Chapter-5

POSSIBILITY OF CARTEL BETWEEN SMALL CAPITAL TRADERS
AND LARGE CAPITAL TRADERS UNDER CHANGING RETAIL AND
WHOLESALE TRADE IN INDIA

5.0 Introduction:
In this chapter we have tried to show that how a strategic move from large capital or corporate traders of agriculture commodities including retailers, wholesalers, and others is affecting and changing the preferences of small capital local traders of agriculture commodities in the market than before when only small capital traders were present and large capital or corporate traders were not allowed to enter. With this changing preferences of SCTs (small capital traders) and strategic move or preferences of LCTs (large capital or corporate traders), here it has been tried to show the possible conditions of cartel between SCTs and LCTs. The Indian market was reformed for domestic large capital or corporate traders including retailers, wholesalers, exporters and importers, food processing firms etc... 100% “Foreign Direct Investment (FDI)” in cash and carry has been opened since 2006 with automatic route and in the single-brand retail market by 2012. Though reforms for multi-brand retail not yet been taken, domestic corporate traders are allowed with collaboration of foreign firms of multi brand in nature. When only small capital traders (SCTs) are there then agriculture sector has to depend only on large competitive traders. As they are competitive firm, so farmers are getting less. On the other hand, if there are only large capital traders (LCTs) in the market then a chance of controlling price offered to farmer or monopoly and /or oligopoly pricing can be happened. In this chapter, we have been pointed out some strategic notions regarding the possible condition of cartel between SCTs and LCTs.
5.1 Theoretical analysis:

Let there are three agent groups in the market which can be identified as viz. N={123}; where player 1 is the Large capital traders (LCTs) including retailers, wholesalers, and other including food processing firms etc., player 2 is the farmers (f) and player 3 is the Small capital traders (SCTs) including wholesalers, and other including food processing firms etc.. The business is like that traders (both LCTs & SCTs) use to collect agricultural commodities including food grains and vegetables and pay the wholesale price to the farmers and after adding some margin to wholesale price i.e. Maximum consumer retail price (MCRP) = (farmer’s margin + margin of intermediaries), sold to the ultimate consumer. Here it is assumed that those farmers who are unable to reach all the markets to sell the produce to the ultimate consumer, they have to depend upon traders (viz. wholesaler, retailer and other forms of traders). The traders are always tried to minimize wholesale price so that their margin can be maximized and on the other hand farmers are tried to increase the wholesale price. For simplicity here, we have not mentioned all the intermediaries in between primary producer and ultimate consumer. A study by Global AgriSystems of fruits and vegetables supply chain in four metros in India viz. Delhi, Mumbai, Bangalore and Kolkata showed that there are at least five to six intermediaries between primary producer and consumer. The intermediaries are, primary producers, transportation cost, village level trader, aggregator, sub wholesaler, retailer. The study showed that, the total margin by all this intermediaries are, retailers-25%, sub wholesaler-6%, wholesaler-10%, aggregator-8%, village level trader-10%, transportation cost-10% and primary producer or grower-25% respectively.
The study showed that primary producer gets only 20% to 25% of the consumer price (15). In our chapter here for simplicity we have denoted all these intermediaries’ margin into the term “margin of intermediaries” and not segregated in different terms as from the farmers point of view they use to know only village level traders at the time of sale of their produce and loose much share of maximum consumer retail price (or MCRP). So all this intermediaries try to maximize their margin and try to minimize wholesale price get by the farmers. Here I assume that if intermediaries were few such that share of farmer will be higher. Hence, share of farmer is dependent much on the industrial organization among intermediaries i.e. size of intermediaries, competition, market share, market access power in the overseas, exportability etc... There was an in-depth study by (Porto, Chauvin, & Olarreaga, 2011) in this regard.

Now we will discuss about the preferences of SCTs and the LCTs. If we can understand about the preferences of SCTs and LCTs then we will be able to answer the question that in the long run cartel between SCTs and LCTs are possible or not and if possible then to what extent. This question is important as if in the long run complete cartel is possible then the farmer must loose share on MCRP (maximum consumer retail price) and the situation will be much worsening than before when LCTs were not allowed. We know from the theory of industrial organization that a cartel is possible when the parties involving in making cartel are under the same preferences domain. If preferences differ by one party then cartel will not be possible (Tirole, 2007), (Sen A., 2007), (Osborne & Rubinstein, Bargaining and Markets, 2005). So let first understand the preferences of LCTs and SCTs.

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(15) A study by global AgriSystems of fruits and vegetables supply chains in four metros-Delhi, Mumbai, Bangalore and Kolkata, published at the newspaper, The Times of India, Kolkata under the article named “Direct sourcing thrives in Bengal” dated, Wednesday, September 11, 2013. The study report was published at this newspaper.
5.2.1 **Preferences of LCTs (large capital or corporate traders):**

The large capital or corporate traders (both domestic and foreign) including retailers, wholesalers, exporters and importers, food processing firms etc. and others operate internationally and tried to create a loyal consumer groups for themselves. They actually maintain a standard in terms of quality products, efficient consumer service especially after sale service and others internationally where they are doing their business. Therefore, they always try to maintain in collecting quality produce from the farmer and pay higher price for that. In West Bengal, only one firm of 100% FDI in cash carry (wholesale) market is operating with other domestic or Indian firms with indirect collaborations of foreign firms. All types of large capital agriculture trading firms do prefer quality produce and collect only quality produce. Farm produce are not always up to the standard specified by these corporate firms. The corporate firms use to collect only quality or standard produce from the farmer and reluctant to accept non standard or below quality produce, for example, to produce potato chips the chips making firms use a standard size of potato which can be used in machine, this is a technical constraint and push the farmer to use the specified quality seed in producing potato which is very soft and required more caution by the farmer at the time of cultivation, this is quality constraint. Another example is that to maintain the mobility in the world market or to maintain sell worldwide the corporate retail and wholesale traders use an international standard of quality produce. So many times farmers are not being able to meet this technical and / or quality standard set by the corporate traders and farmers able to sell very minimal quantity of produce, as per survey from North-24th pargana district, West Bengal, India, farmers are able to sell only 30% to 33% produce to the corporate firms. Corporate firms employed some agents to collect rest through personal interaction with farmers and through participating at the local rural markets. Here
existing infrastructure or local traders including intermediaries are mainly used as agent. These are also included in the small capital traders group. After having collecting the local traders sell to the corporate traders with accepting an agent commission and/or with some margin. The corporate traders pay much higher price for the quality produce but the farmers use to prefer to sell the produce at a time if they would get a moderate price for the entire produce. So farmers use to sell to the local traders at a moderate price, which is higher than before when corporate traders were not present. At North 24th pargana district, West Bengal, India, three corporate firms including one 100% FDI in cash and carry trade are operating. These are Reliance, Keventer Agro and Metro Cash And Carry. Metro Cash and Carry is the only 100% FDI in West Bengal in the wholesale market and others are domestic and collaborated with foreign firms through indirect control. As per information Metro cash and carry only operating through their collection centre at North 24th pargana district and for the rest districts they dependent and/or intervene in the local wholesale markets. The same thing is true for the other two companies though Keventer Agro also collects from the farmer cooperatives from Nadia and Mursidabad districts and buys from there (Nadia and Mursidabad districts) wholesale markets. Therefore, there are dual behaviours by the corporate firms, one collecting directly from the farmer without participating or low degrees of participation at the local wholesale markets and second, only participate at the local wholesale markets for the collection of agriculture produce.

5.2.2 Preferences of SCTs (small capital traders):

Small capital traders on the other hand are local in nature and hardly participate in the international market. Their main customers are the city competitive retail markets for example in Kolkata Sealdah market, Manictala market, Garia market, Hatibagan market etc. and do not maintain any qualitative standard(or constraint) like LCTs. As SCTs were previously present in
the market, they have their own market share. As after the presence of LCTs, they always will try to keep their market share intact. They have always feared of being crowding out from the market. LCTs use to prefer in collecting bulk, sell in bulk to the large capital retailer and food processing firms, and intervene in the international market.

As we have noticed in the previous section that LCTs use to buy only quality or standard produce set by them from the farmer and are paying price accordingly higher than SCTs but they reluctant to buy non standard produce (these qualitative constraints are witnessed in other countries by the behaviour of Wal-Mart which I have cited at the literature review chapter (Basker & Emek, 2007) (Basker & Van, 2008)). So farmers are not found profitable to sell them (i.e. LCTs) only quality produce, which we have discussed. Here is the gape which the SCTs are trying to grab and now they have become more risk averter and offering little bit higher price (moderate price) than before and as they were previously buying entire produce from the farmer now also they are buying entire produce and paying higher than before when LCTs were not present.

Therefore, preferences of LCTs and SCTs are different and the strategic move or preferences by the LCTs are affecting the preferences of SCTs. The SCTs are changing their preferences due to the presence of qualitative and technical constraints set by LCTs.

So in brief, we can say that LCTs are more risk taker, as they are able to fix the qualitative and technical constraints. SCTs now will become more risk averter than before when LCTs were not allowed in the trading market. So in the long run if LCTs can remove or being able to abolish their qualitative and technical constraints, then the SCTs must exit and enter into or create a cartel with the LCTs and number will also be reduced. As per information from survey at North 24th pargana district, West Bengal, India, farmers are able to sell only 30% to 33% produce to the
corporate firms. Corporate firms have employed some agents to collect rest through personal interaction with farmers. These agents are nothing but SCTs. So at the present scenario cartel between LCTs and SCTs are limited with only 30% to 33% produce.

5.3 The Model:

Based on above findings now we are going to present the matter theoretically with the help of Nash bargaining solution where if we divide the agents like producers(farmers) and the traders (SCTs and LCTs) as we have explained above then the Nash bargaining solution between them is to split evenly or ½ to each of them over total gain from trade fulfilling all the axioms given by Nash are, INV (Invariance to equivalent Utility Representations), SYM (Symmetry), IIA (Independence of irrelevant alternatives), PAR (Pareto efficiency). The literature and the theory is based on the research article by Nash (Nash, 1950a) and the role of risk aversion studied in the books of “Bargaining and Markets” by Osborne & Rubinstein (Osborne & Rubinstein, Bargaining and Markets, 2005).

The model is based on the following assumptions.

Assumptions:

The model is the extension and based on the theory of role of risk aversion studied in the book of “Bargaining and markets” (Osborne & Rubinstein, Bargaining and Markets, 2005)

(1) The model is based on the Nash bargaining solution and the role of risk aversion.

(2) The theoretical base of the model is the outcome of survey at the North-24th pargana district, West Bengal, India where three corporate firms are doing their business and intervene in the rural market.
(3) The entire interpretations are based on the survey at the North-24th pargana district, West Bengal, India that where the corporate firms including one 100% FDI firm is collecting agricultural commodities through their collection centre directly from the farmer.

(4) The effect of fluctuations in the farmers and intermediaries share due to fluctuations from different price behaviour over time is ignored here say for example retail price, international price and other effecting variables.

(5) Here all types of taxes and subsidies are ignored for simplicity.

(6) Inter linkages of other factors like market of land, labour & capital in the rural economy have not considered here.

(7) Influences of demand side in the model are not considered here.

Let, FM denotes farmer’s margin, MCRP denotes maximum consumer retail price, and IM denotes that intermediary’s margin. With this terms let Z be the share of farmer on maximum consumer retail price (MCRP) and (1-Z) is denoted the share of traders (or intermediaries) on maximum consumer retail price (MCRP). Total share of farmer and trader is \( Z + (1-Z) = 1 \).

\[
\text{So, } Z = \frac{FM}{MCRP}
\]

Or, \( Z = \frac{FM}{FM + IM} \) (Where, MCRP=FM+IM) \------------------------------- (1)

And the share of traders (or intermediaries) on maximum consumer retail price is

\[
(1-Z) = \frac{IM}{MCRP}
\]
Or, \((1-Z) = \frac{IM}{FM + IM}\) \hspace{1cm} \text{(2)}

From equation (1) it can be said that, if farmer’s share FM will close to MCRP i.e. when farmer will be able to sell directly to the ultimate consumer then the degree of Z will close to or exact to 1, and if FM will close to zero i.e. when farmer will consume entire produce and nothing will be sold to the market then degree of Z will close to zero or exact to zero. In the same way reverse is true for intermediaries i.e. if IM is approaching to zero or equal to zero then degree of \((1-z)\) will be decreasing to or exact to zero and if IM is approaching to or exact to MCRP then \((1-Z)\) will be approaching to or exact to 1. These extreme cases are almost not happened in the real life situation. With this framework, we are going to present our analysis here by enumerating in detail the strategic move by traders and farmer individually. The strategic move which will keep the market with higher bargaining power in the hands of farmer than before, balanced size of the intermediaries, competition among them and relatively fare division of market share among the producer and the intermediaries. If we divide the agents like producers and the intermediaries as have explained above then the Nash bargaining solution between them is \(\frac{1}{2}\) to each of them over 1 fulfilling all the axioms given by Nash are, INV (Invariance to equivalent Utility Representations), SYM (Symmetry), IIA (Independence of irrelevant alternatives), PAR (Pareto efficiency), (Nash, 1950a). Here in this chapter we have tried to show how the solution of farmer is achieving or approaching close to or equal to \(\frac{1}{2}\) irrespective of share of intermediaries (collectively rest share are for intermediaries). In reality, this (Nash solution of share 1/2 to each agent) is not happening. Here we are not giving much importance that this \(\frac{1}{2}\) share for farmer is justified or not and same argument for intermediaries also but have tried to show how the share can close to \(\frac{1}{2}\) for farmer. In practical \(\frac{1}{2}\) may not happen but the situation must improve then before when LCTs were not allowed and the share will be very closer to \(\frac{1}{2}\) and this change of
share is due to the change of preferences of SCTs after the presence of LCTs in the rural wholesale trading market of agricultural commodities.

**Step: 1**

Let the farmers are producing and selling to the competing intermediaries (i.e. SCTs) as discussed initially and denoted them as SCTs. This is a real life situation in India. As SCT are competing in nature so let, all are under same risk preference group and farmers are under same risk preference group but different from SCTs. SCTs are relatively more risk taker than farmers are and farmers are risk averters. Let $u_2$ be the utility function of farmers ($f$) and $u_3$ be the utility function of SCTs and $f$ always try to maximize $Z$ and SCTs will try to maximize $(1-Z)$ where $Z$ defined initially. Therefore, the solution is $Z_0$ to the problem,

$$\max_{0 \leq z \leq 1} u_2(Z) u_3 (1-Z) \quad \text{--------------------------- (3)}$$

Differentiating equation (3) with respect to $Z$ and setting equal to zero we have,

$$\frac{u_2'(z)}{u_2(z)} = \frac{u_3'(1-z)}{u_3(1-z)} \quad \text{--------------------------- (4)}$$

The left hand side of the equation (4) is decreasing in $Z$ and the right hand side is increasing in $Z$. The left hand side term $u_2'$ is marginal utility function and $u_2$ is the utility function (or total utility function). As $Z$ is rising, the term $u_2$ is also rising but marginal utility term $u_2'$ is decreasing so the left hand side of the equation (4) is decreasing in $Z$ and the reverse is true for the right hand side. As $Z$ is rising, then $(1-Z)$ is decreasing so the utility term $u_3(1-Z)$ is
decreasing and marginal utility term $\frac{\partial u_i}{\partial (1-Z)}$ is increasing so the right hand term is increasing in $Z$.

Figure: 5.1

Hence, from the figure- 5.1 it is clear that Nash solution satisfying four axioms viz. SYM, PAR, INV, and IIA is at $\frac{1}{2}$ and the solution here is at $Z_u$ and far away from $\frac{1}{2}$ i.e. $Z_u < \frac{1}{2}$. According to Nash solution and the role of risk aversion if player 2(here farmer) becomes more risk-averse, then player 3’s (here SCTs) share of the $(1-Z)$ in the Nash solution increases and player 2’s share of the $(Z)$ in the Nash solution decreases (Osborne & Rubinstein, Bargaining and Markets, 2005). This is why the solution is at $Z_u < \frac{1}{2}$ as farmer are more risk averse than SCT.
**Step: 2**

Now let in this situation LCTs have come in to existence in the trading market. As Government of India have been allowing domestic multi brand retailers and whole sellers of large capital including 100% FDI in nature in the trading market. It was clear before that LCTs are more risk taker than SCTs and SCTs are relatively risk taker than farmer (f). So let $u_1$, be the utility function of LCTs and after the presence of them in the market the Nash solution of bargaining problem between the LCTs and F as below.

Let $Z_W$ be the solution of the problem

$$\max_{0\leq z\leq 1} u_2(Z) u_1(1-Z) \quad \text{---------------------------------------------- (5)}$$

Differentiating equation (5) with respect to $Z$ and setting equal to zero we have,

$$\frac{u_2'(z)}{u_2(z)} = \frac{u_1'(1-z)}{u_1(1-z)} \quad \text{---------------------------------------------- (6)}$$

If equation (5) can be putted into figure-5.1 then the new figure would be as in the new figure- 5.2.
Hence, from figure- 5.2 it is clear that bargaining between LCTs and F will lead to the solution to $Z_W$, which is far away from $\frac{1}{2}$ and less than $Z_u$ i.e. $Z_W < Z_u < \frac{1}{2}$. The risk preferences of SCTs and LCTs are different. LCTs use to collect only specified quality produce, pay higher price than SCTs, and refuse to buy rest non-standard produce. They (LCTs) are not regional in nature but international and more is the ability to take risk of collecting only specified quality produce worldwide. However, SCTs are relatively risk averter than LCTs. As LCTs are monopolistic, in some cases oligopolistic and international in nature and SCTs are competitive, and are regional in nature so to gain more the SCTs need to collect more produce at lower price and accordingly gain the market share. So SCTs use to collect all the produce without maintaining any standard and pay moderate price to the farmer. This moderate price is relatively lower than what LCTs offer to the farmer. After the presence of LCTs, the SCTs will feel risky as LCT collect only quality produce and pay high price in the bumper crop time. Therefore, there will be a chance of losing market share due to not having of quality produce, as there will be a chance of selling
quality produce to the LCTs at higher price by the farmer. To maintain market share the SCTs will also try to pay not exact but a price close to that price which is paid by the LCTs to the farmer and collect all the produce from the farmer. A survey from North-24th pargana district, West Bengal, India where I have found the fact that the firms (LCTs) like Reliance, Metro cash and carry Keventer Agro use to collect only quality or a minimum specified standard commodities (fruits and vegetables) at a higher price from farmers. Small capital traders (SCTs) are now paying higher price to the farmer due to the presence of LCTs in that village where these LCTs are operating. As from the farmers’ point of view, farmer can sell more to SCTs and less to LCTs because due to the presence of LCTs, SCTs are paying more than before and collecting entire farm produce from the farmer. Hence it is clear that due to presence of LCTs, SCTs will become more risk averse than before so that they can collect maximum produce according to their ability and pay higher than before so that farmers will be ready to sell them (SCTs) only. As SCTs become more risk averse then their preferences which formally were represented by \( u_3 \), can be represented by \( v_3 = h \circ u_3 \) where, \( h: R \to R \) is an increasing concave function with \( h(0) = 0 \). Farmers preferences remain unchanged defined as \( V_2 = u_2 \). Let the bargaining problem for the new situation, in which the utility functions of the players are \( V_2, V_3 \). If \( u_2, u_3 \) and \( h \) are differentiable and the \( Z \), is the solution of the problem,

\[
\max_{0 \leq Z \leq 1} v_2(Z) v_3 (1-Z) \quad \mathrm{--------------------------} (7)
\]

Or,

\[
\max_{0 \leq Z \leq 1} u_2(Z) h (u_3 (1-Z)) \quad \mathrm{--------------------------} (8)
\]

Differentiating equation (8) with respect to \( Z \) and setting equal to zero we have,
Hence incorporating equation (9) into figure- 5.2, we have modified figure- 5.3

\[
\frac{\frac{u'_2(z)}{u_2(z)}}{\frac{V'_2(Z)}{V_2(Z)}} = \frac{\frac{h'(u_3(1-z)) u'_3(1-z)}{h(u_3(1-z))}}{h'(u_3(1-z)) u'_3(1-z)}
\] (9)

Figure: 5.3
From the figure- 5.3 it is clear that after the presence of LCTs in the market SCTs will be more risk averse than before and must be shifted rightward to any place up to ½ point. Let equilibrium is at point G in the bargaining process between farmer (f) and small capital traders (SCTs). At this point the share of farmer and SCTs are ½ respectively i.e. Nash solution maintaining four axioms viz. SYM, PAR, ANV, IIA. Now the question is that what would be the bargaining solution between farmer (f) and LCT?

After the presence of LCTs, SCTs will become more risk averse and competitive with LCTs. Therefore, equilibrium in between f and SCTs will be at point G and equilibrium in between f and LCTs will be at point K (from figure-5.3). This is so as f will be more risk taker in the bargaining process with LCTs now when SCTs are paying more and collecting all the produce.
without maintaining any standard after the presence of LCTs in the market. So let $V_1 = u_1 = \text{utility function of LCTs}$ and $V_2 = \text{new utility function of farmer (f)}$ when bargain with LCTs after the change of preferences (or utility) of SCTs. Where function $V_2$ is more risk taker than $u_2$. Let $Z_v$, is the solution of the problem

$$\max_{0 \leq Z \leq 1} V_2(Z) v_1 (1-Z)$$

(10)

Or,

$$\max_{0 \leq Z \leq 1} V_2(Z) u_1 (1-Z)$$

(11)

Differentiating equation (11) with respect to $Z$ and setting equal to zero we have,

$$\frac{V_2'(Z)}{V_2(Z)} = \frac{u'_1(1-Z)}{u_1(1-Z)}$$

(12)

Hence it can be said by the equations (9) and (12) that farmer when bargain with SCTs then act as risk averter and when bargain with LCTs then act as risk taker. In the same way, it also can be said that SCTs will act as risk averter and pay more to the farmer and LCTs will act as risk natural as before as they are international in nature, collect maintaining quality constraints, and pay more than SCTs to the farmer as we can see from the figure- 5.3 in detail. Hence, we can see that figure- 5.3 offering the result that farmer are getting $\frac{1}{2}$ of $Z$ and getting more with the presence of both SCTs and LCTs in the market. The main condition for farmer’s gain is that both LCTs and SCTs must be in the market and rightly mixed so that farmer’s capacity can be enhanced under the changing market. From figure- 5.3, the equilibrium is not always at $G$ but depends on the production level and other externality also (market demand, international shocks etc...). However, the equilibrium will vary in between the point $E$ and $G$ but not at $E$ with the presence of LCT i.e. $E < \text{(equilibrium point)} \leq G$, where (equilibrium point) is the solution. The
realistic solution is discussed in figure-5.4 i.e. the solution or the equilibrium point is not at point E but right of E and also not at exact G but close to G (where G is the Nash solution point 1/2). Here the equilibrium points are H between the interaction of $f$ and SCTs and point L between the interaction of $f$ and LCTs. Based on this theoretical analysis it is clear that as interactions among farmers ($f$), SCTs and LCTs the farmers must prefer to sell entire produce to the SCTs if they will have got little bit lower but moderate price than price offered by LCTs. In addition, this moderate price is higher than before when LCTs were not present. Farmers do this as LCTs use to reluctant to accept all the produce and ready to pay higher price for standard or quality produce only fix by themselves (LCTs) and due to this behaviour the SCTs are also changed their preferences and become more risk averse than before. This theoretical behaviour we have discussed below with the empirical evidence.

5.4 Empirical evidence:

The empirical analysis which has been discussed here is based on the empirical study has done in the previous chapter. Here we have presented some points again so that the matter can be understood clearly. The Indian market also reformed for domestic large capital or corporate traders including retailers, wholesalers, exporters and importers, food processing firms etc... 100% Foreign Direct Investment (FDI) in cash and carry has been opened science 2006 with automatic route and in the single-brand retail market by 2012. Reforms for Multi-brand retail not yet been taken. At North 24th pargana district, West Bengal, India, three corporate firms including one 100% FDI in cash and carry trade are operating. These are Reliance Fresh, Keventer Agro and Metro Cash and Carry. Metro Cash And Carry is the only 100% FDI in West Bengal in the wholesale market and others are domestic and collaborated with foreign firms through indirect control.
Figure: 5.5- LN AWSP-NORTH-24th PARGANA (Gaussian kernel)

Figure: 5.6- LN AWSP-NORTH-24th PARGANA (Epanechnikov Kernel)
Figure: 5.7- LN AWSP-COMBINED WEST BENGAL AVERAGE (Gaussian kernel)

Figure: 5.8- LN AWSP-COMBINED WEST BENGAL AVERAGE (Epanechnikov Kernel)
At figure- 5.5 and 5.6, we have derived the kernel density functions of Gaussian Kernel and Epanechnikov Kernel based on average wholesale price of potato of North-24th pargana district after taking the natural logarithm on the average district weekly wholesale price of potato from January 2006 to October 2013. To investigate district wise I have chosen vegetable potato and have calculated these two types of kernel as two are different in the compact support. From the figures- 5.5 & 5.6 it can be seen that at North-24th pargana district the kernel density curves though depart significantly at little bit higher price point 6 with density close to 1 but at moderate price (i.e. mean or little bit higher than mean price) point 6.5 density is very close to 1.5 and departs highly significantly from the red and gold normal and t curves. In addition, for other districts (from figure- 5.7 & 5.8) the density at point 6.5 is very lower from 1.5 and close to 1 or below. Here normal and t curves are same as for higher degree of freedom the t distribution approaches toward normal distribution. From figure-5.7 and 5.8, we can see that if we take combined all the districts in West Bengal then this picture is not present there. The kernel curve departs significantly from normal and t curves for left tail or lower price point lower than 6 and did not depart significantly at price point 6.5. Therefore, the data also support that the market wholesale price of potato at North-24th pargana district has at high density of moderate price point and farmers are selling much produce at the moderate price to the local small capital traders. The kernel density function (blue curve from figure-5.5 and 5. 6) of north 24th pargana district showing that after point 7 the curve also departs significantly from the normal and t curves (the red and gold deep line). Therefore, likelihood of higher price is also there. As per survey from North-24 pargana district, West Bengal, India, farmers are able to sell only 30% to 33% produce to the corporate firms and rest are sold to the local small capital traders.
5.5 **Conclusions:**

When LCTs were allowed in the trading market it was expected that they would buy in bulk from the farmer and a direct relationship will be established between LCTs, farmer, and all the intermediaries or so called SCTs will be crowding out from the market. This was the fear expecting by the SCTs. But in reality as LCTs use to maintain a qualitative and technical constraints in collecting agricultural commodities though paying much higher price so the direct relationship did not become 100% but depends on the percentage of quality produce which according to survey data I have found that 30%-33% of the total produce of that district. So after selling only 30% to 33% to the LCTs rest becomes unsold so farmers also do search those traders who will buy entire produce with lower price than LCTs but moderate market price. Now to be in the market SCTs are trying to grab this opportunity and collecting entire produce from the farmer and selling both to the LCTs and to their existing market say retail markets of city or town like Kolkata etc. However, the price, which SCTs are paying to farmer, is higher than before when LCTs were not allowed in the trading market. Data also showing high degree of concentration at the market moderate price in the districts where LCTs are operating through their collection centre. From the above analysis, it is clear that the preferences of SCTs are dependent upon the preferences of LCTs. There are no chances of complete cartel between SCTs and LCTs in the short run and in the long run, the cartel depends on the preferences of LCTs regarding the collection constraints (as LCTs prefers to collect only a specified standard or quality produce). These sorts of preferences of LCTs and SCTs are enabling the farmers to reap greater gain than before when LCTs were not present.