1), 42-49.

Sultanuzzaman, M. R., Fan, H., Akash, M., Wang, B., & Shakij, U. S. M. (2018). The role of FDI inflows and export on economic growth in Sri Lanka: An ARDL approach. *Cogent Economics & Finance*, 6(1), 1518116.

Titus, M. A., & Eagan, K. (2016). Examining production efficiency in higher education: The utility of stochastic frontier analysis. In *Higher education: Handbook of theory and research* (pp. 441-512). Springer, Cham.

World Bank (2018) available at: <https://www.worldbank.org/en/topic/regional-integration/brief/regional-trade-agreements>

Yotov, Y. V., Piermartini, R., & Larch, M. (2016). *An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model*. WTO iLibrary.

BIRAC,2016. Make in India for BIOTECH- the way forward'

https://birac.nic.in/webcontent/Make_in_India_2016.pdf

Paudel, G. P., Devkota, M., Keil, A., & McDonald, A. J. (2020). Climate and landscape mediate patterns of low lentil productivity in Nepal. *PLoS One*, 15(4), e0231377. <https://doi.org/10.1371/journal.pone.0231377>