

IMPACT OF PRICING POLICY ON DOMESTIC PRICES OF SUGAR IN INDIA

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Abstract: The present study is based on secondary data collected from the various published sources, viz. various issues of Cooperative Sugar, Indian Sugar, Published by Indian Sugar Mills Association, Statistical Abstract of India, Indian Agriculture in Brief and Agriculture Prices in India, Data on various aspects including domestic prices of sugar, production of sugar and sugarcane, prices of sugarcane, consumption of sugar, stocks of sugar, quantity of sugar exported and sugar imported for the period 1947-48 to 2013-14 were collected. The main objective of paper is to analyses the impact of price policy on domestic prices of sugar in India. Multiple regression function was used to ascertain the impact of pricing policy on domestic prices of sugar. The study revealed that the increased sugar production had a negative impact on price of sugar. Positive and significant impact of sugarcane price on sugar was observed for all periods under study.

Keywords: Consumption, Export-import, Multiple Regression, Price policy, Sugar prices

INTRODUCTION

Sugar is one of the most important commodities; produced and consumed around the world. Sugar is produced in over 123 countries worldwide but over 70 per cent of world sugar production is consumed domestically and the remaining is traded in the world. In 2014-15, the global production of sugar was 1743.08 lakh tonnes and the global consumption was 1706.00 lakh tones (USDA Report, 2015). World sugar markets have experienced over the last decade a number of fundamental changes which translated into both challenges and opportunities for sugar producing countries. There is substantial government intervention in world sugar markets. Almost all the developed and developing countries protect their domestic sugar production. World sugar market has also been characterized by periods of short-lived price spikes followed by low and downward trending price patterns. This price behavior emerges as a result of extensive use of protective policy measures by governments that isolate sugar producers from the world market. These features make the world sugar market a vital target for policy analysis. There are broad areas of public intervention that regulate the sugar market in India. The government continues to use a buffer stock policy and adjusts its trade policy instruments, depending on domestic production, the price situation, and the global scenario. The guiding principle behind this is allowing domestic prices to move in tandem with trends in world prices but insulating them from sharp troughs and spikes. This has helped India maintain stability in domestic market prices compared to international prices. There are broad areas of public intervention that regulate the sugar market in India, which include domestic price support in form of minimum statutory price/fair and remunerative price (FRP), stock policy, Government's policy of control, Decontrol and partial control, sugar levy. In addition, policy

decision on import tariff rates, export and import subsidies, export restrictions, import licensing *etc.* are also taken from time to time to maintain stability in domestic prices of sugar. How such interventions have impacted the domestic prices of sugar has been attempted in the present paper.

METHODOLOGY

The main objective of paper is to analyses the impact of price policy on sugar prices in India. The present study is based on secondary data collected from the various sources, viz. Cooperative Sugar, Indian Sugar, Statistical Abstract in India, Indian Agriculture in Brief and Agriculture Prices in India *etc.* Data on various aspects including domestic prices of sugar, production of sugar and sugarcane, prices of sugarcane, consumption of sugar, stocks of sugar, quantity of sugar exported and sugar imported for the period 1947-48 to 2013-14 were collected. The data were grouped into four periods depending upon the extent of government intervention in terms of control, decontrol or partial control through various levels of levy on sugar. Period-I is characterized by decontrol of government on sugar and ranged from 1947-48 to 1966-67. Period-II ranged from 1967-68 to 1987-88 which was the period of partial control and extent of levy sugar was 50 per cent or more. Period-III ranged from 1988-89 to 2011-12 and again was the period of partial control, when levy sugar was less than 50 per cent. Period-IV denotes overall period of study ranging from 1947-48 to 2013-14. Wide range of government policies interventions like subsidy policies, import and export policies, general macroeconomic policies; change in exchange rate, trade policies, export quotas, minimum export price (MEP), increasing/decreasing credit availability, removal of quantitative restrictions, non-tariff barriers, import licensing and import restrictions *etc.* do exist

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however, in the present study to ascertain the impact of government intervention on domestic prices of sugar, the variables included were domestic prices of sugar, production of sugar and sugarcane, prices of sugarcane, consumption of sugar, stocks of sugar, quantity of sugar exported and sugar imported. Multiple regression function of the following form was used to analyze the data:

$$Y_i = b_0 + \sum_{i=1}^9 b_i X_i + U_i$$

Where,

Y_i = Domestic prices of sugar (Rs./q)

b_0 = Intercept

b_1 = Partial regression coefficients

X_1 = Production of sugar (lakh tonnes)

X_2 = Production of sugarcane (lakh tonnes)

X_3 = Price of sugarcane (Rs./q)

X_4 = Consumption of sugar (lakh tonnes)

X_5 = Stocks of sugar (lakh tonnes)

X_6 = Quantity of sugar imported (lakh tonnes)

X_7 = Quantity of sugar export (lakh tonnes)

X_8 = Dummy variable for control/decontrol

(X_8 = 1 if control)

(X_8 = 0 if decontrol)

X_9 = Dummy variable for partial control

(X_9 = 1 if partial control)

(X_9 = 0 otherwise)

U_i = Error term

RESULTS AND DISCUSSION

In the early forties and prior to independence, there was complete control on sugar trade in India. Immediately after independence, trade was totally decontrolled. However, it was put under control again after two years. At the start of planning era in India in 1950-51, for the first time, the sugar trade was put under partial control for two years. It stood decontrolled for continuous six years for the period 1952-53 to 1957-58, there after sugar was again put under control for seven years i.e. 1958-59 to 1966-67 except two years of decontrol (1961-62 and 1962-63). The extent of partial control ranged between 10 per cent to 50 per cent of levy sugar and 90 per cent to 50 per cent of free sale sugar. Since 1967-68, the domestic sugar trade in country has more or less been under partial control barring a few years (decontrol during 1977-78 and control during 1978-79). Thus, sugar trade in India witnessed a mixed trend of control, decontrol and partial control in terms of various levels of levy. Similar results were found by C.P Timmer in his work that continuous market interventions and price controls have an impact on the development of a private marketing sector. Investments in physical and human capacity in this sector are not forthcoming if margins are squeezed, policy implementation is erratic or the middle man is held responsible for policy failures. The loss is the absence of competitive traders in search of marketing opportunities for new commodities or greater volumes. Similar findings were observed by Jyothi

and K.C. that since independence, the Government control varied from total control to partial control and total decontrol. The Government control covers all aspects of Sugar business, i.e. licensing, capacity, cane area, procurement, cane pricing, sugar pricing, sugar distribution, imports and exports. The Government control varies from full control to partial and hill decontrol which depends upon the local demand. Due to highly politicized and fluctuating policies of the Government, Sugar imports and Exports also vary to a great extent from time to time. Also similar results found in report of Cabinet which approves Partial Decontrol of Sugar Industry Prime Minister Manmohan Singh abolished the sugar levy and deregulated sale of sugar in the open market. The proposal was based an expert committee report. Sugar industry will continue to be subject to production control by state governments, including sugar industry licensing, specifying area for procurement of cane for each sugar mill and cane pricing. Decontrol of sugar marketing will be reviewed in two years after assessing its effect on farmers and market prices. And on other hand Rangarajan Committee which recommended complete decontrol of the sugar industry dispensing with the sugar levy, decontrolling sugar sales, deregulating sugar purchases by mills and substituting FAR pricing for state-set prices.

Impact of Government Intervention and Other Factors Influencing Domestic Prices of Sugar

Period-I

Table 1 shows the results of the analysis for period-I. The value of R^2 revealed that the independent variables explained the dependent variable by 97 per cent. There was a positive and significant impact of sugarcane prices on sugar prices. An Increase in the prices of sugarcane by 1.00 Rs./q increased prices of sugar by 19.08 Rs./q. All other variables were found to be non-significant.

Period-II

The sugarcane production and sugarcane prices had positive and significant impact on prices of sugar whereas, the increase in sugarcane production by one lakh tonne decreased the sugar price by 1.97Rs./q. Increase in sugarcane price by 1.00 Rs./q significantly increased the sugar price (by 60.34Rs./q).sugar stocks had significant but negative impact on sugar prices whereas, increase in sugar stocks led to decline in the sugar prices by 7.79Rs./q with one lakh tonne increase. Results presented in Table 4.2.2 revealed that during the period-II, value of coefficient of multiple determination was 0.92 and it suggested that the model of multiple regression was well fitted and variable mentioned explained the price of sugar by 92 per cent.

Period-III

The results presented in Table 3 revealed that during the period-III, the 0.97 value of coefficient of multiple determination suggested that the model of multiple regression was well fitted and variable

mentioned affected the prices of sugar by 97 per cent. Results further revealed that with increase in production of sugar by one lakh tonne, sugar price will be decreased by 5.93Rs./q. Further increase in price of sugarcane by 1.00Rs./q will increase the price of sugar by 20.10Rs./q. The increase in stocks of sugar by one lakh tonne resulted in decrease of sugar price by 3.56Rs./q. Remaining variables were found to be non-significant.

Period-IV

Data presented in Table 4 showed that during the period-IV there was a positive and significant impact of sugarcane production, sugarcane prices and sugar consumption on prices of sugar. The increased sugarcane price and sugar consumption increased sugar price by 13.46Rs./q and 3.34Rs./q, respectively. Similar to previous periods, increased sugar stocks decreased the sugar price by 3.90Rs./q. The value of coefficient of multiple determination obtained was 0.97 and it suggested that multiple regression model was well fitted and variable mentioned affected the sugar price by 97 per cent.

Comparative analysis of impact of government intervention and the effect of other explanatory variables on domestic prices of sugar for all the four periods have been given in table 4.2.5. The results reveal that the increased sugar production had a negative impact on price of sugar. With an increase in production of sugar by one lakh tonne, the prices decline by Rs.5.92/q in period-III. The coefficient was also found to be significant for period-III. However, for other periods, the regression coefficients were negative and non-significant. Positive and significant impact of sugarcane price

was observed for all periods under study indicating that as the price of sugarcane increases, the sugar price will increase in a significant manner. The values of regression coefficients were found to be 19.08, 60.34, 20.10 and 13.46 respectively.

The value of regression coefficient for sugar stocks was found to be negative and significant for period-II, period-III period- IV. For period-I, such figure was negative but not significant. Negative signs of the regression coefficients indicate that with increase in stocks of sugar, the prices of sugar in the domestic market will decline.

Comparative analysis of impact of government intervention and the effect of other explanatory variables on domestic prices of sugar for all the four periods revealed that the increased sugar production had a negative impact on price of sugar with an increase in production of sugar by one lakh tonne, the prices decline by Rs.5.92/q in period-III. However, the coefficient was found to be significant for period-III only. Positive and significant impact of sugarcane price was observed for all the periods under study indicating that as the price of sugarcane increases, the sugar price will increase in a significant manner. The values of regression coefficients were found to be 9.08, 60.34, 20.10 and 13.45, respectively. The value of regression coefficients for sugar stocks was found to be negative and significant for period-II, period-III period- IV and period-I, such figure was negative but not significant. Negative signs of the regression coefficients indicate that with increase in stocks of sugar, the prices of sugar in the domestic market will decline.

Table 1. Impact of government intervention and other factors influencing domestic prices of sugar during period-I

Variables	Regression coefficients	Standard Error	t-value
b ₀ (constant)	-6.49	-	-
Sugar production (lakh tonnes)	-0.06	0.992	-0.06
Sugarcane production (lakh tonnes)	0.023	0.02	0.82
Sugarcane prices (Rs./q)	19.08**	5.78	3.29
Sugar consumption (lakh tonnes)	0.27	0.77	0.35
Sugar stocks (lakh tonnes)	-0.52	0.77	-0.67
Dummy variable for control/decontrol	2.529	5.043	0.50
R²	0.97		

**Significant at 5% level of probability

Table 2. Impact of government intervention and other factors influencing domestic prices of sugar during period-II

Variables	Regression coefficients	Standard Error	t-value
b ₀ (constant)	-484.23	-	-
Sugar production (lakh tonnes)	-1.97	3.80	-0.52
Sugarcane production (lakh tonnes)	0.44**	0.19	2.30
Sugarcane prices (Rs./q)	60.34**	17.01	3.55
Sugar consumption (lakh tonnes)	-4.66	2.01	-2.31
Sugar stocks (lakh tonnes)	-7.79**	3.03	-2.57

Dummy variable for partial control	75.70	68.47	1.11
R²	0.92		

**Significant at 5% level of probability

Table 3. Impact of government intervention and other factors influencing domestic prices of sugar during period-III

Variables	Regression coefficients	Standard Error	t-value
b₀ (constant)	21.40	-	-
Sugar production (lakh tonnes)	-5.93**	2.01	-2.95
Sugarcane production (lakh tonnes)	0.68**	0.24	2.81
Sugarcane prices (Rs./q)	20.10**	2.40	8.37
Sugar consumption (lakh tonnes)	1.62	1.90	0.85
Sugar stocks (lakh tonnes)	-3.56**	1.49	-2.40
Dummy variable for partial control	-605.50	88927.33	-0.01
R²	0.97		

**Significant at 5% level of probability

Table 4. Impact of government intervention and other factors influencing domestic prices of sugar during period-IV

Variables	Regression coefficients	Standard Error	t-value
b₀ (constant)	-233.45	-	-
Sugar production (lakh tonnes)	-1.65	1.40	-1.17
Sugarcane production (lakh tonnes)	0.27**	0.09	2.87
Sugarcane prices (Rs./q)	13.46**	1.32	10.14
Sugar consumption (lakh tonnes)	3.34**	1.12	2.97
Sugar stocks (lakh tonnes)	-3.90**	1.39	-2.80
Dummy variable for control/decontrol	23.93	71.06	0.33
Dummy variable for partial control	115.15	65.47	1.75
R²	0.97		

**Significant at 5% level of probability

Table 5. Comparative analysis of impact of government intervention and other factors influencing domestic prices of sugar for selected periods

Variables	Period-I	Period-II	Period-III	Period-IV
b₀ (constant)	-6.49	-484.23	21.40	-233.45
Sugar production (lakh tonnes)	-0.06 (0.99)	-1.97 (3.80)	-5.92** (2.01)	-1.65 (1.40)
Sugarcane production (lakh tonnes)	0.02 (0.02)	0.44** (0.19)	0.68** (0.24)	0.27** (0.09)
Sugarcane prices (Rs./q)	19.08** (5.78)	60.34** (17.01)	20.10** (2.40)	13.46** (1.32)
Sugar consumption (lakh tonnes)	0.27 (0.77)	-4.66** (2.01)	1.62 (1.90)	3.34** (1.12)
Sugar stocks (lakh tonnes)	-0.52 (0.77)	-7.79** (3.03)	-3.56** (1.48)	-3.90** (1.39)
Dummy variable for control/decontrol	2.529 (5.04)	-	-	23.93 (71.06)
Dummy variable for Partial control	-	75.70 (68.470)	605.50 (88927.33)	115.15 (65.47)
R²	0.97	0.92	0.97	0.97

**Significant at 5% level of probability

CONCLUSION

Multiple regression analysis revealed that production of sugar and sugarcane, consumption of sugar, stocks of sugar, price of sugarcane, were the major

components to impact the domestic prices of sugar. Keeping in view, the stability and to check increase in prices of sugar. The partial control may be a desirable policy intervention; however the extent of levy may be decided depending upon the

production of sugar, availability of stocks, domestic demand and supply situation prevailing in the domestic market.

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