Impact of Commodity Futures on Inflation : Perception and Reality

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Abstract

Though it has been proved in many studies that commodity futures trading has a negligible effect on inflation, the relationship between commodity futures trading and inflation cannot be denied completely. In order to curb inflation, the Government of India banned futures trading on wheat, rice, tur, and urad in January 2007 and on chickpea, potato, rubber, and soybean on May 7, 2008. We, in the current study, examined the impact of commodity futures trading on inflation by considering seven agricultural commodities. The current study considered the wholesale price index of the above - mentioned commodities during the 5 year period from 2007 to 2011. Though there were evidences wherein the futures trading influenced the spot prices thereby causing inflation, the ban on futures trading is not the solution to curb inflation. The realistic approach to curb inflation lies in identifying all the factors causing for price rise instead of banning futures trading on selected commodities and waiting for a positive outcome.

Keywords : **spot prices, futures prices, commodity derivatives, NCDEX, inflation**

JEL Classification : D53, G1, G32, Q13

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It is well known that price volatility is the major risk faced by all the participants in commodity markets. The growers, processors, intermediaries, and consumers get affected by adverse price fluctuation. Farmers are the worst hit as the prices of their produce will be lower during the harvesting season. To hedge the price risk, the farmers enter into over the counter forward contract, but the parties to the forward contract face the default risk. However, they can overcome the problem of default risk by entering into futures contract, the contract specifications of which are standardized and traded in recognized exchanges. The greatest challenge of commodity futures trading is increased amount of speculation activities, thereby increasing the commodity prices resulting into intensified inflation in the country.

There are different views about the impact of commodity futures on inflation. Though it has been proved in many studies that commodity futures trading has a negligible effect on inflation, the relationship between commodity futures trading and inflation cannot be denied completely. In the normal market, the futures prices are higher than the spot prices. This phenomenon motivates market participants to indulge in unnecessary hoardings, thereby causing scarce supply of commodities leading to imbalance between demand and supply of commodities. Most of the farmers would like to sell their produce in the futures market rather than in the spot market, which causes scarce supply in the spot market. This phenomenon causes commodity price rise and effects on the inflation. In order to curb inflation, the Government of India banned futures trading on wheat, rice, tur, and

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urad in January 2007, which constituted 3.15% of the total wholesale price index (WPI). The Government of India on May 7, 2008 again banned futures trading on four commodities, that is, chickpea, potato, rubber, and soy oil though it was opposed by the Chairman of the Forward Market Commission, B. C. Khatua. On the same day, the Government announced that there was no further ban on any other farm commodities, and the present ban on the four commodities would not be extended beyond four months.

Review of Literature

Chakrabarty and Sarkar (2010) made an attempt to study the characteristics of the Indian commodity market and examined whether efficient functioning of the market depends on pricing of commodities. The efficiency of the Indian commodity market was tested by using co-integration analysis and it was found that the price rise was influenced by the current news not on the previous news. The study found S&P CNX-50 was cointegrated with the commodity cash market price indices. So, if the news concerning any one of the index was accessible, price risk avoidance can happen on other commodity indices. The results of Bayesian GARCH model revealed that the old news of the market also had a major effect on the existing changes of the stocks and indices. Iyer and Pillai (2010) examined whether commodity futures played a crucial role in spot price detection. The researchers used a two - system threshold vector auto regression (TVAR) and a two - regime threshold auto regression for six commodities. The regimes were defined around the expiration week of the futures contract and it was found that price finding procedure happened in five commodities out of six commodities. Further, the speed of junction of information was sluggish, mainly in the expiration week. In respect of copper, gold, and silver, the rate of convergence was almost instantaneous during the expiration week of the futures contracts, which implied that the futures contracts were an effective hedging tool. In respect of chickpeas, nickel, and rubber, the convergence worsened during the expiration week, which implied the non - usability of futures contracts for hedging.

Mukherjee (2011) revalidated the misperception about commodity derivatives as regards the utility and relevance of commodity derivatives in India using two series of prices of nine selected commodities. The multiple regression model indicated that both the cash and futures markets would respond concurrently to new information, and it showed a strong effect of lagged futures returns on the returns of the cash market. The effect of futures market fluctuations on the spot market return was negligible for most of the commodities. In case of chilli, jeera, and soya oil, futures return volatility was observed to have a simultaneous impact on the spot returns. The volatility spillover from futures to spot market was identified in case of jeera and soya oil. The volatility spillover from spot to futures market was seen only in case of castor seed and soya oil. The results of vector auto regression (VAR) model showed that there was a considerable two way flow of information for most of the commodities excluding wheat, chilli, and castor seed ; however, the causality from futures to spot market was found in other six commodities. The results of GARCH model evidently disclosed that the simultaneous futures return coefficients in the first panel were found to be important with an utmost degree for all nine commodities. There were also a few commodities in which the futures market directed the spot market and vice versa.

Maheshwari and Biyani (2012) studied the impact of inflation on the Indian economy and found that there was a trade-off between inflation and growth. It was also found that there was no direct exclusive relationship between growth rate and inflation. However, high rate of inflation was found to be harmful to the growth of the economy, but its mild dose might be able to sustain high growth.

Kaur and Anjum (2013) studied the association of spot price with futures and hedging against price risk using futures trading. It was observed in the study that the prior price dissemination helped the growers and dealers in agricultural commodities to get better prices and to make profit. The futures also help the farmers from fluctuations. The agricultural commodity futures provide liquidity to the investors as they can take positions in more than one commodity at a time. The paper noted that the farmers were not capable to take benefits from commodity futures because of lack of awareness among farmers in rural areas regarding agricultural commodity

futures market. Kumar (2015) studied the interrelationship between spot and futures commodity market and observed that there was a lack of understanding about the commodity market amid market players, particularly, farmers. The farmers were unable to take benefits of the futures market due to lack of awareness. It was suggested for the linking of the domestic market with the global market.

Narsimhulu and Satyanarayana (2016) examined the efficiency of commodity futures in price discovery and risk management for agricultural commodities in India. The Granger causality test results revealed that there was only a unidirectional causality from futures returns to spot returns of commodities - chilli and turmeric. However, in the case of chana, there was bidirectional causality between futures and spot returns. It was also observed that the commodity futures were more effective in hedging, and the near month futures contracts were suitable for hedging. Irfan and Hooda (2017) examined the effectiveness of commodity derivatives in price discovery in agriculture commodities in India. It was observed that there was a long-run equilibrium relationship in 10 commodities. The outcome of the Granger causality test showed unidirectional Granger lead - lag relationships between spot and futures markets in all agricultural commodities in which there were two co-integrations and causality. Babshetti and Basanna (2018) examined the existence of convergence between spot and futures prices of five selected agricultural commodities during 2011-2017 and the scope for arbitrage profit. The study observed negative spread in December 2015 and June 2016 for chana futures contracts. In case of cumin, the spot prices were greater than futures at some point of time during the contract period of April 2010 and December 2010, and April and September 2011 contracts. The study revealed the presence of scope for arbitrage profit in these contracts and also found the presence of all three types of market patterns in one or the other selected contracts.

Thus, there is no strong and conclusive evidence about whether commodity futures trading affects inflation or not. Hence, the present study was conducted to find out the real cause of inflation rather than banning futures trading and leaving farmers in a worsened economic condition.

Objectives of the Study

We have set the following objective for the current study :

+ To study the commodities banned from derivative trading and examine the impact of the ban on inflation.

Research Methodology

The current study uses an analytical method and quantitative approach as it analyzes quantitative secondary data to examine the impact of commodity futures prices on inflation. The data required for the study were collected from the websites of NCDEX and Office of the Economic Advisor, Government of India with 1993 - 94 as the base year. We considered seven agricultural commodities, that is, wheat, rice, tur (arhar), and urad which were banned from futures trading in 2007 and potato, rubber, and soybean, which were banned in the year 2008. The current study considers wholesale price index of the above mentioned commodities during the 5 year period from 2007 to 2011. Standard deviation and coefficient of variation of wholesale price index of the selected commodities are used to examine the impact of commodity futures prices on inflation.

Analysis and Results

(1) Analysis of Impact of Food Grains Futures on Inflation : In this section, the wholesale price index of food grains (wheat, rice, tur, urad) were collected for the time period from 2007 - 2011 and the data were analyzed to find its impact on inflation.

Figure 1. WPI of Food Grains During 2007

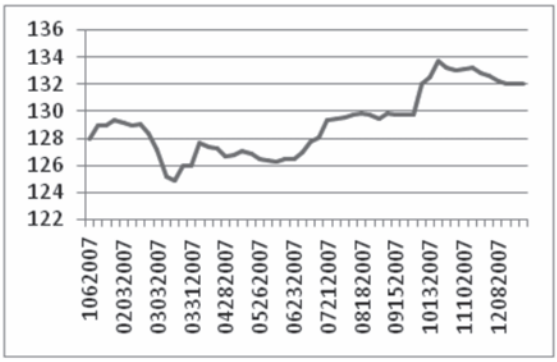


Figure 2. WPI of Food Grains During 2008

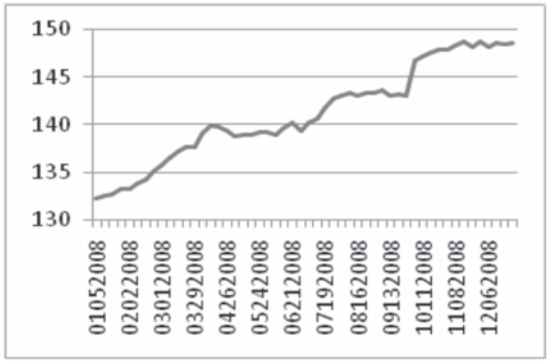


Figure 3. WPI of Food Grains During 2009

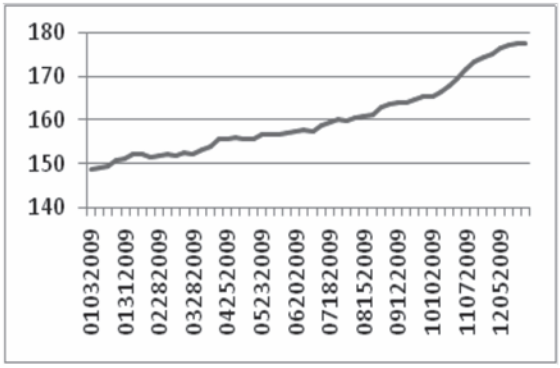


Figure 4. WPI of Food Grains During 2010

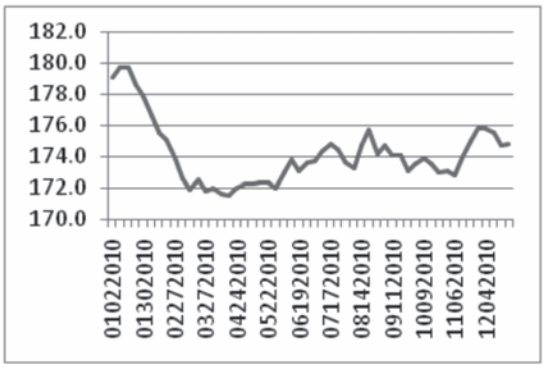


Figure 5. WPI of Food Grains During 2011

Table 1. Percentage Change in WPI of Food Grains During 2007-11

Year	Food Grains Wholesale Price Index					
	Opening	Closing	↑ in WPI	↓ in WPI	%↑ WPI	%↓WPI
2007	128.0	132.0	4.0	-	3.12	-
2008	132.2	148.6	16.4	-	12.40	-
2009	148.5	177.6	29.1	-	19.59	-
2010	179.1	174.8	-	4.3	-	2.4
2011	174.9	182.6	7.7	-	4.40	-
2007-11	128.0	182.6	54.6	-	42.65	-

Source : Office of the Economic Advisor Website (Base year: 1993-94)

Figures 1 - 5 and Table 1 depict the WPI of food grains during 2007 - 2011. The Figures and the Table reveal that the wholesale price index increased during the period from 2007 to 2011 except during the year 2010. The WPI increased by 42.65% over the period of 5 years. However, only during 2010 it decreased by 2.4%, which indicates that the prices of food grains increased in spite of the ban imposed on futures trading on such commodities. Thus, the prices of commodities increased even in the absence of futures trading, and hence, it can be inferred that futures do influence the spot prices abnormally and also influence inflation.

The Table 2 exhibits standard deviation and coefficient of variation of WPI of food grains and its impact on inflation during 2007 - 2011. It is observed from the Table 2 that the WPI of food grains was more volatile only in 2008 and 2009 and inflation was volatile during 2007 - 2010. Though prices of food grains fluctuated more after the ban was imposed, the volatility of inflation was relatively more than the fluctuations in the prices of food grains. Thus, it may be inferred that the fluctuation in inflation may be because of some other factors.

Table 2. *SD* and *CV* of WPI of Food Grains and Inflation During 2007 - 2011

Year	Food Grains WPI		Monthly Inflation	
	Standard Deviation	Co-efft. of Variation	Standard Deviation	Co-efft. of Variation
2007	2.44	1.88	0.66	10.34
2008	5.03	3.56	1.60	19.25
2009	8.33	5.19	2.01	18.56
2010	1.84	1.05	2.54	20.96
2011	2.64	1.47	0.18	1.89

(2) Analysis of Impact of Potato Futures on Inflation : In this section, the wholesale price index of potato collected for the time period from 2007 - 2011 is analyzed to find its impact on inflation.

Figure 6. WPI of Potato During 2007

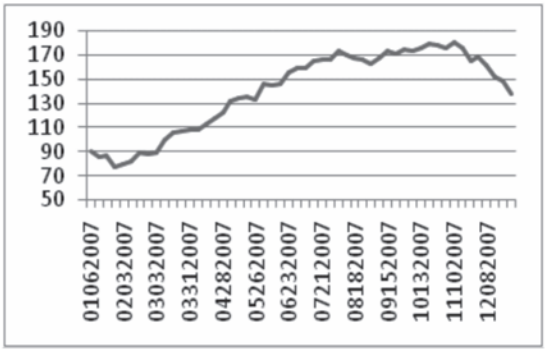


Figure 7. WPI of Potato During 2008

Figure 8. WPI of Potato During 2009

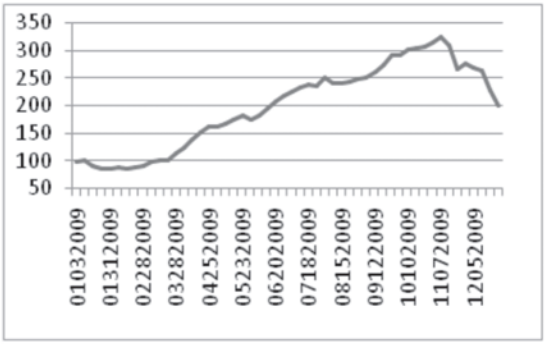
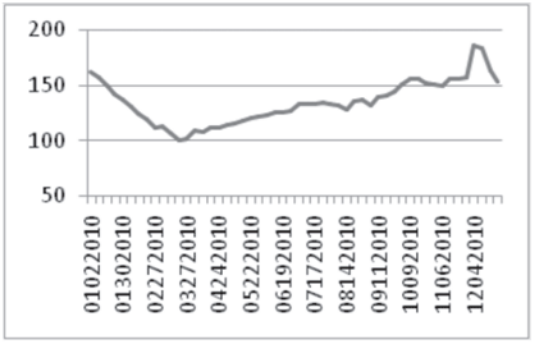


Figure 9. WPI of Potato During 2010



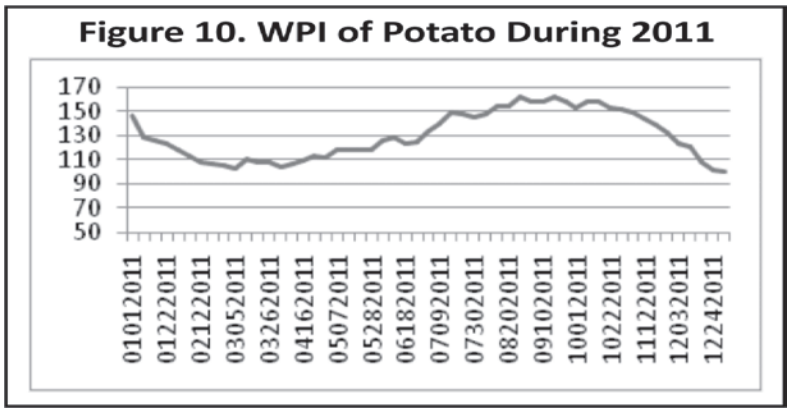


Table 3. Percentage Change in WPI of Potato During 2007-11

Year	Potato Wholesale Price Index					
	Opening	Closing	↑ in WPI	↓ in WPI	%↑ WPI	%↓WPI
2007	89.9	137.4	47.5	-	52.83	-
2008	133.8	98.9	-	34.9	-	26.08
2009	99.4	200.7	101.3	-	101.91	-
2010	162.1	153.5	-	8.6	-	5.30
2011	147.0	100.0	-	47.0	-	31.97
2007-11	89.9	100.0	10.1	-	11.23	-

The Figures 6 - 10 and Table 3 depict the WPI of potato during 2007 - 2011. It is evident from the Table 3 that there was a mixed effect of ban of futures trading on WPI of potato. The WPI of potato increased in 2007 and 2009 and decreased in 2008, 2010, and 2011. It increased by 11.23% during the 5 years period from 2007-11. The effect of ban on futures trading reduced the WPI in 2008, 2010, and 2011, but did not reduce the prices in the remaining years.

The Table 4 exhibits standard deviation and coefficient of variation of WPI of potato and its impact on inflation during 2007-11. It is evident from the Table 4 that the potato WPI was more volatile compared to volatility of inflation in 2007 and 2009, but in the year 2010 and 2011, the prices were stabilized. This proves that the ban on potato futures could not bring stability in potato prices in all the years. The volatility of potato WPI did not affect the rate of inflation proportionately ; hence, it is inferred that the ban on potato futures could not curb inflation.

Table 4. *SD* and *CV* of WPI of Potato and Inflation During 2007-11

Year	Ptato WPI		Monthly Inflation	
	Standard Deviation	Co-efft. of Variation	Standard Deviation	Co-efft. of Variation
2007	33.25	23.77	0.66	10.34
2008	10.13	8.72	1.60	19.25
2009	74.24	37.38	2.01	18.56
2010	18.98	14.09	2.54	20.96
2011	19.059	14.65	0.18	1.89

(3) Analysis of Impact of Raw Rubber Futures on Inflation : In this section, the wholesale price index of raw rubber were collected during 2007 - 2011 and analyzed to find its impact on inflation.

Figure 11. WPI of Raw Rubber During 2007

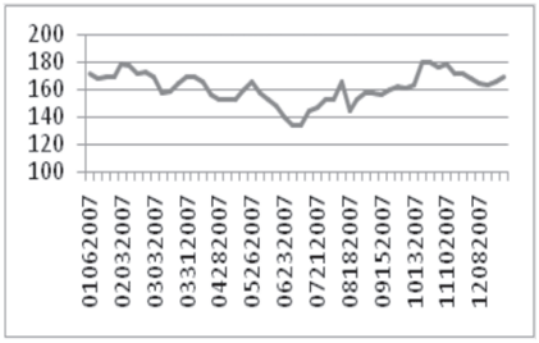


Figure 12. WPI of Raw Rubber During 2008

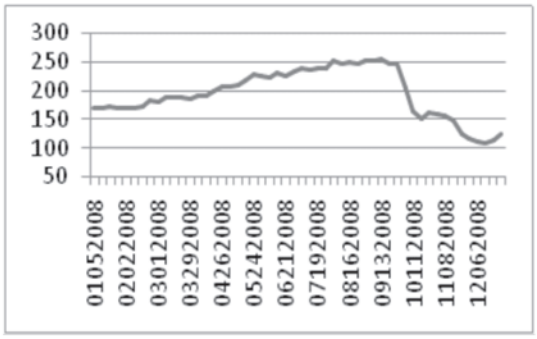


Figure 13. WPI of Raw Rubber During 2009

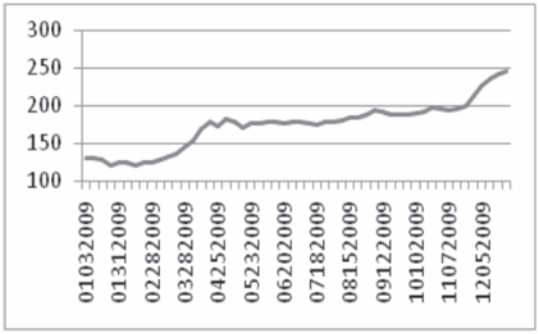


Figure 14. WPI of Raw Rubber During 2010

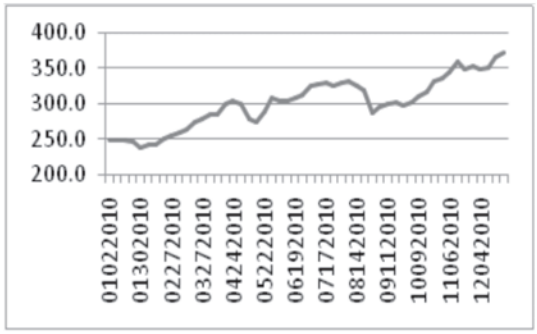


Figure 15. WPI of Raw Rubber During 2011

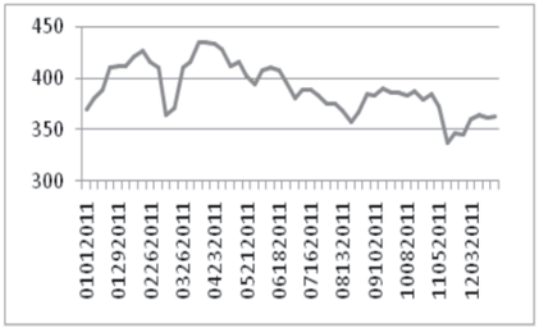


Table 5. Percentage Change in WPI of Raw Rubber During 2007-11

Year	Raw Rubber Wholesale Price Index					
	Opening	Closing	↑ in WPI	↓ in WPI	% ↑ WPI	% ↓ WPI
2007	172.2	169.0	-	3.2	-	1.85
2008	170.6	125.3	-	45.3	-	26.55
2009	131.0	246.7	115.7	-	88.32	-
2010	248.2	372.3	55.9	-	22.52	-
2011	370.4	354.4	-	16	-	4.32
2007-11	172.2	354.4	182.2	-	105.80	-

The Figures 11 - 15 and Table 5 explain the change in WPI of raw rubber during 2007-11. It is observed from the Table 5 and the Figures that there is mixed effect of ban of futures trading on WPI of raw rubber during the period from 2007 - 2011. The WPI of raw rubber declined during 2007, 2008, and 2011 and increased considerably in 2009 and 2010. Overall, the WPI of raw rubber registered a net increase of 105.80% during the period of 5 years. It is thus inferred from the above analysis that the prices of raw rubber increased during the study period despite the ban on rubber futures trading.

The Table 6 exhibits standard deviation and coefficient of variation of WPI of raw rubber and its impact on inflation during 2007-11. It is evident from the Table that the WPI of raw rubber was subject to large fluctuations during 2008 and 2009 and the volatility decreased gradually in 2010 and 2011. The rate of inflation was fluctuating considerably during the first four years and decreased in the fifth year. Overall, the volatility of raw rubber WPI was higher than the volatility of inflation and hence, it can be inferred that no relationship can be established between WPI of raw rubber and rate of inflation.

Table 6. *SD* and *CV* of WPI of Raw Rubber and Inflation During 2007-11

Year	Raw Rubber WPI		Monthly Inflation	
	Standard Deviation	Co-efft. of Variation	Standard Deviation	Co-efft. of Variation
2007	9.79	6.05	0.66	10.34
2008	41.37	21.25	1.60	19.25
2009	31.33	17.96	2.01	18.56
2010	34.67	11.47	2.54	20.96
2011	22.286	5.72	0.18	1.89

(4) Analysis of Impact of Soybean Futures on Inflation : In this section, the wholesale price index of soybean were collected during 2007-11 and the data are analyzed to find its impact on inflation.

Figure 16. WPI of Soybean During 2007

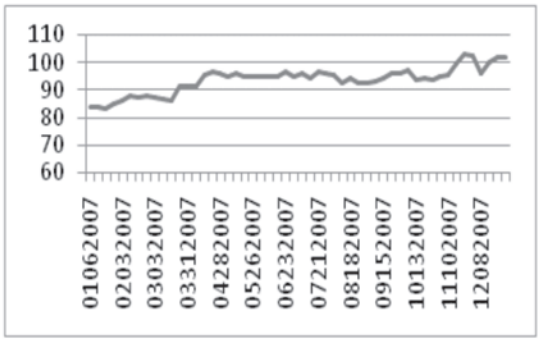


Figure 17. WPI of Soybean During 2008

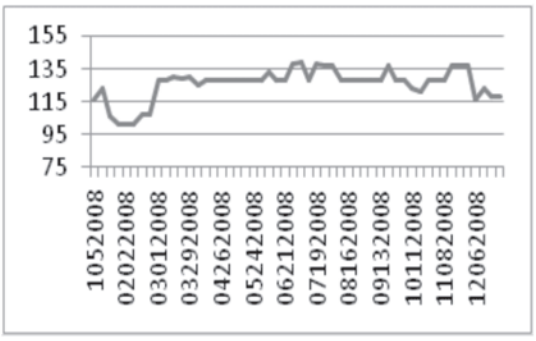


Figure 18. WPI of Soybean During 2009

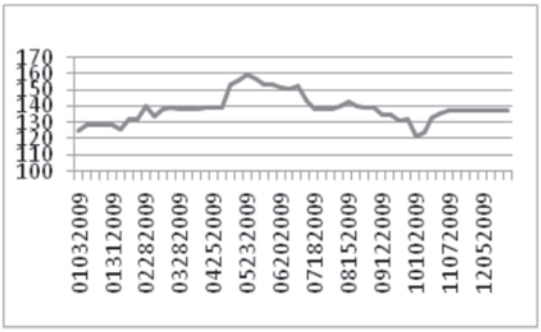
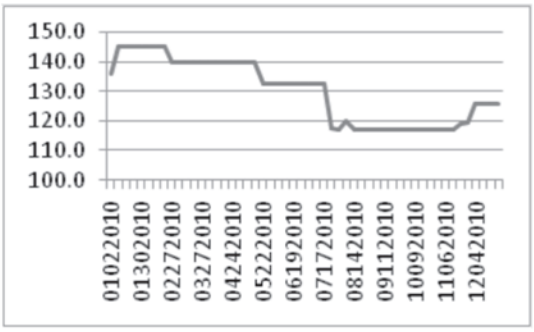


Figure 19. WPI of Soybean During 2010



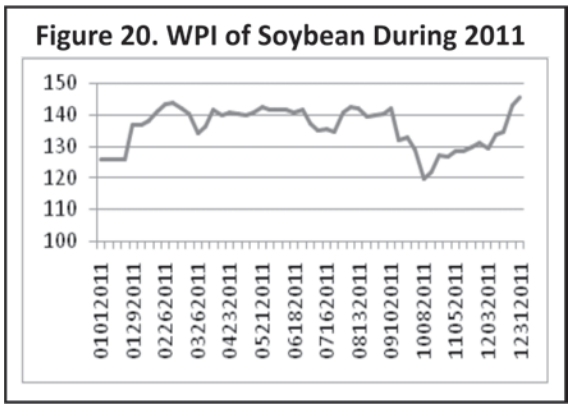


Table 7. Percentage Change in WPI of Soybean During 2007-11

Year	Soybean Wholesale Price Index					
	Opening	Closing	↑ in WPI	↓ in WPI	% ↑ WPI	% ↓ WPI
2007	83.7	101.9	18.2	-	21.74	-
2008	116.1	118.5	2.4	-	2.06	-
2009	125.4	137.6	12.2	-	9.72	-
2010	136.1	125.9	-	10.2	-	7.49
2011	125.9	145.4	19.5	-	15.48	-
2007-11	83.7	145.4	61.7	-	73.71	-

Table 8. *SD* and *CV* of WPI of Soybean and Inflation During 2007-11

Year	Soybean WPI		Monthly Inflation	
	Standard Deviation	Co-efft. of Variation	Standard Deviation	Co-efft. of Variation
2007	4.32	4.62	0.66	10.34
2008	8.78	7.00	1.60	19.25
2009	7.50	5.41	2.01	18.56
2010	10.33	7.95	2.54	20.96
2011	23.93	16.69	0.18	1.89

The Figures 16 - 20 and Table 7 explain the WPI of soybean during 2007-11. The table reveals that the WPI of soybean increased in all the years except during 2010. The soybean WPI registered an increase of 73.71% during the 5 years period. This implies that the ban on futures trading did not reduce the soybean prices and indirectly did not contribute to reduce inflation.

The Table 8 exhibits standard deviation and coefficient of variation of WPI of soybean and its impact on inflation during 2007-11. During the first four years, soybean prices were stable followed by wild fluctuations in the fifth year. Inflation also experienced similar trend during the first four years and decreased substantially in the fifth year. Though there was a ban on soya oil futures, the inflation was subject to wide fluctuations. Hence, it can be inferred from the above analysis that there was an inverse relationship between soybean WPI and inflation during 2011.

Conclusion

Though there are evidences wherein futures trading has influenced the spot prices thereby causing inflation, the

ban on futures trading is not the solution to curb inflation. However, one cannot deny the fact that the weight of all the commodities put together in the wholesale price index was less than 4%. So, an increase in prices of just seven commodities will not have a significant influence. The realistic approach to curb inflation lies in identifying all the factors causing the price rise instead of banning futures trading on selected commodities and waiting for a positive outcome. The policy makers have to identify the factors causing price rise on a continuous basis and initiate measures to check the prices of those commodities. Since the underlying reasons contributing to price rise are dynamic in nature, periodic analysis of data on these underlying reasons are essential to put a break on the general price rise.

Research Implications

As the futures trading on commodities leads to efficient spot price discovery, the society will be protected from inflation and erratic price fluctuation. It also helps the policy makers to initiate suitable policy measures to control inflation, thereby paving way for orderly development of the commodity derivative market.

Limitations of the Study

The current study is subject to the following limitations:

+ It is confined to a 5 year period from 2007 - 2011.

+ It considers the data of only seven commodities which were banned from futures trading that is, wheat, rice, tur (arhar), urad, potato, rubber, and soybean.

Scope for Future Research

The current study is undertaken to examine the impact of only seven commodities which were banned from futures trading. We feel that there is scope for further research on other agricultural and non - agricultural commodities. As spot and futures prices are dynamic in nature, research on the interrelationship between spot and futures prices also needs to be carried out on a continuous basis.

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