

## GROWTH AND INSTABILITY IN RICE EXPORTS FROM INDIA

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### Abstract

Rice is considered as a staple diet for more than half of the world population. India is the largest rice exporting country in the world. The present study intends to analyse the growth and instability in rice exports from India to leading market destinations during the period 2012 to 2021 in terms of quantity and value. Bangladesh, Saudi Arabia, Iran, Iraq, Benin, Nepal, Senegal, United Arab Emirates, Côte d'Ivoire, Yemen, Togo, USA, United Kingdom, Kuwait and Oman were the market destinations considered for the study. Compounded Annual Growth Rate (CAGR) was used to analyse the growth rates in quantity and value of rice exports from India. Cuddy Della Valle Index of instability was used to analyse the instability in exports of rice in terms of quantity and value. Findings show that Togo is the market destination that recorded the largest growth rate in terms of both quantity and value of rice exports from India. Bangladesh was found to be the most unstable market in terms of both quantity and value. Kuwait was found to be the most stable market in terms of quantity whereas Iraq was found to be the most stable market in terms of value.

**Keywords:** Rice Exports, Growth, Instability, Quantity, Value

### Introduction

India is the second largest producer of rice in the world after China and is the largest exporter of rice in the world ('Rice Production in India', 2022; U.S. Department of Agriculture Economic Research Service, n.d.). India exports rice to more than 150 countries all around the world. Basmati rice and Non –Basmati Rice are the two main categories of rice exported from India. Basmati rice is the long grain rice characterised by supreme aroma, superior taste and fluffiness upon cooking (Agriculture and Processed Food Products Exports Development Authority, n.d.). All other types of rice apart from Basmati rice are categorised under the Non – Basmati rice category (Agriculture and Processed Food Products Exports Development Authority, n.d.-b). Saudi Arabia, Iran, Iraq, Yemen and United Arab Emirates are the leading importers of Basmati rice exports from India whereas Benin, Nepal, Bangladesh, Senegal and Togo are the leading importers of Non –Basmati Rice Exports from India (Agriculture and Processed Food Products Exports Development Authority, Ari Exchange, n.d.). The present study aimed at examining the growth and instability in India's rice exports to leading market destinations in terms of quantity and value during the period 2012 to 2021.

### Objectives of the study

- ✓ To analyse the growth in rice exports from India to leading market destinations in terms of quantity and value.
- ✓ To analyse the instability in rice exports from India to leading market destinations in terms of quantity and value.

### Methodology

The study is analytical in nature. Secondary data was used for the study and it was collected from various online journals and websites. 10 years data from 2012 to 2021 was used for analysis. It was obtained from the website of Trade Map, an online database, for international trade statistics of the International Trade Centre (ITC). Compounded Annual Growth Rate (CAGR) was used for analysing the growth in exports in terms of quantity and value. The instability in rice exports has been analysed using the Cuddy Della Valle Index (CVDI) of instability. It is calculated using the following formula  
$$\text{Cuddy Della Valle Index (CVDI)} = \text{Coefficient of Variation} * \text{Square Root}(1 - \text{Adjusted R Square})$$
  
Where,  $\text{Coefficient of Variation} = (\text{Standard Deviation} / \text{Mean}) * 100$



The ranges of instability may range from low, medium to high. A CVDI between 0 and 15 indicates low instability whereas a CDVI between 15 and 30 indicates medium instability. A CVDI greater than 30 indicates high instability (Sihmar, 2014)

## Results and Discussion

### Growth Rates in Rice Exports from India

Compounded Annual Growth Rate (CAGR) was used to analyse the growth rates in quantity and value of rice exports to leading market destinations from India during the period 2012 to 2021.

**Table 1 Compounded Annual Growth Rate in Quantity of Rice Exports from India to leading Market Destinations in terms of quantity**

Market destination	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	CAGR (%)
Bangladesh	2375 5	2367 66	8738 84	4908 29	28231	9473 23	8298 60	4142 7	1738 1	2483 279	8.47
Saudi Arabia	8608 33	9746 33	1089 198	1206 621	92501 6	8505 47	1003 521	1081 828	1284 930	9092 06	1.07
Iran	8756 82	1838 576	1026 995	8367 06	66271 8	9240 18	1135 663	1386 518	1102 108	8713 75	-0.53
Iraq	2649 27	2474 39	2380 73	4743 55	69053 7	5502 96	4193 10	5122 37	8161 16	7479 58	13.52 ***
Benin	4709 01	1375 646	6074 22	5467 11	68836 5	8085 53	6021 16	6753 76	9896 36	1274 725	4.74
Nepal	2851 15	4198 22	5398 23	5125 29	46547 7	5444 22	7056 68	6499 78	1022 791	1320 827	14.32 ***
Senegal	8804 50	8023 12	6920 81	9087 59	54756 9	9067 49	8122 18	1943 22	7320 76	1181 315	-2.50
United Arab Emirates	5933 30	4384 75	4714 97	7740 56	91549 5	6649 26	6191 96	4700 62	5567 39	4809 46	-0.74
Côte d'Ivoire	6877 47	3078 51	2136 30	4119 29	35287 2	4788 35	4310 88	3168 04	5895 29	9096 74	5.91
Yemen	221, 700	229, 410	231, 463	248, 860	195,31 6	203,5 11	267,6 31	261,4 43	390,5 82	310,6 48	4.73 ***
Togo	114, 976	51,5 35	45,5 44	56,4 97	66,802	117,8 53	201,5 57	309,6 01	743,3 23	676,4 44	34.25 ***
USA	124, 060	135, 842	172, 841	151, 064	147,58 9	164,7 93	176,6 24	179,8 34	260,8 61	226,4 15	6.74 ***
United Kingdom	2276 64	1575 57	1562 18	2036 15	16114 1	2289 97	9111 8	1232 47	1833 62	1754 39	-2.71
Kuwait	1881 42	224, 281	2077 52	2219 47	18442 0	1980 79	1960 04	2321 56	2250 25	1858 97	0.10
Oman	8787 6	181, 482	1728 85	1791 37	14446 1	1344 27	1661 59	1294 29	1780 16	1459 05	1.64

Source : Trademap, n.d. Note : Quantity in Tons, CAGR denotes Compounded Annual Growth Rate  
\*\*\* denotes significant at 5 percent.

Table 1 shows the compounded annual growth rates in rice exports from India to leading market destinations in terms of quantity during the period from 2012 to 2021. It is seen that the growth rates



in rice exports from India to all market destinations are positive except in case of market destinations like Iran, Senegal, United Arab Emirates and United Kingdom. The highest growth rate in rice exports from India in terms of quantity was observed in Togo (34.25 percent) followed by Nepal (14.3 percent) and Iraq (13.52 percent).

**Table 2 Compounded Annual Growth Rates in Rice Exports to leading Market Destinations from India in terms of value**

Market Destination	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	CAGR (%)
Bangladesh	11,669	94,566	322,867	159,829	14,363	384,379	335,499	26,672	17,669	934,230	13.40
Saudi Arabia	715,890	1,114,581	1,378,122	1,071,476	703,501	768,036	991,010	1,070,645	1,096,886	788,155	-0.40
Iran	891,324	2,251,916	1,282,864	729,169	502,962	872,990	1,192,318	1,444,563	875,585	662,011	-3.96 ***
Iraq	217,010	284,078	270,638	399,785	410,138	487,436	417,327	472,802	589,942	521,965	10.25 ***
Benin	194,036	585,185	256,031	195,841	242,923	318,761	234,670	249,201	354,914	454,536	2.98
Nepal	73,917	123,564	178,619	172,496	172,819	203,702	263,939	239,797	329,011	427,347	16.76
Senegal	282,922	247,792	205,766	250,377	151,167	274,727	252,072	59,409	220,328	335,792	-2.91
United Arab Emirates	463,366	354,669	413,337	562,725	639,902	514,766	508,261	351,530	385,393	319,287	-2.46
Côte d'Ivoire	254,074	118,075	81,951	141,743	118,166	175,384	162,249	120,326	213,012	318,753	5.54
Yemen	169646	229004	244181	179937	141967	165464	233981	249338	307496	239571	3.84
Togo	42163	21538	18566	19737	23044	44604	76442	111611	271566	238246	32.97 ***
USA	125,507	171,581	204,937	159,747	143,126	173,895	200,618	206,906	260,198	210,700	5.29 ***
United Kingdom	168,933	148,429	174,435	160,054	106,480	192,532	87,864	111,465	149,153	139,601	-3.06
Kuwait	201,188	279,048	299,758	257,119	158,686	183,610	200,495	226,065	196,992	156,061	-4.00
Oman	61,259	117,431	118,212	118,739	105,293	116,359	137,629	108,711	129,645	106,560	3.58

Source : Trademap, n.d. Note : Value in US Dollars CAGR denotes Compounded Annual Growth Rate \*\*\* denotes significant at 5 percent.

Table 2 shows the compounded annual growth rates in rice exports from India to leading market destinations in terms of value during the period between 2012 and 2021. It can be seen that the growth rates in rice exports in terms of value are positive for all market destinations except in market destinations like Saudi Arabia, Iran, Senegal, United Arab Emirates, United Kingdom and Kuwait.



The highest growth rate in rice exports from India in terms of value was observed in Togo (32.97 percent) followed by Nepal (16.76 percent), Bangladesh (13.40 percent) and Iraq (10.25 percent).

### Instability in Rice Exports from India

**Table 3 Instability in Rice Exports in terms of Quantity**

Market Destination	Mean	SD	CV	Adjusted R Square	CVDI (%)	Instability
Bangladesh	597273.5	763721.2	127.8679	0.012888	127.04	High
Saudi Arabia	1018633	145786.4	14.31196	-0.14008	15.28	Medium
Iran	1066036	336114.1	31.52934	-0.0592	32.45	High
Iraq	496124.8	209514.5	42.23019	0.568537	27.73	Medium
Benin	803945.1	310789.5	38.65805	-0.12153	40.94	High
Nepal	646645.2	308098.8	47.64573	0.689933	26.53	Medium
Senegal	765785.1	260421.2	34.00708	-0.13574	36.24	High
United Arab Emirates	598472.2	152741.7	25.52194	-0.12207	27.03	Medium
Côte d'Ivoire	469995.9	207948.8	44.24482	0.520362	30.64	High
Yemen	256056.4	57963.4	22.63696	0.392835	17.64	Medium
Togo	238413.2	261972.9	109.8819	0.630825	66.76	High
USA	173992.3	41623.76	23.92276	0.685317	13.42	Low
United Kingdom	170835.8	43420.88	25.41674	-0.01972	25.67	Medium
Kuwait	206370.3	18219.91	8.828744	-0.1229	9.36	Low
Oman	151977.7	29708.26	19.54778	-0.10195	20.52	Medium

Source : Statistical figures computed based on input obtained from Trademap .n.d

Note : SD denotes Standard Deviation, CV denotes Coefficient of Variation,

CVDI :Cuddy Della Valle Index

Table 3 shows the instability in rice exports from India to leading market destinations in terms of quantity. According to the Cuddy Della Valle Index, the instability in rice exports from India in terms of quantity was found to be the highest for Bangladesh (127.04 percent) and lowest in the case of Kuwait (9.36 percent). Instability was found to be high for market destinations like Bangladesh, Togo, Benin, Senegal, Iran, and Côte d'Ivoire as the corresponding Cuddy Della Valle Indices were greater than 30. A medium instability was observed in the case of market destinations like Iraq, United Arab Emirates, Nepal, United Kingdom, Oman, Yemen and Saudi Arabia as the corresponding Cuddy Della Valle Indices were between 15 and 30. A low instability was observed in the case of USA and Kuwait as the corresponding Cuddy Della Valle Indices were below 15.

**Table 4 Instability in Rice Exports in terms of value**

Market Destination	Mean	SD	CV	Adjusted R square	CVDI (%)	Instability
Bangladesh	230174.3	287399.8	124.8618	0.029299	123.02	High
Saudi Arabia	969830.2	219566.7	22.63971	0.039759	22.19	Medium
Iran	1070570	506642.6	47.32456	0.10692	44.72	High
Iraq	407112.1	119002.2	29.23081	0.785456	13.54	Low
Benin	308609.8	125589.8	40.69534	-0.14043	43.46	High
Nepal	218521.1	102348.9	46.83708	0.816918	20.04	Medium
Senegal	228035.2	76862.29	33.70633	-0.13783	31.30	High
United Arab Emirates	451323.6	104301	23.11002	-0.02449	23.39	Medium
Côte d'Ivoire	170373.3	72675.2	42.65645	0.543873	28.81	Medium



Yemen	216058.5	50342.27	23.30029	0.057173	22.62	Medium
Togo	86751.7	93717.93	108.0301	0.717498	57.42	High
USA	185721.5	38966.16	20.98096	0.301365	17.54	Medium
United Kingdom	143894.6	33072.25	22.98367	-0.0356	23.39	Medium
Kuwait	215902.2	48910.61	22.65406	0.228395	19.90	Medium
Oman	111983.8	20441.6	18.25407	0.113969	17.18	Medium

Source : Statistical figures computed based on input obtained from Trademap .n.d

Note : SD denotes Standard Deviation, CV denotes Coefficient of Variation, CVDI :Cuddy Della Valle Index

Table 4 shows the instability in rice exports from India to leading market destinations in terms of value during the period 2012 to 2021. According to the Cuddy Della Valle Index, the instability in rice exports from India in terms of value was found to be the highest for Bangladesh (123.0 percent) and lowest for Iraq (13.54 percent). Instability was found to be high for market destinations like Bangladesh, Iran, Benin, Senegal and Togo as the corresponding Cuddy Della Valle Indices were greater than 30. A medium instability was observed in the case of market destinations like Saudi Arabia, Nepal, Cote d'Ivoire, United Arab Emirates, United Kingdom, Yemen, Kuwait, USA and Oman as the corresponding Cuddy Della Valle Indices were between 15 and 30. A low instability was observed in the case of Iraq as its Cuddy Della Valle Index was below 15.

#### Findings of the Study

Togo is the market destination, which registered the highest growth rate in rice exports from India in terms of both quantity (34.25 percent) and value (32.97 percent) during the period 2012 to 2021. In terms of quantity, Bangladesh was found to be the most unstable market whereas Kuwait was found to be the most stable market destination for rice exports from India during the period 2012 to 2021. In terms of value, Bangladesh was found to be the most unstable market whereas Iraq was found to be the most stable market destination for rice exports from India during the period 2012 to 2021 in terms of value.

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