

## Original Research Article

# Export Competitiveness of Indian Coffee: Analysing Trade Potential in the Global Market

### Abstract

Coffee plays a vital role in the Indian economy, serving as a significant agricultural export and a major source of income for millions of farmers, particularly in the southern states. The coffee industry not only contributes to India's foreign exchange earnings but also supports rural development and employment in various regions of the country. This study investigates the export competitiveness of Indian coffee in the global market, focusing on production volumes, trade potential, and comparative advantage. **The study is mainly based on the secondary data obtained from ITC trademap, Coffee Board of India, etc.** India ranks among the top coffee producers globally, with Karnataka, Kerala, and Tamil Nadu as the leading coffee-producing states. Despite consistent production growth, India's export competitiveness, measured through Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) indices, remains below that of major coffee-exporting countries like Honduras, Ethiopia, and Colombia. The study employs the gravity model, analysing India's coffee exports to 178 trading partners from 2014 to 2023. The Poisson Pseudo Maximum Likelihood (PPML) method addresses zero trade observations, providing robust estimates. The results indicate that larger economies import more coffee from India, while greater geographical distance negatively impacts trade. Interestingly, the analysis reveals a disconnect between India's current export focus and its untapped trade potential. India has exhausted its trade potential in key markets like Italy and Belgium, yet these remain major export destinations. Conversely, significant untapped potential exists in markets like the United Kingdom, France, and the Netherlands. This misalignment suggests an opportunity for India to redirect its export strategies towards underutilized markets. The study concludes that enhancing production efficiency, improving product quality, and aligning export strategies with markets offering the greatest growth potential are critical for strengthening India's position in the global coffee trade.

**Keywords;** Coffee, trade competitiveness, trade potential, international trade, gravity model.

### 1. Introduction

Coffee is grown primarily in India's southern states and is heavily reliant on the southwest monsoon [1]. Coffee is one of the highly traded agricultural commodities in the world with a total trade value of \$42.2 billion (Table 1) and more than 9.5 billion kg produced [2].

Globally Brazil shares first position in coffee production with a percentage of 17.40 followed by Switzerland and Germany. Coffee has been cultivated in approximately 80 tropical countries [3]. Outside of the Arabian Peninsula, coffee is thought to have been grown in India for the longest time. India ranks eight among the top twenty countries in the world in terms of coffee production (Table 2) and occupies 18<sup>th</sup> position in global export (Table 1). India's coffee was considered as best coffee in the world. To increase the sustainability of coffee production, an emphasis should be placed on improving coffee quality through sustainable, environmental friendly cultivation practices, which can result in higher net returns in long run. India is becoming known around the world as one of the world's leading coffee producers. India produces some of the world's best coffee, which is grown in the shade. With over 3 million coffee growers, coffee cultivation is a source of employment in India. The economics of the coffee industry have changed in recent years, with international market prices falling [4]. Different coffee plantations were established in the 18th century. The Indian coffee industry has made a distinct mark over time on the global coffee map. All coffees in India are cultivated beneath a “well-defined two-tier shadow canopy of evergreen legumes,” which is unique in the world [5]. India today has 16 distinct coffee kinds grown in 13 different coffee-growing regions, the majority of which are in the country’s southern region. Indian coffee varieties are ideal for cappuccinos and espressos, and there is no equivalent in any other coffee-growing countries.

**Table 1: Major players in global coffee exports, 2023. (Value in million US\$)**

Sl No.	Exporters	Export value	% share in world trade
1	Brazil	7351	17.40
2	Switzerland	3644	8.63
3	Germany	3408	8.07
4	Viet Nam	3382	8.01
5	Colombia	2915	6.90
6	Italy	2586	6.12
7	Honduras	1488	3.52
8	Belgium	1310	3.10
9	France	1271	3.01
10	Ethiopia	1225	2.90
11	Netherlands	1200	2.84
12	USA	1193	2.83
13	Uganda	955	2.26
14	Guatemala	949	2.25
15	Indonesia	929	2.20
16	Peru	829	1.96
17	Canada	764	1.81
18	India	747	1.77
	World	42245	100

Source; ITC Trade map dataset.

The purpose of this study was to analyse the competitive position of India in World coffee export and gravity model of trade has been employed to find new markets for India. There are very few studies on Indian Coffee competitiveness in the International market which comprehensively deals with the export potential of coffee and its export competitiveness. Majority of the studies focus mainly on the disaggregated products like horticulture sector as a whole or beverages as whole, but in our study we are dealing with particular product level, in this way the present study will add to the current literature. This study first calculated Revealed comparative advantage (RCA) and Revealed symmetric comparative advantage (RSCA) for Indian coffee. Panel-gravity approach was used to calculate potential markets for Indian Coffee. The gravity model turns out to be in greatly accepted approach as it deals with all kinds of trade flows [6].

## 2. Materials and methods

This study is entirely based on secondary data obtained from various sources viz., WITS database, ITC trade map, CEPII database and FAOSTAT. This study mainly confines to the period 2014-2023, as the trade data of these ten years are sufficient to study the trade competitiveness and trade potential of any commodity. Trade competitiveness of major coffee exporters was analysed by using Revealed Comparative Advantage (RCA) index. The RCA Index developed by *Balassa* [7] is one of the popular methods of indicating competitiveness in the international trade. It shows how much competitive is a product in country's export compared to that product's share in the global trade. A product with high RCA value is competitive and can be exported to countries with low RCA value. The RCA index is computed by Equation (1):

$$RCA = \frac{(X_{ij}/X_{ik})}{(X_{nj}/X_{nk})} \quad (1)$$

Where,

$X_{ij}$  = Exports by 'i<sup>th</sup>' country of 'j<sup>th</sup>' commodity, i.e. coffee

$X_{ik}$  = Exports by 'i<sup>th</sup>' country of a set of 'k' commodities, i.e. agricultural commodities

$X_{nj}$  = Exports by a set of 'n' countries of 'j<sup>th</sup>' commodity and

$X_{nk}$  = Exports by a set of 'n' countries of a set of 'k' commodities

However, RCA suffers from the problem of asymmetry as 'pure' RCA is basically not comparable on both sides of unity. The index is made symmetric following the methodology suggested by *Dalum, et al.*, [8] and the new index is called Revealed Symmetric Comparative Advantage (RSCA) Index (Equation 2). This index ranges between -1 and +1 and is free from skewness problem.

Mathematically,

$$RSCA = \frac{(RCA-1)}{(RCA+1)} \quad (2)$$

The gravity model, essential for analysing bilateral trade flows and potential, was first empirically studied by Tinbergen [9] and Poyhonen [10]. Its use surged with further

developments by Anderson [11], Bergstrand [12], and Helpman and Krugman [13]. Based on Newton's law of gravitation, the model posits that trade flows between two countries are proportional to their economic mass (GDP) and inversely proportional to the distance between them. GDP indicates market size, promoting trade as economies grow. Distance suggests higher transport costs and cultural barriers, reducing trade. To capture qualitative trade aspects, dummy variables like shared borders, languages, and colonial ties are included. Such factors reduce transaction costs and strengthen trade relations, enhancing trade, especially among Free Trade Agreement members [14]. By keeping these things in mind, the traditional gravity model is augmented following Irshad *et al* [15] as:

$$Cexp_{ijt} = \alpha_1 + \alpha_2 \ln(Dist_{ijt}) + \alpha_3 \ln Y_{jt} + \alpha_4 \ln Y_{it} + \alpha_5 EU_{jt} + \alpha_6 \ln(Trade\_Flow)_{ijt} + \alpha_7 Comrelig_{ij} + \alpha_8 Comcol_{ij} + \alpha_9 WTO_{ijt} + \alpha_{10} \ln(Exr_{ijt}) + \alpha_{11} TA_{ijt} + \varepsilon_{ijt} + \mu_t \quad (3)$$

Where,

- Cexp<sub>ijt</sub> = India's coffee export to country j in year t
- Dist<sub>ijt</sub> = distance between India and partner country
- Y<sub>jt</sub> = GDP of partner country j
- Y<sub>it</sub> = GDP of exporting country *i.e.*, India
- EU<sub>jt</sub> = 1 if country currently is a EU member
- Trade\_Flow<sub>ijt</sub> = Bilateral trade flow (in thousands current US\$)
- Comrelig<sub>ij</sub> = Religious proximity index
- Comcol<sub>ij</sub> = 1 if countries share a common colonizer post 1945
- WTO<sub>ijt</sub> = 1 if destination country currently is a WTO member
- Exr<sub>ijt</sub> = bilateral exchange rates of India and the partner country.
- FTA<sub>ijt</sub> = dummy variable for trade agreements.

This study utilizes data from ITC trademap and CEPII databases in order to estimate the gravity model, then results will be used to calculate India's trade potential in coffee with various countries, considering factors like distance, GDP, openness, landlocked status, common language, colonial ties and free trade agreements. The export potential (EP) formula is:

$$EP = \left[ \frac{\left\{ \left( \frac{Actual}{Potential} \right) - 1 \right\}}{\left\{ \left( \frac{Actual}{Potential} \right) + 1 \right\}} \right] \quad (4)$$

This formula standardizes export potential between -1 and 1. A positive index (0 to 1) indicates higher-than-predicted millets trade, showing exports have reached or exceeded potential. A negative index (-1 to 0) suggests the opposite [16]. Another method to calculate India's millets exports is the absolute difference between potential and actual trade ( $\Delta T = \text{Potential trade value} - \text{Actual trade value}$ ), forecasting future trade direction [17]. A positive  $\Delta T$  indicates trade expansion potential, while a negative  $\Delta T$  shows India has exceeded its export potential with a specific country. These different indicators help to identify countries with potential for expanding India's coffee exports.

### 3. Results and discussions

### 3.1. Coffee production scenario in the world and in India

Top 20 coffee-producing countries in 2022 by production volume in tonnes are presented in table 2. Brazil leads with over 3.17 million tonnes, followed by Viet Nam with approximately 1.95 million tonnes. Indonesia and Colombia are third and fourth, producing 794,762 and 665,016 tonnes, respectively. India ranks eighth with 338,619 tonnes. The list includes a mix of countries from different continents, with Ethiopia, Uganda, and Honduras among other notable producers. The production volumes highlight Brazil's dominance in the coffee industry, while other countries contribute significantly smaller, yet substantial, amounts.

**Table 2: Top 20 major coffee producers in the world in 2022. (Production in tonnes).**

Sl. No.	Country	Production	Sl. No.	Country	Production
1	Brazil	3172562	11	Guinea	261645
2	Viet Nam	1953990	12	Guatemala	225500
3	Indonesia	794762	13	Mexico	181706
4	Colombia	665016	14	Lao People's Democratic Republic	171000
5	Ethiopia	496200	15	Nicaragua	170181
6	Uganda	393900	16	China	108886
7	Peru	352645	17	China, mainland	108000
<b>8</b>	<b>India</b>	<b>338619</b>	18	Costa Rica	79200
9	Honduras	315490	19	Côte d'Ivoire	70000
10	Central African Republic	306901	20	United Republic of Tanzania	67200

Source; FAOSTAT dataset pertaining to the year 2022.

The table 3 compares coffee production across various states in India for the years 2022-23 and 2023-24, focusing on two varieties: Arabica and Robusta. Karnataka is the leading producer, contributing over 70% of India's total coffee production in both years. Kerala follows, with around 19-20% of the total production, dominated by Robusta. Tamil Nadu, Andhra Pradesh, Orissa, and the North Eastern Region contribute smaller shares. The overall coffee production in India increased from 352,000 tons in 2022-23 to 374,200 tons in 2023-24, with both Arabica and Robusta seeing growth. The percentages in parentheses represent each state's contribution to the total production within the given year.

**Table 3: Status of coffee production in India.**

States	2023-24			2022-23		
	Arabica	Robusta	Total	Arabica	Robusta	Total
<b>Karnataka</b>	81960 (72.53)	184925 (70.80)	266885 (71.32)	72020 (72.02)	176000 (69.84)	248020 (70.46)
<b>Kerala</b>	2075 (1.84)	70750 (27.09)	72825 (19.46)	1975 (1.98)	70450 (27.96)	72425 (20.58)
<b>Tamil Nadu</b>	13,045 (11.54)	5,390 (2.06)	18,435 (4.93)	13,250 (13.25)	5,450 (2.16)	18,700 (5.31)

<b>Andhra Pradesh</b>	15,340 (13.58)	40 (0.02)	15,380 (4.11)	12,225 (12.23)	40 (0.02)	12,265 (3.48)
<b>Orissa</b>	500 (0.44)	0 (0.00)	500 (0.13)	465 (0.47)	0 (0.00)	465 (0.13)
<b>North Eastern Region</b>	80 (0.07)	95 (0.04)	175 (0.05)	65 (0.07)	60 (0.02)	125 (0.04)
<b>Grand Total (India)</b>	1,13,000 (100)	2,61,200 (100)	3,74,200 (100)	1,00,000 (100)	2,52,000 (100)	3,52,000 (100)

**Note:** Figures in the parenthesis indicates percentages.

Source; Coffee Board of India. Data pertains to 2022-23 and 2023-24.

### 3.2. Major destination for Indian coffee

From this study it was evident that Globally Indian coffee is having the export value of 747.20 (US\$) among this Italy was the major market with value of US\$ 146.30 million and 20 per cent share of Indian coffee exports. Followed by Germany with 15.14 per cent share and US\$ 113.10 million export value. Australia occupied the tenth position in the major market for Indian coffee with value of US\$17.50 million (Table 4). This variation in unit values indicates differences in the quality, processing, and market positioning of Indian Coffee exports among these countries.

**Table 4: Major destinations for Indian Coffee –2023. (Value in million US\$)**

<b>Importers</b>	<b>Export value</b>	<b>Percentage (%)</b>
Italy	146.3	19.59
Germany	113.1	15.14
Belgium	57.8	7.74
Jordan	47.9	6.40
United Arab Emirates	42.5	5.69
Libya, State	35.9	4.81
Kuwait	30.5	4.08
Saudi Arabia	19.3	2.58
Greece	17.7	2.37
Australia	17.5	2.34
World	747.2	100

Source: Authors' computations from ITC trademap data 2023.

### 3.3. Trade competitiveness

The comparative advantage indices *i.e.* RCA and RCSA of 10 major exporting countries was studied and the results were presented in Table 5. Equation (1) and (2) were used to estimate RCA and RCSA indices respectively. These indices were calculated for a period of ten years (2014 to 2023) and also overall averages of these indices were listed in Table 5. From these results it was evident that the Honduras was the first country with highest average Revealed

Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) values, which have been consistently increasing over the years. This trend underscores Honduras growing strength and efficiency in the millet export market followed by Ethiopia (18.20) and Columbia (16.10). Based on the outcome of RCA and RSCA index analysis, India is less competitive for coffee export when compared to other major coffee exporting countries in the world with RCA and RSCA index value of 0.8 and -0.1 respectively. These values have shown a constant growth from 2013 to 2023, reflecting India's strengthening position and competitive edge in the global coffee market. India's improvements highlight its capacity to enhance production; quality and market reach over the decade. Conversely, the Honduras and Ethiopia demonstrate relatively higher comparative advantages in coffee exports. Their RCA and RSCA values are comparatively highest, indicating high competitiveness in the global market. This could be due to various factors such as lesser production costs, higher yields and more efficient supply chains. Belgium and France were found to have least exporter of coffee, faces a comparative disadvantage. This is evident from their negative RSCA values and RCA values less than 1. These metrics suggest that Belgium and France struggles to compete effectively in the International coffee market. Factors contributing to this disadvantage could include less favourable climatic conditions, or lower productivity compared to its competitors. The results are comparable with those of Al-Abdulkader [18], Kumareswaran [19], Hassen, K *et al* [20] and Chinnappa and Rajashekar [21].

Overall, the comparative analysis of these major coffee exporters highlights the varying levels of competitiveness and the dynamic nature of global agricultural trade. Honduras and Ethiopia stand out with their increasing comparative advantages, while the remaining countries included for the study face challenges that affect their positions in the coffee export market.

**Table 5: Comparative advantage indices of 10 major exporters of Coffee in comparison with India.**

Countries	Index	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Average
Brazil	RCA	3.4	3.3	3.0	2.5	2.6	2.8	2.9	2.8	2.6	2.3	2.8
	RSCA	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.5
Switzerland	RCA	10.3	9.7	10.0	10.6	11.8	13.0	14.4	16.1	13.4	15.0	12.4
	RSCA	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9
Germany	RCA	1.3	1.3	1.3	1.4	1.5	1.5	1.6	1.6	1.5	1.5	1.5
	RSCA	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Viet Nam	RCA	8.8	6.1	7.2	6.6	6.9	5.6	4.9	4.8	5.2	6.2	6.2
	RSCA	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Colombia	RCA	16.3	16.6	16.2	15.9	16.1	16.7	16.5	17.2	15.4	13.6	16.1
	RSCA	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Italy	RCA	1.5	1.5	1.6	1.6	1.7	1.8	1.6	1.7	1.6	1.7	1.6
	RSCA	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.3	0.2
Honduras	RCA	<b>18.2</b>	<b>19.0</b>	<b>18.3</b>	<b>19.2</b>	<b>23.3</b>	<b>24.1</b>	<b>17.8</b>	<b>25.9</b>		<b>18.6</b>	<b>20.5</b>
	RSCA	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9		0.9	0.9
Belgium	RCA	1.0	1.1	1.0	0.9	0.9	0.9	1.0	1.0	1.1	1.0	1.0

	RSCA	0.0	0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
<b>France</b>	RCA	0.5	0.5	0.5	0.7	0.8	0.9	1.0	0.9	0.6	0.7	0.7
	RSCA	-0.3	-0.4	-0.3	-0.2	-0.1	-0.1	0.0	-0.1	-0.3	-0.2	-0.2
<b>Ethiopia</b>	RCA	14.1	14.9	14.2	17.3	17.9	18.4	18.4	21.6	23.2	22.1	18.2
	RSCA	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
<b>India</b>	RCA	0.7	0.8	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.8	0.8
	RSCA	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1
<b>Source: Authors' computations from ITC trademap data from 2014 to 2023</b>												

### 3.4. Trade potential

The gravity model analyses India's coffee exports to 178 trading partners from 2014 to 2023, addressing zero trade observations using the PPML method, as recommended by Silva and Tenreyro [22] and applied in agricultural trade studies by Fadeyi *et al.* [23] and Sun & Reed [24]. Table 6 presents the estimation results using equation (3), showing that most variables have expected signs and significance levels. A higher GDP of the importing country positively and significantly affects trade, reflecting greater demand potential. Similarly, a higher GDP of the exporting country indicates greater production potential, leading to increased exports. Our findings confirm this for India's coffee exports: a 1% increase in trading partners' GDP results in a 1.54% [ $\exp(0.432)$ ] increase in coffee exports from India. This positive relationship indicates that larger economies import more coffee from India, holding other factors constant. Geographical distance, a proxy for transportation costs, negatively impacts India's coffee exports. Specifically, a 1 per cent increase in distance results in a 0.65% [ $\exp(-0.422)$ ] decrease in coffee exports, implying that India trades more with countries where transportation costs are lower. While there is no impact of exchange rates on Indian coffee export, our study found a negligible effect on Indian coffee trade. The dummy variable for religious proximity index and common colonizer, positively and significantly affects India's coffee exports, showing that a 1.9 per cent increase in religious proximity index and common colony correlates with 8.5 per cent and 0.10 per cent increase in coffee exports. This suggests that India typically exports commodities to other countries without trade agreements, indicating that such agreements do not significantly impact agricultural commodities exports. Sometimes, free trade agreements and trade liberalization policies can negatively affect the home industry [25], as tariff reductions might harm India's agricultural and coffee sectors. Most explanatory variables align with the gravity model theory, demonstrating a positive relationship with India's coffee exports. Interestingly, dummy variable for common colonial history is positive, indicating that countries with a British colonial past tend to import more coffee from India.

To compete globally, India's coffee industry needs to ensure high product quality, competitive pricing, and adherence to international labelling and packaging standards. Export growth can drive India's economic development and help it become a significant player in the global market.

**Table 6: Panel gravity model results.**

Variable	Coefficient	Std. err.	z	P>z	[95% conf. interval]	
Distance	-0.422	0.145	-2.91	0.0040	-0.706	-0.138
GDP of destination	0.432	0.078	5.52	0.0000	0.279	0.586
GDP of origin	0.417	0.163	2.56	0.0100	0.098	0.735
European Union	1.898	0.143	13.24	0.0000	1.617	2.179
Bilateral trade flow	0.323	0.072	4.45	0.0000	0.181	0.464
Common religion	8.514	1.943	4.38	0.0000	4.707	12.321
Common colony	0.107	0.191	0.56	0.5750	-0.267	0.481
WTO membership of destination	-0.205	0.204	-1.01	0.3140	-0.605	0.195
Exchange rate	0.000	0.000	-2.16	0.0310	0.000	0.000
FTA	-1.985	0.251	-7.91	0.0000	-2.477	-1.493
_cons	-10.820	3.782	-2.86	0.0040	-18.232	-3.408

Source: Authors' computations from ITC trademap data and CEPII database for the period of 2014-2023.

The gravity model coefficients are used to estimate India's predicted coffee exports, which are then compared to actual exports to assess export potential. From the export potential calculations it was revealed that India has coffee trade potential with Table 7 highlights India's coffee export potential with 135 out of 179 countries. In order to make efficient use of space, the results are confined to only top 20 countries where export potential exists and last 20 countries where India has exhausted the coffee trade potential. The analysis reveals that India has the highest trade potential in the United Kingdom, France, the Netherlands, the United States, and Poland. However, India has already exhausted its trade potential in markets like Italy, Belgium, Jordan, Germany, and Slovenia. Interestingly, India's major export destinations are primarily those where its trade potential is already exhausted. This paradox highlights the disconnect between India's trade potential and its current export focus, suggesting an opportunity to redirect efforts toward underutilized markets.

**Table 7: Trade potential of Indian coffee in Global market.**

List of countries with which India has trade potential			List of countries with which India has exhausted trade potential		
Country	export potential in US\$ 1000	Export potential Index	Country	exhausted potential in US\$ 1000	Export potential Index
United Kingdom	32127	-0.79	Italy	-104985	0.62
France	29419	-0.74	Belgium	-24641	0.42
Netherlands	17316	-0.63	Jordan	-18607	0.89
United States	9937	-0.42	Germany	-15878	0.15
Poland	9135	-0.71	Slovenia	-11059	0.69
Sweden	8873	-0.87	Kuwait	-10461	0.62
UAE	7586	-0.36	Australia	-9743	0.68
Austria	7382	-0.84	Libya	-9369	0.83
Denmark	6964	-0.80	Korea, Rep.	-5083	0.84
Spain	6892	-0.19	Israel	-5046	0.55

Turkey	6214	-0.65	Greece	-4847	0.28
Ireland	5998	-0.98	Switzerland	-4109	0.52
Czech Republic	5378	-0.97	Croatia	-3783	0.59
Finland	4503	-0.63	Syria	-3197	0.65
Hungary	4353	-1.00	Russia	-2937	0.27
Romania	3497	-0.63	Tunisia	-1837	0.52
Iraq	3246	-0.95	Albania	-1647	0.88
Hong Kong, China	3123	-0.98	Egypt	-1417	0.18
Slovak Republic	2795	-1.00	Ukraine	-1310	0.47
Qatar	2755	-0.78	Algeria	-1187	0.19

Source: Authors' computations ITC trademap data and CEPII database for the period of 2014-2023.

#### 4. Conclusion

The present study on export competitiveness of Indian coffee reveals a complex and nuanced position for India in the global coffee market. India's coffee production and export data, coupled with the analysis of trade potential, illustrate both strengths and areas for improvement in its export strategy. India stands as a significant player in the global coffee market, producing a substantial volume of coffee, particularly in the states of Karnataka, Kerala, and Tamil Nadu. The increase in overall coffee production from 2022-23 to 2023-24, particularly in both Arabica and Robusta varieties, showcases India's growing capacity to meet international demand. However, despite this production growth, India's export competitiveness, as measured by the Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) indices, indicates that India lags behind other major coffee-exporting countries like Honduras, Ethiopia, and Colombia. The RCA and RSCA values for India, although improving over the years, remain below 1, highlighting a less competitive position in comparison to its global counterparts. The gravity model analysis further underscores the opportunities and challenges faced by Indian coffee in the international market. While the model confirms a positive relationship between the GDP of trading partners and Indian coffee exports, it also highlights the negative impact of geographical distance on trade volumes. Countries with closer proximity to India are more likely to import Indian coffee, whereas distant markets, despite potential demand, face higher transportation costs, which dampens trade. This finding suggests a need for India to explore and invest in cost-effective logistics solutions to enhance its competitiveness in distant but lucrative markets. A critical insight from this study is the mismatch between India's actual export destinations and its untapped trade potential. The analysis reveals that while India has exhausted its trade potential in key markets like Italy, Belgium, and Germany, these countries remain major export destinations. Conversely, markets with significant untapped potential, such as the United Kingdom, France, and the Netherlands, are not fully leveraged. This misalignment indicates an opportunity for India to diversify its export strategy by focusing on underutilized markets where its coffee could achieve greater market penetration. To strengthen its position in the global coffee market, India must address both the internal and external factors influencing its export competitiveness. This includes improving production

efficiency, enhancing product quality, and aligning export strategies with markets that offer the most significant growth potential. By redirecting efforts toward these underexploited markets and optimizing supply chain logistics, India can improve its competitiveness and secure a more robust and sustainable position in the global coffee trade.

### **Disclaimer (Artificial intelligence)**

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

### **5. References**

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