



An analysis of export performance of major spices of India in the globalized regime

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(Manuscript received: 23.7.2024, Revised:03.01.2025, Accepted: 23.09.2025)

Abstract

Spices of India hold significant economic importance due to its contribution to exports, providing livelihood for millions of people and being net foreign exchange earner. In the era of globalisation, countries of the world are integrating through trade and investment. The Indian spices exports are facing international competition after liberalizing its trade as part of New Economic Policy of 1991. In this regard, the present study analysis the export performance of Indian Spices since 1991. Comparison is also made with period prior to trade liberalisation. Multiple regression analysis is applied to quantify and analyse the export performance of Spices. The results of multiple regression shows that cumin and chilli exports during the pre-globalization period were not highly responsive to economic variables, as government interventions and domestic consumption patterns limited the influence of global market forces. Unlike the pre-globalization period, where trade restrictions limited the impact of economic factors, exchange rate fluctuations, emerged as a key determinant of cumin and chilli exports in the liberalized era. Further the findings indicate that, in the post-globalization era, spice exports have become more responsive to global economic trends, with exchange rate movements, international demand, and price dynamics playing a crucial role in shaping India's competitive position in the global spice trade.

Keywords: export, cumin, chilli, multiple regression, globalisation

Introduction

India is the world's largest exporter, consumer and producer of the spices in the world. The country is described as the "Spice Bowl of the World" (Angles *et al.*, 2011). Indeed, almost every state and union territory in India cultivates at least one variety of spice. The Spices Board Act of Parliament states that 52 different spices are brought within its jurisdiction. About 75 of the 109 varieties classified by the International Organization for Standardization (ISO) are produced in the country, which also accounts for half of all the spice trade that occurs worldwide. The diverse agro-climatic conditions, ranging from tropical to subtropical to temperate, that prevail is conducive for wide variety of spices. Spices are an important component of international trade and influence social, political, and economic phenomena across the world. Developing nations, such as India, serve as

predominant suppliers in the global spice trade (Jaffee, 2005). Notably, India produces a wide range of major spices, including pepper, cardamom, chilli, ginger, turmeric, coriander, and cumin, (Devi and Jadav, 2018). Among these, cumin and chilli hold immense economic importance due to their high demand in both domestic and international markets. Nearly 80 percent of the cumin cultivated in India is consumed within the country (Krishnadas, 2010). Indian cumin is known for its quality and competitive pricing, making it a preferred choice in the international markets. India's chilli export share, during the year 2022, represented a substantial 71.15 percent of the world's chilli exports by value. India maintained its stability in the international market during post liberalisation, because there was less variation in both the value and volume of its chili exports (Chaitra and Sonnad, 2019). India's dominance in spice exports

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has been reinforced by its ability to produce high-quality spices that cater to the tastes and preferences of consumers worldwide.

Before 1991, The Indian spice industry was protected by government policies. However, in 1991, the Indian government adopted trade liberalization, opening the spice sector to global markets. In the context of globalization, the trade scenario for spices has undergone a remarkable transformation. As Indian spices continue to hold international recognition for their quality and variety, globalization has provided a platform for Indian spice producers and traders to showcase the products and take advantage of increased demand worldwide. Thus, evaluation of effect of globalization on Indian spices is essential as it has not only contributed to growth of the economy but also has opened up new opportunities for trade expansion and global market integration. Among the various spices exported, cumin and chilli hold substantial economic importance due to their high demand worldwide. In this background, the study aims to evaluate the impact of globalization on India's spice trade, focusing on cumin and chilli. By analysing key economic indicators such as exchange rates, production trends, global demand, and policy changes, the research provides insights into how globalization has influenced the trade performance of these spices. This study aims to examine the factors influencing the trade performance of Indian major spices during the post-globalization period. While several studies have analysed the impact of globalization on the Indian spice sector, most have taken a broad industry-wide approach, covering multiple spices collectively. However, the present study specifically focuses on cumin and chilli, two of India's most valuable and widely traded spices. The study provides a more detailed and precise analysis of the trade performance of these spices in the post-globalization period. The findings will help to understand India's evolving role in the international spice market and the challenges and opportunities that globalization presents in an increasingly interconnected world.

Materials and Methods

The Multiple regression has been used to examine the set of factors (independent variables) influencing on India's spice export (independent variable) in the globalised regime (Murthy *et al.*, 2023). This analytical approach

offers valuable insights into the factors influencing cumin and chilli exports. The economic note focusing on the dependent variable – spice (cumin and chilli) exports - and considering key independent variables such as production, export unit value, exchange rate, world import and the impact of globalization as represented in two different data sets to analyse the globalisation impact on spice export. Examining the impact of globalization on selected spices, namely cumin and chilli through the application of multiple regression tools provides a robust framework for understanding the relationships between export and other key variables. Globalization, a multifaceted phenomenon involving increased interconnectedness and interdependence among nations, can have profound implications for the international trade of spices. Here, the multiple regression tool serves as a statistical method to quantify and assess the specific impacts of globalization in combination with other relevant factors. The analysis covers the period from 1971 to 2023, which is divided into two distinct phases: the pre-globalization period (1971–1990) and the post-globalization period (1991–2023). The pre-globalization phase, represents a period when India's spice trade was largely protected by government policies, with restricted international market access and limited foreign competition. The post-globalization phase, on the other hand, marks a shift towards an open-market economy, where trade liberalization policies, currency fluctuations, and changing global demand patterns have significantly influenced spice exports. By segmenting the dataset into these two periods, the study provides a comparative assessment of how key economic factors have evolved and impacted the trade performance of major Indian spices, namely cumin and chilli before and after globalization.

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + u_i$$

Where,

Y = Export (Tonnes)

X₁ = Production (Tonnes)

X₂ = Export Unit Value (dollars/per kg)

X₃ = World Import (Tonnes)

X₄ = Exchange Rate

a = Constant or Intercept

ui = error term

b₁ b₂ b₃ b₄ and b₅ = regression coefficient

Results and Discussion

The impact of globalization on cumin and chilli exports is analysed by examining key economic factors in both the pre-globalization (1971–1990) and post-globalization (1991–2023) periods. The results highlight significant differences in the determinants of export performance across these two phases.

Factors influencing cumin export: Pre and post globalisation period

Table 1, presents the analysis of factors influencing cumin exports during the pre-globalization period (1971–1990). It highlights the limited role of market forces in determining trade performance. The R-squared value (0.38) indicates that only 38% of the variation in cumin exports can be explained by the selected independent variables, suggesting that government policies, trade restrictions, and domestic consumption patterns played a significant role in shaping export trends. Among the key determinants, world import demand is statistically significant at the 5% level with a

positive coefficient (2.63), implying that higher global demand had a direct impact on cumin exports. This indicates that despite restrictive trade policies, there was a clear export response to international market conditions, albeit in a constrained manner. In contrast, exchange rate fluctuations had a significant negative effect, suggesting that currency depreciation adversely impacted cumin exports. This counter-intuitive result may be attributed to India's fixed exchange rate regime during this period, which did not provide the expected competitive advantage for exporters. Production levels and export unit value were both found to be statistically insignificant, indicating that cumin exports were not significantly driven by domestic production levels or pricing strategies. This suggests that much of the cumin produced in India was consumed domestically, leaving little room for exports. Overall, the findings suggest that cumin exports during the pre-globalization period were not highly responsive to economic variables, as government interventions and domestic consumption patterns limited the influence of global market forces. This highlights the constraints faced by Indian spice exporters before the trade liberalization policies of 1991, which later facilitated greater market integration and competitiveness in the international spice trade.

Table 1. Factors influencing cumin export: during pre-globalisation period

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.82	10.2	-1.16	0.26
lnExchange_Rate	-3.78	1.34	-2.82	0.01***
lnEUUV	0.62	0.87	0.71	0.49
lnProduction	-0.17	0.46	-0.36	0.72
lnWorld_Import	2.63	1.24	2.13	0.05**
R-squared	0.38	Durbin-Watson stat	1.86	
Adjusted R-squared	0.22	Breusch pagan Godfrey	0.09	
Prob(F-statistic)	0.1			

*Note: ***, **and * indicate the significance of the coefficients at 1%, 5%, and 10% levels of significance, respectively*

Table 2, represents the analysis of factors influencing cumin exports during the post-globalization period (1991–2023), highlighting the significant role of economic variables in shaping trade performance in an open-market environment. The R-squared value of 0.94 indicates that 94% of the variation in cumin exports is explained by the selected independent variables, demonstrating a strong model fit. Unlike the pre-globalization period, where trade restrictions limited the impact of economic factors, exchange rate fluctuations, emerged as a key determinant of cumin exports in the liberalized era. The variable is statistically significant at the 1% level, with a positive coefficient of 1.88, suggesting that currency depreciation made Indian cumin more competitive in global markets, thereby boosting exports. Similarly, export unit value is positively significant at the 5% level, indicating that higher prices did not discourage demand, reflecting the premium quality of Indian cumin in international

markets. The world import demand is also statistically significant, with a coefficient of 1.29, suggesting that rising global consumption has contributed to India's export growth. However, domestic production remains statistically insignificant, implying that supply-side constraints or domestic consumption patterns did not strongly influence cumin exports.

The Durbin-Watson statistic (1.84) suggests no major autocorrelation issues, and the F-statistical probability (0) confirms the overall model's robustness. These findings indicate that, in the post-globalization era, cumin exports have become more responsive to global economic trends, with exchange rate movements, international demand, and price dynamics playing a crucial role in shaping India's competitive position in the global spice trade. The stark contrast with the pre-globalization period underscores the transformative impact of trade liberalization, which has enhanced India's integration into global markets and strengthened its dominance in the spice export sector.

Table 2. Factors influencing cumin export: during Post Globalisation Period

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-15.64	4.36	-3.59	0.00***
lnExchange_Rate	1.88	0.6	3.14	0.00***
lnEUUV	1.04	0.5	2.06	0.05**
lnProduction	0.17	0.25	0.67	0.51
lnWorld_Import	1.29	0.57	2.28	0.03**
R-squared	0.94	Durbin-Watson stat	1.84	
Adjusted R-squared	0.94	Breusch pagan Godfrey	0.09	
Prob (F-statistic)	0			

Factors influencing chilli export: pre and post Globalisation Period

Table 3, represents the factors influencing chilli exports during the pre-globalization period. The regression results indicate that the model has a weak explanatory power, with an R-squared value of 0.28 and an adjusted R-squared of 0.09, suggesting that only a small portion of the variation in chilli exports can be explained by the independent variables. The coefficients of all the

key variables—exchange rate, export unit value, production and world imports are statistically insignificant, as their p-values are well above conventional significance levels. The negative coefficient of the exchange rate suggests that currency depreciation did not provide any advantage to chilli exports during this period, possibly due to inefficiencies in trade policies, high transaction costs, or limited global market access. Similarly, the export unit value and

production levels had no significant influence on exports, indicating that domestic production capabilities and pricing strategies were not the primary drivers of export performance before globalization. The only variable with a higher impact was world imports (1.88), though it still

remained statistically insignificant. The overall weak statistical significance of the model suggests that factors outside the included variables might have played a larger role in determining chilli exports during this period.

Table 3. Factors influencing chilli export: during pre- globalisation period

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10.88	29.67	-0.37	0.72
lnExchange_Rate	-0.61	2.09	-0.29	0.78
lnEUUV	-0.34	1.15	-0.29	0.77
lnProduction	-0.06	2.44	-0.02	0.98
lnWorld_Import	1.88	1.27	1.48	0.16
R-squared	0.28	Durbin-Watson stat	1.28	
Adjusted R-squared	0.09	Breusch pagan Godfrey	0.06	
Prob(F-statistic)	0.25			

*Note: ***, **and * indicate the significance of the coefficients at 1%, 5%, and 10% levels of significance, respectively*

Table 4, presents the factors influencing chilli exports during the post-globalization period, indicating a substantial improvement in the predictability of export determinants. The high R-squared value (0.94) and adjusted R-squared (0.93) indicate that the independent variables collectively explain a significant proportion of the variance in chilli exports. The exchange rate has a positive effect on chilli exports, suggesting that depreciation of the domestic currency enhances competitiveness in international markets, making Indian chillies more affordable for foreign buyers. This is a remarkable shift from the pre-globalization period, where the exchange rate had an insignificant and negative impact, implying that globalization improved the efficiency of exchange rate adjustments in boosting exports.

World's imports emerge as the most significant factor, representing that increasing global demand played a crucial role in boosting

India's chilli exports. On the other hand, the export unit value and production remain statistically insignificant, indicating that pricing and domestic production levels did not directly drive exports even after globalization.

The analysis clearly showed that globalization had a positive impact on India's chilli exports. Before globalization, the export market was highly uncertain, with key economic variables failing to show significant influence on trade. However, after globalization, the export sector became more responsive to global demand, with world imports playing a decisive role. The exchange rate also shifted from having a negative impact to a positive one, indicating that trade liberalization and policy reforms helped Indian chilli exports become more competitive. Overall, globalization contributed to a more stable and efficient export environment, integrating Indian chilli exports with global trade dynamics.

Table 4. Factors influencing chilli export: during post globalisation period

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.89	5.86	-1.52	0.14
lnExchange_Rate	0.90	0.52	1.72	0.10
lnEUUV	-0.33	0.22	-1.48	0.15
lnProduction	0.09	0.55	0.16	0.87
lnWorld_Import	1.23	0.26	4.68	0.00***
R-squared	0.94	Durbin-Watson stat		2.03
Adjusted R-squared	0.93	Breusch pagan Godfrey		0.05
Prob(F-statistic)	0			

Note: ***, **and * indicate the significance of the coefficients at 1%, 5%, and 10% levels of significance, respectively

Conclusion

Globalization plays a key role in the context of cumin and chilli exports by facilitating market access, trade agreements, and global demand synchronization. It opens doors to new markets and enhances market competitiveness through improved access to technology, capital, and information. The multiple regression analysis on factors influencing cumin export reveals significant predictors. The analysis of cumin exports before and after globalization reveals a structural shift in trade determinants. Before globalization, world's import demand played a crucial role, but currency depreciation negatively impacted exports due to inefficiencies. In contrast, after globalization, exchange rate movements positively influenced exports, indicating improved market competitiveness. The significance of export unit value in the post-globalization period highlights India's stronger position in global pricing dynamics. Similarly, chilli exports experienced a positive transformation due to globalization, becoming more responsive to global economic forces. The transition from an ineffective pre-globalization trade model to a more robust and explanatory post-globalization framework demonstrates the impact of trade liberalization, reduced trade barriers, and improved access to international markets. These factors have collectively contributed to the steady growth and resilience of India's chilli exports. Overall, the findings suggest that globalization has not only improved the trade performance of cumin and chilli but has also reinforced India's role as a key player in the global spice market. The ability to adapt to changing market

conditions, leverage trade opportunities, and maintain competitive pricing has positioned India as a stronger contender in the international trade of spices. Moving forward, continued policy support, strategic trade negotiations, and technological advancements will be crucial in sustaining and further enhancing the growth trajectory of cumin and chilli exports in the global marketplace.

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