



A Study on Impact of exchange rates on India's cardamom prices

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Abstract:

The study investigates the link between exchange rate and cardamom value. Variety of variants influence the price of Cardamom. However, this analysis focuses only on the exchange rate as the exchange rates affect the prices of imports, as well as domestic commodities that rely on external components and raw materials, the impact of the macroeconomic factor exchange rate. Exchange rates also contribute to inflation, interest rates, and investment efficiency. The relationship between the value of money and cardamom is unknown. The study uses data sets from February 2006 to August 2021. Linking, multiple regression, and ANOVA were statistical tools used to evaluate the study. The findings suggest that, over time, exchange rate fluctuations have a negative and statistically significant effect on cardamom values. The exchange rate and cost of cardamom have the opposite effect.

Keywords: Macroeconomic variable, Exchange rate, Agri commodities, correlation, regression.

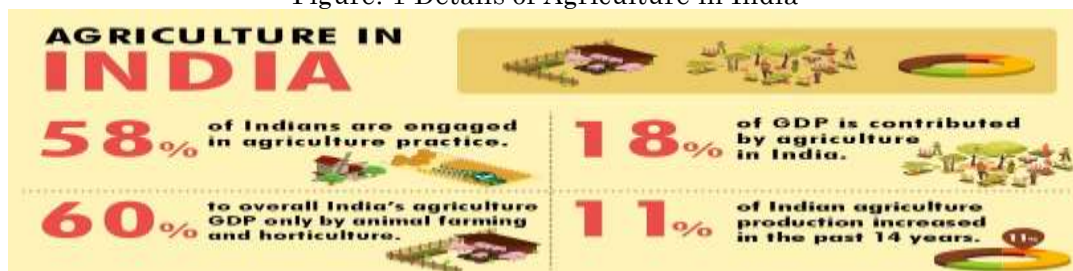
Introduction:

Particularly in less developed countries, agriculture is crucial to the global economy. The major source of employment, income, and food worldwide is agriculture, which satisfies these basic needs. India is an agricultural country, In 2020 – 21, out of GDP with agriculture accounting for 19.9% up in 2019 – 20 from 17.8%. When it last contributed to GDP, in 2003-04, agriculture made up 20% of the total. Agriculture employs 58 per cent of Indians, with animal farming and horticulture accounting for 60 per cent of India's agricultural GDP. In the last 14 years, 11 per cent of Indian agricultural production has grown.

Furthermore, India is the world's most significant producer of fruits, including

bananas, guava, mango, lemon, papaya, and vegetables such as chickpea. India also produced spices such as ginger, pepper, and chile. India ranks 1st in production of milk, 2nd in dry fruit output, 3rd in production of fish, 4th in production of egg, and 5th in production of poultry worldwide. Indian agricultural production rose by 11 per cent during the last 14 years, from 87 billion USD to 397 billion USD. India has the world's most extensive irrigated land, at 96 million hectares. Indian agriculture has various facets, and livestock farming and horticulture alone account for 60% of India's agricultural GDP. India is the world's leading wheat producer.

Figure: 1 Details of Agriculture in India



Source: <https://www.tractorjunction.com/blog/wp-content/uploads/2020/11/Agriculture-in-India-compressed.jpg>

Cardamom:

Due to its incredibly alluring aroma and flavor, mature dried fruit from cardamom plants, also known as "cardamom of trade," is sometimes referred to as the "Queen of Spices." Indian cardamom is available in a variety of grades for overseas markets, including "Alleppey Green Bold" (AGB), "Alleppey Green Superior" (AGS) and "Alleppey Green Extra Bold" (AGEB). Cardamom is farmed on a small scale in Papua New Guinea, Sri Lanka, Cambodia, Vietnam, El Salvador, Thailand, Laos, Honduras, and Tanzania, in addition as economically in Guatemala. Cardamom may be grown at an optimal altitude range of 600

to 1500 meters above mean sea level. Between 8- and 30-degrees north latitude and 75- and 78-degrees longitude are the cardamom growing regions of South India.

Cardamom is an herbaceous herb with 50–140 aerial leafy branches and subterranean rhizomes. Each shoot has 9 to 13 tillers that develop to a height of 1.7 to 2.6 meters. Two sides of the leaves are glabrous, with a pronounced mid-rib. Each capsule is trilocular and contains several seeds. The main growing regions for huge cardamom are in North Eastern India's Sub-Himalayan region, along with Bhutan and Nepal. It produces in cold, humid circumstances beneath the shadow of trees.

Table: 1 Details of Cardamom Area and Production in India

Cardamom Area & Production in India									
(Area in Hec., Production in Tons)									
Spices	2016 – 2017		2017 – 2018		2018 – 2019		2019 – 2020		2020-2021(ADV. EST)
	A	P	A	P	A	P	A	P	A
Cardamom (Small)	69357	17990	69330	20650	69132	12940	69994	11235	69190
Cardamom (Large)	26617	5572	26617	5906	42826	8669	44082	8530	44701

Source: <http://www.indianspices.com/sites/default/files/majorspicewise2021.pdf>

Note: A = Area, P = Production

Spice board regulates cardamom production; Pepper production: 2018-19 major cardamom trade rates include Arunachal Pradesh and Nagaland. Due to bad weather conditions, cardamom release dropped in 2018. The FAO estimates that nutmeg, mace, and cardamom production would grow by 10.8% to 143,829 metric tonnes by 2029 to share production with India from 129,725 metric tonnes in 2017. Indonesia and Guatemala came in second and third, generating 41,000 and 38,610 metric tonnes, respectively, in 2020. A

total of 28.5% and 26.8% of the world's cardamom output is produced in Indonesia and Guatemala, respectively. In March 2020, Mercy Corps started a three-year campaign in partnership with the Twinings tea company. The initiative expects an increase in cardamom production, which has helped cardamom growers' poor incomes in northern Guatemala. The northern region of Alta Verapaz is where more than 70% of the cardamom plant in Guatemala is grown.

Table: 2 Details of Cardamom Production, Exports and Imports from 2000 – 2021 in India

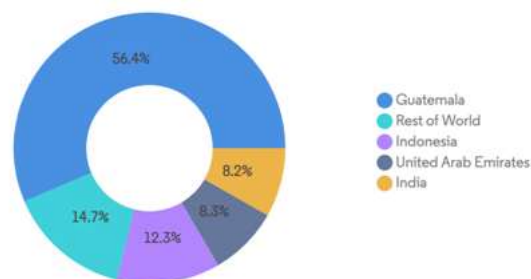
Year	Production (MT)	Exports (MT)	Imports (MT)
2000 – 2001	10,480	1,545	380
2001 - 2002	11,365	1,031	383

2002 – 2003	11,920	682	410
2003 – 2004	11,580	690	390
2004 – 2005	11,415	620	420
2005 – 2006	12,540	863	437
2006 – 2007	11,235	655	623
2007 – 2008	9,450	500	875
2008 – 2009	11,000	750	180
2009 - 2010	10,075	1,975	95
2010 – 2011	10,380	1,175	769
2011 – 2012	15,000	4,650	817
2012 – 2013	14,000	2,372	956
2013 – 2014	16,000	3,600	1110
2014 – 2015	18,000	3,795	450
2015 – 2016	23,890	5,500	850
2016 – 2017	17,990	3,850	1720
2017 – 2018	20,650	5,680	-
2018 – 2019	12,940	2,850	-
2019 – 2020	11,230	2,090	-
2020 – 2021	-	-	-
2021 - 2022	-	-	-

Source: www.mcx.com

Figure: 2 Export Value Share in %

Cardamom Market: Export Value Share in %, Geography, Global, 2020



Source: ITC trade, Mordor intelligence

During the coming quarters, the cardamom market expects to grow at a CAGR of 6.1 per cent (2022-2027). Due to unpredictable demand from major importers like the United Arab Emirates and Saudi Arabia as well as a drop in global supply as a result of

unfavorable weather in key producing countries like India, Guatemala, and Indonesia, cardamom prices are inconsistent. In 2019, Guatemala produced the most cardamom, accounting for more than 55% of global output. Significant cardamom

producers include Asian countries including Indonesia, Sri Lanka, Nepal and India. The three most popular varieties of cardamom farmed globally are Madagascar, black, and green varieties. The cardamom market

analyses the trends in cardamom prices in each nation in terms of exports (value and volume), consumption (value and volume), imports (value and volume), and production (volume).

Figure: 3 Market Size in % by region

Global Cardamom Market : Market Size in %, By Region, Global, 2021



Source: www.mordorintelligence.com

Exchange Rate:

The exchange rate is the ratio of one country's currency to another's currency or economic zone. The majority of exchange rates are erratic and shift often in reaction to market supply and demand. Direct exchange rates, in contrast to free floating rates, are influenced by the value of other currencies and may be subject to regulation. The price of imported financing is less expensive when the currency is strong. The price of imported materials and components will also lower the cost of manufacturing the company, resulting in a drop in consumer pricing.

Review of Literature:

D.Orden(2002), noted that due to the constant strengthening of the US dollar over the past four years, the value of the agricultural exchange rate has risen again. This paper reviews an analysis of the effects of the exchange rate, reviews the rationale for the concept, summarizes the information that agricultural economists and economists have collected from a few recent and mid-1970 papers, and presents the latest figurative analysis of the exchange rate. results. In addition, a brief discussion of the harmful effects the ongoing dollar awareness on American agricultural policy has included. N.M. Gatawa, A.A. Mahmud (2017), a research project looking at the short- and long-term impacts of inflation on Nigeria's agricultural trade. According to the short-term findings, agricultural exports are negatively impacted by predicted agricultural export values, which also adds to financial

market volatility, while agricultural exports are positively impacted by the volume of legal transactions and agricultural loans. levels that have the effect of growing reliance Contrary to common opinion, long-term results have produced comparable outcomes excluding the official exchange rate, which also has a statistically significant effect on the amount of agricultural exports.

Oluwatoyese, Oyetade P.Applanaidu, Shri DewiRazak, Nor Azam Abdul (2016), Agriculture is a major engine of the economy and is a major source of employment for a large number of people in many developing countries. Nigeria, a developing country, has not yet made wise use of the industry's resources to promote growth and export. Due to the expansion of other research, this study aims to analyze many of the major economic issues affecting Nigerian agriculture. Their relationship analysis was performed using annual data from 1981 to 2013 as well as a multivariate co-integration approach. Dependent variations and descriptive variables were different from each other. Policies for national development are provided based on the findings.

Liefert, William, Persaud, Suresh (2009), Changes in exchange rates may have a significant effect on the prices paid by manufacturers and consumers in goods, which may alter the motivation of those groups to produce, eat, and trade. Changes in the inflation rate, however, may not be fully transferred (continued) to local prices. Intensive research shows that agricultural products are less expensive and that the

exchange rate is spreading in many developing countries. This is partly a result of trade rules, but also a result of inadequate infrastructure and other market failures. Fadaei, Mohsen Shoukat, Leila Khalighi (2017), The main objective of this study was to look at how trade rates affected day exports, which is one of the most important and profitable horticulture in the Iranian agricultural sector in terms of foreign exchange earnings. Between 1991 and 2011 it was selected as the time frame for the study. The export value of the date and the variables obtained through static tests were assessed for relationships using the standard small square (OLS) method. The research was conducted using a library research strategy. Important information is collected from a variety of scientific and research sources. Findings have shown that both senders and dates need to consider the level of currency. Yeboah, Osei, Shaik, Saleem, Allen, Albert, (2009), The impact of four non-farm products — fertilizers, chemicals, farm machinery, and food — on the exchange rate between the US dollar and the Mexican peso is being evaluated. A unit root analysis shows that the use of a trend model, the four input rates and the exchange rate support the existence of unit roots, however the first difference model may not. This result is consistent with a fixed price / price

Data Analysis:

framework, in that the prices of industrial commodities are more likely than those of agricultural products to be resistant to the exchange rate.

Research Aim:

To ascertain the link between the Price of Cardamom and exchange rate.

The objective of the Study:

1. Look at the long-term relationship between cardamom prices and currency rates.
2. To ascertain how the price of cardamom varies in reaction to variations in currency rates.
3. To assist commodity investors in identifying better financing options.

Hypothesis:

(H0):The price of cardamom and the currency rate are unrelated.

(H1): The price of cardamom and the currency rate are correlated.

Research Methodology:

Analytical research is used in the analysis since it helps define a specific scenario in an area.

Data Collection:

Information was gathered from the mcx website and Fred solutions from 2006 to 2021.

Data Tools:

The investigation included multiple regression analysis, correlation, and ANOVA.

Table: 3 Monthly Cardamom monthly prices from 2006 to 2021

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
2006		277.2	272.1	233.1	244.4	259.3	337.1	482.4	527	444.5	391	405.5
2007	444.1	460.4	484	468.7	478.7	485.7	478.7	485.7	523.6	514.5	563.5	511.5
2008	688	692.5	617.5	627	692	654.5	662.3	691.5	729.8	619	565.8	553.5
2009	567.8	604.5	639	710.5	785.8	879	852	825.8	717	792.8	983.3	1,112.70
2010	1,123.80	1,143.90	1,256.90	1,380.70	1,587.90	1,840.90	1,472.30	1,379.60	1,070.50	885.1	1,202.60	1,581.40
2011	1,368.60	1,143.00	1,083.30	988.6	744.7	840.8	845.4	725.4	712.2	662.4	604	600.7
2012	663.8	922.8	1,179.10	1,123.40	1,307.70	1,344.60	1,460.40	971.1	990.3	810.4	978.5	1,021.70
2013	1,034.50	965	874.1	809	716.2	762.9	674.2	720	708.5	710.6	706.6	675.3
2014	755.7	792.4	872.5	963.2	912.5	948.1	923.5	939.6	832.2	889.7	775	998.7
2015	1,087.90	1,068.30	888.4	878.4	834.8	842.8	792.7	853.7	808.8	760.2	692.2	761.1
2016	770.5	639.4	707	775.9	807.7	873.9	959.7	1,138.80	1,151.60	1,290.50	1,358.90	1,364.70
2017	1,464.	1,467.	1,400.	1,209.	974.3	1,033.	1,189.	1,200.	1,071.	965.5	944.9	1,104.

7	80	00	40	20		90	40	60	70			00
2018	1,173.60	1,081.70	1,047.90	935.7	895.5	994.7	1,123.80	1,350.00	1,416.90	1,408.60	1,488.40	1,513.40
2019	1,555.50	1,457.50	1,679.70	1,963.10	2,449.30	2,993.20	3,816.70	2,844.40	2,990.50	2,434.10	2,827.50	3,791.40
2020	3,800.40	2,889.30	2,003.20	1,669.10	1,570.00	1,336.00	1,538.00	1,750.00	1,551.00	1,450.00	1,500.00	1,500.00
2021	1,450.00	1,450.00	1,450.00	1,650.00	1,450.00	1,450.00	1,500.00	1,500.00				

Source: www.mcx.com

Table: 4 Monthly Exchange Rates monthly prices from 2006 o 2021

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
2006	-	44.23	44.3378	44.8245	45.1959	45.8886	46.3675	46.4461	46.0105	45.3552	44.7257	44.4835
2007	44.2062	44.0195	43.7936	42.0176	40.5686	40.5905	40.2738	40.6791	40.1735	40.1735	39.3267	39.375
2008	39.2676	39.6735	40.1452	39.9668	42.0019	42.7633	42.7027	42.9057	45.53	48.6155	48.8517	48.5132
2009	48.6995	49.2484	51.1291	49.9655	48.51	47.6736	48.3624	48.2426	48.2924	46.6524	46.5305	46.5273
2010	45.89	46.27	45.45	44.44	45.77	46.50	46.76	46.46	45.87	44.35	44.9315	45.10
2011	45.38	45.38	44.91	44.30	44.9024	44.8109	44.396	45.3135	47.6905	49.202	50.6785	52.3824
2012	51.0015	49.1812	50.3635	51.69	54.33	55.94	55.42	55.49	54.35	53.0995	54.7845	54.647
2013	54.23	53.81	54.4229	54.3236	54.9845	58.3835	59.7609	62.8109	63.648	61.6059	62.5179	61.811
2014	62.1057	62.1642	60.9476	60.3464	59.2843	59.7367	60.0956	60.8738	60.8976	61.3668	61.6828	62.7071
2015	62.13	61.99	62.48	62.6414	63.715	63.7809	63.6045	65.0971	66.1667	65.0262	66.1	66.5023
2016	67.3332	68.2395	66.8909	66.4219	66.8895	67.2655	67.158	66.9035	66.71	66.74	67.64	67.81
2017	68.05	66.97	65.80	64.54	64.42	64.4482	64.42	63.97	64.48	65.04	64.8435	64.2445
2018	63.65	64.43	65.05	65.67	67.51	67.79	68.69	69.63	72.28	73.56	71.74	70.83
2019	70.71	71.17	69.49	69.41	69.78	69.39	68.74	71.19	71.31	71.01	71.49	71.16
2020	71.28	71.53	74.55	76.17	75.66	75.71	74.93	74.57	73.52	73.56	74.23	73.62
2021	73.11	72.81	72.82	74.52	73.21	73.58	74.539	74.116	-	-	-	-

Source: <https://fred.stlouisfed.org/series/EXINUS>,

Table: 5 Analysis of Descriptive Statistics

	Mean	Std. Deviation	N
Cardamom_Price	1080.7759	612.22355	187
Exchange_Rate	57.3100	11.85649	187

Cardamom price is the response variable and has a standard deviation of 612.2235 and mean of 1080.7759. Each variable is

represented by a row in the table. Exchange Rate mean value is 57.3100 and a standard deviation is 11.85649.

Table: 6 Summary of model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.535 ^a	.286	.283	518.56461	.286	74.255	1	185	.000

a. Predictors: (Constant), Exchange_Rate

b. Dependent Variable: Cardamom_Price

From the table is the correlation R value is 0.535 and this is a high level of correlation. The R²- 28.6 percent illustrates the overall

variation on the dependent variable, the price of cardamom, can be described mostly by independent variable exchange rate.

Table: 7 Analysis of ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19967876.286	1	19967876.286	74.255	.000 ^b
	Residual	49748211.716	185	268909.253		
	Total	69716088.002	186			

a. Dependent Variable: Cardamom_Price

b. Predictors: (Constant), Exchange_Rate

Dependent variable is significantly well predicted by the regression model, according to this table. This shows how statistically significant the regression model that was used was. The total statistical significance of

the regression model's prediction of the outcome variable in this case can be seen by score of p 0.0005, which is less than 0.05.

Table: 8 Analysis of Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	-502.963	187.661		-2.680	.008			
	Exchange_Rate	27.635	3.207	.535	8.617	.000	.535	.535	.535

a. Dependent Variable: Cardamom_Price

This regression model predicts that the price of cardamom rises when the exchange rate rises, with p=0.000 (which is marginally significant at alpha=0.05). The price of cardamom rises by 27.635 points for a rise in the exchange rate, to be more precise.

In order to display the regression equation as:

Price of a cardamom: 502.963 + 276 (Exchange Rate)

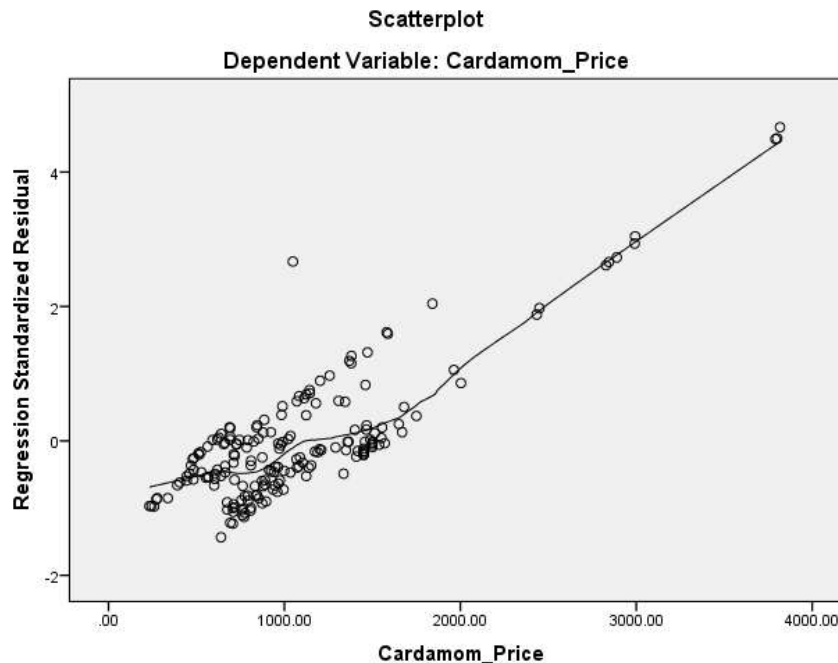
Table: 8 Summary of Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-335.7735	1601.9657	1080.7759	327.64947	187
Residual	-743.40942	2420.05957	.00000	517.16874	187
Std. Predicted Value	-4.323	1.591	.000	1.000	187
Std. Residual	-1.434	4.667	.000	.997	187

a. Dependent Variable: Cardamom_Price

The regression's predictions and residuals are simply summarized in this table, though visualizations may make it simpler to see them.

Figure: 4 Scatter plot chart



We may infer from the Loess curve that the connection between the response variable and predictors is 0 to 4 since the residual looks to be randomly distributed from 0 to 4.

Conclusion:

This study examines the long-term relationship between exchange rates and Cardamom prices. It is important to consider the need, supply, market situation and other aspects of the larger economy to determine the amount of cardamom. Currency exchange rate is one of the factors affecting price of cardamom. Studies show that the Exchange rate and the price of cardamom are off-linerelated. The correlation coefficient means that there is a linear correlation between exchange rate and cardamom price. This result means that the exchange rate is important macroeconomic variables affecting the price of cardamom.

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