Global Economics Science
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UNIVERSAL WISER PUBLISHER

Research Article

An Analysis of India's Revealed Comparative Advantage in Merchandise Trade with Australia

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Received: 14 June 2022; **Revised:** 16 January 2023; **Accepted:** 19 January 2023

Abstract: India's export sector has considerably improved since 1991 economic and trade reforms. It has gained momentum after the signing of various trade agreements with several countries. India and Australia started free trade agreement (FTA) negotiations over a decade ago in 2011 and finally concluded a landmark Economic Cooperation and Trade Agreement (ECTA) on 2nd April 2022. This study examines India's trade relations with Australia using the revealed comparative advantage (RCA) index and trade intensity index (TII) for exports and imports, to determine the patterns of exports and areas of specialisation of the two countries. The findings suggest that the bilateral trade between India and Australia has not strengthened. However, India enjoys a comparative advantage in several product groups, which fall into the category of primary goods, low-technology manufacturers, and manufactured goods as well. Overall, the RCA is much higher for India's exports than that for Australia's exports to India. The study finds that India has trade potential in several product groups with Australia and efforts should be made to bring greater benefits from the trade agreement for both countries in the years to come.

***Keywords*:** India, Australia, trade agreement, exports, revealed comparative advantage

JEL Code: F02, F13, F14, F15

1. Introduction

The remarkable growth in international trade among the countries is due to the reduction in trade costs and trade barriers (Batra & Khan, 2005). Trade liberalisation is an important ingredient that stimulates economic growth. Over the years, international trade has become important to raising the living standards across the globe (Shahzeb et al., 2021).

The growth performance of economies is positively related to trade (Park et al., 2010). Trade becomes a major component of the gross domestic product (GDP) of many countries and is also helping in generating employment across countries (Gaurav & Bharti, 2018). Mityakov et al. (2013) supported that economic liberalisation promotes international trade and thereby improves welfare. The process of trade liberalisation has helped in increasing trade among the countries around the world (Gaurav & Bharti, 2018).

Greenaway et al. (2002) maintained that liberalisation is a requirement for growth. International trade has become a significant driver of economic growth during the last few decades for many countries. International trade helps in the

DOI: https://doi.org/10.37256/ges.4120231623

efficient usage of factor endowments of different countries, and it lowers the prices of goods and provides a huge choice of consumption of goods (Maryam & Mittal, 2019). International trade allows countries to make use of abundant raw materials and provides consumers with greater choices to make (Shahzeb et al., 2021).

Export performance plays an important role in the economic development of countries (Singla, 2015). Due to globalisation, majority of the countries have started focusing on export performance to increase their share in world trade (Kaimakoudi et al., 2014). The structure and pattern of economic development of countries are closely linked with changes in export diversification the world over (Samen, 2010). Over the past decades, the economic trends and growth in many countries have crossed different economic regimes (Singh, 2014). The globalization process has led to make necessary changes in economic policies the world over (Das, 2006). To increase the growth and development process, countries have started signing regional trade agreements (RTAs) since the 1990s (Kumar & Ahmed, 2015).

India has integrated itself with the world economy by bringing certain institutional changes in domestic policies (Mustafa, 2022). In the early 1990s, India announced economic and trade reforms to open up the economy (Batra & Khan, 2005; Arora & Verma, 2015; Mukherjee & Mukherjee, 2012; Jagdambe, 2019). The free trade policies adopted by India by dismantling quantitative restrictions, and reductions in tariff rates have had a large impact on the volume and structure of trade (Shahzeb et al., 2021). The export-import policy reaffirmed India's commitment to freer trade (Arora & Verma, 2015). With the introduction of these market-oriented policies in the 1980s and 1990s, the Indian economy has witnessed rapid economic growth in the recent past and has contributed significantly to higher global economic output. During the past two decades, the Indian economy has changed into an open economy with a considerable global presence in the world market (Mukherjee & Mukherjee, 2012; De, 2013). The Indian economy has made remarkable economic progress after the gradual reduction of trade barriers (Mustafa & Sharma, 2022).

India started signing trade agreements with several countries only after the economic reforms (Das, 2014). The first trade agreement was signed with Sri Lanka (Singh, 2014). After that, it signed various trade and economic agreements with several countries and regional groups including Singapore, Thailand, the South Asian Association for Regional Cooperation (SAARC), Association of Southeast Asian Nations (ASEAN), Malaysia, and Mauritius (Saraswati & Jandhyala, 2007). To forge deeper economic cooperation agreements, it has signed a Comprehensive Economic Partnership Agreement (CEPA) with two developed economies i.e., South Korea in 2009 and Japan in 2011, respectively.

India and Australia had started FTA negotiations over a decade ago in 2011, but were suspended in 2015 due to a stalemate on various issues related to dairy products and visa liberalisation. Both countries again started a new round of negotiations on the FTA started in 2021, and on 2nd April 2022, they signed a bilateral trade pact.

The ECTA removes the tariffs on various goods. It will also reduce the tariff rates on other goods. The trade agreement also addresses the issues of non-tariff barriers (NTBs), sanitary and phytosanitary restrictions has also been addressed. The trade pact is likely to double the trade in goods in five years to $50 billion. Both sides are committed to deepening the current trade engagement and will work toward a Comprehensive Economic Cooperation Agreement (CECA).

Trade performance, competitiveness and market access for goods have become important policymaking tools for various countries for future development (Lages et al., 2015; Katsikeas et al., 1996). Against the above backdrop, this study investigates India's export performance and competitiveness over time using various trade indexes with Australia.

The rest of this article includes a literature review, methodology, and data sources used to fulfill the objectives of the study, an analysis of the empirical results of the study, and the conclusion of the study.

1.1 *India's share in global trade*

India's contribution to global trade has been small. Even though its exports have increased over the years, its share remains small. India's total export as a percentage of world exports and total import as a percentage of world imports during the period 2001 to 2020 is presented in Table 1. India's export as a percentage of world exports crossed the 1% mark in 2006. Overall, India's share of global exports has remained at less than 2% from the 2001-2020 period. Similarly, on the import front, India's share crossed the 1% mark in 2004. India's share is over 2% of world imports from 2009 onwards. The highest import share was recorded in 2018, when its share increased to 3.14%.

Table 1. India's share in World Exports and Imports (US$ million)

Year	Total Export of India	Total Export of World	India's export as a % of World Export	Total Import of India	Total Import of World	India's import as a % of World Import
2001	43,878.49	6,137,362.86	0.71	50,671.11	6,304,700.27	0.80
2002	50,097.96	6,432,105.96	0.78	57,453.47	6,613,505.96	0.87
2003	59,360.66	7,498,530.92	0.79	72,430.52	7,716,152.53	0.94
2004	75,904.20	9,110,737.60	0.83	98,981.13	9,400,565.04	1.05
2005	100,352.64	10,360,495.75	0.97	140,861.67	10,624,771.01	1.33
2006	121,200.61	11,979,108.57	1.01	178,212.44	12,278,064.53	1.45
2007	145,898.05	13,809,800.62	1.06	218,645.29	14,142,062.74	1.55
2008	181,860.90	16,007,659.83	1.14	315,712.11	16,401,008.40	1.92
2009	176,765.04	12,384,813.28	1.43	266,401.55	12,686,095.68	2.10
2010	220,408.50	15,098,981.17	1.46	350,029.39	15,341,780.41	2.28
2011	301,483.25	18,141,372.92	1.66	462,402.79	18,373,600.66	2.52
2012	289,564.77	18,399,990.90	1.57	488,976.38	18,524,823.89	2.64
2013	336,611.39	18,858,726.56	1.78	466,045.57	18,868,733.14	2.47
2014	317,544.64	18,862,399.13	1.68	459,369.46	18,933,344.75	2.43
2015	264,381.00	16,416,895.80	1.61	390,744.73	16,571,394.14	2.36
2016	260,326.91	15,923,096.95	1.63	356,704.79	16,078,166.18	2.22
2017	294,364.49	17,561,440.02	1.68	444,052.35	17,793,804.64	2.50
2018	322,291.57	19,327,897.41	1.67	617,945.60	19,672,729.80	3.14
2019	323,250.73	18,750,885.15	1.72	478,883.73	19,101,195.73	2.51
2020	275,488.75	17,488,466.27	1.58	367,980.36	17,724,123.55	2.08

Source: WITS

Figure 1 shows that India's imports have always remained higher than its exports over the last two decades. This bears ample testimony to the fact that India's dependence on imports is substantially high.

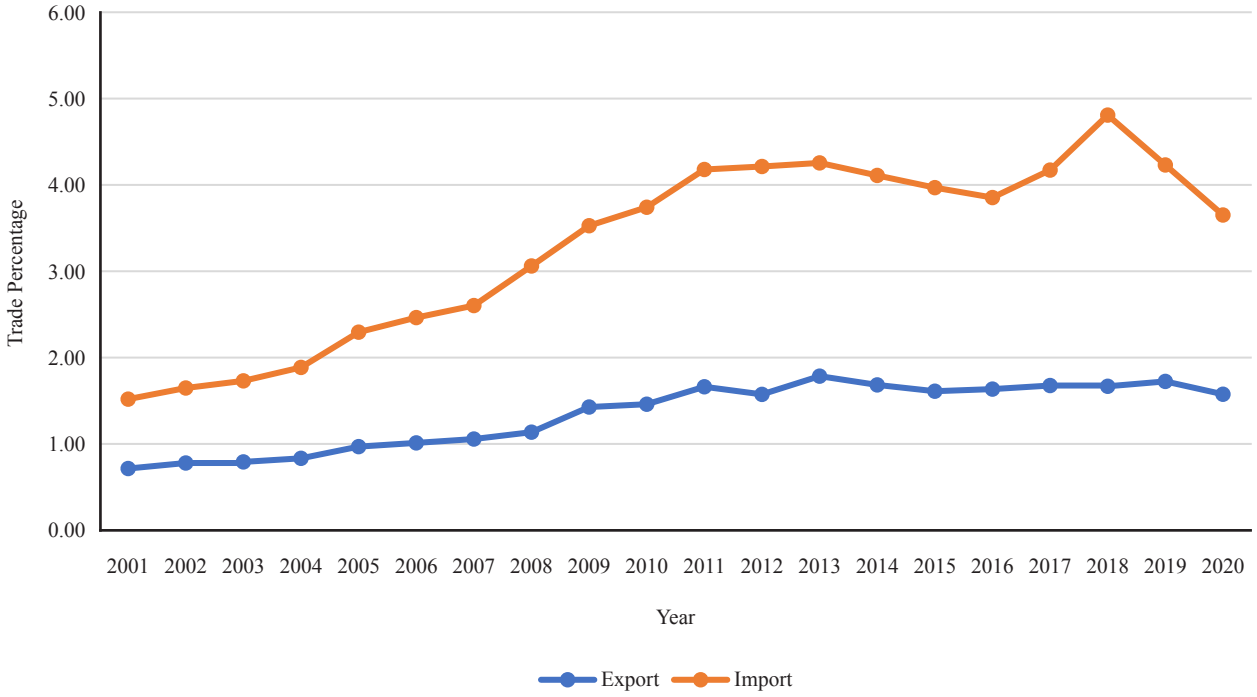

Figure 1. India's Trade as a percentage of global trade

Source: Authors' construction.

1.2 *India's trade relations with Australia*

Australia is among India's top 20 important trading partners. From 2000 onward, India made cumulative progress in trade with Australia. However, India has an adverse balance of trade with Australia and its overall trade deficit has increased over the years.

India's exports, imports, total trade, and trade balance performance with Australia from 2000 to 2020 has been presented in Table 2. India's exports increased gradually between 2000 and 2006, whereas imports increased slowly between 2000 and 2002. Exports and imports improved significantly from 2007 to 2012 and from 2004 to 2012. India's exports to Australia and imports from Australia reached a maximum value of US$ 3,875.78 million and US$ 14,352.35 million, respectively in 2017. India's exports decreased significantly to US$ 3,734.04 million in 2018 and a further US$ 2,973.87 in 2019. However, its imports from Australia also decreased to US$ 14,080.34 million in 2018 and further to US$ 10,569.39 million in 2019. Surprisingly, India's exports to Australia during the coronavirus pandemic increased to US$ 3,471.13 million in 2020, while its imports decreased very significantly to US$ 7,263.30 during the pandemic, which is the lowest since 2007. Overall, India has a trade deficit with Australia from 2000 to 2020.

The commodity trade between India and Australia is presented in Table 3 and Table 4, respectively. It shows the top 10 products of India's exports to and imports from Australia. To make the analysis more systematic, a comparison is made between the top 10 products exported and imported based on the higher trade values in 2000, 2010 and 2020, respectively. The major export items to Australia and which continued to be a part of the top ten products are Other made textile articles, sets, worn clothing etc. (63), pearls, precious stones, metals, coins, etc. (71), articles of iron or steel (73), Electrical, electronic equipment (85) and nuclear reactors, boilers, machinery, etc. (84). India's export items consist of capital goods, raw materials and primary products. This indicates that India's exports to Australia are more diversified.

Table 2. India's Trade with Australia (Values in US $ Millions)

Year	Exports	Growth (%)	Imports	Growth (%)	Total Trade	Growth (%)	Trade Balance	Growth (%)
2000	397.40		1,049.82		1,447.72		-652.41	
2001	398.28	0.22	1,243.36	18.44	1,641.64	13.43	-845.08	29.53
2002	486.80	22.22	1,346.30	8.28	1,833.09	11.66	-859.50	1.71
2003	557.99	14.62	2,036.95	51.30	2,594.94	41.56	-1,478.96	72.07
2004	661.56	18.56	3,549.56	74.26	4,211.12	62.28	-2,888.00	95.27
2005	826.59	24.95	4,899.71	38.04	5,726.30	35.98	-4,073.12	41.04
2006	886.63	7.26	6,502.16	32.70	7,388.79	29.03	-5,615.53	37.87
2007	1,083.02	22.15	7,680.94	18.13	8,763.96	18.61	-6,597.92	17.49
2008	1,347.33	24.40	9,568.94	24.58	10,916.27	24.56	-8,221.61	24.61
2009	1,410.20	4.67	12,017.05	25.58	13,427.25	23.00	-10,606.85	29.01
2010	1,650.87	17.07	12,061.24	0.37	13,712.10	2.12	-10,410.37	-1.85
2011	2,095.77	26.95	13,416.62	11.24	15,512.39	13.13	-11,320.85	8.75
2012	2,633.03	25.64	12,928.89	-3.64	15,561.93	0.32	-10,295.86	-9.05
2013	2,397.69	-8.94	10,871.89	-15.91	13,269.58	-14.73	-8,474.21	-17.69
2014	2,593.53	8.17	9,934.69	-8.62	12,528.22	-5.59	-7,341.16	-13.37
2015	3,252.81	25.42	9,411.87	-5.26	12,664.68	1.09	-6,159.05	-16.10
2016	2,948.41	-9.36	8,730.66	-7.24	11,679.07	-7.78	-5,782.25	-6.12
2017	3,875.78	31.45	14,352.35	64.39	18,228.13	56.08	-10,476.56	81.19
2018	3,734.04	-3.66	14,080.34	-1.90	17,814.38	-2.27	-10,346.30	-1.24
2019	2,973.87	-20.36	10,569.39	-24.94	13,543.25	-23.98	-7,595.52	-26.59
2020	3,471.13	16.72	7,263.30	-31.28	10,734.42	-20.74	-3,792.17	-50.07

Source: UN COMTRADE

The major import items from Australia and which continued to be a part of the top ten products are Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes (27), Ores, slag and ash (26), Natural, cultured pearls; precious, semi-precious stones; precious metals, metals clad with precious metal, and articles thereof; imitation jewellery; coin (71) and Wool, fine or coarse animal hair; horsehair yarn and woven fabric (51). India's import items mainly consist of raw materials and primary products.

Table 3. Top 10 Products of India's Exports to Australia

2000	2010	2020
Articles of apparel, accessories, not knit or crochet (62)	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals cladwith precious metal, and articles thereof; imitation jewellery; coin (71)	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes (27)
Other made textile articles, sets, worn clothing etc (63)	Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof (87)	Pharmaceutical products (30)
Pearls, precious stones, metals, coins, etc (71)	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles (85)	Natural, cultured pearls; precious, semi-precious stones; precious metals, metals clad with precious metal, and articles thereof; imitation jewellery; coin (71)
Articles of iron or steel (73)	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof (84)	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof (84)
Electrical, electronic equipment (85)	Pharmaceutical products (30)	Electrical machinery and equipment and parts thereof; sound recorders and reproducers; television image and sound recorders and reproducers, parts and accessories of such articles (85)
Cotton (52)	Other made up textile articles; sets; worn clothing and worn textile articles; rags (63)	Iron or steel articles (73)
Articles of leather, animal gut, harness, travel goods (42)	Articles of iron or steel (73)	Textiles, made up articles; sets; worn clothing and worn textile articles; rags (63)
Nuclear reactors, boilers, machinery, etc (84)	Coffee, tea, matÃ© and spices (9)	Vehicles; other than railway or tramway rolling stock, and parts and accessories thereof (87)
Articles of apparel, accessories, knit or crochet (61)	Plastics and articles thereof (39)	Apparel and clothing accessories; not knitted or crocheted (62)
Carpets and other textile floor coverings (57)	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof (90)	Chemical products n.e.c. (38)

Source: UN COMTRADE

Table 4. Top 10 Products of India's Imports from Australia

2000	2010	2020
Mineral fuels, oils, distillation products, etc (27)	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes (27)	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes (27)
Ores, slag and ash (26)	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals cladwith precious metal, and articles thereof; imitation jewellery; coin (71)	Inorganic chemicals; organic and inorganic compounds of precious metals; of rare earth metals, of radio-active elements and of isotopes (28)
Wool, animal hair, horsehair yarn and fabric thereof (51)	Ores, slag and ash (26)	Natural, cultured pearls; precious, semi-precious stones; precious metals, metals clad with precious metal, and articles thereof; imitation jewellery; coin (71)
Ships, boats and other floating structures (89)	Wool, fine or coarse animal hair; horsehair yarn and woven fabric (51)	Ores, slag and ash (26)
Cotton (52)	Edible vegetables and certain roots and tubers (7)	Aluminium and articles thereof (76)
Electrical, electronic equipment (85)	Nickel and articles thereof (75)	Iron and steel (72)
Pearls, precious stones, metals, coins, etc (71)	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes (28)	Vegetables and certain roots and tubers; edible (7)
Photographic or cinematographic goods (37)	Fertilisers (31)	Wool, fine or coarse animal hair; horsehair yarn and woven fabric (51)
Nuclear reactors, boilers, machinery, etc (84)	Copper and articles thereof (74)	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring matter; paints, varnishes; putty, other mastics; inks (32)
Iron and steel (72)	Cereals (10)	Fruit and nuts, edible; peel of citrus fruit or melons (8)

Source: UN COMTRADE

2. Review of literature

Kien et al. (2010) analysed the trade relations between Korea and Vietnam using trade indexes such the trade intensity index, intra-industry trade index, revealed comparative advantage index, and trade complementarity index (TCI). The results showed that the trade between them is significant. The larger proportion of Vietnam's exports consisted of low-technology manufacturing and primary goods where it enjoyed a comparative advantage, whereas, Korea's exports are technology-embedded. Thus, the structure of trade between them is complementary and uncompetitive. The trade between them is mainly of an inter-industry type and is less intense. Reddy (2011) analysed the aggregate level of exports and imports between India and Australia from 1991-2006. It observes the policy changes in terms of their bilateral trade relations. The study found that there is an absolute growth in Indian exports and imports and that India's general growth rate of exports and exports to Australia shows that the impact of growth is much less than 200 percent. Whereas, imports from Australia have a better record for achieving more than 150 percent of all Indian imports. The results also revealed that the share of exports to Australia is consistently low and that the import share is very high with violent fluctuations. Cho and Yoon (2014) analysed the sectoral effects of trade liberalisation of Australia and India signing an FTA. The results revealed that different trade liberalisation policies lead to increased production in the export sectors, falling prices in the import sectors, and aggregate welfare gains. It also shows that

Australian exports become heavily concentrated, while imports also show substantial growth. Bano and Paswan (2016) in their study used the trade intensity index for exports and imports, and the RCA index to identify the sectors having a comparative advantage between New Zealand and India from 1990-2014. The study also examined the extent of Intra-industry trade (IIT) using the IIT index to analyse the trade patterns. The results found that the trade relations between them have strengthened moderately and bilateral trade between them remained below its potential. However, the findings of the study also showed that there is a great degree of the comparative advantage and that there is growth in IIT for several product groups. Alam and Ahmed (2017) empirically investigated India's trade relations with the Gulf Cooperation Council (GCC) from 2001 to 2014. The analysis was carried out at the HS 2-digit level using various trade indices. The results reveal that trade is strong with these countries. The study also showed that India has trade potential in many sectors with the United Arab Emirates (UAE), Bahrain, Qatar, Saudi Arabia, Kuwait, and Oman. The study suggested that economic cooperation between India and the GCC will immensely benefit both sides. Raghuramapatruni and Chary (2017) evaluated the trade relations between India and Australia. The study used various trade indexes for the analysis. The findings of the study show that India's import intensity is more than one. Its imports from Australia are about fifteen times that of its exports to Australia. There has been a slow growth in exports based on RCA over the years and only ten commodities are feasible for trade, and only six are feasible for trade between Australia and India. The study found scope for further expansion of trade and suggested that a free trade agreement could increase trade potential. Garg (2018) examined the trade relations between India and Sri Lanka from 1991 to 2015 using trade indexes like the revealed comparative advantage index and the trade intensity index. The study found that India had RCA > 1 in the export of several products. However, there was no comparative advantage for imports from Sri Lanka. India's trade intensity for exports and total trade is more than one. Ahmad et al. (2018) examined trade patterns between India and China with the help of the RCA index and bilateral RCA index. The study carried out the RCA analysis at the aggregate level from 1985 to 2012. The disaggregate product analysis was performed only for 2014. The findings of the study suggest that there are many complementarities in trade between the two economies. Also, both are competitive at the same time in the global market. The results showed that at a disaggregate level, India's exports mostly hold engineering goods and technologically driven goods. However, China's product specialization is much wider compared to India. The study found scope for intra-industry trade in chemicals, electrical, transport materials, food-based goods, etc. Maryam et al. (2018) studied the trade intensity among BRICS countries and with the European Union from 2001 to 2015. The comparative advantage for exports is also assessed by BRICS countries in 2015. The study used the TII index and RCA index for the analysis. The results revealed that the export structure of the BRICS countries has undergone some changes. The RCA results depicted that Brazil and Russia hold a comparative advantage in primary products, whereas, India and China enjoy a comparative advantage in industrial goods. Sawhney and Kiran (2019) empirically analysed the bilateral trade among BRICS countries from 2006-2015. The study calculated trade intensities for exports and imports among the countries. Due to greater trade and economic integration and the existence of trade complementarity among the economies, the study suggested that the countries should sign separate trade agreements with each other so that the gains from trade can be enhanced with each other. Khalid and Ismail (2020) analysed the trade dynamics between India and Malaysia from 2001-2018. They have used various trade indexes such as the TII, RCA, and the IIT index to calculate the competitiveness, complementarity, and nature of trade patterns among them. The study showed that the trade is more intense between the two countries and that there exists a comparative advantage in various non-overlapping advantageous sectors. The IIT index results showed high intra-industry trade in manufactured goods.

3. Objectives of the study

This study attempts to analyse the following aspects:

- The export competitiveness for India and Australia using the RCA index
- The pattern of India's trade intensity index for exports and imports

4. Data and methodology

This study carries out the aggregate level of analysis of Harmonized System (HS) classification of goods at the

two-digit level. The revealed comparative advantage index for both India and Australia was calculated using the Balassa (1965) index. The RCA measurement determines the structure of trade and reflects the specialization of international trade of the countries, and it also gives an outline of several demand and supply factors. Likewise, the analysis of the trade intensity index has been measured using Kojima's (1964) index to know the trade performance of the two countries with each other.

To fulfill the objectives of the study, quantitative analysis was carried out using trade indexes. The period of the study was from 2010 to 2020. This period captures the period, during which India began negotiating for entering into a free trade agreement with Australia. The secondary data have been collected from various online databases such as the UN COMTRADE Database and ITC Trade Map.

4.1 *Revealed Comparative Advantage (RCA) index*

The Revealed Comparative Advantage index was proposed by Balassa (1965). The bilateral revealed comparative advantage (BRCA) between any two countries is given as

$$BRCA_{ab}^{k} = \left[\frac{\left(X_{ab}^{k} / X_{ab} \right)}{\left(X_{wb}^{k} / X_{wb} \right)} \right]$$

Where $BRCA_{ab}^{k}$ is the bilateral revealed comparative advantage of India with Australia for the commodity k, X_{ab}^{k} is the export of commodity k from India) to Australia, X_{ab} is the total exports from India to Australia, X_{wb}^{k} is the total exports of the world of commodity k to Australia and X_{wb} is the total exports of the world to Australia. Similarly, the *BRCA* can be calculated for Australia in the same manner.

4.2 *Trade Intensity Index (TII)*

The trade intensity index is measured using Kojima's (1964) index. This index helps to find out the trade performance of a country. In this study, both the export intensity index (EII) and the import intensity index (MII) are measured.

The export intensity index (EII) is given as

$$EII_{ab} = \frac{\left[X_{ab} / X_{a} \right]}{\left[\left(M_{b} - M_{ba} \right) / \left(M_{w} - M_{a} \right) \right]}$$

Where EII_{ab} = export intensity index of India with Australia; X_{ab} = exports of India to Australia; X_{a} = total exports of India; M_{b} total imports of Australia; M_{ba} = imports of Australia from India; M_{w} = total world imports; M_{a} = total imports of India.

Similarly, the import intensity index (MII) is given as

$$MII_{ab} = \frac{\left[M_{ab} / M_{a} \right]}{\left[\left(X_{b} - X_{ba} \right) / \left(X_{w} - X_{a} \right) \right]}$$

Where M_{ab} = import trade intensity index of India with Australia; M_{ab} = imports of India from Australia; M_{a} = total imports to India; X_{b} total exports of Australia; X_{ba} = exports of Australia to India; X_{w} = total world exports; X_{i} = total exports of India.

5. Empirical results

5.1 *Trade intensity index of exports and imports*

Table 5 shows the year-wise analysis of India's export intensity and import intensity with Australia. The results showed that the value of the export intensity index exceeded 1 in 2015, 2017, and 2020, respectively, while the import intensity was more than one for the full period i.e., from 2010 to 2020. The EII value is at maximum in 2020 with a value of 1.100 and at least in 2011 with a value of 0.537. Similarly, the value of MII is recorded maximum in 2010 with a value of 2.602 and at least in 2020 with a value of 1.374. Although the trade between India and Australia has improved, the analysis revealed that India imports more than it exports. It also shows that the trade between them remained below its potential.

Table 5. Export and Import Intensity Index of India with Australia

Year	Export Intensity Index (EII)	Import Intensity Index (MII)
2010	0.56	2.60
2011	0.54	2.04
2012	0.66	1.91
2013	0.57	1.74
2014	0.67	1.64
2015	1.01	2.12
2016	0.96	2.11
2017	1.05	2.54
2018	0.99	2.16
2019	0.81	1.54
2020	1.10	1.37

Source: Authors' estimation.

The value of export intensity and import intensity of India with Australia is shown in Figure 2. It can be seen from Figure 2 that the import intensity is more than the export intensity for the full period i.e., from 2010 to 2020. Such high import dependency results in India suffering from a significant trade deficit with Australia.

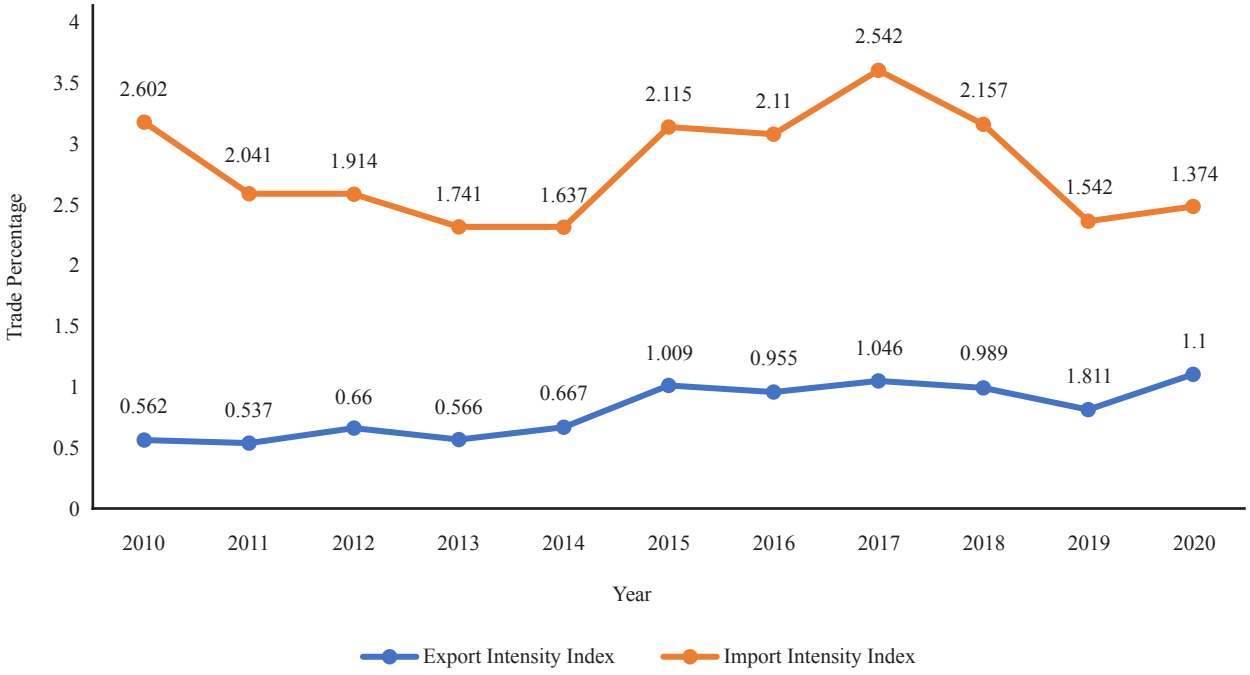

Figure 2. India's Export and Import Intensity Indices with Australia

Source: Authors' construction.

5.2 *Revealed comparative advantage of India and Australia*

Table 6 depicts the products, for which India and Australia hold RCA over each other during the period 2010 to 2020 has been presented. These are the total number of products, in which both the countries have RCA more than one over all other goods. In 2010, India enjoyed comparative advantage i.e., RCA > 1 in 47 product groups whereas, in 2020, it has decreased to 36.

The products, in which Australia enjoyed comparative advantage has marginally decreased. In 2010, Australia enjoyed comparative advantage i.e., RCA > 1 in 18 product groups, whereas, in 2020, it has slightly decreased to 13.

Figure 3 shows the revealed a comparative advantage of India and Australia with each other during the period 2010 to 2020. Figure 3 displays that India has more comparative advantage in the export of products to the Australian market. On average, India had RCA in 42 product groups, whereas, Australia had RCA in 15 product groups during the period.

Table 6. Number of items enjoying a comparative advantage in merchandise exports

Years	Total number of products, for which India holds a comparative advantage (RCA > 1)	Total number of products, for which Australia holds a comparative advantage (RCA > 1)
2010	47	18
2011	50	16
2012	43	17
2013	44	18
2014	43	19
2015	35	14
2016	40	16
2017	38	13
2018	41	15
2019	45	13
2020	36	13

Source: Authors' estimation.

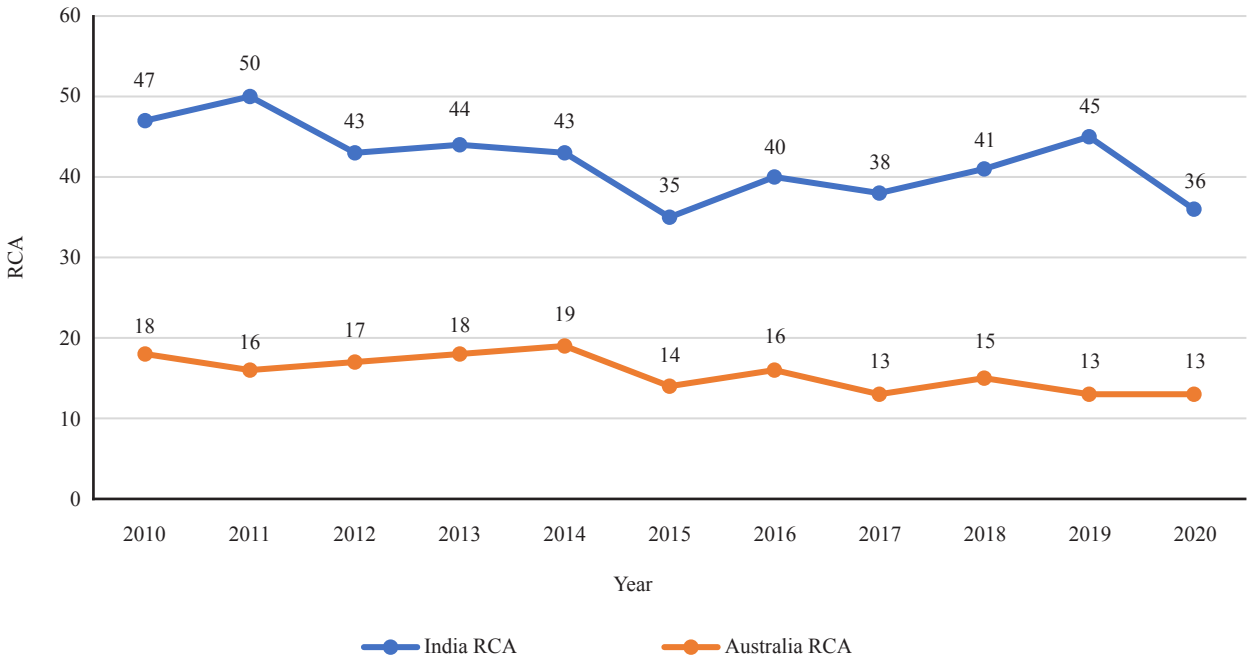

Figure 3. Revealed comparative advantage (RCA) of India and Australia

Source: Authors' construction.

5.2.1 *India's RCA*

Table 7. India's RCA Index Value

HS Code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
06	3.17	3.97	2.97	2.61	2.33	1.45	1.45	1.31	1.53	1.75	0.86
07	2.45	1.88	1.86	2.14	1.98	1.68	1.72	1.60	1.90	2.51	2.26
09	13.14	12.10	9.91	8.84	7.11	5.53	5.58	5.12	5.20	5.89	5.29
10	5.72	13.23	17.34	23.41	20.59	14.85	15.24	16.00	17.32	12.58	11.46
11	5.36	6.34	16.40	9.40	6.38	5.02	5.83	5.26	5.25	6.34	7.02
12	7.75	6.98	6.10	8.66	7.76	4.12	4.12	2.91	3.40	4.37	3.62
13	15.47	29.94	69.39	22.00	17.01	11.23	9.08	7.54	7.89	10.48	8.68
14	1.42	3.15	1.76	0.50	7.53	1.44	1.09	1.96	2.38	3.49	2.19
20	1.60	1.34	1.43	1.79	1.45	1.05	1.12	1.16	1.36	1.49	1.48
25	3.44	4.37	3.25	3.70	2.54	1.46	1.32	1.33	1.48	1.53	1.13
29	1.49	2.46	2.02	2.19	1.51	1.03	1.11	0.80	1.15	1.52	1.09
30	1.12	1.20	1.36	1.85	1.89	1.64	1.82	1.57	1.85	2.17	1.95
32	5.27	6.00	4.02	4.13	3.86	2.28	1.99	1.71	1.67	2.18	1.56
38	2.75	2.60	2.03	2.55	1.80	2.46	2.20	1.72	1.92	2.34	2.44
40	1.55	1.64	1.37	1.44	1.39	1.11	1.10	1.04	1.21	1.16	0.97
41	2.74	3.22	2.19	2.32	1.89	1.18	1.69	1.91	1.75	6.13	2.94
42	5.72	6.31	4.87	5.23	4.72	3.48	3.41	3.08	3.30	3.53	3.04
50	38.68	27.29	19.88	18.83	13.72	9.58	10.16	6.22	7.52	8.14	7.28
51	0.91	1.59	3.07	2.64	2.84	2.19	2.21	1.69	1.85	2.14	2.61
52	10.69	14.58	8.38	10.34	8.05	6.19	6.23	5.40	6.60	6.24	6.01
53	26.90	41.10	40.51	51.35	45.26	36.49	40.75	33.27	33.41	41.26	35.77
54	2.31	2.75	2.34	3.37	2.64	2.79	2.89	2.93	3.62	5.55	4.36
55	4.58	6.62	6.56	7.14	6.10	5.18	5.32	4.54	3.34	3.63	3.24
56	4.12	4.94	4.40	4.80	3.83	10.09	2.12	1.78	2.31	2.90	2.10
57	10.94	11.78	9.58	10.26	10.39	8.24	8.83	8.97	9.76	13.06	12.61
58	3.34	2.95	4.37	5.65	3.91	2.73	3.02	2.97	2.87	3.42	2.89
61	1.51	1.54	1.34	1.59	1.50	1.04	1.22	1.34	1.47	1.99	1.61
62	2.03	2.75	2.15	2.54	2.52	2.02	2.17	2.02	1.96	2.75	1.90
63	8.31	9.58	9.40	9.57	7.83	5.79	5.93	5.41	5.47	6.66	2.77
71	3.28	2.88	3.37	4.56	4.32	3.30	2.37	2.44	2.69	2.93	1.54
72	1.37	1.42	0.82	3.49	3.75	1.43	1.59	1.06	1.51	1.69	2.28
73	1.63	2.17	3.85	1.49	1.40	0.91	1.29	1.68	1.67	2.24	1.90
82	1.98	2.79	1.96	2.16	2.17	1.29	1.63	1.62	1.78	2.06	1.59

Source: Authors' estimation.

5.2.2 *Australia's RCA*

Table 8. Australia's RCA Index Value

HS Code	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
02	6.49	0.08	2.41	24.77	13.61	5.68	5.30	4.23	4.29	4.60	11.73
07	1.55	2.81	7.38	4.66	3.79	8.44	7.97	12.11	1.13	1.47	2.93
10	16.12	2.83	5.86	15.61	22.49	34.79	19.02	12.61	5.87	0.71	4.35
11	7.82	12.34	15.44	19.13	17.11	14.50	11.11	5.68	8.85	6.96	5.52
26	6.04	7.37	10.40	7.51	7.55	5.78	6.47	4.17	5.46	7.28	6.43
27	1.50	1.51	1.29	1.44	1.63	2.17	2.21	2.25	2.27	2.57	2.88
32	0.91	1.25	1.34	1.88	2.73	1.58	1.71	1.66	2.16	2.14	2.09
51	10.39	15.97	17.51	22.96	24.96	22.14	22.95	21.57	25.82	22.42	18.42
78	3.03	4.35	6.17	8.82	10.42	9.32	7.33	5.20	6.17	2.47	4.27
79	1.30	1.58	1.65	2.57	2.02	2.24	1.14	1.75	2.30	1.51	1.28

Source: Authors' estimation.

The Bilateral Revealed Comparative Advantage index for the period 2010-2020 at the aggregate level (HS-two digits) is computed for India with Australia, to find the products, in which India holds a comparative advantage. The BRCA for India's export to Australia is calculated for 99 products and only those products whose value is greater than one during the entire period of analysis i.e., from 2010 to 2020 have been presented in Table 7. India holds a comparative advantage, i.e., RCA value is greater than unity in 33 products.

The product groups with the maximum comparative advantage from 2010 to 2020 are identified as Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn (53). The other top products with a high comparative advantage are Cotton (52), Milling industry goods; malt; wheat gluten (11), Textile articles; worn clothing; rags (63), Coffee, tea, and spices (09), Silk (50), Cereals (10), Carpets and other textile floor coverings (57), and Lac; gums, resins and other vegetable saps and extracts (13). The RCA values were greater than five during the entire period of analysis.

However, products like Miscellaneous chemical products (38), Raw hides and skins (other than furskins) and leather (41), Organic chemicals (29), Pharmaceutical products (30), Articles of apparel and clothing accessories (62), Articles of iron or steel (73), Edible vegetables and certain roots and tubers (07), Rubber and articles thereof (40), Wool, fine or coarse animal hair; horsehair yarn and woven fabric (51), Iron and steel (72), special woven fabrics (58), Articles of apparel and clothing accessories (61), Vegetable planting materials (14), Preparations of vegetables, fruit, nuts (20), and Tools, cutlery, base metal (82) do have a comparative advantage but with lower RCA values between 1 and 2.

There are some products, whose RCA values decreased over the years like Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles (42), Live trees and other plants (06), Salt; sulphur; earths and stone; plastering materials, lime and cement (25), Other made-up textile articles (63), Tanning or dyeing extracts; dyes, pigments and other colouring (32), Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad (71), and Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal (12).

Similarly, the pattern of the comparative advantage is computed for Australia with India for the period 2010-2020 at the aggregate level (HS-two digits), to find the products, in which Australia holds a comparative advantage. The BRCA for Australia's export to India is calculated for 99 products and only those products whose value is greater than one from 2010 to 2020 have been presented in Table 8. Australia holds a comparative advantage, i.e., the RCA value is

greater than unity in 10 products. Thus, Australian exports enjoy a comparative advantage in a lesser number of product groups in the Indian market.

The products with the greatest comparative advantage from 2010 to 2020 were identified as Wool and woven fabric (51). The other top products with a high comparative advantage are Meat and edible meat offal (02), Products of the milling industry; malt; starches; inulin; wheat gluten (11), and Ores, slag and ash (26).

However, products like Mineral fuels, mineral oils and products of their distillation; bituminous substances; minerals (27), Tanning, dyes, and pigments (32), Zinc (79) do have a comparative advantage but with low RCA values, which vary between 1 and 2.

The study also points out that there are some products, whose RCA values are decreasing over the years like Cereals (10). Whereas, some products show a fluctuating trend Edible vegetables and certain roots and tubers (07) and Lead and articles thereof (78). Thus, Australia's comparative advantage is confined to a narrow range of products.

6. Discussion and conclusion

The growing importance of trade for the development of an economy has necessitated many countries to sign bilateral and regional trade agreements with other countries. India has, however, stalled trade negotiations with many countries and has opted out of major trade agreements in the recent past such as Regional Comprehensive Economic Partnership (RCEP) agreement. India is renegotiating the existing regional trade agreements to enhance their scope in terms of liberalization of goods, services, and investments. The main concern for India is that the existing trade agreements have not benefitted India's manufacturers or exporters and that there is a growing huge trade deficit with a number of these countries.

However, there is a shift in the policy change related to India's external trade sector recently. It has started signing and negotiating trade agreements both at the bilateral and multilateral levels to increase its presence in the world market share. India has shown an interest in signing trade agreements with several countries bilaterally. India signed the CEPA with the UAE in February 2022. Besides this, it has started trade negotiations with several countries, such as Israel, Taiwan, Canada, and the United Kingdom. It also wanted to kickstart a fresh round of negotiations with regional groups like the European Union and the Gulf Cooperation Council.

After more than a decade, India and Australia signed a trade agreement in May 2022. The Economic Cooperation and Trade Agreement, which was signed by the two countries will eliminate or lower tariffs on the greatest number of goods. About 96.4% value of Indian exports will get zero-duty market access to Australian markets, while tariffs on more than 85% of Australian goods exports will be eliminated by India.

This study evaluates the structure and patterns of the export performance of India and Australia. The study suggests that both exports and imports of India performed well after 2007 onwards with Australia. However, the bilateral trade between them remains below its potential. Overall, the total trade is improving moderately, India still imports more from Australia than it exports and India's import intensity is more than one during the entire period of analysis. However, its export intensity remained below one for most of the period of analysis i.e., from 2010 to 2020.

Further, the analysis revealed that India has RCA > 1 in 47 product groups in 2010, which decreased to 36 in 2020, while Australia has RCA > 1 in 18 product groups, which decreased to 13 in 2020. The findings showed that from 2010 to 2020, India has on average RCA > 1 in 42 product groups, while Australia has only 15 product groups. Over the past decade i.e., from 2010 to 2020, India has sustained and consistent RCA > 1 in as many as 33 product groups during the entire period, while Australia has consistent RCA > 1 only in 10 product groups. Thus, the RCA analysis suggests that India possesses a strong comparative advantage in many intermediate goods for low-technology industries and primary agricultural goods such as cereals, milling industries products, oil seeds, lac, gums, resins, vegetable saps and extracts, silk, cotton, textile fibres, woven fabrics, carpets, textile industries materials, pearls, precious stones, organic chemicals, pharmaceutical products and manufactured goods. On the other hand, Australia has a high degree of RCA in meat and edible meat offal, cereals, milling products, ores, slag and ash, lead and zinc articles, wool, animal hair, horsehair yarn and fabric. India enjoys the comparative advantage of the greatest number of product categories over Australia. Thus, there is a wider scope for India's exports to Australia as revealed by the RCA index, and the trade agreement which was signed recently is likely to bring greater benefits for India's exporters. There are many products in which RCA < 1 for the two countries, thus providing scope for extending specialisation in those products also. This will help increase the

competitiveness of many other products in the market.

The trade agreement that was signed between India and Australia is said to benefit India's labour-intensive sectors such as textile and apparel, plastics, toys, agricultural and fish products, pharmaceutical products, engineering goods, leather and footwear, jewellery, furniture, sport goods will gain from the duty-free access to the Australian market. On the other hand, Australia, too, will gain from the agreement as the tariff on products such as sheep meat, wool, metallic ores, minerals, coal and alumina will be reduced to zero.

There is huge potential for the expansion of bilateral trade between India and Australia. The export basket of the two countries also revealed a huge trade complementarity between India and Australia in the different product categories. Additionally, there is also a scope of intra-industry trade between India and Australia in primary goods such as edible vegetables, cereals, products of the milling industry, tanning or dyeing extracts and wool products.

From the analysis, it is concluded that India has a huge trade potential in several product groups, more specifically in such products where it had a comparative advantage (RCA > 1). India-Australia ECTA provides great opportunities for manufacturers and exporters belonging to both countries to accelerate their trade and commerce. Efforts should also be made to increase the volume of trade and also to diversify its exports to fully exploit the existing trade potential between them. The trade agreement will mainly benefit India's labour-intensive sectors, such as textiles, footwear, leather products, toys, plastic products, gems and jewellery and so on. The free trade agreement will unlock huge trade opportunities in the years to come.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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