CHAPTER 5

Impact of Futures Trading on Inflation

5.1 Introduction

Inflation in India is a major concern not only for investors and policy makers but also for consumers since it reduces the real purchasing power. Economists around the world have been suggesting different policies to tame inflation. Though these policy measures work in the short run for softening inflation, yet in the long run high inflation restores due to uncertainty in the economy. However, question remains unresolved about the root cause of inflation. It has been argued that futures market is one of the reasons which causes inflation to rise. Possible reason might be speculation activities. Speculator infuses money into the futures market, which can be felt in increasing prices of commodities. There are also several other factors which affect inflation such as seasonal and cyclical variations etc. previous studies have given differential views on futures market and inflation. A few studies claim futures market causes inflation (IMF, 2008\textsuperscript{44}, Nath and Lingaredy, 2008\textsuperscript{45}). Some other studies are inconclusive on futures market and inflation (RBI, 2010\textsuperscript{46}, Sen, 2008\textsuperscript{47}). Therefore, looking at dearth of conclusive evidence on impact of futures trading on inflation, this study makes an attempt to solve this issue empirically.


Futures market has been growing significantly in recent years where commodity becomes more investment asset than consumption asset class. This financialisation of commodity markets usually affects commodity price behaviour in general, although views about the extent of influence vary widely among analysts. One perspective is that financialisation of commodities is largely beneficial and improves market efficiency and price discovery. Another view is that recent commodity price surges are largely driven by speculators and herd behaviour among investors looking for alternative asset classes. Increase in food and essential commodity prices in India in 2010-2011 brought to the fore the debate on the commodity futures market is influencing price trends. UNCTAD (2010)\(^4\) argues that commodity futures market is the major cause of price rise as there are extra ordinary increases in the volume of commodity derivatives as asset classes, which attracts swings of short term portfolio investments, causing prices to deviate further from their trend levels. This increasing interest in commodities as an asset class has been termed as “financialization of commodity markets” which is a relatively new factor in price formation in commodity futures market.

Some studies disagree the fact that futures trading causes inflation. Sen (2008) finds that no strong conclusion can be drawn on whether introduction of futures trading is associated with increase or decrease in spot price volatility. RBI annual report, 2010, also finds inconclusive result that futures market causes inflation. Moreover, it suggests that commodity prices in India seem to be influenced more by other drivers of price changes, particularly demand-supply gap in specific commodities, the degree of dependence on imports and international price movements in these commodities. On the contrary, forward market commission says

that future trading does not have any impact on inflation. The price of any commodity is
determined by the actual demand and supply position in the market. In an open market
situation, prices are bound to fluctuate either way, depending on the additional information
which influences expectations of market participants, relating to future demand and supply
conditions. The futures market does not alter the basic condition of demand and supply but
merely estimates the prices based on the actual and expected demand and supply factors. The
demand and supply conditions also influence prices of commodities in which there is no
futures trading. The demand-supply gap causes price rise in such commodities too. Therefore,
futures trading is not responsible for increase in the prices of commodities. Moreover, it is
important to understand that if a rise in spot prices after the introduction of futures trading is
seen as an adverse impact, then a fall in spot prices after futures trade without support from
fundamental factors to that extent is equally bad for the farmers/producers. Hence, the impact
of futures trade on spot prices can be best evaluated in terms of their effectiveness in
decreasing seasonality. The uni-directional rise in prices can be identified with futures trade
only under specific market (scarce/market) condition of the underlying commodity.

Futures market is considered as inflation hedge as investors ultimately care for the real
purchasing power of their returns, which means that the threat of inflation is a concern for
investors. For them, commodity futures might be a better inflation hedge than stocks or
bonds. Firstly, because commodity futures represent a bet on commodity prices, they are
directly linked to the components of inflation. Secondly, because futures prices include
information about foreseeable trends in commodity prices, they rise and fall with unexpected
deviations from components of inflation. On the other hand, many traditional asset classes
such as bond and equities are a poor hedge against inflation. Bonds are nominally
denominated assets, and their yields are set to compensate investors for expected inflation
over the life of the bond. When inflation is unexpectedly higher than the level investors
contracted for, the real purchasing power of the cash flows will fall short of expectations. To the extent that unexpected inflation leads to revisions of future expected inflation, this loss of real purchasing power can be significant. Similarly, there are reasons to expect equities to provide a better hedge than bonds against inflation. After all, stocks represent claims against real assets, such as factories, equipment, and inventories, whose value can be expected to hold pace with the general price level. However, firms also have contracts with suppliers of inputs, labour and capital, that are fixed in nominal terms and hence act very much like nominal bonds. In addition, (unexpected) inflation is often not neutral for the real economy. Unexpected inflation is associated with negative shocks to aggregate output, which is generally bad news for equities (Gorton and Rouwenhorst, 2005)\(^{49}\). In a nutshell, the opposite exposure to (unexpected) inflation may help to explain why futures do well when stocks and bonds perform badly.

Sen (2008) says that it is difficult to distinguish whether futures markets cause increases (or decreases) in spot prices as both markets reflect the same fundamental supply-demand conditions almost simultaneously. Information based trades can occur in either of the markets depending upon relative transaction costs. The other market then adjusts to maintain the no-arbitrage relationship. In well functioning markets this adjustment is instantaneous so that it may be difficult to identify the sequence of market reactions. Therefore, hardly any conclusive evidence can be drawn that futures market increases spot price.

Speculative activity in futures market is one of the major reasons that cause rise in prices of commodity. For example, if everyone is expecting a price rise of commodity, then it may be thought that there are no dissenting opinions on price rise. All opinions would seem to

converse over a price rise. It is thought that under these circumstances, if speculators enter the futures market, they would also be buyer rather than sellers and their buying activity may further aggravate the price rise of the commodity and hence inflation. There is a study which says increased investor interest has led to some private analysts to suggest that speculative activity has been a major contributor to the recent surge in commodity prices. It is argued that speculation has magnified the impact of changes in the fundamental determinants of supply and demand, which have been supportive of higher prices, to an extent that in some cases prices have risen far in excess of levels justified by fundamentals. Excessive speculation in the commodity futures market could, in principle, push up futures prices (through arbitrage) and spot prices above levels justified by fundamentals. It is also widely believed that manipulative activity is creating distortion in the futures market and causing inflation. However, an alternative view is that increased investor activity, by providing the necessary liquidity, is simply a vehicle to translate changing views about fundamentals into changing prices. In this case, higher prices would be the cause (rather than the effect) of increased investor participation. In the intermediate case, there could be a two way causality between prices and speculation, so that higher prices induce an increase in speculation, which in turn pushes prices up further until a new equilibrium is achieved.

During financial crisis in 2008, commodity futures markets were heavily influenced by the reactions of institutional investors to growing economic and financial uncertainties. The rise in the notional value of commodity derivative was one of the underlying causes of the increase in prices, and the crisis unfolded; the rapid unwinding of commodity futures positions aggravated the bust and amplified the price shocks. There are also several other factors which causes price rise of commodities apart from futures trading. For example, global food price pressures reflect the combined impact of growing demand and weak supply response. On the supply side, the availability of arable land is shrinking due to increasing
urbanization as well as diversion of land for bio-fuels production. Recent spikes in oil prices have also raised the input costs for farms, including transportation and fertilizer costs. Climatic changes and weather related disturbances also impact global commodity prices. Import barriers and large farm subsidies in advanced economies are influencing the supply response through price distortions.

Inflation in India has been increasing significantly in recent years. Analysts believe that futures market is one of the reasons which causes inflation. However, other factors such as implementation of sixth pay commission’s recommendations, government’s welfare scheme like MGNREGA, increment of MSP etc. also cause inflation to rise. These factors contribute to increase in purchasing power of the rural as well as urban people and hence cause inflation. On the other hand, Low energy efficiency and policies on oil subsidies have also contributed to the growth of demand. The demand for metals and minerals, particularly steel, copper, aluminium, oil and coal have increased. In the case of oil, the peak oil hypothesis seems to suggest that global production may be rising. Financialisation of commodities has added a new dimension to the commodity price cycle. Geo-political factors continue to be an important factor behind sudden and sharp increases in oil prices, as has been the case since the beginning of 2011. The spillover effects to domestic prices depend on the degree of import dependence in a commodity, domestic supply demand trends, administered price interventions and pricing power at the wholesale level. The impact ultimately depends on the weight of respective commodities in the WPI and the linkages with other commodities that determine the second round effects. The second round effect reflects response of wages and prices aimed at protecting real wages and profit margins as input costs rise, RBI (2011).
5.3 Literature Review

Some studies argue that futures market causes inflations while others disagree on that. The study reviews some of the important literature, statement of economists and view of the policy makers as follows:

Nath and Lingareddy (2008) attempt to explore the effect of the introduction of futures trading on spot prices of pulses. They find that volatility in urad as well as pulses prices was higher during the period of futures trading than in the period prior to its introduction as well as after the ban of futures contracts.

RBI (2010) studies the impact of futures trading in commodities on their spot prices is through Granger causality tests. The test relating to the sample period for which data are available indicates that futures prices have casual impact on spot prices in the case of sugar and urad. It is also observed that spot prices Granger causes futures prices in case of urad, chana, wheat and sugar. Sugar and urad seem to exhibit two-way causality between spot and futures. The test relates to a monthly data for the period of 2004 to 2009. For commodities on which ban was imposed, data for the period of 2004 to 2007 the empirical analysis, thus, does not provide any conclusive evidence in support of the relationship between spot and futures prices. Commodity prices in India seem to be influenced more by other drivers of price changes, particularly demand-supply gap in specific commodities, the degree of dependence on imports and international price movements in these commodities.

IMF (2008) finds that the short-run causality generally runs from spot and futures prices to speculation, and not vice versa. For crude oil, speculation appears to have had a significant but very small effect on futures prices. However, this has not been translated into a causal impact on spot prices. On the contrary, Gorham (1981) says high and variable rates of inflation have been partly responsible for the tremendous growth in the use of futures markets.
since many years. Generally, inflation affects the rules which govern the operations of these markets. Periods of rapid inflation also tend to be periods of highly variable differences in the price increases of individual items or commodities. On the positive side, this price uncertainty increases the demand for both the hedging and speculative opportunities afforded by futures markets. On the negative side, this price uncertainty makes it much more difficult for the exchanges to project their own operating costs (Gorham, 1981).

Sen Committee was constituted in 2007 to study whether effects of the futures trading on prices of agricultural commodities. Although in certain sensitive commodities, prices of the commodities did accelerate after introduction of futures trading but it does not necessarily follow that introduction futures trading was the causative factor.

Raizada and Sahi (2006) study the commodity futures market efficiency in India and analyse its effect on social welfare and inflation in the economy. Applying Johansen’s cointegration approach on wheat futures market from different futures forecasting horizons ranging from one week to three months, they find that commodity futures market is not efficient even in the short run and the growth in commodity futures markets volumes also has significant impact on the inflation.

Bose (2009) disagrees that futures market causes the price rise of the commodity. She put emphasis on the role participants can possibly play in the market rather than supply-demand side factor leading to the inflation. On the contrary, Working group on consumer affairs (2011), headed by Modi, suggests that futures trading on essential commodities should be kept, for the time being, out of the futures market as there is lack of strong linkages between spot and futures market.

National Commodity and Derivative Exchange (NCDEX) dismisses allegations that futures trading was causing high inflation in the country and says commodities not being traded
contributed almost three times more to the wholesale price index than those traded. NCDEX managing director PH Ravikumar says “Pricing of commodities have gone up due to stagnant productivity and supply shortfalls and to blame commodity exchanges for inflation is misplaced accusation.” Montek Singh Ahluwalia, deputy chairman of planning commission, says that commodity futures trading is not the main cause for price rise and inflation in the economy. “I don’t support the notion that futures market creates inflation. We should not look at banning futures trading as this market plays an extremely important role in price discovery. Banning futures trading will be contrary to real economic rationale,” Mr Ahluwalia avers.

B.C. Khatua, Chairman, Forward Markets Commission (FMC), has said, “futures trading has become a newfound scapegoat for price rise in commodities.” Reacting to the manufacturers demand for a ban on steel futures trading to rein in spiralling prices, Mr Khatua said, “India produces about 60 million tonnes of steel per annum, while exchanges trade just about 10-15 lac tonnes. There is no point to say that futures exchange causes price rise of commodities.

The organization of the petroleum exporting countries (OPEC) have also suggested that while geopolitical uncertainties have been a major force behind higher prices, speculation has also been a significant factor, given the organization’s accommodative supply policies and the historically high level of inventories in OECD countries. The lack of solid evidence partly reflects data and definitional problems associated with defining and measuring speculation. A price bubble is certainly a theoretical possibility and a periodic occurrence in commodity futures markets.

Due to shortage of conclusive evidence about the impact of futures market on inflation, this study makes an attempt to examine the impact of futures trading on commodity inflation.
5.3 Wholesale Price Index (WPI) in India

Prices do not remain constant in a dynamic market. Inflation rate calculated on the basis of the movement of the Wholesale Price Index (WPI) is an important measure to monitor the dynamic movement of prices. As WPI captures price movements in a most comprehensive way, it is widely used by Government, banks, industry and business circles. Important monetary and fiscal policy changes are often linked to WPI movements. Similarly, the movements of WPI serve as an important determinant, in formulation of trade, fiscal and other economic policies by the Government of India. The WPI indices are also used for the purpose of escalation clauses in the supply of raw materials, machinery and construction work.

Latest revision of WPI in India has been done by shifting base year from 1993-94 to 2004-05. A representative commodity basket comprising 676 items has been selected and weighting diagram has been derived for the new series consistent with the structure of the economy. The number of quotations selected for collecting price data for the above items are 5482. Total weight to all commodities is 100, and all commodities are divided into three major groups, i.e., primary articles, fuel & power and manufactured products. Primary articles are assigned 20.12 weight, fuel & power is assigned 14.91 where as manufactured products are assigned 64.74 weight.

As it is evident from the aforesaid discussion that the linkage between futures trading and inflation in India is still to be understood which necessitates an empirical investigation. Against this backdrop, the following section has made an attempt to examine the nexus between futures trading and inflation.
5.4 Nature and Sources of Data

To show the impact of futures trading on inflation, the study uses monthly Wholesale Price Index (WPI) from November 2006 to December 2011. WPI has three sub-components, i.e. primary articles, fuel & power and manufacturing products. Sub-component of WPI i.e. fuel & energy data is collected from RBI database and MOSPI. The study has not considered gold, silver and copper for the analysis as the weight assigned to these commodities is very minimal in WPI. The study has considered fuel & power for the analysis where crude oil and natural gas are given maximum weight (i.e. 9.36439). The nearby futures price series of crude oil and natural gas are taken for the analysis. The series is constructed by taking into account the nearby futures contract, which is a contract with the nearest active trading delivery month to the day of trading. The nearby futures contract is used because it is highly liquid and the most active. The commodities are chosen based on MCX’s world ranking in terms of number of futures contracts traded in 2011. The daily closing price of crude oil and natural gas futures data from November, 2006 to December, 2011 are collected from MCX website. Then, the study has converted daily data into the average monthly series. That data are transformed into log return form.

A subcomponent of WPI constituting fuel and power has been taken as WPI proxy for the analysis. The above subcomponent carries combined weight of 9.36. As this study concentrates on gold, copper, silver, crude oil and natural gas for studying futures commodity market in India. The study has not considered the whole WPI index for the studying nexus between futures trading and inflation. Therefore, the aforesaid subcomponent (crude oil & natural gas) have been chosen as the proxy futures trading in India. In the process, the study has attempted to examine the impact of futures trading proxy on inflation proxy.
5.6 Tools of Time Series

There has been lot of controversy in this area related to whether the recent commodity price boom has been underpinned by the rapid rise in investment in commodity futures by investors seeking to diversify their portfolios. Because the fair value of commodities is difficult to determine, the issue of whether such behaviour has driven prices away from fundamentals can be addressed through indirect approaches. One approach is to examine whether changes in commodity futures lead to changes in WPI using Granger causality test. Granger causality test has been used in examining the causal linkage between the futures trading and inflation.

The following Granger causality equations have been tested for the said explanation.

\[ F_t = \sum_{i=1}^{n} \alpha_i WPI_{t-i} + \sum_{j=1}^{n} \beta_j F_{t-j} + \varepsilon_{1t} \]

\( (5.5.1) \)

\[ WPI_t = \sum_{i=1}^{n} \gamma_i F_{t-i} + \sum_{j=1}^{n} \sigma_j WPI_{t-j} + \varepsilon_{2t} \]

\( (5.5.2) \)

Where \( F_t \) is the futures and \( WPI_t \) is the wholesale price index at period t and it assumed that disturbance terms \( \varepsilon_{1t} \) and \( \varepsilon_{2t} \) are uncorrelated. Equation (5.5.1) says futures is related to past values of itself as well as past values WPI. Similarly, equation (5.5.2) reveals WPI is related to past values of itself as well as past values of futures. There are four cases of causation. First, unidirectional causality from WPI to futures is indicated if estimated coefficients on the lagged in equation (5.5.1) are statistically different from zero as a group and the set of estimated coefficient on the lagged futures in equation (5.5.2) is not statistically different from zero. Secondly, unidirectional causality from futures to WPI exists if the set of lagged spot coefficients in (5.5.1) is not statistical significant from zero and set of lagged futures
coefficients in (5.5.2) is statistically different from zero. Thirdly, feedback, or bilateral causality, is suggested when the sets of futures and WPI coefficients are statistically significantly different from zero in both regressions. Finally, independence is suggested when the sets of futures and WPI coefficients are not statistically significant in both the regressions.

5.7 Empirical Analysis

To analyze whether futures market causes inflation, the study uses Granger causality test to crude oil futures and natural gas futures. The test results are reported in the table 5.1 for commodities. Different Lag length is selected on the basis of five major selection criteria i.e. LR, FPE, AIC, SC and HQ. In case of crude oil and WPI, we find that uni-directional causality from crude oil futures to WPI that means crude oil futures is the one of the major reasons for causing commodity inflation in India. On the contrary, in the case of natural gas futures and WPI, it is observed that uni-directional causality from WPI to natural gas futures. Moreover, Inflation often increases as per weight given to the commodities in WPI basket. From the results, it is found mix response relation between futures and inflation. Therefore, it can not strongly concluded that futures trading is the only reason that causes inflation to rise.
5.1 Granger Causality Test Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Lag</th>
<th>Null Hypothesis</th>
<th>F-statistic &amp; Prob.</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Oil Futures &amp; WPI</td>
<td>6</td>
<td>WPI does not Granger Cause Crude Oil Futures</td>
<td>1.25 (0.29)</td>
<td>Uni-direct.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crude Oil Futures does not Granger Cause WPI</td>
<td>4.49 (0.00)</td>
<td></td>
</tr>
<tr>
<td>Natural Gas Futures &amp; WPI</td>
<td>5</td>
<td>WPI does not Granger Cause Natural Gas Futures</td>
<td>4.18 (0.003)</td>
<td>Uni-direct.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Natural Gas Futures does not Granger Cause WPI</td>
<td>1.90 (0.11)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Probability values in parenthesis

5.4 Conclusion

Analysing individual commodity, it is found crude oil futures causes inflation where natural gas futures does not cause inflation but natural gas futures can be used as inflation hedge. The study concludes that individual commodity futures trading can be blamed for causing inflation but not the whole futures market. Moreover, whether futures trading causes inflation depends on the weight assigned to the commodities in WPI basket. If a commodity is assigned more weight in WPI than the possibility of commodity futures trading causes inflation will be more. In addition, futures trading alone cannot be blamed for causing inflation in India. There are several other factors such as welfare schemes introduced by Government of India, supply shocks, economic and political instability in developed as well as developing countries could be the cause of inflation in India. The study suggests that there is need for further investigation to understand inflation dynamics in India.