

Index Of Trade Openness and Intensity: A Study of India-Afghanistan Relations

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Abstract

The trade relationship between India and Afghanistan is as old as their cultural and political relations, dating back to ancient times. The trade between the two nations has been consistent over the years. India's trade relations with Afghanistan have improved significantly after signing various trade agreements like the Preferential Trade Agreement (PTA) in March 2003. The study aims to measure the index of openness of India and Afghanistan with the world of economy and evaluate the degree of trade intensity of both nations to each other using the trade-to-GDP ratios and K. Kojima's (1964) trade intensity index over the period 2014 - 2023. The findings of trade openness show that Afghanistan has a higher trade openness than India, showing its higher dependency on and openness to global trade. However, the analysis of trade intensity highlights that the bilateral trade between India and Afghanistan has not strengthened and remained below its potential. The study suggests that Afghanistan diversify its exports and boost domestic production to reduce import dependency. It also highlights the need for stronger trade cooperation and policies aimed at enhancing bilateral trade and strengthening global economic integration.

Keywords: India, Afghanistan, Trade openness, Export intensity, Import intensity

JEL code: F14, F15, F41, O53

1. Introduction

In today's interconnected world economy, trade serves as a driving force behind economic growth, technological advancement, and global cooperation. As the world expands globally into larger markets, it is interesting to note that some countries have not experienced an appropriate rise in the ratio of imports and exports to their gross national products, even though they are highly

involved in the cross-border movement of goods and services. Trade remains a central focus of economic development. But, the liberalization of trade policies, advancements in transportation and digital technologies, and the expansion of free trade agreements (FTAs) have strengthened economic interdependence (Rodrik, 2017). Trade has become an essential element of economic development, poverty reduction, and geopolitical strategy. Countries that adopt trade liberalization benefit from enhanced productivity, expanded market access, and greater competitiveness in global markets (WTO, 2023).

Within this global context, the trade relationship between India and Afghanistan shaped by geographical proximity, cultural ties, and economic interests. As one of the fastest-growing economies, India has leveraged trade openness to enhance its presence in global markets, fostering trade agreements and strengthening export capacity (World Bank, 2023). In contrast, Afghanistan a landlocked country, relies heavily on trade for economic stability and recovery. Particularly in the post-war period. Its strategic position along key trade routes connecting South Asia and Central Asia. Afghanistan-India trade corridor has played a significant role in facilitating bilateral trade ties through the Chabahar Port, which provides Afghanistan with greater access to the international markets (Mehta, 2024).

A country's level of economic integration is shown in the total value of its global trade in goods and services. Trade openness and intensity are fundamental to the evolving dynamics of international trade and economic integration. Trade openness measured the significance of foreign transactions relative to domestic ones (OECD, 2011). Empirical research suggests that economies with high trade openness experience faster economic growth due to access to larger markets, enhanced efficiency through specialization, and the diffusion of innovation (Frankel & Romer, 1996). Trade intensity, on the other hand, examines the depth of trade relationships between two or more economies, highlighting the importance of bilateral and regional trade agreements (Balassa, 1985). These indicators are crucial for assessing economic performance, competitiveness, and the degree of interdependence between trading nations.

An analysis of the index of openness and trade intensity provides valuable insight into the economic integration and bilateral trade dependence of both nations. India imports Afghan agricultural products such as dry fruits, saffron, and medicinal herbs. On the other hand, Afghanistan exports essential commodities like pharmaceuticals, textiles, and engineering goods. However, despite these strong linkages, political instability, security concerns, and trade barriers continue challenging seamless trade flows between the two countries.

Given the rising importance of trade relations between India and Afghanistan, this paper examines the index of openness to determine which of selected country has increased its openness to trade. It also analyses the degree of trade intensity between them, assessing whether it is below or above one. The remainder of the paper is organized as follows: Section 2 presents a brief literature review. Section 3 outlines the data sources and research methodology. Section 4 explains the findings and interpretation, followed by the concluding remarks in Section 5.

2. Literature Review

In this section, we have briefly reviewed a selection of recent studies on bilateral trade, focusing on trade relations involving India-Afghanistan's trade, and broader economic implications. This combination establishes a foundation for understanding trade dynamics, intensity, and openness.

(Monyela & Saba, 2024) examined the dynamic between foreign direct investment (FDI), economic growth, and trade openness of India from 1979 to 2017 using Zivot-Andrew and autoregressive distributed log models. The study findings show that Trade openness has a long-term negative effect on economic growth and long-term economic growth is boosted by foreign direct investment (FDI), but short-term growth appears to be unaffected by FDI. The study also suggests that policymakers should adopt more export-oriented policies to enhance economic growth in the long run and aim at extracting the benefits of foreign direct investment.

Mustafa & Sharma (2023) investigated trade intensity and export competitiveness patterns for both India and Australia using the Revealed Comparative Advantage (RCA) and the Trade Intensity (TI) indices. The findings revealed that the trade tie between the two nations has not significantly improved. Nonetheless, India enjoys a notable competitive edge in the export of many product categories, including primary goods, low-technology manufacturers, and other manufactured products. The RCA index is far higher for the exports of India than for the exports of Australia to India. The paper highlights that India's sector has witnessed notable growth since the 1991 economic and trade performance, which showed a crucial change in the country's trade policy.

(Paswan & Jha, 2022) evaluated trade intensity and trade competitiveness of India with BRICS countries from 2008 to 2021 using the Trade Intensity Index (TII) and Revealed Comparative Advantage (RCA). The findings highlight that India's trade intensity with BRICS countries has experienced a decent improvement over the years. While India has enjoyed a trade surplus with Brazil for the majority of years, China remains its strongest trading among the BRICS countries, showing the highest trade intensity. In contrast, Russia and South Africa are India's smaller trading partners within the bloc. India shows a comparative advantage in agriculture and manufacturing products but faces a comparative disadvantage wood and articles sectors. The study further suggests that lowering costs, cutting excessive tariffs, and implementing proper trade management policies could be effective for India's exports in the long run.

(Keeryo et al., 2020) investigated the strength and nature of the bilateral trade relationship between India and Pakistan from 2009 to 2018 using K.Kojima (1964) trade intensity index. The result indicates that Pakistan's export index with India declined from 0.63 in 2009 to 0.62 in 2018, while the import intensity index increased from 1.65 in 2009 to 5.13 in 2018. The study also highlights a significant potential for growth in bilateral trade between the two nations, However, factors such as the lack of sea routes, tariff and non-tariff barriers, mutual mistrust, and political instability have impeded the expansion of trade between them.

(Burhani & Wani, 2019) applied several indices such as the revealed comparative advantage (RCA), Trade intensity index (TII), Revealed import dependency (RID), Export Intensity Index (TII), and Import intensity index (III) for Afghanistan and India. The study analysed the trade relationship between both nations and studied the pattern of Comparative advantage based on their production as per SITC (Rev 3) in different products. The results indicated that Afghanistan's

economy is agriculture-dominated. Adversely, India is a service and industrial-oriented economy. The investigation suggests that both nations have to rejuvenate and recognize sectors where they have trade advantages.

(Maryam et al., 2018) studied the BRICS-EU and intra-BRICS trade flows. The study analysed the trade intensity index (TII) among BRICS countries with EU, from 2001 to 2015. and evaluated the comparative advantage of BRICS countries' exports using Balassa's revealed comparative advantage index at the two-digit (HS) and four-digit (HS) code classification in the 2015 year in the world market. The findings suggest that there are large bilateral trade flows among BRICS members. Russia has emerged as a top trading partner of the EU. The RCA index analysis showed there are slight structural changes in these members' export combinations. China and India held a comparative advantage in processed and manufactured products, while Brazil and Russia had a comparative advantage in items based on natural resources. According to the trade intensity analysis, India and China are competitors in the EU.

(Adeel-Farooq et al. 2017) analysed the impact of trade-to-GDP ratio and financial liberalization on the economic growth of Pakistan and India for the period 1985 to 2015 using autoregressive distributed lag and principal component techniques. The results presented that trade openness has had a positive impact on Pakistan's economic development in both the short and long term, whereas financial liberalization has had only a modest positive effect. In contrast, both trade openness and financial liberalization have had a positive effect on India's economic growth in the short and long term. The study emphasizes the need for Pakistan to implement proper policies and trade policies to achieve stable economic growth.

(Tahir et al., 2016) used econometric techniques on panel data for the six countries chosen India, Nepal, Pakistan, Bangladesh, Bhutan, and Sri Lanka to examine the impact of trade openness on the development of the industrial sector from 1980 to 2013 for economic members of the South Asian Association for Regional Cooperation (SAARC). The finding presents that trade openness has positively and importantly impressed the industrial sector of the selected countries. Other determinant factors such as education and investment have also played a crucial role in helping the sampled countries to develop their industrial sector. The study also recommends that SAARC member countries' policymakers liberalize global trade sustainably to boost the industrial sector's contribution to GDP and achieve the goal of sustainable long-term growth.

(Yanikkaya, 2003) investigated the relationship between economic growth and trade openness using multiple trade openness ratios measured across different countries over the past three decades. The findings suggest that trade liberalization is generally associated with higher economic growth, but its impact is not always direct. And trade intensity ratios largely align with conventional economic theories. However, the paper also highlights that trade barriers can have a significant link with trade-to-GDP ratio and growth. The investigations suggest that controlled trade policies may provide economic benefits by supporting national industries and promoting a more gradual integration into global trade.

(Kotcherlakota & Sack-Rittenhouse, 2000) used various trade-to-GDP indicators, including export openness, import openness, and trade openness ratios, to analyses the connection between

the trade-to-GDP and economic growth development from 1973 to 1993 across different countries. The finding suggests that trade openness generally follows a pattern of stabilizing, rising, and steadily decreasing as a country develops. The study highlights that regional trade blocs experienced an initial increase in the trad-to-GDP ratio throughout the time due to protectionist policies aimed at preventing resource outflow and the natural maturation of economics. The European Union serves as an example of this trend.

While the existing literature provides valuable insights into trade dynamics, intensity, and bilateral trade relations involving India and other global countries, there remains a significant gap in the literature regarding India and Afghanistan's trade intensity and their engagement with the world of economy in a single framework over consistent time fame. In light of these gaps, the study aims to provide a comprehensive analysis of intra-trade intensity and their Economic engagements in the global economy from 2014 to 2023 using openness and Kojima's trade intensity indices.

3. Methodology and Data sources

The paper adopts the Trade openness index and K. Kojima's (1964) Trade intensity index to measure the economic engagement of India and Afghanistan with the global economy and to evaluate the strength of their bilateral trade relationship over the period 2014 to 2023. Trade openness is a macro-level indicator capturing the importance of international transactions relative to domestic transactions, while trade intensity evaluates the depth of trade flows between the two nations. Using both indices provides both a bilateral and global perspective on trade performance. The data for this study were collected from various reliable sources, such as the International Monetary Fund (IMF), World Trade Map, UNCTAD, UNCOMTRADE, and the National Statistics and Information Authority of Afghanistan (NSIA).

Formulas

Trade Openness Index:

Trade openness is an economic indicator that measures the extent of a country's integration into the global economy by calculating a Country's exports and imports to its Gross domestic product (Kotcherlakota & Sack-Rittenhouse, 2000). We further breakdown the index as follows:

$$\text{Export openness} = \frac{X}{\text{GDP}} \times 100$$

$$\text{Import Openness} = \frac{M}{\text{GDP}} \times 100$$

While export and import ratios provide individual insights, the Trade Openness offers comprehensive measure of economic globalization. It is measured as shown below.

$$\text{Trade openness} = \frac{(X + M)}{\text{GDP}} \times 100$$

Where:

X = Exports

M = Imports

GDP = Gross domestic product

A higher degree of trade openness shows greater integration into global trade, whereas a lower degree shows less trade integration in global trade flows.

Trade intensity index:

The trade intensity index measured using Kojima's index (1964), which examines the level of economic exchange between two countries or region, showing the strength and depth of trade relations. In this study, both the import intensity index (MII) and export intensity index (EII) are analyzed. The export intensity index (EII) is given as follows:

$$\text{Export Intensity Index (EII}_{ia}) = (X_{ia}/X_{it}) / (M_{at} / (M_{wt} - M_{it}))$$

Where **EII_{ia}** indicates export intensity of country i with country a, X_{ia} is total exports from country i to country a, X_{it} is the total exports of country i, while M_{at} is the total imports of country a. M_{wt} is total world imports, M_{it} is the total imports of country i, and t is the year.

A similar method can be used to measure the import intensity index:

$$\text{Import Intensity Index (III}_{ia}): (M_{ia}/M_{it}) / (X_{at} / (X_{wt} - X_{it}))$$

Where **III_{ia}** shows import intensity of country i with country a, M_{ia} is total imports of country i from a, M_{it} indicates total imports of country i, while X_{at} indicates the total exports of country a, X_{wt} indicates total world exports, X_{it} indicates total exports of country i. and t is the year.

The index's value lies between 0 and $+\infty$. An index value greater than one shows a strong trading relationship between the partner nations, while a value less than one indicates a weak relationship.

4.Findings and Data analysis

4.1 The openness indices of India and Afghanistan

One of the most significant changes during the last century has been the integration of national economies into a global economic system. Trade between countries has grown considerably as a result of this integration process. In this section, the index openness of India and Afghanistan is measured individually from 2014 to 2023, Providing insight into the extent of their engagement with global trade.

Trade Openness of India

Table 1 presents India's trade openness indices from 2014 to 2023. The results showed the total trade-to-GDP ratio peaked at 39.88% in 2014 and reached its lowest level of 25.39 % in 2020. reflecting international trade disruptions caused by the COVID-19 pandemic, which have led to a decrease in global demand for Indian goods and significant restrictions on trade activities. The export-to-GDP ratio decreased from 16.30% in 2014 to a low of 10.87% in 2020, while the import-to-GDP ratio followed a fluctuating pattern, reaching its highest point at 24.64% in 2022. Overall, despite global challenges, India's trade openness has shown resilience, and the post-2020 recovery points to a stronger reintegration into the global economy.

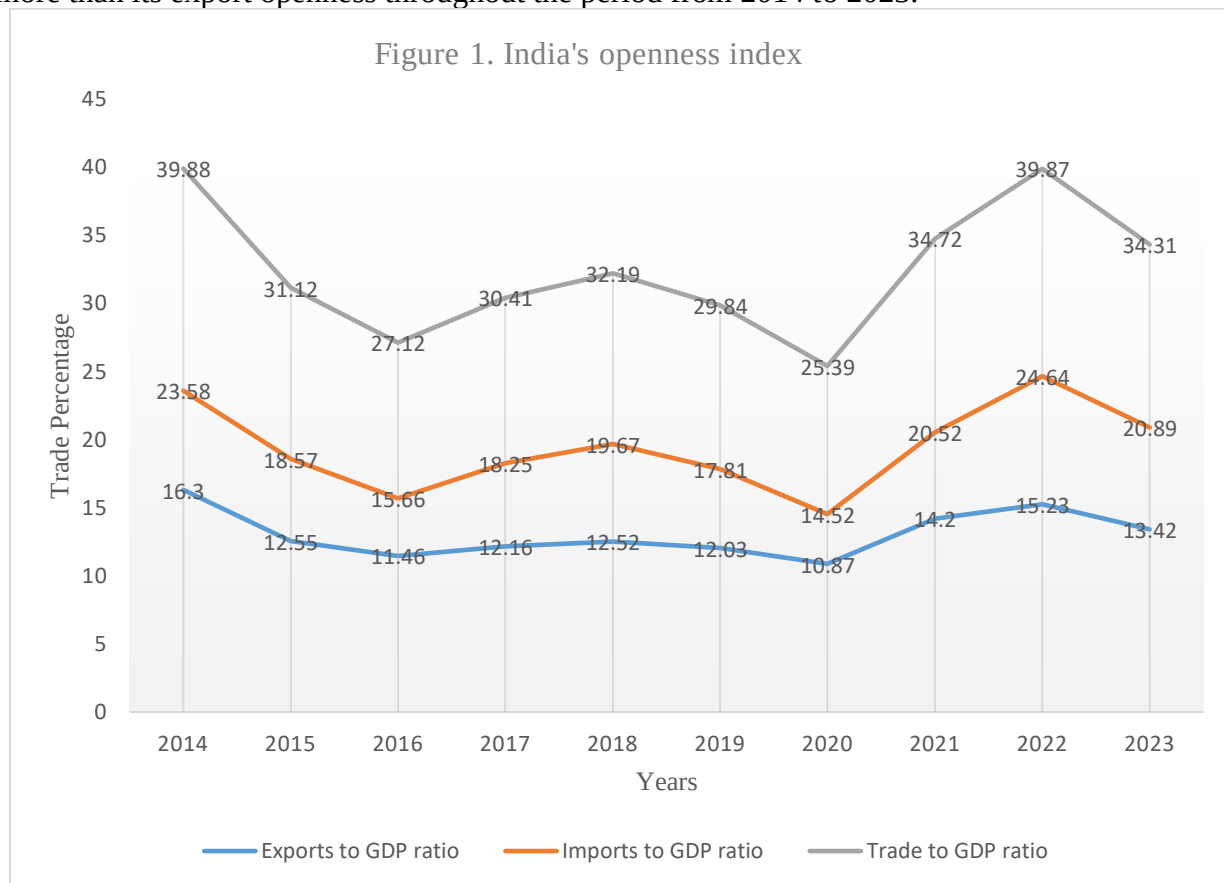
Table 1. Trade openness of India from 2014 to 2023

(Percent)			
Year	E_i/GDP_i	M_i/GDP_i	$(E+M)_i /GDP_i$
2014	16.30	23.58	39.88
2015	12.55	18.57	31.12
2016	11.46	15.66	27.12
2017	12.16	18.25	30.41

2018	12.52	19.67	32.19
2019	12.03	17.81	29.84
2020	10.87	14.52	25.39
2021	14.20	20.52	34.72
2022	15.23	24.64	39.87
2023	13.42	20.89	34.31

Source: Author's Calculations based on data from the World Development Indicators (WDI) and the International Trade Center (ITC).

The percentage of Export Openness, Import Openness, and Trade Openness of India with the global economy is shown in Figure 1. It can be seen from the figure 1 that the import openness of India more than its export openness throughout the period from 2014 to 2023.



Source: Author's Compilation from Table 1

Trade Openness of Afghanistan

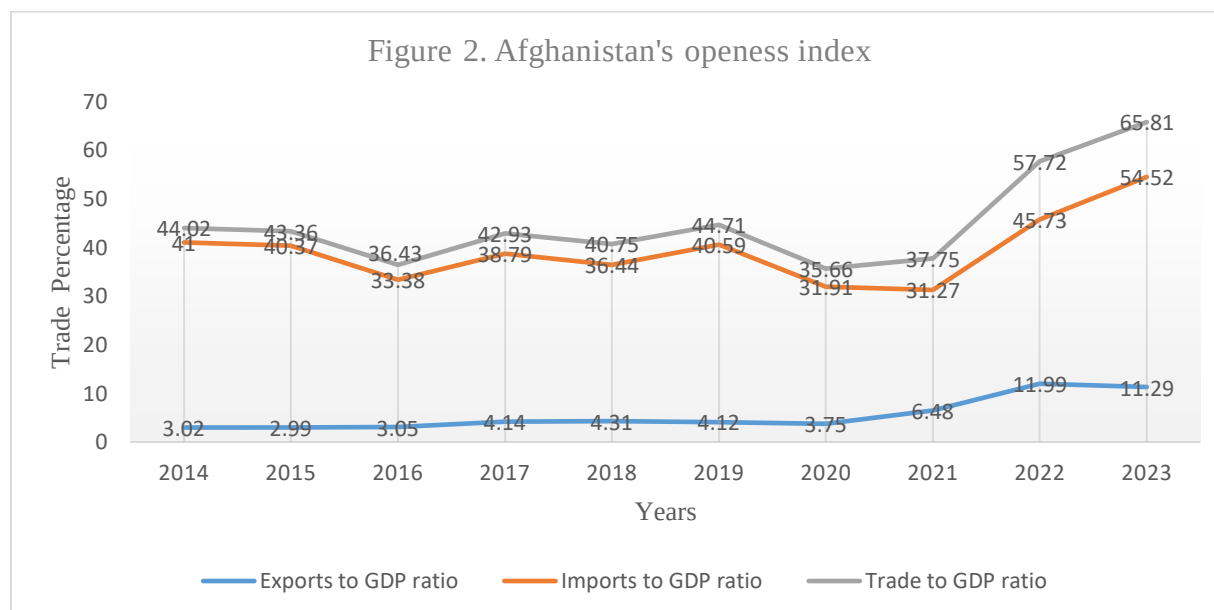
Table 2 explains the trade openness of Afghanistan with the world economy from 2014 to 2023. The results showed that Afghanistan's trade openness remained high, reaching a maximum of 65.81 % in 2023 and a minimum of 35.66% in 2020. Afghanistan's export-to-GDP ratio of Afghanistan peaked at 11.99% but declined to 2.99% in 2015. The import-to-GDP ratio remained notably high, reaching at 54.52% in 2023, while its lowest point was recorded at 31.27% in 2021. In general, the trade-to-GDP ratio dropped dramatically in 2020, reflecting the global impact of the COVID-19 pandemic on both exports and imports and the political instability in Afghanistan.

Table 2. Trade openness of Afghanistan from 2014 to 2023
(Percent)

Year	E_a/GDP_a	M_a/GDP_a	$(E+M)_a / GDP_a$
2014	3.02	41.00	44.02
2015	2.99	40.37	43.36
2016	3.05	33.38	36.43
2017	4.14	38.79	42.93
2018	4.31	36.44	40.75
2019	4.12	40.59	44.71
2020	3.75	31.91	35.66
2021	6.48	31.27	37.75
2022	11.99	45.73	57.72
2023	11.29	54.52	65.81

Source: Author's own calculations based on data sourced from the National Statistics and Information Authority of Afghanistan (NSIA), Trade Statistical Yearbook 2023, World Development Indicators (WDI) and the International Trade Centre (ITC).

The percentage of Trade Openness, Export Openness, and Import Openness of Afghanistan in relation to the global economy is presented in Figure 2. As shown in Figure 2, Afghanistan's trade openness has experienced fluctuations, and the export openness of Afghanistan is less than its import openness for the entire period from 2014 to 2023.



Source: Author's Compilation from Table 2

4.2. Analysis of Export and Import intensity

Export and import intensity measure how strongly two countries are economically linked through trade. A high intensity indicates strong reliance on a specific partner, shaping trade policies and economic strategies. In this section, the trade intensity indices of India and Afghanistan are measured together for the period 2014 to 2023, and vice versa.

India's Export and Import intensity with Afghanistan

Table 3 illustrates the analysis of India's Trade intensity indices with Afghanistan from 2014 to 2023. The results showed that India's export and import intensity values with Afghanistan was more than one for the full period. India's export intensity (EII) is at maximum in 2020 with a value of 6.20 and at least in 2023 with a value of 2.25. Likewise, India's import intensity (III) declined significantly from 23.1 in 2015 to 13.02 in 2023. The analysis showed that India's imports more than its exports. It also indicates India's trade with Afghanistan was more intense.

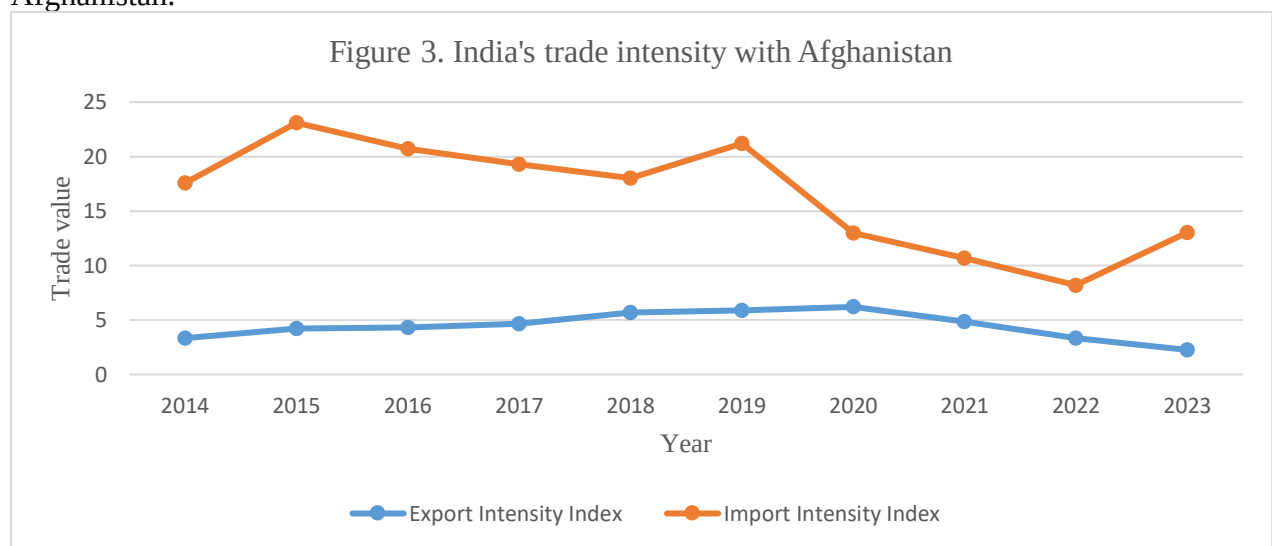
Table 3. India's Export and Import intensity with Afghanistan (2014-2023)

Year	India's EII with Afghanistan	India's III with Afghanistan
2014	3.33	17.6
2015	4.19	23.1
2016	4.33	20.7
2017	4.67	19.3
2018	5.69	18.0
2019	5.86	21.2

2020	6.20	13.0
2021	4.84	10.7
2022	3.33	8.2
2023	2.25	13.02

Source: Author's calculations based on data from UN COMTRADE database and the International Trade Center (ITC)

The trade intensity values for India's export and import with Afghanistan is presented in Figure 3. It can be observed from Figure 3 that India's import intensity is more than its export intensity for the entire period of 2014 to 2023. Such high import intensity shows that India is less dependent on Afghanistan.



Source: Authors' construction from Table 3

Afghanistan's Export and Import Intensity with India

Table 4 presents Afghanistan's export and import intensity with India from 2014 to 2023. The result indicated that the export intensity index value was greater than one throughout the period, while the value of import intensity index exceeded one on all years except for 2014, where it was 0.81. The Export Intensity Index (EII) peaked in 2019 at 18.8 and reached its lowest value in 2022 at 8.5. Similarly, Import Intensity Index (III) showed an upward trend from 0.81 in 2014 to 6.41 in 2020. The analysis showed that Afghanistan exports more than its imports. It also showed there is still untapped potential in the trade between tow nation.

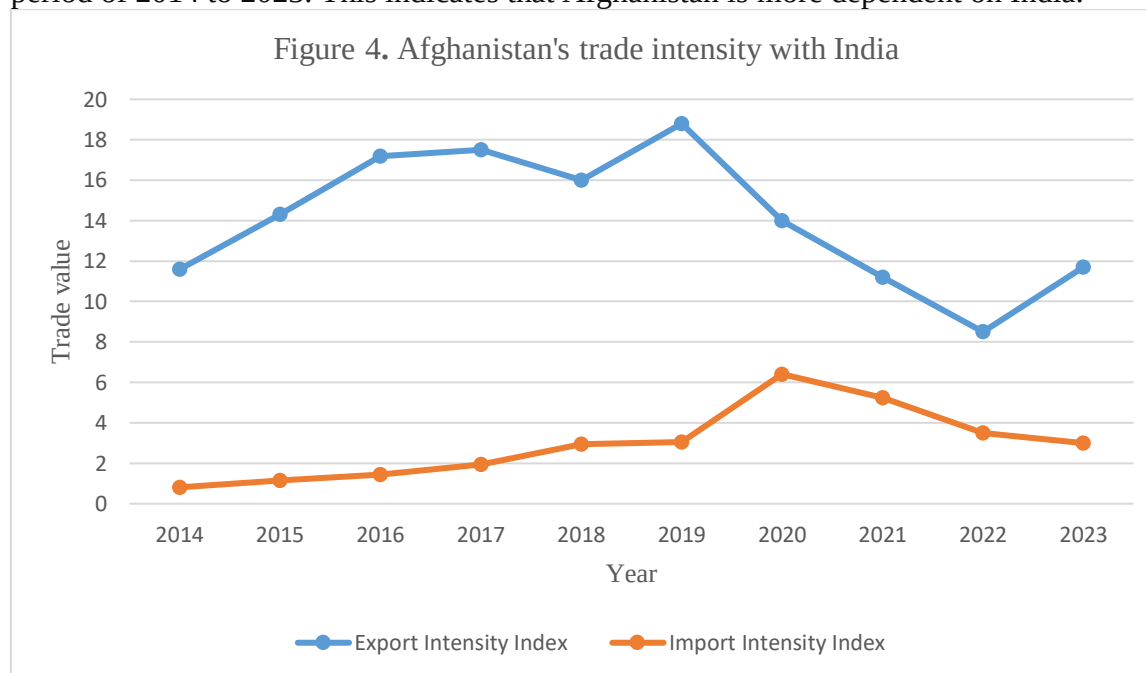
Table 4 . Afghanistan's Export and Import intensity with India (2014-2023)

Year	Afghanistan's EII with India	Afghanistan's III with India
2014	11.6	0.81
2015	14.3	1.14
2016	17.2	1.43
2017	17.5	1.94

2018	16.0	2.93
2019	18.8	3.05
2020	14.0	6.41
2021	11.2	5.23
2022	8.5	3.50
2023	11.7	3.00

Source: Author's calculations based on data from UN COMTRADE database, the National Statistics and Information Authority of Afghanistan (NSIA), Trade Statistical Yearbook 2023, and ITC

The export and import values of Afghanistan with India are in Figure 4. It can be depicted from Figure 4 that the export intensity of Afghanistan is higher than its import intensity for the entire period of 2014 to 2023. This indicates that Afghanistan is more dependent on India.



Source: Authors' construction from Table 4

5. Conclusion and Policy implications

In this paper, the analysis of trade openness highlights that India and Afghanistan show a contrasting pattern. India shows a relatively balanced export-import ratio, reflecting gradual stabilization. In contrast, Afghanistan maintains high trade openness and is pushed by import dependence, with low export contributions. However, Afghanistan's total trade-to-GDP ratio is higher than India's. It also highlights that Afghanistan is more dependent on international trade than India. These patterns suggest that while India's trade structure is more resilient and diversified, Afghanistan's economic stability is highly sensitive to external trade flows.

The Trade Intensity Index (which includes the intensity of exports and imports indexes) has been used to analyse the trade intensity between the two countries. India's export intensity with Afghanistan was larger than 1. Likewise, Afghanistan's export intensity index was more than 1 for

all the years. The outcome shows a higher level of trade intensity between India and Afghanistan. Furthermore, India's import intensity with Afghanistan has consistently been higher than 1. Similarly, Afghanistan's Import intensity to India has always been higher than 1, except for 2014. However, Afghanistan still largely depends on trade with India, highlighting the two countries' close economic ties.

The findings also suggest that Afghanistan must prioritize export diversification and enhance domestic production to reduce vulnerability caused by excessive import dependency. India and Afghanistan could boost their current trade relationship, particularly in areas where there are competitive edge for both nations. Furthermore, India can play a key role in supporting Afghanistan's integration and stability, which may benefit both economies in the region.

Acknowledgement

The authors extend their heartfelt gratitude to the Editor and the anonymous reviewers for their invaluable contributions.

Fundings

The authors did not receive support from any organization for the submitted article.

Conflict of interest

The authors states that there is no conflict of interest regarding the publication of this article.

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